BEFORE THE
ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: PETITION OF SOUTHERN ILLINOIS POWER COOPERATIVE FOR AN ADJUSTED STANDARD FROM 35 ILL. ADMIN. CODE PART 845 OR, IN THE ALTERNATIVE, A FINDING OF INAPPLICABILITY	AS 2021-006 (Adjusted Standard)

NOTICE OF FILING

To: Don Brown, Clerk of the Board
Illinois Pollution Control Board
60 E. Van Buren St., Ste 630
Chicago, Illinois 60605

Carol Webb, Hearing Officer
Illinois Pollution Control Board
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Illinois Environmental Protection Agency
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Springfield, Illinois 62794

PLEASE TAKE NOTICE that I have today filed with the Office of the Clerk of the Pollution Control Board the attached Second Amended Petition of Southern Illinois Power Cooperative for an Adjusted Standard from 35 Ill. Admin. Code Part 845 and a Finding of Inapplicability, an Entry of Appearance, and a Certificate of Service, copies of which are herewith served upon you.

Respectfully Submitted,

SOUTHERN ILLINOIS POWER COORPERATION

/s/ *Sarah L. Lode*

Dated: December 20, 2024

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CERTIFICATE OF SERVICE

I, the undersigned, certify that on this day of:

I have electronically served a true and correct copy of the attached SECOND AMENDED PETITION OF SOUTHERN ILLINOIS POWER COOPERATIVE FOR AN ADJUSTED STANDARD FROM 35 ILL. ADM. CODE PART 845 AND A FINDING OF INAPPLICABILITY and AN ENTRY OF APPEARANCE by electronically filing with the Clerk of the Illinois Pollution Control Board and by e-mail upon the following persons:

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My e-mail address is Sarah.Lode@afslaw.com;

The number of pages in the e-mail transmission is 407.

The e-mail transmission took place before 5:00 p.m.

/s/ *Sarah L. Lode*

Dated: December 20, 2024

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APPEARANCE OF SARAH L. LODE
AND CONSENT TO E-MAIL SERVICE

I, Sarah L. Lode, hereby enter my appearance on behalf of SOUTHERN ILLINOIS POWER COOPERATIVE. I authorize the service of documents on me by email in lieu of receiving paper documents in the above-captioned proceeding. My email address to receive service is as follows: Sarah.Lode@afslaw.com.

/s/ Sarah L. Lode
Sarah L. Lode

Dated: December 20, 2024

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BEFORE THE
ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: PETITION OF SOUTHERN ILLINOIS POWER COOPERATIVE FOR AN ADJUSTED STANDARD FROM 35 ILL. ADMIN. CODE PART 845 OR, IN THE ALTERNATIVE, A FINDING OF INAPPLICABILITY	AS 2021-006 (Adjusted Standard)

SECOND AMENDED PETITION FOR AN ADJUSTED STANDARD FROM 35 ILL. ADMIN. CODE PART 845 AND A FINDING OF INAPPLICABILITY

Submitted on behalf of
Southern Illinois Power Cooperative

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I. INTRODUCTION

This Second Amended Petition for an Adjusted Standard ("Petition") concerns eight existing and former ponds located at Southern Illinois Power Cooperative's ("SIPC's") Marion Generating Station ("Marion Station") in Williamson County, Illinois. These ponds are as follows: Pond 3 (including Pond 3A), Pond 4, former Pond B-3, South Fly Ash Pond, Pond 6 (together the "De Minimis Units"), the Initial Fly Ash Holding Area, the former Replacement Fly Ash Holding Area, and the former Fly Ash Holding Area Extension (together the "Former Fly Ash Holding Units").[1] This Second Amended Petition also addresses a unit known as the Former Landfill Unit, located on top portions of the Former Fly Ash Holding Units.

This Second Amended Petition amends the Amended Petition for Adjusted Standard filed by SIPC on September 2, 2021. The Amended Petition reflected the results of a Pond Investigation Report for Certain Ponds at SIPC's Marion Station ("Pond Investigation Rep.") (Ex. 29),[2] the Updated Opinion of Lisa Bradley ("Updated Bradley Op.") (Updated Ex. 28), and the Supplemental Declaration of Kenneth W. Liss ("Supp. Liss Dec.") (Ex. 30). A redline comparison showing changes made since the initial Petition was attached as Exhibit 31. This Second Amended Petition reflects an updated proposed adjusted standard, a Human Health and Ecological Risk Assessment from Gradient Corporation (Ex. 37), the Expert Opinion of Andrew Bittner setting

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[1] The De Minimis Units and the Former Fly Ash Holding Units are depicted on the Site Map prepared by Andrews Engineering for SIPC (May 2021) ("Site Map"), Ex. 3.

[2] For Exhibit 29, the Pond Investigation Report, SIPC attached to the electronically filed version of the Amended Petition only the Report itself and not the appendices, as they are several hundred pages long. Those appendices were being transmitted separately to the Board and to IEPA. *See* Pond Investigation Rep., Ex. 29.

forth a closure impact assessment for Pond 4 (Ex. 38), and the Expert Opinion of Ari Lewis regarding the De Minimis Units (Ex. 36).[3]

As discussed herein, neither the De Minimis Units nor the Former Fly Ash Holding Units are regulated "CCR surface impoundments" for purposes of Illinois's Standards for the Disposal of Coal Combustion Residuals ("Part 845"). Nor are they CCR surface impoundments regulated by the federal CCR regulations upon which Part 845 was based. None of these former or current ponds pose the types of risks to the environment and human health that federal and state CCR regulations aim to address. In fact, they fall into categories of units that were intended to be excluded from the definition of CCR surface impoundment. Indeed, some of the ponds at issue closed decades ago and have not contained water since then, some are secondary and tertiary finishing ponds containing *de minimis* amounts of CCR, and one had any water and CCR removed years ago. Nevertheless, the Illinois Environmental Protection Agency ("IEPA") has so far taken the incorrect position that all eight current and former ponds, and the Former Landfill Area, are covered by Part 845.

Compliance with Part 845 is plainly not required for the units at issue, which do not fall under the definition of "CCR surface impoundment" and therefore are not covered by Part 845. However, to the extent the Illinois Pollution Control Board (the "Board") finds that any of the units at issue are regulated CCR surface impoundments (they are not), an adjusted standard is warranted because they differ from the surface impoundments the Board targeted for regulation under Part 845 and the units at issue pose minimal—if any—risk to human health and the environment. The

[3] SIPC has attached only new (beginning with Exhibit 32) or updated (labeled "Second Amended Pet. Updated Ex. ___") exhibits to this Petition. All other exhibits referred to within are attached to SIPC's initial or Amended Petition, as the case may be.

updated adjusted standard proposed in this Second Amended Petition will not result in any adverse impact to health or the environment while allowing for adjustments based on the units' unique characteristics.

Accordingly, for the reasons set forth herein, SIPC respectfully requests that the Board issue a finding of inapplicability with respect to the current and former ponds at issue or, in the alternative, an adjusted standard as set forth in Appendix A to this Second Amended Petition.

II. FACTUAL AND PROCEDURAL BACKGROUND.[4]

A. Nature of Petitioner's Activity and General Plant Description

Marion Station is a gas and coal-fired power plant located approximately seven miles south of the City of Marion in Williamson County, Illinois. *See* Site Map, Ex. 3. Marion Station currently consists of one operating coal-fired unit (Unit 123), with a nominal capacity of 1402 Metric Million British Thermal Units per hour ("mmBtu/hr"), and two additional gas-fired combined-cycle units (Units 5 and 6).

Unit 123 was constructed in the early 2000s, repowering the existing steam turbine that had been powered by retired Units 1, 2, and 3. Units 1, 2, and 3 were 33-megawatt ("MW") coal-fired cyclone generating units constructed in the 1960s. An additional 173 MW coal-fired unit (Unit 4) came online in 1978. Unit 4 shut down permanently in October 2020. A 109 MW circulating fluidized bed boiler provides steam to generating Unit 123. The two gas-fired simple-cycle units (Units 5 and 6) are nominally rated at 969 mmBtu/hr each (dependent upon ambient air temperature). Marion Station uses Illinois basin bituminous coal for Unit 123. Since 1978,

[4] The Declarations of Wendell Watson (Second Amended Pet. Updated Ex. 1) and Todd Gallenbach (Updated Ex. 2) are provided in support of facts stated herein regarding Marion Station and the current and former ponds at issue. SIPC's investigation into the facts set forth herein is ongoing, and SIPC reserves the right to further supplement or amend its Second Amended Petition to reflect receipt of new or additional information.

SIPC also has burned more than ten million tons of mine waste, helping to clean up many abandoned mines.

SIPC owns 4,674 acres around Marion Station and employs seventy-seven people. Nearby Lake of Egypt (the "Lake") was constructed in 1963 to provide cooling water for the Station's coal-fired generating units. The Lake provides some local public water supply and is also used for recreational purposes, such as boating and fishing. The local water authority periodically tests the Lake water for public use. *See, e.g.*, Lake Egypt Water District IL 1995200, Annual Drinking Water Quality Report (Jan. 1–Dec. 30, 2019), Ex. 4. SIPC owns several parcels bordering the plant property. Other nearby land uses include agricultural and recreational use, including a golf course and a country club. Shawnee National Forest is located approximately fifteen miles to the south of Marion Station. The closest identified potential groundwater well is at the Lake of Egypt Country Club, located more than 2,000 feet away from any pond at issue in this proceeding. That well is up gradient from the Station's pond system.

B. <u>CCR Management at Marion Station.</u>

Coal combustion residuals ("CCR") are a byproduct of the coal-fired power generation process. Currently, only Unit 123 generates CCR (in the form of ash) at the Station. The majority of CCR generated from Unit 123 is handled dry and used for mine reclamation beneficial use off-site and a portion is sold for beneficial uses allowed under 415 Ill. Comp. Stat. 5/3.135. Unit 123 controls SO^2 through its combustion process, and thus, no scrubber is needed.

There is no wet handling of CCR generated from current operations at Marion Station. While in operation, former Units 1, 2, and 3 generated CCR in the form of fly ash and bottom ash. Former Unit 4 generated CCR in the form of fly ash and bottom ash as well as scrubber sludge from an SO^2 scrubber installed around 1978. This was the first wet SO^2 scrubber installed in

Illinois—and one of the first in the nation—and reflects SIPC's early environmental commitment, which continues to this day. The historic handling, storage, and disposal of CCR at Marion Station is described below.

1. Fly Ash.

SIPC began collecting fly ash from former Units 1, 2, and 3 after installing electrostatic precipitators ("ESPs")[5] at each unit in 1975 in accordance with the Clean Air Act.[6] Because Units 1, 2, and 3 were cyclone units, they generated relatively small amounts of fly ash as compared to other types of coal-fired boilers. Cyclone boilers produce less than twenty-five percent of the fly ash pulverized coal units produce.

Between 1975 and 1978, on information and belief, fly ash from Units 1, 2, and 3 was collected wet using a hydroveyer system and conveyed to an area labeled on historic documents as a "fly ash holding area" (the "Initial Fly Ash Holding Area") located just to the west of Pond 3. *See* Site Map, Ex. 3. In 1977, SIPC received a permit from IEPA to abandon and cover the Initial Fly Ash Holding Area and to construct an additional holding area for fly ash (the "Replacement Fly Ash Holding Area"). *See* IEPA Water Pollution Control Permit, No. 1977-EN-5732 (Nov. 14, 1977) ("1977 Permit"), Ex. 5.

In 1978, Unit 4 was constructed. Around the same time, the hydroveyer system was modified to allow for dry collection of fly ash. From 1978 until 2003, most of the fly ash collected from Unit 4 was collected dry using the hydroveyer system. Most of that fly ash was disposed of

[5] ESPs are control devices that capture particulate matter in the exhaust gas, including fly ash.
[6] Prior to installation of the ESPs, most of the fly ash from Units 1, 2, and 3 would have been expected to exit the stack with exhaust gases, and only minimal amounts of fly ash may have been collected from the cyclone Units 1, 2, and 3. On information and belief, any minimal amounts of fly ash collected would likely have been conveyed to Pond 1, Pond 2, or the Initial Fly Ash Holding Area, which had an outlet to Pond 3.

at a former on-site, permit-exempt landfill ("Former Landfill"), often mixed with scrubber sludge as discussed further below.

Also around 1978, documents indicate that SIPC constructed the Replacement Fly Ash Holding Area to the North of Pond 2. *See* 1977 Permit, Ex. 5. The Replacement Fly Ash Holding Area likely received spent water from the hydroveyer system, which is believed to have contained only *de minimis* amounts of fly ash. *See* Letter from SIPC to IEPA (July 27, 1982), Ex. 6. On information and belief, the Replacement Fly Ash Holding Area also was designated to receive sluiced fly ash from Unit 4 during intermittent emergencies in which the fly ash was unable to be conveyed to the Former Landfill. *Id*.

In or around 1981, SIPC received a permit from IEPA to build a fly ash holding area extension (the "Fly Ash Holding Area Extension"), to the west of the Replacement Fly Ash Holding Area, and a berm around a portion of the Former Landfill that received fly ash and scrubber sludge from Unit 4. *See* IEPA Water Pollution Control Permit, No. 1981-EN-2776-1 (Oct. 13, 1981) ("1981 Permit"), Ex. 7. That bermed area collected stormwater runoff from the Former Landfill, and that collected water eventually became what is now denominated as Pond 6 (discussed *infra*).

On information and belief, between 1978 and 1985, limited fly ash from Units 1, 2, and 3[7] may have been sluiced to the Replacement Fly Ash Holding Area. In 1985, former Pond A-1 was constructed. After 1985, water from the hydroveyer system and, on information and belief, any fly ash from Units 1, 2, and 3 were conveyed to Pond A-1 or, in limited cases of Pond A-1 outrages

[7] Units 1, 2, and 3 were run infrequently after the installation of Unit 4.

between 1985 and 2003 (*see infra* at14–15), former Pond B-3. *See, e.g*., Letter from SIPC to IEPA (Sept. 16, 1993) ("1993 Letter"), Ex. 8.

On information and belief, the Replacement Fly Ash Holding Area and the Fly Ash Holding Area Extension stopped receiving wastes after former Pond A-1 was built. Subsequently, those two units were drained of water—other than occasional stormwater runoff—and, by the early 1990s, were covered at least in part by the Former Landfill. Currently, the area that previously contained those units is within the Former Landfill cover area and part of the Proposed Closure Plan SIPC submitted to IEPA for the Former Landfill, as described further below. Declaration of Kenn Liss ("Liss Dec."), Ex. 9; *see also* Andrews Engineering, SIPC's Proposed Closure Plan for IEPA Site No. 199055505 (Dec. 16, 2020) ("Former Landfill Closure Plan"), Ex. 10.

In 2003, SIPC repowered the old Units 1, 2, and 3 with a Circulating Fluidized Bed ("CFB"), now referred to as Unit 123. The CFB allowed SIPC to convert its fly ash system to one hundred percent dry ash handling and disposal and ended even the minimal wet fly ash discharge that had previously occurred at Marion Station.

2. <u>Scrubber Sludge</u>.

Unit 4 came online in 1978 and produced scrubber sludge, which was predominately calcium sulfite. The scrubber sludge was mixed with fly ash and moved via a conveyer to the Former Landfill, which ceased accepting waste prior to October 2015 and for which SIPC has submitted a landfill Closure Plan to IEPA at IEPA's request (*see infra* at 15–16). Former Landfill Closure Plan, Ex. 10. In 2009, the scrubber was modified to a forced oxidation system, which produced calcium sulfate, better known as gypsum. One hundred percent of the gypsum generated at Marion Station was sold as an agricultural modifier or an ingredient for cement. With the closure of Unit 4, Marion Station no longer generates scrubber sludge or gypsum.

3. Bottom Ash.

Historically, bottom ash from now-retired Units 1, 2, 3, and 4 was sluiced to Ponds 1 and 2. On information and belief, SIPC sold one hundred percent of its bottom ash to shingle manufactures, grit blasting companies, and local highway departments for more than forty years. For almost the entire lives of the ponds, the water in Ponds 1 and 2, from which bottom ash was removed, discharged to Pond 4 and, from there, through permitted Wastewater Discharge Outfall 002. Beneficial use Ponds 1 and 2 are no longer in use with the closure of Unit 4 and have been cleaned to the clay. Ash from Unit 123's fluidized bed boiler is handled dry and beneficially used offsite.

4. Other Non-CCR Waste Streams.

Minor other non-CCR waste streams from the Marion Station, including air heater wash water and flue gas desulfurization decant excess water, were historically discharged to the former Emery Pond. The former Emery Pond was built in the late 1980s as a stormwater storage structure for drainage from the adjacent plant area, including the more recent Gypsum Loadout Area. *See* Hanson, Emery Pond Corrective Action and Selected Remedy Plan, Including GMZ Petition (Mar. 29, 2019), Ex. 11. Process wastewater discharges to the former Emery Pond have ceased and any water or CCR in the former Emery Pond has been removed pursuant to closure and related plans overseen by IEPA. The former Emery Pond's closure has been conducted consistent with Part 257 and, although the field work was completed before adoption of Part 845, the closure was generally consistent with Part 845 as well. A new storm basin is located in the area of the former Emery Pond.

C. <u>The Ponds Subject to This Petition.</u>

This Petition concerns the De Minimis Units—five current or former ponds at SIPC's Marion Generating Station: the South Fly Ash Pond, Pond 3 (including Pond 3A), Pond 6, Pond 4, and former Pond B-3, which have contained only *de minimis*, if any, amounts of CCR. These current and former ponds are described in Section C.1. This Petition also addresses the Former Fly Ash Holding Units: three former fly ash ponds that closed and were dewatered decades ago, at least one of which under IEPA oversight and permitting, and are now part of the Former Landfill, which are described below Section C.2.

1. <u>The De Minimis Units</u>.

A map showing the location of the De Minimis Units is attached to SIPC's May 11, 2021, Petition. Site Map, Ex. 3. As discussed below, none of the De Minimis Units receive or received meaningful direct discharges of CCR and, to the extent they contain CCR as a result of limited historic or incidental discharges, such CCR should be *de minimis* in light of historic practices. In addition, as discussed *infra* at 31–33, Haley & Aldrich, Inc., on behalf of SIPC, has completed an investigation of the De Minimis Units pursuant to an investigation protocol negotiated with IEPA, which confirmed that the De Minimis Units contain only *de minimis* amounts of CCR. *See infra* at 31–33; *see also* Pond Investigation Rep., Ex. 29.

<u>South Fly Ash Pond</u> – The South Fly Ash Pond was built around 1989 as a potential replacement for Pond A-1, in case one was needed. *See* IEPA Water Pollution Control Permit, No. 1989-EN-3064 (May 17, 1989), Ex. 12. Ultimately, Pond A-1 did not need replacement and operated until 2003, as described above; thus, despite being permitted as a fly ash settling pond, the South Fly Ash Pond was never used for that purpose. Rather, the South Fly Ash Pond served as a secondary finishing pond, receiving decant water from the former Emery Pond until Emery

Pond stopped receiving process wastewater discharges in the fall of 2020. No fly ash, bottom ash, or scrubber sludge was ever directly sent to or placed into the South Fly Ash Pond. If the pond received any CCR throughout its life, it was *de minimis*, consisting only of any residual CCR in decanted pond overflow from the former Emery Pond or stormwater.

The Pond Investigation Report confirms that the South Fly Ash Pond contains minimal sediments, with a mean sediment thickness of approximately 1.57 feet, representing approximately 11 percent of historic pond volume[8]. *See* Pond Investigation Rep., Ex. 29 at 7. That is far less than the amount of sediment present in a typical CCR surface impoundment that is used for the storage, treatment, or disposal of CCR. *Id*. at 7–8 ("In Haley & Aldrich's experience, for typical CCR impoundments, the volume of CCR materials is often a major portion (>50%) of the overall impoundment volume."). Further, of that small amount of sediment, only a fraction (ranging from ten percent to sixty-four percent in the sediment samples that were taken from the South Fly Ash Pond) is estimated to include CCR material.[9] *Id*. at 14. Further, the South Fly Ash Pond has a berm, but boring logs associated with the berm do not indicate the presence of fly ash in that berm. *Id.* at Attachment C (boring logs for B-B3a and B-B3b).

<u>Pond 3 (including 3A)</u> – Water from the South Fly Ash Pond is permitted to flow to Pond 3, then Ponds 6 and 4, before discharging through Outfall 002.[10] *See* IEPA Reissued National

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[8] As explained in the Pond Investigation Report, the South Fly Ash Pond's water level was lowered for operational reasons during the time the bathymetric survey. *See* Pond Investigation Rep., Ex. 29 at 7. As a point of comparison, Haley & Aldridge also estimated sediment volume as a percentage of pond volume using the 2007 pond elevation for the South Fly Ash Pond and Pond 4, which was determined to be more representative of historical conditions. *See id.*

[9] The CCR percentages included here and below, as reflected in Exhibit 29, include the estimated percentage of materials, through polarized light microscopy ("PLM"), determined to be fly ash, bottom ash and/or slag. Pond Investigation Rep., Ex. 29 at 14.

[10] SIPC timely applied for a National Pollution Discharge Elimination System ("NPDES") permit renewal and is currently working with IEPA on permit reissuance.

Pollutant Discharge Elimination System Permit, No. IL0004316 (February 1, 2007) ("2007 NPDES Permit"), Ex. 13. On information and belief, Pond 3 may have received some overflow from the Initial Fly Ash Holding Area and later the Fly Ash Holding Area Extension, serving as a secondary finishing pond. *See* IEPA Water Pollution Control Permit, No. 1973-ED-1343-OP (June 1973), Ex. 14. Pond 3 also received stormwater runoff, coal pile runoff, and water from the Station's floor drains. Later, by 1982, a berm was built within Pond 3 to separate Pond 3 into two areas, with one area now known and referred to as Pond 3A.

Pond 3 has been cleaned to remove pond sediment and debris, including vegetation, twice—once in 2006 and again in 2011. Pond 3A was drained of water and cleaned of debris and sediment in 2014. Those cleanings would also have removed any CCR that may have collected in the pond from historic operations. Starting around 2007, SIPC built a berm around Pond 3 to prevent landfill runoff from reaching that pond. Since the pond's last cleanings, any CCR that has entered Pond 3 or Pond 3A is *de minimis*, such as through stormwater, potential overflow from South Fly Ash Pond, or air deposition; no ash has been placed in the pond for treatment, storage, or disposal.

The Pond Investigation Report, which included a survey of the ponded areas of Pond 3, confirms that Pond 3 (including 3A) contains minimal sediments, with a mean sediment thickness of approximately 1.38 feet in Pond 3 and 1.45 feet in Pond 3A, representing approximately 9 percent and 13.3 percent of pond volume, respectively. *See* Pond Investigation Rep., Ex. 29 at 7. That is far less than the amount of sediment present in a typical CCR surface impoundment which is used for the storage, treatment or disposal of CCR. *Id*. at 7–8 ("In Haley & Aldrich's experience, for typical CCR impoundments, the volume of CCR materials is often a major portion (>50%) of the overall impoundment volume."). Further, of that small amount of sediment, only a fraction (ranging from twenty-three percent to thirty-four percent in the samples that were taken from Pond 3/3A) is estimated to include CCR material. *Id*. at 14 (explaining slag, fly ash and bottom ash (i.e. CCR) makes up 23% and 34%, respectively, of the sediment samples from Pond 3). Additionally, samples from Pond 3A contain carbon contents much higher than would be expected from CCR materials. *Id.* at 8–10. A carbon to nitrogen/hydrogen correlation analysis demonstrates that coal is the likely common contributor to the organic content in pond sediment samples with a high carbon content. *Id.*

Pond 6 – Pond 6 was developed to manage stormwater runoff associated with the Former Landfill and grew within a berm built to capture runoff from the Former Landfill that was addressed in a 1982 construction permit issued by IEPA. Originally, Pond 6 discharged through Outfall 001. In or around 1993, in accordance with another IEPA-issued permit, SIPC extended Pond 6 and installed pumps to pump water from Pond 6 to Pond 4, where it then discharged through Outfall 002 to Little Saline Creek. *See* 1993 Letter, Ex. 8. Outfall 001 was subsequently eliminated. Any CCR discharges Pond 6 received throughout its life were *de minimis*, consisting of incidental amounts of CCR inflow from other ponds and stormwater runoff from the Former Landfill. Thus, Pond 6 was designed and served as a stormwater management unit to contain runoff from the Former Landfill and was not designed to accumulate CCR and liquids or to treat, store, or dispose of CCR in more than *de minimis* amounts.

The Pond Investigation Report confirms that Pond 6 contains minimal sediments, with a mean sediment thickness of approximately 0.84 feet, representing approximately 8.2 percent of pond volume. *See* Pond Investigation Rep., Ex. 29 at 7. That is far less than the amount of sediment present in a typical CCR surface impoundment which is used for the storage, treatment or disposal of CCR. *Id*. at 7–8 ("In Haley & Aldrich's experience, for typical CCR impoundments, the volume of CCR materials is often a major portion (>50%) of the overall impoundment volume."). Further, of that small amount of sediment, only a fraction (ranging from thirty percent to fifty-three percent in the samples that were taken from Pond 6) is estimated to include CCR material. *Id*. at 14.

Pond 4 – Pond 4 is a stormwater runoff and secondary finishing pond that received no more than *de minimis* amounts of CCR. Pond 4 has primarily served two purposes at the Station: to receive decant water from Ponds 1 and 2, when they were in operation before Unit 4's shutdown, and to receive coal pile runoff. Pond 4 has also received decanted overflow water from Pond 6 for approximately thirty years and discharges through Outfall 002 into the Little Saline Creek.

During an outage in 2010, Pond 4 was dewatered and cleaned down to the clay, removing plant debris and any ash, coal fines, and other sediment that may have collected in the pond. There were two types of materials in the pond after it was dewatered: (1) dry and dark materials (consisting of sixty to seventy percent of the pond materials) and (2) muddy materials high in organic matter. Declaration of Jason McLaurin, Ex. 32. The dry and dark materials were taken to the coal yard to further dry and then were burned at the Station for fuel. *Id*. Again, this demonstrates the materials consisted of primarily coal fines deposited into the pond as a result of stormwater runoff from the coal pile and that the amount of CCR present in Pond 4 has been consistently *de minimis*. Since its cleaning in 2010, any CCR that has entered Pond 4 is *de minimis*, such as through stormwater, overflow from Pond 6, or air deposition. Pond 4's primary use continues to be to catch stormwater runoff from the coal pile.

The Pond Investigation Report confirms that Pond 4 contains minimal sediments, with a mean sediment thickness of approximately 1.67 feet, representing approximately 10.9 percent of pond volume. *See* Pond Investigation Rep., Ex. 29 at 7. That is far less than the amount of sediment present in a typical CCR surface impoundment which is used for the storage, treatment or disposal of CCR. *Id*. at 7–8 ("In Haley & Aldrich's experience, for typical CCR impoundments, the volume of CCR materials is often a major portion (>50%) of the overall impoundment volume."). Further, of that small amount of sediment, only a fraction (ranging from twenty-five percent to sixty-eight percent in the samples that were taken from Pond 4) is estimated to include CCR material. *Id*. at 14. Additionally, samples from Pond 4 contained carbon contents much higher than would be expected from CCR materials. *Id.* at 8–10. A carbon to nitrogen/hydrogen correlation analysis demonstrated that coal is the likely common contributor to the organic content in pond sediment samples with a high carbon content. *Id.*

Pond B-3 – Former Pond B-3 was built by 1985 and was used primarily as a secondary pond to Pond A-1. Pond A-1 received some fly ash (as described above) and coal pile runoff until 2003, at which time all fly ash was handled dry and the runoff was directed to Pond 4. During periodic, intermittent outages of Pond A-1, former Pond B-3 may have received some discharges of fly ash from Units 1, 2, and 3 prior to their shut down in 2003. On information and belief, Pond A-1 was taken offline at most three to four times between 1985 and 2003, and each of those outages lasted approximately two weeks. Most (or all) of those outages would have occurred during boiler shutdowns, when Marion Station was operating at less than full capacity and generating less ash. Accordingly, any fly ash sluiced to former Pond B-3 during these intermittent outages would have been minimal.

In 2017, former Pond B-3 was cleaned out down to the clay and has not held water since that time. A BTU analysis showed the material removed had a heat content comparable to coal—not CCR—and at least a portion of the material was consumed for energy production.

Because former Pond B-3 no longer holds water, except in a small area of the former pond where stormwater may collect after storms before drainage and evaporation, it was not able to be included as part of the bathymetric survey conducted in conjunction with the Pond Investigation Report. However, Haley & Aldridge performed an analysis of two samples taken of a berm associated with former Pond B-3 in conjunction with the Pond Investigation Report, as well as nine samples taken in 2017, and concluded that those samples contained little, if any, CCR material.[11] *See* Pond Investigation Rep., Ex. 29 at 12 (including shake test results for samples B-B3a and B-B3b).

2. <u>The Former Fly Ash Holding Units</u>.

As discussed below, the Former Fly Ash Holding Units no longer contain water and are covered by the Former Landfill (or, in the case of the Fly Ash Holding Area Extension, a combination of dry CCR disposed in the landfill area, as well as sediments and other materials cleaned out from the pond system). The Former Fly Ash Holding Units were located within the green area on the site map attached to SIPC's May 11, 2021, initial Petition. Site Map, Ex. 3.

<u>The Initial Fly Ash Holding Area</u> – On information and belief, the Initial Fly Ash Holding Area received wet fly ash that was collected from Units 1, 2, and 3 until approximately 1977. In October 1977, IEPA issued a permit to SIPC for the Replacement Fly Ash Holding Area with a condition that required the Initial Fly Ash Holding Area to be abandoned and covered. *See* 1977 Permit, Ex. 5. In the early 1990s, plant personnel observed that while stormwater might on occasion collect for short periods after precipitation, the Initial Fly Ash Holding Area contained

[11] Hanson Engineering, which performed the bathymetric survey and collected the data analyzed in the Pond Investigation Report, attempted to take a soil boring from the area of former Pond B-3 but was unable to access the agreed-upon IEPA sampling location. *See* Pond Investigation Rep., Ex. 29 at 6.

no pond or other area that continuously held water. Further, as of that time, the area was covered by a combination of the Former Landfill and a soil/vegetation cover. Based upon these area observations and in light of the "abandon and cover" permit condition, SIPC believes that the area was covered before the 1990s pursuant to the permit condition issued and approved by IEPA.

The Replacement Fly Ash Holding Area – In October 1977, IEPA issued a permit to SIPC to construct the Replacement Fly Ash Holding Area to the north of Pond 2. *See* 1977 Permit, Ex. 5. On information and belief, the Replacement Fly Ash Holding Area likely received spent water from the hydroveyer system, which likely contained *de minimis* amounts of fly ash. The Replacement Fly Ash Holding Area also may have received discharges of fly ash from Units 1, 2, and 3 prior to the construction of Pond A-1 in 1985. On information and belief, the Replacement Fly Ash Holding Area may have also been designated to receive sluiced fly ash from Unit 4 during intermittent emergencies in which the fly ash was unable to be conveyed to the Former Landfill. It is unknown whether the Replacement Fly Ash Holding Area ever received sluiced fly ash from Unit 4 during emergencies. By the early 1990s, the Replacement Fly Ash Holding Area had been drained of water and was covered by the Former Landfill.

The Fly Ash Holding Area Extension – In or around 1982, SIPC received a permit from IEPA to construct the Fly Ash Holding Area Extension to the west of the Replacement Fly Ash Holding Area and build a berm around a portion of the Former Landfill area that received fly ash and scrubber sludge from Pond 4. *See* 1981 Permit, Ex. 7. The extent to which the Fly Ash Holding Area Extension actually received any fly ash is unknown. As with the Initial Fly Ash Holding Area, by the early 1990s the Fly Ash Holding Area Extension did not hold water and was covered in part by the Former Landfill. The remaining area was covered by soil and other material from the Station, including debris cleaned from the pond system.

All three Former Fly Ash Holding Units are in the area of the Former Landfill. *See* Site Map, Ex. 3. These units were included in the Former Landfill area and, thus, were of part of the Former Landfill operation for decades before the landfill ceased operating in 2015. At least most of the area that at one time encompassed these units when operating was covered by 1991, and the entire area was covered before October 2015 by Former Landfill material, which included dry CCR, soil, and sediments. As discussed above, use of the Former Landfill is believed to have started around 1978 for scrubber sludge and fly ash disposal. SIPC estimates that the maximum volume of scrubber sludge and ash deposited in the Former Landfill was approximately 1.5 million cubic yards.

In September of 1992, SIPC submitted to IEPA an Initial Facility Report ("IFR") for the Former Landfill. *See* IEPA Initial Facility Report – for On-Site Facilities (Sept. 18, 1992), Ex. 15. In 1993, SIPC installed groundwater monitoring wells around the Former Landfill in accordance with Illinois landfill regulations. After that time, SIPC submitted annual groundwater monitoring reports to IEPA pursuant to the landfill regulations. Because the Former Landfill did not receive CCR after the effective date of 40 C.F.R. Part 257, Subpart D, the landfill is not subject to those requirements. *See* 40 C.F.R. § 257.50(d).

As discussed below, in March 2020, IEPA issued a Violation Notice ("VN") for the Former Landfill, alleging violations of Section 21 of the Illinois Environmental Protection Act ("the Act"), the Illinois landfill regulations, and Illinois's groundwater quality standards, and listing several remedial actions SIPC could take to resolve the alleged violations. *See* IEPA Violation Notice L-2020-00035 (Mar. 20, 2020) ("2020 Landfill VN"), Ex. 16. In December 2020, and in response to IEPA's request, SIPC submitted a Former Landfill Closure Plan to IEPA consistent with the Illinois landfill regulations for closure cited by IEPA in the landfill VN (2020 Landfill VN, Ex.

16), and since that time, SIPC has negotiated some elements of that plan with IEPA. SIPC was ready to proceed with that Closure Plan, in accordance with the requirements of 35 Ill. Admin. Code § 811.314, upon receiving IEPA's approval for the plan. *See* Former Landfill Closure Plan, Ex. 10, Figure B-05. In March 2021, nearly three months after receiving SIPC's proposed Closure Plan, an IEPA representative for the first time informed SIPC of a new position that the Former Landfill was regulated by and required to close pursuant to Part 845, rather than pursuant to the Illinois landfill regulations under which the Former Landfill had been operating for decades (and under which IEPA had issued the VN). Subsequently, IEPA withdrew the Landfill VN via a letter dated May 6, 2021.

Despite issuing a VN to SIPC for alleged violations of landfill regulations, IEPA now appears to argue—apparently based on its proximity to the Former Fly Ash Holding Units—that the Former Landfill (which has been treated by SIPC and regulators as a landfill for more than thirty years) meets the definition of a CCR surface impoundment, "a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the surface impoundment treats, stores, or disposes of CCR," under Part 845 that became effective as of April 21, 2021 (and which explicitly exempts CCR landfills from coverage). As discussed *infra* at Part III.B, IEPA's position is incorrect. In addition, this development has delayed finalization and execution of SIPC's proposed Former Landfill Closure Plan. The Former Landfill area, including the Former Fly Ash Holding Units, is not a CCR surface impoundment and this area qualifies for a finding of inapplicability. However, to the extent the Board finds this area is a CCR surface impoundment, SIPC has proposed an adjusted standard that would close the entirety of this area consistent with Part 845 performance standards and with a Part 845 compliant groundwater monitoring and corrective action program.

D. The Federal CCR Rule and the WIIN Act.

CCR disposal is regulated at the federal level pursuant to Part 257, Subpart D, which was promulgated on April 17, 2015. *See* Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, 80 Fed. Reg. 21,302 (April 17, 2015) ("Final Rule"), attached in relevant part as Second Amended Pet. Updated Ex. 17. Part 257 was promulgated pursuant to the federal Resource Conservation and Recovery Act, Subtitle D, and includes comprehensive technical requirements for regulated CCR landfills and CCR surface impoundments. Part 257 defines a "CCR surface impoundment" as "a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR." 40 C.F.R. § 257.53.

In December 2016, the President signed the Water Infrastructure Improvements for the Nation Act (the "WIIN Act"), Pub. L. No 114-322 (2016). The WIIN Act authorized states to adopt permit programs that, upon approval by the U.S. Environmental Protection Agency ("U.S. EPA"), may operate in lieu of Part 257. 42 U.S.C. § 6945(d)(1)(B). State programs must be as protective as Part 257. *Id.* § 6945(d)(1)(B)(ii). The WIIN Act further allows U.S. EPA to enforce violations of the Part 257 and requires U.S. EPA to develop a federal permitting program for CCR surface impoundments that would apply in states that elect not to seek approval of a state CCR permitting program. 42 U.S.C. § 6945(d)(2)(B).

In 2024, U.S. EPA amended Part 257 (the "2024 Legacy Rule"). *See* Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments, 89 Fed. Reg. 38,950 (May 8, 2024) (the "2024 Legacy Pond Final Rule"), attached in relevant part as Ex. 33. The 2024 Legacy Rule amends Part 257 to include CCR regulations for inactive surface impoundments at inactive electric utilities, referred to as "legacy CCR surface impoundments," requiring owners and operators of legacy CCR surface impoundments to comply with all existing requirements applicable to inactive CCR surface impoundments at active facilities, except for the location restrictions and liner design criteria. In addition, the 2024 Legacy Rule establishes groundwater monitoring, corrective action, closure, and post closure care requirements for other areas where CCR was disposed of or managed on land outside of regulated units at regulated CCR facilities, referred to in the 2024 Legacy Rule as "CCR management units" (regardless of how or when that CCR was placed).

E. <u>The Illinois CCR Act and Part 845.</u>

On July 30, 2019, the Illinois Legislature adopted the Illinois Coal Ash Pollution Prevention Act ("Illinois CCR Act"). 415 Ill. Comp. Stat. 5/22.59. In the findings section of the Illinois CCR Act, the Legislature stated that "CCR generated by the electric generating industry has caused groundwater contamination and other forms of pollution at active and inactive plants throughout this State," and "environmental laws should be supplemented to ensure consistent, responsible regulation of all existing CCR surface impoundments[.]"[12] 415 Ill. Comp. Stat 5/22.59(a)(3), (4).

The Illinois CCR Act copied Part 257's definition of a CCR surface impoundment: "a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR." 415 Ill. Comp. Stat. 5/3.143. A pond that does not satisfy this definition is not subject to Part 257 or the Illinois CCR Act.

[12] Prior to passage of the Illinois CCR Act, most CCR surface impoundments in Illinois were regulated as wastewater treatment units. *See* R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, IEPA's Statement of Reasons (Mar. 30, 2020) ("IEPA Statement of Reasons"), Ex. 18 at 4.

The Illinois CCR Act prohibits any person from allowing the discharge of contaminants from a CCR surface impoundment to the environment so as to cause a violation of the Illinois CCR Act; requires owner and operators of CCR surface impoundments to obtain construction permits from IEPA; requires IEPA approval prior to closing any CCR surface impoundment; and requires post-closure financial assurance for closed CCR surface impoundments.[13] 415 Ill. Comp. Stat. 5/22.59(b), (d), (f).

The Illinois CCR Act also set forth a fee regime, pursuant to which covered CCR surface impoundment owners and operators must pay initial and annual fees to IEPA for certain closed CCR surface impoundments, as well as those that have not completed closure. 415 Ill. Comp. Stat. 5/22.59(j). The Illinois CCR Act also required the Board to adopt rules governing CCR surface impoundments that must be at least as protective and comprehensive as Part 257. *See* 415 Ill. Comp. Stat. 5/22.59(g).

F. <u>The Part 845 Rulemaking.</u>

On March 30, 2020, IEPA proposed regulations titled "Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments" to be included as Part 845 of Illinois Administrative Code's Title 35. According to the Statement of Reasons issued with the proposed regulations,

> [t]he foremost purpose and effect of this regulatory proposal is to fulfill Illinois EPA's statutory obligation to propose CCR rules consistent with the requirements in Section 22.59(g). The second purpose and effect of this regulatory proposal is to protect the groundwater within the state of Illinois. . . . Groundwater has an essential and pervasive role in the social and economic well-being of Illinois, and is important to the vitality, health, safety, and welfare of its citizens. This rule has been developed based on the goals above and the principle that groundwater resources should be utilized for beneficial and legitimate purposes. *See* 415 ILCS

[13] The Illinois CCR Act's financial assurance requirements do not apply to SIPC because it is a not-for-profit electric cooperative. 415 Ill. Comp. Stat. 5/22.59(f).

> 55/1 *et seq*. ***Its purpose is to prevent waste and degradation of Illinois' groundwater***. The proposed rule establishes a framework to manage the underground water resource to allow for maximum benefit of the State.

IEPA Statement of Reasons, Ex. 18 at 10 (emphasis added).[14] IEPA's Statement of Reasons attached a list of "power generating facilities with CCR surface impoundments [that] may be affected by Illinois EPA's proposed rule." *Id*. at 36–37. IEPA indicated, incorrectly, on that list that Marion Station includes nine CCR surface impoundments. *Id*. at 37.

The Board held two sets of hearings and received 138 written public comments on the proposed rules. SIPC submitted public comments to the Board on September 25, 2020. In those comments, SIPC stated that only one of the units at Marion Station of the nine ponds then identified by IEPA—former Emery Pond (which is not at issue in this Petition)—is a regulated CCR surface impoundment as defined in the then-proposed regulations, the Illinois CCR Act, and Part 257. *See* R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, SIPC Comments to Illinois Pollution Control Board (Sept. 25, 2020), Ex. 19.

G. <u>The Board's Opinion and the Final Rule.</u>

The Board issued its Second Notice Opinion and Order ("Second Notice Opinion") on February 4, 2021. The Second Notice Opinion largely adopted IEPA's proposed rules, including its definition of "CCR surface impoundment" as a "natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the surface impoundment treats, stores, or disposes of CCR." R2020-019, *In the Matter of Standards*

[14] For all citations to R2020-019 rulemaking materials—except Board orders and the final Part 845—we provided excerpted documents including only the relevant and cited page numbers, which were attached to SIPC's May 11, 2021, initial Petition. The page number cited here, and for all R2020-019 materials, is the page number of the original document, not the page number of the Exhibit.

for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845, Illinois Pollution Control Board's Second Notice Opinion and Order at 11 (Feb. 4, 2021) ("Second Notice Opinion and Order"); *see also* 35 Ill. Admin. Code § 845.120. Thus, the Board, like the legislature in the Illinois CCR Act, adopted Part 257's definition of "CCR surface impoundment."

The final Part 845 also adopted the following definitions that are relevant to the instant Petition:

> "Existing CCR surface impoundment" means a CCR surface impoundment in which CCR is placed both before and after October 19, 2015, or for which construction started before commenced prior to October 19, 2015 and in which CCR is placed on or after October 19, 2015. A CCR surface impoundment has started commenced construction if the owner or operator has obtained the federal, State, and local approvals or permits necessary to begin physical construction and a continuous on-site, physical construction program had begun before prior to October 19, 2015.
>
> . . .
>
> "Inactive CCR surface impoundment" means a CCR surface impoundment in which CCR was placed before but not after October 19, 2015 and still contains CCR on or after October 19, 2015. Inactive CCR surface impoundments may be located at an active facility or inactive facility.

35 Ill. Admin. Code § 845.120. The Board declined industry's request to adopt a new definition of *de minimis* units in Part 845, at least in part because it did not want to "create" new language that was not in Part 257, which could create inconsistency. Second Notice Opinion and Order at 14–15. In so doing, the Board appeared to recognize that such units may not be subject to Part 845, just as such units are not subject to Part 257, because they are not "CCR surface impoundments." The Second Notice Opinion suggested that there is authority to determine such units are not covered CCR surface impoundments subject to Part 845, and that operators of *de*

minimis units could—if necessary—petition for a variance or an adjusted standard from Part 845 if it disagrees with how the IEPA characterized a unit:

> Regulatory relief mechanisms are available to owners and operators when they disagree with an IEPA determination concerning whether a unit is a CCR surface impoundment. In those instances, an owner or operator may seek an adjusted standard or a variance from the Board

Id. at 14.

Following approval by the Joint Committee on Administrative Rules ("JCAR"), the Board adopted Part 845 as final on April 15, 2021, with an effective date of April 21, 2021. *See* R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, Illinois Pollution Control Board's Final Order Adopted Rule (Apr. 15, 2021) ("Final Order").

H. <u>The Pond Investigation</u>

SIPC has received VNs from IEPA that are related to the units that are the subject of this Petition.[15] *See* 2020 Landfill VN, Ex. 16; IEPA Violation Notice W-2020-00046 (July 28, 2020), Ex. 20; IEPA Violation Notice W-2020-00087 (Dec. 16, 2020), Ex. 21. In connection with discussions related to these VNs, IEPA requested, and SIPC agreed, that SIPC complete a pond investigation pursuant to an agreed protocol designed to yield information related to whether the five De Minimis Units at issue in this Petition qualify as excluded *de minimis* units. The investigation was intended to gather information related to the extent and composition of the sediments in the De Minimis Units.

[15] By a letter dated July 3, 2018, IEPA also issued a VN to SIPC pursuant to Section 31(a)(1) of the Act (Violation Notice No. W-2018-00041), alleging violations of groundwater quality standards for various constituents based on groundwater sampling at monitoring wells surrounding or near the former Emery Pond. As discussed *supra*, SIPC closed the former Emery Pond by removal pursuant to an IEPA-approved closure compliant with Part 257, and it is not included in this Petition.

The pond investigation involved (1) completion of a bathymetric survey to determine the amount of sediments below water in the De Minimis Units (with the exception of former Pond B-3, which no long holds water); and (2) analysis of pond sediments to determine whether and to what extent they contain CCR. At the request of IEPA, soil borings were also taken from the berms associated with Ponds 3 (including 3A), B-3, and 4.[16] Field work and data collection was completed by Hanson Engineering, Inc. Haley & Aldridge analyzed the results and authored the Pond Investigation Report. SIPC provided an initial version of that Report to IEPA on August 6, 2021. Haley & Aldridge subsequently updated the Report following a call with IEPA, including to address questions raised by IEPA, and that updated version is the version attached as Ex. 29.

I. <u>Requested Relief</u>

Through this Petition, SIPC requests a finding of inapplicability from the Part 845 requirements for the De Minimis Units and the Former Fly Ash Holding Units (including the Former Landfill) or, in the alternative, an adjusted standard for the De Minimis Units and the Former Fly Ash Holding Units as set forth in Appendix A.

III. <u>REQUEST FOR FINDING OF INAPPLICABILITY</u>.

The Board has recognized that a Petition for an adjusted standard can, in the alternative, seek a finding of inapplicability from the regulation at issue. *See* AS 2009-003, *In the Matter of Petition of Westwood Lands, Inc. for an Adjusted Standard from Portions of 35 Ill. Adm. Code 807.14 and 35 Ill. Adm. Code 807.104 and 35 Ill. Adm. Code 810.103 or, in the Alternative, a Finding of Inapplicability*, Opinion and Order of the Board (Oct. 7, 2010) (granting request for a

[16] IEPA also requested that borings be taken from former Pond A-1 (which is not part of this Petition) and former Pond B-3. As discussed, SIPC was unable to collect either of those borings because bedrock was encountered at the surface of former Pond A-1 (confirming no CCR present) and the designated boring area of former Pond B-3 was inaccessible. *See* Pond Investigation Rep., Ex. 29 at 6.

finding of inapplicability from solid waste regulations); AS 2004-002, *In the Matter of Petition of Jo'Lyn Corporation and Falcon Waste and Recycling Inc. for an Adjusted Standard from 35 Ill. Adm. Code 807.103 and 35 Ill. Adm. Code 810.103, or in the Alterative, a Finding of Inapplicability*, Opinion and Order of the Board (Apr. 7, 2004) (granting a request for a finding of inapplicability from solid waste regulations). Such relief is appropriate here on the basis that none of the units at issue are CCR surface impoundments subject to Part 845, as set forth further below.

A. The De Minimis Units Are Not Subject to Part 845.

Part 845 is clear that it only regulates "CCR surface impoundments." The regulation's "Scope and Purpose" section specifies that Part 845 applies to "owners and operators of new and existing CCR surface impoundments," 35 Ill. Admin. Code § 845.100(a), and "inactive CCR surface impoundments at active and inactive electric utilities or independent power producers." *Id.* § 845.100(b). As discussed below, none of the units at issue are CCR surface impoundments, new or existing CCR surface impoundments, or inactive CCR surface impoundments, and therefore, none of the current and former ponds at issue are covered by Part 845.

1. The De Minimis Units Are Not "CCR Surface Impoundments."

As discussed below, the De Minimis Units are not "CCR surface impoundments" as defined in Part 257 or Part 845. Both Part 257 and Part 845 define a CCR surface impoundment as "a natural topographic depression, man-made excavation, or diked area, which ***is*** designed to hold an accumulation of CCR and liquids, ***and*** the unit[17] treat***s***, store***s***, or dispose***s*** of CCR." 40

[17] Part 845 substitutes "surface impoundment" for "unit," but this works no substantive change. 35 Ill. Admin. Code § 845.120

C.F.R. § 257.53 (emphasis added); *see also* 35 Ill. Admin. Code § 845.120. None of the De Minimis Ponds meet this two-part definition.[18]

As discussed above, the De Minimis Units are not designed to—and do not—hold a necessary accumulation of CCR and liquids. Accordingly, the De Minimis Units do not fall within the first part of the definition of CCR surface impoundment. Further, none of the De Minimis Units treat, store, or dispose of CCR, and (to the extent they ever did) have not done so since October 19, 2015, as required by the second part of the definition of CCR surface impoundment.

The De Minimis Units primarily received CCR only through their service as secondary finishing ponds (through decanted overflow water), stormwater runoff, or air deposition. The only unit to ever receive direct disposal of CCR was former Pond B-3. However, that disposal occurred only three to four times during then entire course of its operation (when Pond A-1 was not in operation). *See supra* at Part II.C.1. When materials from B-3 were removed in 2017, it had a high BTU content, and at least a portion of those materials were burned, suggesting any CCR in the pond was *de minimis*.

The fact that certain of the De Minimis Units *may* have received historic, largely indirect, discharges of CCR does not bring them within the definition of a "CCR surface impoundment."

[18] Part 257, upon promulgation, did not impose any requirements on any CCR surface impoundments that no longer existed or had closed before the rule's effective date—i.e., those that no longer contained water and could no longer impound liquid. Final Rule, Second Amended Pet. Updated Ex. 17 at 21,343. Whether a unit met the definition of CCR surface impoundment depended on what waste was managed in the unit ***as of October 19, 2015***. The court's decision in *Util. Solid Waste Activities Grp. v. Envtl. Prot. Agency*, 901 F.3d 414 (D.C. Cir. 2018) ("*USWAG*") reversed and remanded the Final Rule to the U.S. EPA to regulate any ash pond that was a "legacy pond," which is an inactive CCR surface impoundment at a closed or no longer operating facility. The *USWAG* decision described the risks posed by legacy ponds as risks associated with open, wet ponds that were not closed. See *USWAG*, 901 F.2d at 432–33. The *USWAG* decision's remand did **not** speak to ponds at active facilities that contained *de minimis* CCR or could no longer contain water and impound liquid as of the effective date of the Final Rule. Accordingly, the *USWAG* decision did not order U.S. EPA to regulate units like the De Minimis Units or the Former Fly Ash Holding Units.

To the contrary, both the history and the current condition of the De Minimis Units make clear that they are precisely the type of *de minimis* units excluded from the definition of CCR surface impoundment in Part 257 and Part 845.

In its preamble to the Final Rule, U.S. EPA stated that

> The Agency received many comments on the proposed definition of CCR surface impoundment. The majority of commenters argued that the definition was overly broad and would inappropriately capture surface impoundments that are not designed to hold an accumulation of CCR. Commenters were concerned that the proposed definition could be interpreted to include downstream secondary and tertiary surface impoundments, such as polishing, cooling, wastewater and holding ponds that receive only *de minimis* amounts of CCR.

Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357.

In response to those concerns, U.S. EPA reviewed the risk assessment on which Part 257 was based "to determine the characteristics of the surface impoundments that are the source of the risks the rule seeks to address." *Id*.

> Specifically, these are units that contain a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants. . . . EPA agrees with commenters that ***units containing only truly ''de minimis'' levels of CCR are unlikely to present the significant risks this rule is intended to address***.

Id. (emphasis added).

Accordingly, U.S. EPA amended the definition of CCR surface impoundment in the Final Rule "to clarify the types of units that are covered by the rule": "a natural topographic depression, man-made excavation, or diked area, which ***is*** designed to hold an accumulation of CCR and liquids, ***and the unit treats, stores, or disposes of CCR***." *Id.* (emphasis added). The intent of the amendment was to implement U.S. EPA's determination, as described in Part 257's preamble, that *de minimis* units would be **excluded** from Part 257 requirements. U.S. EPA's amended definition is, as noted above, the same definition used in Part 845. *See* 35 Ill. Admin. Code § 845.120. In making the change, U.S. EPA noted that it

> agrees with commenters that relying solely on the criterion from the proposed rule that the unit be designed to accumulate CCR could inadvertently capture units that present significantly lower risks, such as process water or cooling water ponds, because, although they will accumulate any trace amounts of CCR that are present, they *will not contain the significant quantities* that give rise to the risks modeled in EPA's assessment. By contrast, units that are designed to hold an accumulation of CCR and in which treatment, storage, or disposal occurs will contain substantial amounts of CCR and consequently are a potentially significant source of contaminants.

Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357. U.S. EPA further stated that "CCR surface impoundments do not include units generally referred to as cooling water ponds, process water ponds, wastewater treatment ponds, storm water holding ponds, or aeration ponds. These units are not designed to hold an accumulation of CCR, and *in fact, do not generally contain significant amounts of CCR*." *Id.* (emphasis added). Further, U.S. EPA stated that secondary or tertiary ponds that do not receive "significant amounts of CCR from a preceding impoundment" would not fall within the definition of a regulated CCR surface impoundment. *See Id.* at 21,357; *see also*, U.S. EPA, *Frequent Questions about Definitions and Implementing the Final Rule Regulating the Disposal of Coal Combustion Residuals*,[19] Ex. 34 ("Surface runoff, coal pile runoff, CCR landfill leachate, stormwater and evaporation ponds would not generally be expected to meet the definition of a CCR surface impoundment, because based on their typical design and function, such units are not usually designed primarily to hold an accumulation of CCR and liquid and would not be expected to treat, store, or dispose of CCR.")

[19] Available at https://www.epa.gov/coalash/frequent-questions-about-definitions-and-implementing-final-rule-regulating-disposal-coal#q7.

U.S. EPA reiterated the *de minimis* exception in the 2024 Legacy Rule, explaining that "evaporation ponds, or secondary or tertiary finishing ponds that have not been properly cleaned up" are expected to "contain no more than a *de minimis* amount of CCR" and, therefore, would not be regulated under Part 257. 2024 Legacy Pond Final Rule, Ex. 33 at 39,050. Further, U.S. EPA stated in its proposal for the 2024 Legacy Rule that "the following would not be considered CCR [management units]: . . . closed or inactive process water ponds, cooling water ponds, wastewater treatment ponds, and storm water holding ponds or aeration ponds. These units are not designed to hold an accumulation of CCR, and *in fact, do not generally contain a significant amount of CCR*. . . ." Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments, 88 Fed. Reg. 31,982, 32,018 (May 18, 2023) (emphasis added), attached in relevant part as Ex. 35. SIPC's request that the Board find Part 845 inapplicable to the De Minimis Ponds is consistent with federal law as the units contain little to no CCR and, therefore, are not federally regulated.

The Illinois CCR Act and Part 845 both incorporate Part 257's definition of "CCR surface impoundment," including the amended language that implemented U.S. EPA's determination that *de minimis* units would not be considered regulated surface impoundments. Thus, Part 845 and the Illinois CCR Act do not apply to *de minimis* units.

The Board declined to "create" a new definition of "*de minimis,*" as it is not expressly defined in Part 257, but that decision did not mean that *de minimis* units would be covered under Part 845. Second Notice Opinion and Order at 14–15. Indeed, that decision was based at least in part on concerns about assuring conformity with Part 257, *id.* at 15, and Part 257 does not apply to *de minimis* units as such units are described by U.S. EPA, including in the Preamble to its Final Rule. *See* Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357. Consistently, the Board also implicitly recognized in its discussion of defining *de minimis* units that IEPA might make decisions about whether a unit qualifies as an excluded *de minimis* unit, and, if a company disagreed, it could choose to seek relief from the Board, including, for example, through an adjusted standard. Second Notice Opinion and Order at 14. IEPA, and the Board, may determine that a unit is *de minimis* and thus not regulated because the regulations do not apply to such units under the identical "CCR surface impoundment" definitions in Part 257 and Part 845. Here, for the reasons set forth below, SIPC asks the Board in the first instance[20] to determine that the De Minimis Units are not regulated CCR surface impoundments.

Both the Pond Investigation Report and the history of the De Minimis Units outlined above show that the units do not "contain a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants." Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357; *see also* Pond Investigation Rep., Ex. 29. To the extent any of the De Minimis Units ever received discharges of CCR, the discharges were mostly indirect, either from pond overflow or process wastewater. The only De Minimis Unit that is known to have received direct discharges of CCR—former Pond B-3[21]—likely only did so for short periods of time, has not received any CCR for decades, and is no longer able to contain water. *See supra* at Part II.C.1. Accordingly, none of the De Minimis Ponds at issue ever contained "significant quantities" or "substantial amounts" of CCR. Further, all the De Minimis Units have been cleaned of debris since Marion Station switched to fully dry handling fly ash, and those cleanings would have removed any CCR that would have accumulated in them as a result of historic operations. As a

[20] As set forth below, if the Board denies this request, SIPC asks the Board for an adjusted standard with respect to the De Minimis Units.
[21] While the South Fly Ash Pond was *designed* to receive direct discharges of CCR, it never did receive direct discharges of CCR. *See supra* at 9–10.

result, the De Minimis Units simply do not present the "significant risks" Part 257 and Part 845 are intended to address.

This conclusion is bolstered by the results and analysis set forth in the Pond Investigation Report. As summarized in that report, Haley & Aldridge reviewed extensive information relating to the De Minimis Units, including bathymetric survey results, results of analyses of pond sediments, and results of a PLM analyses, which characterize the fraction of CCR in sediment samples. Based on that information, Haley & Aldridge determined that the De Minimis Units contain on average less than 2 feet of total sediments. Of that less than two feet, Haley & Aldridge determined that the average fraction of CCR materials in the De Minimis Units was approximately forty percent. Pond Investigation Rep., Ex. 29 at 13. In other words, the De Minimis Units contain only a small amount of sediment, and only a fraction of those sediments appears to contain CCR materials. Haley & Aldridge accordingly concluded that "these results are consistent with what we understand to be the function of [the De Minimis Units], which generally did not receive direct discharges of CCR materials, were not designed to hold an accumulation of CCR and water, and have not been used for the treatment, storage and disposal of CCR." Pond Investigation Rep., Ex. 29 at 7.

Haley & Aldridge also contrasted the volume and type of pond sediments in the De Minimis Units with the characteristics of a "typical" CCR surface impoundment that is used to treat, store, or dispose of CCR. As discussed in the Pond Investigation Report, the volume of sediments in such CCR surface impoundments generally is greater than fifty percent of pond volume. In contrast, the volume of sediments in the De Minimis Units ranged from 8.2 percent (Pond 6) to 13.3 percent (Pond 3A). Similarly, the total volume of sediments in the De Minimis Units is far smaller than one would expect to see in a CCR surface impoundment used for the treatment storage or disposal of CCR. *See* Pond Investigation Rep., Ex. 29 at 7. These results further bolster the conclusion that the De Minimis Units are not CCR surface impoundments as defined in or Part 845 or Part 257.

Further, Haley & Aldridge reviewed multiple years of groundwater monitoring data collected by SIPC and determined that any CCR that is in the De Minimis Units has not had any appreciable impact on groundwater at SIPC. *See* Pond Investigation Rep., Ex. 29 at 26. Ms. Lewis concurs with this conclusion and determines that the De Minimis Units do not pose appreciable risk to human health or the environment—and are therefore not the type of units intended by regulated by Part 845 or Part 257—based on her review of the Pond Investigation Report and her own review of Station groundwater monitoring data and pond histories. Ari Lewis, M.S. *Support for the Petition of an Adjusted Standard for Pond 4, Ponds 3 and 3A, Pond S-6, Former Pond B-3, and South Fly Ash Pond* (Dec. 20, 2024) ("Lewis Op."), Ex. 36. As discussed by Ms. Lewis in her report, the De Minimis Units are precisely the types of *de minimis* units that U.S. EPA sought to exclude from regulation under Part 257 because they do not "***present the significant risks [Part 257] is intended to address***." Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357; *see also* Lewis Op., Ex. 36. They should likewise be excluded under Part 845, as discussed below.

Given that the De Minimis Units are not CCR surface impoundments under Part 257, the Board should find that they also are not covered by Part 845. As noted above, the definition of "CCR surface impoundment" is identical in both Part 257 and Part 845 and plainly excludes the De Minimis Units. As a practical matter, it would be anomalous, to say the least, that the same words mean something different in Part 845 and that a unit is subject to Part 845 but excluded from Part 257 under the same rule language. Part 257 clearly excludes units such as the De

Minimis Units. Further, the administrative record is clear that the legislature, IEPA, and the Board in adopting the same definition of "CCR surface impoundments" as Part 257, all intended for Part 845 to regulate the same universe of "CCR surface impoundments" as Part 257. *See, e.g.*, R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, IEPA Responses to Pre-Filed Questions (Aug. 3, 2020) ("IEPA Responses"), attached in relevant part as Updated Ex. 22 at 7–8 ("It is the Agency's position that the same universe of CCR surface impoundments [that is regulated by Part 257] is intended to be regulated by Part 845."); *id*. at 17 ("CCR surface impoundments not subject to Part 257, are not subject to the requirements of Part 845. (Agency Response)"); R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, Hearing Transcript (Aug. 11, 2020), Ex. 23 at 43–44 (Q: "[M]y question was is Part 845 intended to apply to the same ponds that are subject to requirements under Part 257 given that they both define CCR surface impoundments in an identical fashion?" A: "In the Agency's opinion, they will be the same ones."); Final Order at 8 (noting that "many of the technical elements required of owners and operators of CCR surface impoundments are already required under federal law.").

Indeed, to the extent IEPA *had* desired to deviate from Part 257 for the scope of units of covered by Part 845, it admitted that it did not conduct its own risk assessment or otherwise gather evidence that would support doing so. *See, e.g.*, IEPA Responses, Updated Ex. 22 at 55 (Q: "Are you familiar with the Risk Assessment performed by U.S. EPA when it finalized the 2015 Federal CCR Rule?" A: "No."); R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, First Supplement to IEPA Pre-Filed Responses (Aug. 5, 2020), Ex. 24 at 37–38 (admitting that IEPA did not perform its own risk assessment and IEPA relied upon U.S. EPA's risk assessment "to the extent that USEPA's risk assessment was used by USEPA to develop the requirements of Part 257"). There is no question, then, that the De Minimis Units are excluded from regulation under both Part 257 **and** Part 845.

2. The De Minimis Units Are Not Existing or Inactive CCR Surface Impoundments.

The De Minimis Units also do not fall within the definition of "existing CCR surface impoundment" or "inactive CCR surface impoundment" under either Part 845 or Part 257. As an initial matter, under either regulatory scheme, a unit cannot be an "existing CCR surface impoundment" or an "inactive CCR surface impoundment" unless it is first a "CCR surface impoundment" which, as discussed above, the De Minimis Units are not. *See, e.g.*, Second Notice Opinion and Order at 15 ("The Board notes that for an impoundment to be an inactive surface impoundment, first it must be a *CCR surface impoundment*, which is defined in Section 845.120 as being designed to 'hold CCR and liquid.'" (emphasis in original)). Furthermore, it is undisputed that none of the De Minimis Units "received" CCR or had CCR "placed" in them—other than any small amounts that may have been incidentally deposited through indirect overflow discharges, runoff, or air—on or after October 2015. Other than B-3, they also did not "receive" CCR or have CCR "placed" in them—again, other than any small amounts that may have been incidentally deposited through indirect overflow discharges, runoff, or air—prior to October 2015. These ponds, used for secondary overflow, stormwater runoff, and landfill runoff, are exactly types of units U.S. EPA expected would be *de minimis.* The De Minimis Units thus are clearly not "existing CCR surface impoundments" under Part 257 or Part 845.

The De Minimis Units are likewise not "inactive CCR surface impoundments." Part 257 defines an "inactive surface impoundment" as a "CCR surface impoundment that no longer receives CCR on or after October 19, 2015 and still contains both CCR and liquids on or after October 19, 2015" 40 C.F.R. § 257.53. Part 845 similarly defines "inactive CCR surface impoundment" as a "CCR surface impoundment in which CCR was placed before but not after October 19, 2015 and still contains CCR on or after October 19, 2015." 35 Ill. Admin. Code § 845.120. There is no dispute that CCR was never "placed" in the South Fly Ash Pond or Pond 6, either before or after October 19, 2015. Those ponds plainly are not inactive CCR surface impoundments. To the extent any CCR was ever "placed" in the Ponds 3, 4, or B-3 decades ago, the historical record is clear that any historic receipt of CCR by those ponds was temporary and intermittent in nature and of a *de minimis* amount not intended to be covered under Part 257 or Part 845. Accordingly, the De Minimis Units do not contain more than *de minimis* amounts of CCR, which is not sufficient to meet the requirements for regulation as an inactive CCR surface impoundment under either Part 257 or Part 845. Accordingly, the De Minimis Units should not be regulated as inactive CCR surface impoundments under Part 257 or Part 845.

B. The Former Fly Ash Holding Units Are Not Subject to Part 845.

1. The Former Fly Ash Holding Units Are Not CCR Surface Impoundments, Existing CCR Surface Impoundments, or Inactive CCR Surface Impoundments.

The Former Fly Ash Holding Units are likewise not "CCR surface impoundments" subject to Part 257 or Part 845. The Former Fly Ash Holding Units are—and have been since at least the early 1990s—dry and operated in conjunction with the Former Landfill, which, in turn, has been operated and regulated as an on-site, permit-exempt landfill pursuant to 35 Ill. Admin. Code Part 815 for decades. *See e.g.* 2020 Landfill VN, Ex. 16. The Former Fly Ash Holding Units are not currently, and were not as of October 19, 2015, "designed to hold an accumulation of CCR and liquids" and accordingly, fall outside of the plain definition of "CCR surface impoundment." *See supra* at Part III.A.1; *see also* U.S. EPA, Comment Summary and Response Document: Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities; Proposed Rule, Vol. 3 (Dec. 2014), Ex. 25 at 73 ("CCR surface impoundments that have been dewatered and are no longer able to hold free liquids" prior to October 19, 2015 "are not subject to [Part 257].").

Because the Former Fly Ash Holding Units are not CCR surface impoundments, they do not fall within the definition of "existing" or "inactive CCR surface impoundments." *See supra* at Part III.A.2 (relating to the De Minimis Units and emphasizing that to be regulated as an existing or inactive CCR surface impoundment, the unit at issue must first be a "CCR surface impoundment" within the meaning of Parts 845 and 257).

2. <u>The Former Fly Ash Holding Units Have Been Managed for Decades as a Landfill, which Is Excluded from Regulation under Part 845</u>.

The Former Fly Ash Holding Units are not subject to Part 845 for the separate reason that they function (and have functioned for decades) as part of the Former Landfill, and both Part 257 and Part 845 make clear that CCR landfills are not surface impoundments. Part 257 specifically defines a CCR landfill as **not** being a CCR surface impoundment: "CCR landfill or landfill means an area of land or an excavation that receives CCR ***and which is not a surface impoundment***, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave." 40 C.F.R. § 257.53 (emphasis added). Part 257 likewise contains separate and distinct requirements for CCR landfills and CCR surface impoundments. *Compare e.g.*, 40 C.F.R. § 257.70 *with* 40 C.F.R. § 257.71 and 40 C.F.R. § 257.84 *with* 40 C.F.R § 257.83.

The 2024 Legacy Rule continues to make this distinction by promulgating federal requirements for CCR landfills that ceased receiving CCR prior to October 19, 2015. 2024 Legacy Pond Final Rule, Ex. 33 at 38,951. There is simply no question that the U.S. EPA intended to regulate CCR landfills separately from CCR surface impoundments in Part 257.[22]

Part 845 is likewise clear that it does not regulate CCR landfills; the "Scope and Purpose" section states "this Part ***does not apply*** to landfills that receive CCR." 35 Ill. Admin. Code § 845.100(h) (emphasis added); *see also* IEPA Responses, Updated Ex. 22 at 6 ("A man-made excavation where CCR is disposed could be a CCR surface impoundment or a landfill***, but a landfill that receives CCR is not a CCR surface impoundment***." (emphasis added)). The Board explicitly declined to extend Part 845's reach to landfills and other unconsolidated piles of CCR during the rulemaking, stating "that regulation of these unconsolidated coal ash fills and piles is beyond the scope of [the Illinois CCR Act]." Second Notice Opinion and Order at 12. Instead, the Board opted to open a separate sub-docket to explore regulating CCR in landfills and unconsolidated coal ash fills and piles. *Id*. IEPA agreed with the Board, taking the position that "limiting Part 845 to CCR surface impoundments is necessary and appropriate." R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, IEPA Post-Hearing Comments (Oct. 30, 2020), Ex. 26 at 10. There is no question that the Former Landfill, which includes the Former Fly Ash Holding Area Units, has been regulated as a landfill for decades. *See supra* at Part II.C.2. Indeed, as recently as March 2020, IEPA issued a VN to SIPC for alleged violations of the Illinois landfill regulations at the Former Landfill. As part of the Former Landfill, the Former Fly Ash Holding Units cannot be subject to

[22] As noted *supra*, the Former Landfill at Marion Station is not regulated pursuant to Part 257 because it stopped receiving waste prior to October 2015. 40 C.F.R. § 257.53.

Part 845. Illinois landfill regulations, consistent with Part 257 and Part 845, clearly state that a landfill is not a surface impoundment.[23]

3. The Board Should Reject IEPA's Apparent Position that the Historic Presence of a CCR Surface Impoundment Converts a Landfill into a CCR Surface Impoundment.

Finally, the Board should reject IEPA's apparent new and convoluted argument that, notwithstanding its regulation of the Former Landfill as a landfill for decades—including its issuance of a VN asserting alleged violations of Illinois landfill regulation—, the landfill regulations do not apply, and the entire Former Landfill area, including the Former Fly Ash Holding Units, is actually a CCR surface impoundment subject to Part 845.

IEPA's argument appears to be this: the Former Fly Ash Holding Units were once, decades ago, used to store CCR and water. They no longer contain water and no longer receive CCR, but the fact that they once did and appear on a map in the vicinity of the Former Landfill somehow converts the (now closed) Former Landfill, which both SIPC and IEPA have recognized for decades as a landfill, into a CCR surface impoundment. This is an illogical and absurd result, and one that runs directly contrary to the definition of "CCR surface impoundment" in Part 257, Part 845, and Illinois landfill regulations.

Treating the Former Fly Ash Holding Units, and indeed the entire Former Landfill, as CCR surface impoundments after years of regulating the area as a landfill upends years of settled expectations about the requirements for operation and closure, raising significant retroactivity and fairness concerns for this not-for-profit cooperative and its owners. The Board should reject

[23] 35 Ill. Admin. Code § 810.103 ("'Landfill' means a unit or part of a facility in or on which waste is placed and accumulated over time for disposal, and that is not a land application unit, a surface impoundment or an underground injection well."); *see also* 35 Ill. Admin. Code § 810.104 ("For the purposes of this Part and 35 Ill. Adm. Code 811 through 815, a surface impoundment is not a landfill.").

IEPA's last-minute overreach and find that Part 845 does not apply to the Former Landfill, including the Former Fly Ash Holding Units.[24]

IV. PETITION FOR AN ADJUSTED STANDARD.

If the Board declines to issue a finding of inapplicability and determines that the current and former ponds at issue in this Petition are "CCR surface impoundments," SIPC requests in the that the Board grant an adjusted standard from 35 Ill. Admin. Code Part 845 for the De Minimis Units and the Former Landfill (including the Former Fly Ash Holding Units). When petitioned, the Board may grant an adjusted standard from a rule of general applicability for persons who can justify such an adjustment under the applicable statutory factors. 415 Ill. Comp. Stat. 5/28.1(a).

In this Petition, SIPC is requesting an adjusted standard as described below and with the language presented in the attached Appendix A. The adjusted standard would result in the closure of all the units subject to this Petition consistent with Part 845 performance standards. It will also require groundwater monitoring and corrective action for each of the units consistent with Part 845 requirements. SIPC's proposed adjusted standard accounts for the unique characteristics of these units while ensuring no adverse impact to health or the environment.

As set forth below, the requested adjusted standard is warranted based on the factors set forth in Section 28.1 of the Act, including consistency with Section 27(a). Accordingly, SIPC's request for an adjusted standard for the De Minimis Units and the Former Landfill (including the

[24] The Indiana Office of Environmental Adjudication recently rejected similar attempts by environmental groups to argue that a portion of a former Duke Energy ash pond—which had been closed for decades—was subject to Part 257, stating that "an impoundment's regulatory status over three decades ago is not relevant to determining whether it is currently subject to the Federal CCR Rule." *In the Matter of Objection to the Issuance of Partial Approval of Closure/Post Closure Plan Duke Gallagher Generating Station Ash Pond System*, No. 20-S-J-5096 (OEA May 4, 2021), Ex. 27 at 14.

Former Fly Ash Holding Units) should be granted in the event the Board does not grant its request for a finding of inapplicability.

A. **Regulatory Standard.**

Section 28.1 of the Act describes the factors the Board must consider in granting an adjusted standard:

> (c) If a regulation of general applicability does not specify a level of justification required of a petitioner to qualify for an adjusted standard[[25]], the Board may grant individual adjusted standards whenever the Board determines, upon adequate proof by petitioner, that:
>
> (1) factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;
>
> (2) the existence of those factors justifies an adjusted standard;
>
> (3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and
>
> (4) the adjusted standard is consistent with any applicable federal law.

415 Ill. Comp. Stat. 5/28.1(c)(1)–(4).

Part 845, which is a regulation of general applicability, does not specify a level of justification or other requirements for an adjusted standard outside of those set forth in Section 28.1 of the Act. Any adjusted standard must also be "consistent" with subsection (a) of Section 27 of the Act, which provides that

> the Board shall take into account the existing physical conditions, the character of the area involved, including the character of surrounding land uses, zoning classifications, the nature of the existing air quality, or receiving body of water, as the case may be[[26]], and the technical feasibility and economic reasonableness of

[25] Part 845 does not specify a level of justification required to qualify for an adjusted standard.

[26] The physical conditions at Marion Station and character of the area involved, including the character of surrounding land uses, zoning classifications, and the nature of the receiving body of water are discussed *supra* at Part II.A.

measuring or reducing the particular type of pollution.

415 Ill. Comp. Stat. 5/27(a).[27] Extremely high costs of controlling a particular pollutant have been determined to be economically unreasonable.[28] A treatment or control technology is not economically reasonable if it would not significantly improve environmental conditions or increase the aesthetic or recreational value of the receiving water body, especially given high associated implementation costs.[29]

As discussed below, granting the requested adjusted standard for the De Minimis Units and the Former Landfill (including the Former Fly Ash Holding Units) is justified by the factors set forth in Section 28.1 and consistent with the factors set forth in Section 27.

B. De Minimis Units Pond 3/3a and South Fly Ash Pond.

1. SIPC Requests an Adjusted Standard for De Minimis Units Pond 3/3a and the South Fly Ash Pond.

In the event the Board denies SIPC request for a finding of inapplicability, the Board should grant the very limited adjusted standard from Part 845 for De Minimis Units Pond 3/3A and the South Fly Ash Pond set forth in Appendix A. The primary adjustments requested from Part 845 for Pond 3/3A and the South Fly Ash Pond are related to the timeframe for submitting operating

[27] The Illinois Court of Appeals has held that the Board's review is limited to the factors set forth in Sections 27(a) and 28.1: "The Act sets forth the factors the Board is to consider when determining whether to grant an adjusted standard. The Board lacks the authority to add to or rewrite the statutory factors." *Emerald Performance Materials, LLC v. Ill. Pollution Control Bd.*, 2016 IL App (3d) 150526, ¶ 27.

[28] *EPA v. Pollution Control Bd.*, 308 Ill. App. 3d 741, 752 (2d Dist. 1999) (upholding Board's finding that compliance would be economically unreasonable where "[a]ccording to the uncontested figures Swenson presented, the cost of installing a powder coating system would be more than 15 times the average control cost the Board historically has used to measure reasonableness"); *see also Granite City Div. of Nat. Steel Co. v. Ill. Pollution Control Bd.*, 155 Ill. 2d 149, 183 (1993) ("The Act specifically provides for variance and adjusted standard procedures by which the Board may relieve a discharger from compliance with its environmental control standards upon a showing of unreasonable economic or individual hardship.").

[29] *See, e.g.*, R 1981-024, *In the Matter of Proposed Water Quality Standard for Wood River (Olin, East Alton)*, Proposed Rule First Notice Order and Opinion of the Board, at 6 (Nov. 12, 1982); PCB 2009-038, *Ameren Energy Generating Co. v. IEPA*, Order and Opinion of the Board, at 42 (Mar. 18, 2010).

and closure construction permit application materials. These adjustments are a necessary step to the application of the remaining Part 845 requirements to these units. As of the filing of this Petition, the applicability of Part 845 has been stayed for Pond 3/3A and the South Fly Ash Pond and deadlines for submitting these permit application materials have passed. *See* 35 Ill. Adm. Code §§ 845.230, 845.700. As explained further below, these units are also not subject to Part 257's CCR requirements. Thus, these adjustments simply provide a reasonable timeframe for SIPC to take the steps necessary to comply with the remainder of Part 845's requirements.

Under the adjusted standard, SIPC also proposes to commit itself to closing these units via removal in accordance with Section 845.740. Thus, the closure alternatives assessment for the units would consider only closure by removal with off-site disposal or on-site disposal (to the extent practicable). These units will otherwise be subject to the remainder of applicable Part 845 requirements, including those related to permitting, location restrictions, design criteria, operating criteria, groundwater monitoring and corrective action, closure and post-closure care, and recordkeeping.[30]

2. The Factors Relating to Pond 3/3A and the South Fly Ash Pond Are Substantially and Significantly Different from the Factors and Circumstances on which the Board Relied in Adopting Part 845.

In determining whether to grant an adjusted standard, the Board first considers whether the factors relating to the Petition are significantly different from the factors considered in adopting the regulation at issue (Part 845). *See* 415 Ill. Comp. Stat. 5/28.1(c)(1). As discussed below, they are here.

[30] As a "not-for-profit electric cooperative as defined in Section 3.4 of the Electric Supplier Act," SIPC is exempt from the financial assurance requirements in Part 845. 415 Ill. Comp. Stat. 5/22.59(f).

Like the Part 257 rules relating to surface impoundments, Part 845 was intended to address the risks posed by CCR surface impoundments that have resulted or are likely to result in groundwater contamination:

> The second purpose and effect of this regulatory proposal is to protect the groundwater within the state of Illinois. The proposed rule contains a program for groundwater monitoring and the remediation of contaminated groundwater resulting from leaking CCR surface impoundments. Groundwater has an essential and pervasive role in the social and economic well-being of Illinois, and is important to the vitality, health, safety, and welfare of its citizens. This rule has been developed based on the goals above and the principle that groundwater resources should be utilized for beneficial and legitimate purposes . . . Its purpose is to prevent waste and degradation of Illinois' groundwater. The proposed rule establishes a framework to manage the underground water resource to allow for maximum benefit of the State.

IEPA Statement of Reasons, Ex. 18 at 10; *see also id*. at 3–4 ("The presence of [certain contaminants that can be found in CCR] threatens groundwater as these contaminants are soluble and mobile. When the CCR surface impoundments are not lined with impermeable material, these contaminants may leach into the ***groundwater***, affecting the potential use of the ***groundwater***." (emphasis added)).

In its Second Notice Opinion, the Board likewise emphasized that "[a]mong the program's primary goals is protecting groundwater from contamination by CCR pollutants leaking from surface impoundments." Second Notice Opinion and Order at 1; *see also id*. at 3 ("In Illinois, CCR has caused groundwater contamination and other forms of pollution that are harmful to human health and the environment."); *id*. at 41 ("[T]he installation and operation of a leachate collection system in a new CCR surface impoundments serves the same purpose as in a landfill to reduce the head on the liner to reduce the threat of groundwater contamination."); *id*. at 48 ("The Board finds that the proposed leachate collection system provides additional groundwater protection against the potential threats of contamination from new CCR surface impoundments, while allowing the operation of the impoundments in compliance with Part 845.").[31]

In determining which types of CCR surface impoundments pose the risks that Part 845 seeks to address, Part 257 is instructive; both because of its identical definition of "CCR surface impoundment" and the fact that IEPA did not perform any risk assessment of its own to support its Part 845 proposal and, instead, modeled its proposal on Part 257, which was based upon U.S. EPA's risk assessment. In other words, because the IEPA-proposed and Board-adopted Part 845 rules were based upon Part 257, and IEPA never conducted a risk assessment, Part 845 too must be based upon U.S. EPA's risk assessment. U.S. EPA was clear that it was targeting for regulation those "units that contain *a large amount* of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants." Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357 (emphasis added); Lewis Op., Ex. 36 at 4–10.

The factors relating to Pond 3/3A and the South Fly Ash Pond are substantially and significantly different than those that motivated U.S. EPA in Part 257, and also the state legislature, IEPA, and the Board in regulating CCR surface impoundments in Illinois with the aim of protecting Illinois groundwater. As discussed above, these and the other De Minimis Units do not contain large amounts of CCR under a hydraulic head that promotes rapid leaching of contaminants to groundwater. Lewis Op., Ex. 36 at 8–10, 14. These units are not known to have ever received direct wastewater discharges of CCR. To the extent they received historic, indirect discharges of CCR, the amounts of CCR were *de minimis* in nature. *Id.* The South Fly Ash Pond

[31] The Illinois legislature also made clear that the Illinois CCR Act is intended to address and prevent groundwater contamination caused by CCR surface impoundments. *See* 415 Ill. Comp. Stat. 5/22.59(a)(3) ("The General Assembly finds that . . . CCR generated by the electric generating industry has caused ***groundwater*** contamination . . . ." (emphasis added)).

served as a secondary pond, receiving only decanted water from the former Emery Pond. Pond 3/3A received overflow from the Initial Fly Ash Holding Area and later the Fly Ash Holding Area Extension, stormwater runoff, coal pile runoff, and water from the plant's floor drains. Further, since the closure of Unit 4 and the former Emery Pond, all CCR generated at the Station is handled dry, meaning no unit on site is continuing to receive any direct discharges of CCR.

As Ms. Lewis explains in her report, the U.S. EPA determined *de minimis* units—like Ponds 3/3A and the South Fly Ash Pond—do not pose the risk to groundwater, human health, or the environment that Part 257 (or Part 845) seeks to prevent. *See* Lewis Op., Ex. 36 at E-1–E-2, 11–20 (explaining the De Minimis Units "do not present the same level of risk as the surface impoundments evaluated in the US EPA CCR risk assessment.").

These forgoing facts, alone, are sufficient to establish that Pond 3/3A and the South Fly Ash Pond do not pose a similar threat to groundwater as the CCR surface impoundments that motivated Part 257 and Part 845. This conclusion is bolstered by the Pond Investigation Report. As described in the report, Haley & Aldridge reviewed the results of shake tests taken of pond sediment samples, as well as the results of Site groundwater monitoring wells, and determined that any potential presence of CCR in Pond 3/3A and the South Fly Ash Pond should not be expected to cause and has not had a material adverse impact on groundwater at the Site. *See* Pond Investigation Rep., Ex. 29 at 26; *see also* Lewis Op., Ex. 36 at 11–16. Further, a site-specific assessment of the De Minimis Units, including Pond 3/3A and the South Fly Ash Pond, confirms there is no unacceptable risk to human health or the environment from CCR constituents that may have migrated to groundwater. Lewis Op., Ex. 36 at 17–20 (demonstrating no unacceptable risk to human health or ecological receptors). Thus, the requested adjusted standard may be granted based upon this Petition.

Another important difference between these units and the CCR surface impoundments that drove Part 845 is the burden of compliance. During the rulemaking, IEPA argued, and the Board agreed, that certain Part 845 requirements, including expedited timeframes for compliance, were feasible and reasonable because units subject to Part 845 were also subject to Part 257, and therefore, owners had years to develop and implement compliance plans. *See* Final Order at 8–9. However, as discussed above, the De Minimis Units, including Pond 3/3A and South Fly Ash Pond, are not subject to Part 257, and thus, there has been no need to undertake compliance actions under Part 257, such as groundwater and location restriction assessments. Accordingly, the timing and cost of Part 845 compliance for Pond 3/3A and the South Fly Ash Pond differs substantially from the units the Board anticipated would be covered by Part 845, which were units subject to Part 257 and that already had years of Part 257 compliance activity that could be used to comply with Part 845.

3. <u>The Factors Relating to the Pond 3/3A and the South Fly Ash Pond—which Differ from those Relied upon by the Board in Passing Part 845—Justify an Adjusted Standard.</u>

The factors unique to the Pond 3/3A and the South Fly Ash Pond —namely that they are not subject to Part 257 and do not contain a large quantity of CCR managed under a hydraulic head—justify the requested adjusted standard. As discussed above, the De Minimis Units like Pond 3/3A and the South Fly Ash Pond simply do not present the risks that Part 845 was intended to address. Additionally, the adjusted standard is only requesting adjustments to provide a timeline for coming into compliance with the full scope of Part 845 in the event a finding of inapplicability is not granted for Pond 3/3A or the South Fly Ash Pond. Further, as discussed below, the adjusted standard will have no adverse impact to human health or the environment. Accordingly, SIPC's adjusted standard is justified.

4. The Requested Adjusted Standard Will Not Result in Adverse Environmental or Health Effects.

The adjusted standard requested for Pond 3/3A and the South Fly Ash Pond "will not result in environmental or health effects substantially or significantly more adverse than the effects considered by the Board in adopting" Part 845. 415 Ill. Comp. Stat. 5/28.1(c)(3).

As discussed above, the history of receipt of minimal amounts of CCR indicate these units do not present the types of risk to human health and the environment that Part 845 (and Part 257) seek to address. Neither of these units present a risk to human health or the environment. *See Gradient,* Human Health Risk Assessment, Marion Power Station (Dec. 20, 2024) ("Risk Assessment"), Ex. 37. Further, the units are not anticipated to pose a reasonable probability of adverse effects on health or the environment. Lewis Op., Ex. 36 at 4–20.

Significantly, the adjusted standard proposed for Pond 3/3A and the South Fly Ash Pond will require full compliance with the requirements of Part 845. The only adjustment being sought is for deadlines to submit operating and construction permit application materials. SIPC is further committing to close these units via a closure by removal, thereby removing any potential for sediments from these units to impact groundwater in the future. There is no adjustment being sought from the portions of Part 845 aimed at protecting human health and the environment, including its closure standards, groundwater monitoring requirements and corrective action requirements. Thus, the proposed adjusted standard will not result in any adverse environmental or health effects.

5. The Requested Adjusted Standard Is Consistent with Federal Law.

As discussed above, Pond 3/3A and the South Fly Ash Pond are not regulated as existing CCR surface impoundments or inactive CCR surface impoundments under Part 257. Accordingly, any adjustment from Part 845 for these units is consistent with federal law. *See* 35 Ill. Admin. § Code 104.406(i).

Further, Part 845 is not currently a federally designated program, thus Part 845 and Part 257 operate independently and concurrently. Owners and operators of CCR surface impoundments must comply with both sets of regulations and an adjustment from Part 845 has no impact on a requirement to comply with Part 257. Thus, the Board is free to grant an adjustment from Part 845 requirements without consideration of Part 257.

C. De Minimis Unit Former Pond B-3

1. SIPC Requests an Adjusted Standard for De Minimis Unit Former Pond B-3.

As explained above, former Pond B-3 was dewatered and cleaned to the clay in 2017, well before the promulgation of Part 845. Nothing remains within the unit other than an internal berm. Thus, it makes little sense to require Part 845 requirements related to continued operation or an extended closure construction application process apply to former Pond B-3, which poses no ongoing risk, does not currently have the characteristics of a CCR surface impoundment (lacking both water—other than the occasional stormwater—and sediment), and is nearly closed consistent with Part 845 closure by removal standards.

SIPC's adjusted standard for former Pond B-3 seeks to have those Part 845 provisions apply that are necessary to ensure the unit is closed consistent with Part 845 and in a way that is protective of human health and the environment. Under the adjusted standard, the unit will be subject to the same operating permit, and other operating requirements, applicable to units that completed closure prior to June 30, 2021. *See* 35 Ill. Admin. Code § 845.230(d)(3). SIPC will be required to submit a final closure plan for the unit to IEPA for review and approval and complete closure of former Pond B-3 in a manner consistent with Section 845.740's closure by removal requirements. Former Pond B-3 will also be subject to Part 845, Subpart F's groundwater monitoring and corrective action requirements and any recordkeeping requirements relevant to the Part 845 provisions that apply under the adjusted standard.

Given the unique nature of this unit, Part 845's location restrictions, design criteria, and other operating criteria, as explained below, do not make practical sense for former Pond B-3. Also, given that closure by removal consistent with Part 845 requirements is nearly complete under the unit's current state, the adjusted standard seeks to have the closure process completed as quickly as possible, by requiring a closure plan and approval from IEPA but not requiring a closure construction permit. As explained further below, application of these requirements makes little sense given the unique nature of this unit and the adjusted standard will have no detrimental impact on human health or the environment.

2. The Factors Relating to former Pond B-3 Are Substantially and Significantly Different from the Factors and Circumstances on which the Board Relied in Adopting Part 845.

The factors relating to former Pond B-3 are substantially and significantly different from the factors considered by the Board in adopting Part 845 for the same reasons described in Section IV.B.2 above. *See* 415 Ill. Comp. Stat. 5/28.1(c)(1). Former Pond B-3 only ever accumulated small amounts of CCR compared to those CCR surface impoundments that were the subject of the risk assessment completed to justify promulgation of Part 257 and, correspondingly, Part 845. *See supra*, IV.B.2. Former Pond B-3 primarily served as a secondary pond, receiving decant water from Pond A-1. During three to four outages at Pond A-1, former Pond B-3 may have received discharges of fly ash from Units 1, 2, and 3 prior to their shut down in 2003. When former Pond B-3 was closed in 2017, tests confirmed its sediment was high in BTU content and at least a portion of the removed sediment was burned as fuel. This supports the conclusion that former Pond B-3 differs from the types of units intended to be regulated under Part 845 because it did not ever hold significant amounts of CCR. *See* Lewis Op. Ex. 36.

Additionally, since 2017, unlike all (or nearly all) of the units regulated under Part 845, this unit has been cleaned of sediments and no longer holds water, except in a small area of the former pond where stormwater may collect after storms before drainage and evaporation. Samples taken of the berm at former Pond B-3 indicate it contains little, if any, CCR material. Pond Investigation Rep, Ex. 29 at 12. This further distinguishes former Pond B-3. There is no ongoing management of sediment with water, let alone CCR with water, that would justify the unit being subject to many of the Part 845 requirements related to ongoing operation, such as location restrictions, design criteria, and operating criteria. Many of these portions of Part 845 address physical circumstances that do not exist at former Pond B-3. *See generally* Second Notice Opinion and Order at 32–61. Instead, former Pond B-3 is most similar to a unit that underwent closure prior to the promulgation of Part 845. Thus, it makes sense for former Pond B-3 to be subject to the same operating permit, design criteria, and operating criteria applicable to such units under Part 845. This is what SIPC has proposed in its adjusted standard.

Further, given that former Pond B-3 has been cleaned to the clay, the only material that remains is a small internal berm with little, if any, CCR. Pond Investigation Rep., Ex. 29 at Appendix C. It makes little sense for closure of the unit under 845 to be completed via any method other than closure by removal (consistent with Section 845.740). Additionally, due to the limited steps that remain to complete closure of the unit by removal and the fact that the berm contains little, if any, CCR, it makes little practical sense for the unit to be subject to the full closure construction permitting requirements of Part 845.

The proposed adjusted standard for former Pond B-3 takes into account the unit's unique characteristics, while ensuring it closes with IEPA oversight, consistent with Part 845 closure performance standards, and subject to groundwater monitoring and corrective action requirements to protect against any risk to human health and the environment.

3. The Factors Relating to the Former Pond B-3—which Differ from those Relied upon by the Board in Passing Part 845—Justify an Adjusted Standard.

The factors unique to former Pond B-3 —namely that it is not subject to Part 257, does not contain, and has never contained, a large quantity of CCR managed under a hydraulic head, and has been dewatered and cleaned to the clay—justify the requested adjusted standard. As discussed above, former Pond B-3 simply does not present the risks that Part 845 was intended to address. Additionally, as discussed below, the adjusted standard for former Pond B-3 will have no adverse impact to human health or the environment. Accordingly, SIPC's adjusted standard is justified.

4. The Requested Adjusted Standard Will Not Result in Adverse Environmental or Health Effects.

The adjusted standard requested for former Pond B-3 "will not result in environmental or health effects substantially or significantly more adverse than the effects considered by the Board in adopting" Part 845. 415 Ill. Comp. Stat. 5/28.1(c)(3).

As discussed above, the history of receipt of minimal amounts of CCR indicate this unit does not present the types of risk to human health and the environment that Part 845 and Part 257 seek to address. *See* Lewis Op., Ex 36. B-3 has been cleaned of sediment and no longer contains water (other than the occasional stormwater). It does not currently present a human health or environmental risk. *See* Risk Assessment, Ex. 37 (identifying no unacceptable risks to human or ecological receptors resulting from CCR exposures associated the De Minimis Units). Further, the former Pond B-3 is not anticipated to pose a reasonable probability of adverse effects on health or the environment. Lewis Op., Ex. 36 at 4–20.

More importantly, while evidence demonstrates that this unit does not and would not be expected to pose any risk to human health or the environment (*id.*) the adjusted standard also requires compliance with all Part 845 requirements necessary to ensure that is and remains the case. For example, the adjusted standard requires that closure of former Pond B-3 is completed consistent with Part 845 closure standards. It also requires that former Pond B-3 be subject to the groundwater monitoring and corrective action requirements in Part 845, meaning, if former Pond B-3 is causing or contributing to exceedances of the groundwater protection standards in Section 845.600, SIPC will be required to undertake corrective action to remediate that contamination. Thus, to the extent former Pond B-3 poses any risk to human health or the environment (and there is no indication that it does), those risks will be addressed under the adjusted standard.

5. The Requested Adjusted Standard Is Consistent with Federal Law.

As discussed above, the De Minimis Units, including former Pond B-3, are not regulated as existing CCR surface impoundments or inactive CCR surface impoundments under Part 257. Accordingly, any adjustment from Part 845 for former Pond B-3 is consistent with federal law. *See* 35 Ill. Admin. Code § 104.406(i).

Further, Part 845 is not currently a federally designated program, thus Part 845 and Part 257 operate independently and concurrently. Owners and operators of CCR surface impoundments must comply with both sets of regulations and an adjustment from Part 845 has no impact on a requirement to comply with Part 257. Thus, the Board is free to grant an adjustment from Part 845 requirements without consideration of Part 257.

6. <u>Consideration of Section 27(a) Factors.</u>

Existing physical conditions, the character of the area involved, and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution all support granting the adjusted standard for former Pond B-3. 415 Ill. Comp. Stat. 5/27(a). There are costs associated with the Part 845 requirements from which SIPC seeks an adjustment at former Pond B-3. Additionally, given the physical condition of the unit and surrounding area, these requirements make no practical sense as applied because, as explained above, former Pond B-3 was cleaned and closed years ago. A unit such as this simply does not cause a hazard, risk of structural instability, or contain material that could contribute fugitive dust, for example. The unit also poses no active threat to human health or the environment, including groundwater or a neighboring water body. Risk Assessment, Ex. 37; Lewis Op., Ex. 36.

D. <u>De Minimis Unit Pond 4</u>

1. <u>SIPC Requests an Adjusted Standard for De Minimis Unit Pond 4</u>

SIPC requests two adjustments from Part 845 requirements for De Minimis Unit Pond 4. First, like Pond 3/3A, the South Fly Ash Pond, and former Pond B-3, the adjusted standard provides 12 months from its entry for SIPC to submit an operating permit application for Pond 4. Again, this adjustment is necessary because the deadline for submitting an initial operating permit application under Part 845 has passed (*see* 35 Ill. Admin. Code §§ 845.230; § 845.700) and Pond 4 is not subject to Part 257, so SIPC will not have already undertaken the activities necessary to compile the operating permit application. This adjustment will allow a reasonable period of time for SIPC to prepare its operating permit application for Pond 4.

Second, the adjusted standard provides an adjustment to the Part 845 closure construction permit application deadline. Under the adjusted standard, SIPC will be required to either initiate closure or begin retrofitting Pond 4, by way of submitting a construction permit application, upon the earlier of the following occurrences: (1) within 12 months of a finding that CCR within Pond 4 are the source of an exceedance of the Section 845.600 groundwater protection standards, or (2) the end of the life of the Marion Station. Thus, the adjusted standard will allow SIPC to continue the operation of Pond 4 through the end of Marion Station's life, so long as it is not contributing to groundwater contamination, as measured through a Part 845 compliant groundwater monitoring program. If Pond 4 is found to contribute to a groundwater protection standard exceedance, this extension no longer applies and SIPC must submit a closure or retrofit construction permit for Pond 4 within twelve months of that finding. As explained below, these adjustments account for Pond 4's unique condition and will be protective of health and the environment.

Under the adjusted standard, Pond 4 will be subject to the remainder of Part 845's requirements, including any other applicable permitting requirements, location restrictions, design criteria, operating criteria, groundwater monitoring and corrective action requirements, closure and post-closure care requirements, and recordkeeping requirements. Through its adjusted standard, SIPC is also committing to closing this unit via closure by removal requirements (35 Ill. Admin. Code § 845.740). Thus, the closure alternatives assessment for the unit would consider only closure by removal with off-site disposal or on-site disposal (to the extent practicable).

2. The Factors Relating to Pond 4 Are Substantially and Significantly Different from the Factors and Circumstances on which the Board Relied in Adopting Part 845.

The factors relating to the Pond 4 are substantially and significantly different from the factors considered in adopting Part 845 for the same reasons described in Section IV.B.2, above. See 415 Ill. Comp. Stat. 5/28.1(c)(1). Pond 4 only ever accumulated small amounts of CCR compared to those CCR surface impoundments that were the subject of the risk assessment completed to justify promulgation of Part 257 and, correspondingly, Part 845. *See supra*, IV.B.2. Pond 4 never directly received CCR. It received decant water from Ponds 1 and 2, stormwater runoff from the coal pile, and overflow water from Pond 6. As part of regular maintenance activities at the Marion Station in 2010, Pond 4 was dewatered, and its contents removed. The majority of removed materials were dark in color, taken to the coal yard, and burned as fuel at the Station. This would not have been possible if the materials were CCR or high in CCR content. The Pond Investigation Report found that the materials sampled in Pond 4 contained high carbon content, which is also inconsistent with a finding that the materials are CCR or high in CCR content. Pond Investigation Rep., Ex. 29 at 8-10. This supports the conclusion that Pond 4 differs from the types of units intended to be regulated under Part 845 because it did not ever hold significant amounts of CCR. *See* Lewis Op., Ex. 36.

Additionally, unlike the CCR surface impoundments regulated under Part 845, Pond 4's primary purpose is not CCR management. Rather, its primary purpose has historically been and continues to be stormwater management of the coal pile: an operating need for as long as the Marion Station is in operation.

3. The Factors Relating to Pond 4—which Differ from those Relied upon by the Board in Passing Part 845—Justify an Adjusted Standard.

The factors unique to Pond 4 —namely that it is not subject to Part 257, does not contain and has never contained a large quantity of CCR managed under a hydraulic head, and is primarily used for coal pile stormwater management—justify the requested adjusted standard. As discussed above, Pond 4 simply does not present the risks that Part 845 was intended to address. Additionally, as discussed below, the adjusted standard for Pond 4 will have no adverse impact to human health or the environment. Accordingly, SIPC's adjusted standard is justified.

4. The Requested Adjusted Standard Will Not Result in Adverse Environmental or Health Effects.

The adjusted standard requested for Pond 4 "will not result in environmental or health effects substantially or significantly more adverse than the effects considered by the Board in adopting" Part 845. 415 Ill. Comp. Stat. 5/28.1(c)(3).

Extending the closure construction permit deadline for Pond 4 will not have an adverse impact on human health or the environment. Pond 4 will still be subject to the groundwater monitoring and corrective action requirements in Part 845. Accordingly, if the Pond contributes to a groundwater protection standard exceedance, it will result in corrective action, similar to any other unit regulated under Part 845. Additionally, as explained above, to the extent Pond 4 is found to have contributed to an exceedance of the groundwater protection standards, the extension of its closure construction permit deadline to the end of the life of Marion Station will no longer apply. Instead, SIPC will be required to submit a closure or retrofit construction permit within 12 months of such a finding. Thus, the adjusted standard ensures that Pond 4 is monitored for groundwater impacts and that any groundwater impacts will be remediated, resulting in no adverse impact on health or the environment.

Additionally, Pond 4 does not present a current risk to human health or the environment. Risk Assessment, Ex. 37 (identifying no unacceptable risks to human health or ecological receptors resulting from CCR exposures associated the De Minimis Units); Andrew Bittner, M.Eng., P.E. *Closure Impact Assessment, Pond 4* at 2 (Dec. 20, 2024) ("Bittner Op."), Ex. 38. Further, the units are not anticipated to pose a reasonable probability of adverse effects on health or the environment. Lewis Op., Ex. 36 at 4–20.

The closure impact assessment for Pond 4 further concludes that there is no reduction in risk to health or the environment that would be achieved through the closure of Pond 4, thus the extension of the closure construction permit deadline will not have an adverse impact on health or the environment. Bittner Op., Ex. 38 at 12. Specifically, this report demonstrates there is little risk of flood related CCR release from Pond 4; based on current groundwater monitoring data, Pond 4 is not the likely source of any potential groundwater protection standard exceedances; closure of Pond 4 is unlikely to affect the surface water quality in Little Saline Creek (however, construction activity associated with a closure or retrofit could increase the potential for surface runoff and sedimentation to the creek); and construction activities associated with closure or retrofit could result in air quality impacts (e.g., related to fugitive dust, green-house gas emissions) in greater amounts than the current status quo. Bittner Op., Ex. 38 at 12–16. Thus, extending the time period for closing Pond 4 will not have an adverse human health or environmental impact.

5. <u>The Requested Adjusted Standard Is Consistent with Federal Law</u>.

As discussed above, Pond 4 is not regulated as an existing CCR surface impoundment or inactive CCR surface impoundment under Part 257. Accordingly, any adjustment from Part 845 for Pond 4 is consistent with federal law. *See* 35 Ill. Admin. Code § 104.406(i).

Further, Part 845 is not currently a federally designated program, thus Part 845 and Part 257 operate independently and concurrently. Owners and operators of CCR surface impoundments must comply with both sets of regulations and an adjustment from Part 845 has no impact on a requirement to comply with Part 257. Thus, the Board is free to grant an adjustment from Part 845 requirements without consideration of Part 257.

6. Consideration of Section 27(a) Factors.

Existing physical conditions, the character of the area involved, and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution all support granting the adjusted standard for Pond 4. 415 Ill. Comp. Stat. 5/27(a).

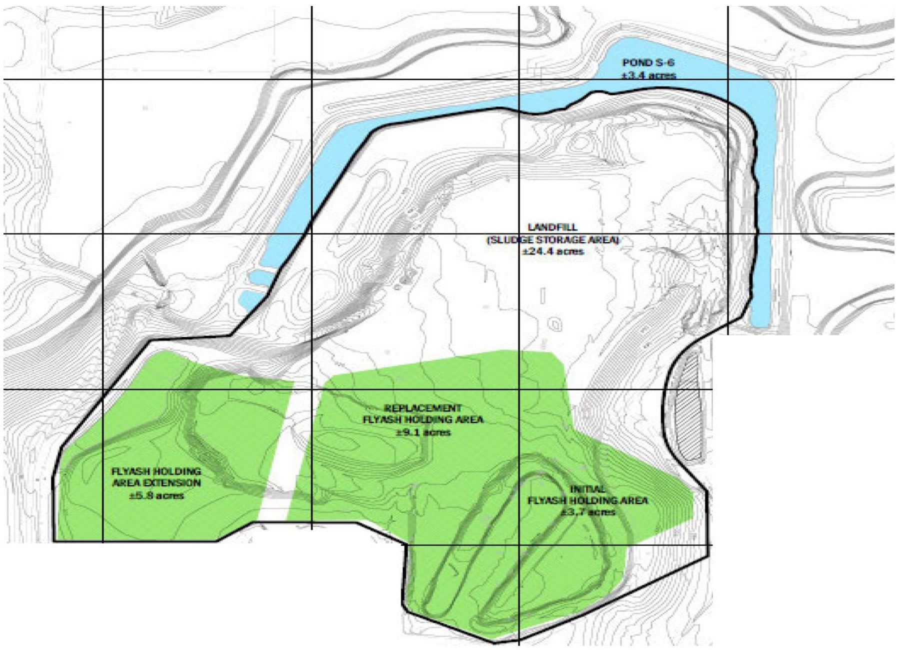
If Pond 4 does not receive the requested adjusted standard, SIPC will be required to either retrofit or close the unit. *See* 35 Ill. Admin Code. §§ 845.700–.770. However, SIPC requires the continued use of Pond 4 into the foreseeable future for stormwater management at Marion Station, particularly due to the location of the coal pile. Accordingly, SIPC must either close the pond by removal ***and then rebuild it*** as a stormwater basin or retrofit it by cleaning it (i.e., removing materials within the Pond) and installing a liner. Due to the additional exorbitant costs of dredging and installing liners, closure by removal is the least costly, technically feasible alternative. That "least costly" alternative would still cost SIPC a significant amount in capital costs (with no human health or environmental benefit). *See* Supp. Liss Dec., Ex. 30 at ¶ 6; Bittner Op., Ex. 38. This cost does not include the cost of constructing a new stormwater basin, which would be needed to replace Pond 4. Supp. Liss Dec., Ex. 30 at ¶ 6.

Significantly, this adjusted standard does not propose to put economic reasonableness considerations above protection of human health and the environment. While there are significant costs with closing or retrofitting Pond 4 (and in the event of closure building a new stormwater basin to replace Pond 4), SIPC is committing to closing or retrofitting Pond 4 earlier than at the end of Marion Station's life if Pond 4 is found to potentially impact human health or the environment (i.e. if it is contributing to Section 845.600 groundwater protection standard exceedances).

E. <u>The Former Fly Ash Holding Units and Pond 6</u>

1. <u>SIPC Requests an Adjusted Standard For the Former Landfill Area (including the Former Fly Ash Holding Units) and Pond 6.</u>

SIPC proposes an adjusted standard that would apply to the Former Landfill Area (including the Former Fly Ash Holding Units) and Pond 6. Given the multiple units involved, below is a diagram (pulled from Ex. 3 of the initial Petition) depicting the area discussed in this Section for ease of reference.[32]



The Former Fly Ash Holding Units (which as explained above, consists of the Initial Fly Ash Holding Area, the Replacement Fly Ash Holding Area, and the Fly Ash Holding Area Extension) are within the footprint of the Former Landfill at Marion Station. The Former Landfill has been historically regulated as a permit-exempt landfill under Illinois landfill regulations and, thus, is required to be covered pursuant to the Part 811 Closure Plan SIPC has already submitted

[32] As explained above, the Initial Fly Ash Holding Area, Replacement Fly Ash Holding Area, and Fly Ash Holding Extension make up the "Former Fly Ash Holding Units." The Former Landfill consists of the entire "Landfill" area outlined in bold. Pond 6, labeled as Pond S-6 on this diagram, is located to the north of the Former Landfill.

to IEPA. Former Landfill Closure Plan, Ex. 10. As discussed above, that Closure Plan was submitted to IEPA at IEPA's request in connection with IEPA's claims that the Former Landfill failed to have the permanent cover required by Part 811. That closure plan involves closing the Former Landfill in place with a cover system (which would include the areas consisting of the Former Fly Ash Holding Units) while allowing De Minimis Unit Pond 6, located to the north of the Former Landfill, to serve as a stormwater pond to manage runoff.

The adjusted standard proposes to go beyond the Part 811 Closure Plan and close the entirety of the Former Landfill (including the Former Fly Ash Holding Units) and Pond 6 in accordance with Part 845 performance standards and subject to additional Part 845 requirements. Given the unique nature of this area (as further explained below), however, SIPC requests three categories of adjustment from Part 845 requirements for the Former Landfill (including the Former Fly Ash Holding Units) and Pond 6.

First, the adjusted standard provides deadlines for submittal of operating and closure construction permit applications. This adjustment is a necessity resulting from the fact that this area is not regulated under Part 257 and that Part 845 deadlines for permit applications have passed during the pendency of this adjusted standard proceeding. This adjustment also allows time to pursue the unique opportunity to close this area via removal while sending the CCR for beneficial use, as described below. The adjusted standard requests an 18-month period to submit a final operating permit application and closure construction permit application for this area.

Second, the adjusted standard provides an adjustment from the closure alternatives assessment requirements in Section 845.710. Rather than conduct a closure alternatives assessment, the adjusted standard would require this area to close via closure by removal with beneficial use of the CCR remaining in the area, if SIPC determines, with IEPA oversight, that this is a feasible closure option. If not, the Former Landfill (including the Former Fly Ash Holding Units) will be closed in accordance with 35 Ill. Admin. Code § 845.750's closure with final cover system requirements while Pond 6 will be closed in accordance with 35 Ill. Admin. Code § 845.740's closure by removal requirements.

Third, in the event closure by removal with beneficial use of CCR is a viable closure option for the Former Landfill area, the adjusted standard would allow Petitioner to request additional time, in two-year increments, from IEPA to complete closure, so long as CCR in the area continues to be removed for beneficial use. The adjusted standard includes requirements for Petitioner to provide a narrative demonstration to IEPA explaining why the extension is needed, how it will allow for the continued "beneficial use of CCR," and the estimated date upon which "beneficial use of CCR" will be complete. No more than five two-year extensions will be allowed.

With the exception of these adjustments, the Former Landfill Area will be subject to any remaining applicable Part 845 requirements, including those related to permitting, location restrictions, design criteria, operating criteria, groundwater monitoring and corrective action, closure and post-closure care, and recordkeeping.

2. The Factors Relating to the Former Landfill, including the Former Fly Ash Holding Units, and Pond 6 Are Substantially and Significantly Different from the Factors and Circumstances the Board Relied on in Adopting Part 845.

The factors relating to the Former Landfill Area, including the Former Fly Ash Holding Units, and Pond 6 differ significantly from the factors that were considered and motivated the Board in adopting Part 845. As noted *supra* at Part IV.B.2, the legislature, IEPA, and the Board were all motivated to address the same risk that U.S. EPA sought to address in Part 257 for surface impoundments[33]—the risk posed by CCR surface impoundments that contain large amounts of CCR managed with water under a hydraulic head. The Former Fly Ash Holding Units and the Former Landfill's stormwater pond, Pond 6, are different, in several important respects.

First, the Former Fly Ash Holding Units do not contain water and have not contained water for at least thirty years. Accordingly, any CCR remaining in the Fly Ash Holding Units is not under a hydraulic head and presents far less risk to groundwater than the units the Board sought to regulate in Part 845 (which the Board acknowledged when it declined to extend the Part 845 rulemaking to CCR landfills). *See* Lewis Op., Ex. 36, at 11–14.

Second, the Former Fly Ash Holding Units are now covered by and a part of the Former Landfill, which operated and was regulated as a permit-exempt, on-site landfill for decades under Part 815. The Board clearly did not intend to regulate CCR landfills under the adopted Part 845 surface impoundment rules, and in fact, it opened a subdocket to address possible, future CCR landfill regulations. Second Notice Opinion and Order at 12; *see also* Illinois Pollution Control Board Docket No. R2020-19(A). Additionally, the Former Landfill, including the Former Fly Ash Holding Units, make up one contiguous area, and Pond 6 is used to manage runoff from the Former Landfill. Thus, from a practical perspective, it makes sense to close the entire area together.

Third, IEPA seems to be claiming that Part 845 surface impoundment requirements apply to the entirety of the Former Landfill (not just the Former Fly Ash Holding Units) after having treated the Former Landfill as a landfill for years, including by issuing the Landfill VN to SIPC in 2020. 2020 Landfill VN, Ex. 16. SIPC operated the Former Landfill as a landfill, submitted

[33] As mentioned above, the Former Landfill ceased receiving CCR prior to October 2015, and thus, it is not subject to Part 257's landfill requirements. Consistent with that assertion, in its Landfill VN, IEPA asserted that Illinois's landfill regulations, Part 811 *et seq.*, were applicable, not Part 257.

landfill reports to IEPA, and ceased using the Former Landfill at a time that made Part 257 landfill requirements inapplicable. Unlike the other "CCR surface impoundments" regulated under Part 845, both SIPC and IEPA treated this area as a landfill under the Illinois regulations. IEPA continued to treat this area as a landfill after the promulgation of Part 257.

Having expected Part 257 to be inapplicable given the plain applicability language, reinforced by IEPA's prior view that the Former Landfill was subject to Illinois landfill requirements under Part 811, SIPC has not planned for Part 257 applicability, and it has not taken any Part 257 compliance actions. Indeed, if anyone had thought at the time it was adopted that Part 257 applied at all, it would have been anomalous, to say the least, for SIPC to have taken compliance action for its Former Landfill consistent with Part 257 surface impoundment requirements, but IEPA appears now to claim that Part 845's requirements, which are based on Part 257's surface impoundment requirements, apply to the Former Landfill.

In adopting Part 845, the Board included some very aggressive deadlines because, in its view, companies were already complying with Part 257 and could use those actions to comply with Part 845. *See supra* Section IV.B.2. That is simply not true for the Former Landfill, including the Former Fly Ash Holding Units within the landfill footprint and related stormwater runoff Pond 6. No one could reasonably have expected that Part 257's (and later Part 845's) surface impoundment requirements would apply to the Former Landfill, especially when IEPA asserted as late as 2020 that the Former Landfill was a landfill and regulated under Illinois landfill regulations. The Board did not consider or assess in its Part 845 rulemaking the application of Part 845's surface impoundment requirements to landfills, including the costs, feasibility, and necessity of compliance or the risks to be addressed. Applying Part 845 surface impoundment requirements to the Former Landfill area also would cause unfair surprise and retroactive change of regulatory status concerns.

Fourth, the Former Landfill, including the Former Fly Ash Holding Units, are unique because they contain CCR that is suitable for "beneficial use of CCR" as defined in 35 Ill. Admin. Code § 845.120. SIPC has been working with a third-party to evaluate additional uses of the CCR and to send samples to potential customers to gather additional data on demand and uses. SIPC will need some time to develop the market viability for third-party beneficial use of the landfill CCR, which this adjusted standard will allow. Potential end uses for the material include use as "green material" such as cement binder, sand, aggregate, and construction insulation.

Fifth, as discussed above, Pond 6 contains *de minimis* amounts of CCR and thus does not present the risk targeted by Part 845. *See* Section IV.B.2, *supra*. Pond 6 only ever accumulated small amounts of CCR compared to those CCR surface impoundments that were the subject of the risk assessment completed to justify promulgation of CCR surface impoundments in Part 257 and, correspondingly, Part 845. Pond 6 has only received incidental amounts of CCR through decanted overflow from other ponds or stormwater runoff from the Former Landfill. Additionally, Pond 6 serves the necessary operational function of capturing runoff from the Former Landfill. Thus, it makes sense for its closure to be tied to, and conducted with, the closure of the Former Landfill.

3. The Factors Relating to the Former Fly Ash Holding Units—which Differ from those Relied upon by the Board in Passing Part 845—Justify an Adjusted Standard.

The factors discussed above all justify granting the adjusted standard here, particularly where the units will be closed in accordance with Part 845 closure performance standards and in a manner that is protective of human health and the environment, as discussed below.

4. <u>The Requested Adjusted Standard Will Not Result in Adverse Environmental or Health Effects.</u>

As an initial matter, the adjusted standard will require compliance with Part 845 closure performance standards and groundwater monitoring and corrective action requirements, so to the extent the units in this area are having an impact on groundwater, those impacts will be addressed in accordance with the Part 845 requirements.

Additionally, the Former Fly Ash Holding Units do not contain water and, therefore, do not pose the same risks to the environment as CCR surface impoundments that contain large quantities of CCR under a hydraulic head. *See* Lewis Op., Ex. 36 at 14. Instead, they function as a landfill, which U.S. EPA, IEPA, and the Board have all recognized pose less of a threat to the environment than the units that the Board sought to regulate under Part 845. Final Rule, Second Amended Pet. Updated Ex. 17 at 21,342 ("As noted, EPA's risk assessment shows that the highest risks are associated with CCR surface impoundments due to the hydraulic head imposed by impounded water."); Lewis Op., Ex. 36 at 11–13. Further, Pond 6 is a landfill runoff, *de minimis* pond, and as discussed above, it too does not present a human health or environmental risk warranting regulation under Part 845. Risk Assessment, Ex. 37; Lewis Op., Ex. 36.

Finally, there are significant environmental benefits to allowing the CCR to be removed for beneficial use. As U.S. EPA has explained

> The beneficial use of CCR is a primary alternative to current disposal methods. And as EPA has repeatedly concluded, it is a method that, when performed correctly, can offer significant environmental benefits, including greenhouse gas (GHG) reduction, energy conservation, reduction in land disposal (along with the corresponding avoidance of potential CCR disposal impacts), and reduction in the need to mine and process virgin materials and the associated environmental impacts. . . . Three of the most widely recognized beneficial applications of CCR are the use of coal fly ash as a substitute for Portland cement in the manufacture of concrete, the use of FGD gypsum as a substitute for mined gypsum in the manufacture of wallboard, and the use of CCR as a substitute for sand, gravel, and

> other materials in structural fill. Reducing the amount of cement, mined gypsum, and virgin fill produced by substituting CCR leads to large supply chain-wide reductions in energy use and GHG emissions. . . . CCR can be substituted for many virgin materials that would otherwise have to be mined and processed for use. These virgin materials include limestone to make cement, and Portland cement to make concrete; mined gypsum to make wallboard, and aggregate, such as stone and gravel for uses in concrete and road bed. Using virgin materials for these applications requires mining and processing, which can impair wildlife habitats and disturb otherwise undeveloped land. It is beneficial to use secondary materials—provided it is done in an environmentally sound manner—that would otherwise be disposed of, rather than to mine and process virgin materials, while simultaneously reducing waste and environmental footprints. . . . Beneficially using CCR instead of disposing of it in landfills and surface impoundments also reduces the need for additional landfill space and any risks associated with their disposal. . . . As discussed in the final rule RIA, the current beneficial use of CCR as a replacement for industrial raw materials (e.g., Portland cement, virgin stone aggregate, lime, gypsum) provides substantial annual life cycle environmental benefits for these industrial applications.

Final Rule, Second Amended Pet. Updated Ex. 17 at 21,329.

Thus, the proposed adjusted standard will not have an adverse impact on human health or the environment, and in fact may result in environmental benefits.

5. <u>The Requested Adjusted Standard is Consistent with Federal Law</u>.

As discussed *supra*, the Former Fly Ash Holding Units and Pond 6 are not existing or inactive CCR surface impoundments under Part 257. Accordingly, excluding them from Part 845 is not inconsistent with federal law. *See* 35 Ill. Admin. Code § 104.406(i).

Further, Part 845 is not currently a federally designated program, thus Part 845 and Part 257 operate independently and concurrently. Owners and operators of CCR surface impoundments must comply with both sets of regulations and an adjustment from Part 845 has no impact on a requirement to comply with Part 257. Thus, the Board is free to grant an adjustment from Part 845 requirements without consideration of Part 257.

F. **Proposed Language of Adjusted Standard.**

See Appendix A.

G. **Part 845 Was Promulgated to Implement Section 22.59 of the Act and the Automatic Stay Applies.**

Because SIPC filed its initial petition for an individual adjusted standard within 20 days after the effective date of Part 845 (April 21, 2021), the operation and application of Part 845 is automatically stayed as to the De Minimis Units and Former Fly Ash Holding Units pending the disposition of this petition. 415 Ill. Comp. Stat. 5/28.1(e).

The only exception to this automatic stay is for regulations "adopted by the Board to implement, in whole or in part, the requirements of the federal Clean Air Act, Safe Drinking Water Act or Comprehensive Environmental Response, Compensation and Liability Act, or the State RCRA, UIC or NPDES programs." 415 Ill. Comp. Stat. 5/28.1(e). Part 845 was promulgated to implement Section 22.59 of the Act and the federal Resources Conservation and Recovery Act, Section 4005. It was not promulgated to implement, in whole or in part, the requirements of the federal Clean Air Act, Clean Water Act Safe Drinking Water Act or Comprehensive Environmental Response, Compensation and Liability Act, or the State RCRA, UIC or NPDES programs. *See* 35 Ill. Adm. Code 104.406(b).

H. **Hearing Request.**

SIPC requests a hearing for this adjusted standard pursuant to 35 Ill. Admin. Code § 104.406(j).

I. **Supporting Documentation.**

Documents and legal authorities supporting the Petition are cited herein (and, where applicable, on the attached Index of Exhibits) when they are used as a basis for the Petitioner's proof. Relevant portions of updated or new documents and legal authorities, other than Board's final Order State regulations, statutes, and reported cases, are attached to this Petition. *See* 35 Ill. Admin. Code § 104.406(k).

V. **CONCLUSION.**

SIPC respectfully requests that the Board grant its request for inapplicability or, in the alternative, an adjusted standard as set forth herein.

Respectfully Submitted,

SOUTHERN ILLINOIS POWER
COORPERATION

/s/ *Bina Joshi*
One of its attorneys

Dated: December 20, 2024

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INDEX OF EXHIBITS

Second Amended Petition Updated Exhibit 1	The Declaration of Wendell Watson
Updated Exhibit 2	The Declaration of Todd Gallenbach
Exhibit 3	Site Map prepared by Andrews Engineering for SIPC (May 2021)
Exhibit 4	Lake Egypt Water District IL 1995200, Annual Drinking Water Quality Report (Jan. 1–Dec. 30, 2019)
Exhibit 5	IEPA Water Pollution Control Permit, No. 1977-EN-5732 (Nov. 14, 1977)
Exhibit 6	Letter from SIPC to IEPA (July 27, 1982)
Exhibit 7	IEPA Water Pollution Control Permit, No. 1981-EN-2776-1 (Oct. 13, 1981)
Exhibit 8	Letter from SIPC to IEPA (Sept. 16, 1993)
Exhibit 9	Declaration of Kenn Liss
Exhibit 10	Andrews Engineering, SIPC's Proposed Closure Plan for IEPA Site No. 199055505 (Dec. 16, 2020)
Exhibit 11	Hanson, Emery Pond Corrective Action and Selected Remedy Plan, Including GMZ Petition (Mar. 29, 2019)
Exhibit 12	IEPA Water Pollution Control Permit, No. 1989-EN-3064 (May 17, 1989)
Exhibit 13	IEPA Reissued National Pollutant Discharge Elimination System Permit, No. IL0004316 (February 1, 2007)
Exhibit 14	IEPA Water Pollution Control Permit, No. 1973-ED-1343-OP (June 1973)
Exhibit 15	Initial Facility Report – for On-Site Facilities (Sept. 18, 1992)
Exhibit 16	IEPA Violation Notice L-2020-00035 (Mar. 20, 2020
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Exhibit 18	R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, IEPA's Statement of Reasons (Mar. 30, 2020)

Exhibit 19	R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, SIPC Comments to Illinois Pollution Control Board (Sept. 25, 2020)
Exhibit 20	IEPA Violation Notice W-2020-00046 (July 28, 2020)
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Updated Exhibit 22	R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, IEPA Responses to Pre-Filed Questions (Aug. 3, 2020)
Exhibit 23	R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, Hearing Transcript (Aug. 11, 2020)
Exhibit 24	R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, First Supplement to IEPA Pre-Filed Responses (Aug. 5, 2020)
Exhibit 25	U.S. EPA, Comment Summary and Response Document: Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities; Proposed Rule, Vol. 3 (Dec. 2014)
Exhibit 26	R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, IEPA Post-Hearing Comments (Oct. 30, 2020)
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Exhibit 29	Pond Investigation Report for Certain Ponds at SIPC's Marion Station
Exhibit 30	The Supplemental Declaration of Kenneth W. Liss
Exhibit 31	Amended Petition Redline
Exhibit 32	The Declaration of Jason McLaurin
Exhibit 33	Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities;

	Legacy CCR Surface Impoundments, 89 Fed. Reg. 38,950 (May 8, 2024) (excerpted)
Exhibit 34	U.S. EPA, *Frequent Questions about Definitions and Implementing the Final Rule Regulating the Disposal of Coal Combustion Residuals*
Exhibit 35	Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments, 88 Fed. Reg. 31,982, 32,018 (May 18, 2023)
Exhibit 36	Ari Lewis, M.S. *Support for the Petition of an Adjusted Standard for Pond 4, Ponds 3 and 3A, Pond S-6, Former Pond B-3, and South Fly Ash Pond* (Dec. 20, 2024)
Exhibit 37	Gradient, *Human Health Risk Assessment, Marion Power Station* (Dec. 20, 2024)
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APPENDIX A

SIPC's SECOND AMENDED PETITION FOR A FINDING OF INAPPLICABILITY OR, IN THE ALTERNATIVE, AN ADJUSTED STANDARD

The Board hereby grants the following adjusted standard, as applicable to the below listed units at Southern Illinois Power Cooperative's ("Petitioner's") Marion Generating Station in Williamson County, Illinois:

I) **Pond 3/3A, and the South Fly Ash Pond** shall be exempt from all requirements of 35 Ill. Admin. Code Part 845, except for the following requirements, which shall apply subject to any modifications described below.

a. All of Subpart A (General Provisions);

b. Subpart B (Permitting):

1. Subsection 845.200(a) and (b) (Permit Issuance Requirements);

2. Section 845.210 (Permitting General Provisions);

3. Subsection 845.220 (Construction Permits), except Section 845.220(d)(1), and further modified such that Petitioner's initial closure construction permit application for Pond 3/3A and the South Fly Ash Pond shall be due to the Illinois Environmental Protection Agency (the "Agency") within 12 months after entry of this adjusted standard;

4. Subsection 845.230 (Operating Permit Submission) modified such that Petitioner's initial operating permit application for Pond 3/3A and the South Fly Ash Pond shall be due to the Agency within 12 months after entry of this adjusted standard;

5. Section 845.240 (Pre-Application Public Notification and Public Meeting);

6. Section 845.250 (Tentative Determination and Draft Permit);

7. Section 845.260 (Draft Permit Public Notice and Participation);

8. Section 845.270 (Final Permit Determination and Appeal);

9. Within 30 days of Agency approval of a construction permit or operating permit, Petitioner shall provide notice to the Board of its issuance; and

10. Section 845.280 (Transfer, Modification, and Renewal);

11. Section 845.290 (Construction Quality Assurance Program);

c. All of Subpart C (Location Restrictions);

d. Subpart D (Design Criteria) these criteria shall be applicable until the initiation of physical construction under an approved Part 845 closure construction permit:

1. Subsections 845.440 (Hazard Potential Classification Assessment);

2. Subsections 845.450 (Structural Stability Assessment); and

3. Subsections 845.460 (Safety Factor Assessment);

e. All of Subpart E (Operating Criteria);

f. Subpart F (Groundwater Monitoring and Corrective Action):

1. Section 845.600 (Groundwater Protection Standards);

2. Subsections 845.610 (General Requirements);

3. Section 845.620 (Hydrogeologic Site Characterization);

4. Section 845.630 (Groundwater Monitoring Systems);

5. Section 845.640 (Groundwater Sampling and Analysis Requirements);

6. Subsection 845.650 (Groundwater Monitoring Program);

7. Section 845.660 (Assessment of Corrective Measures);

8. Subsection 845.670 (Corrective Action Plan); and

9. Subsection 845.680 (Implementation of the Corrective Action Plan);

g. Subpart G (Closure and Post-Closure Care):

1. Section 845.710 (Closure Alternatives Assessment), however Petitioner’s closure alternatives assessment shall discuss only closure by removal for the Pond;

2. Subsection 845.720(b) (Final Closure Plan);

3. Section 845.740 (Closure by Removal); and

4. Section 845.760 (Completion of Closure Activities);

h. Subpart H (Recordkeeping):

1. Subsection 845.800(a), as it relates to the information Petitioner is required to produce under this Adjusted Standard;

2. Subsections 845.800(b), (c);

3. Subsections 845.800(d) as it relates to the information Petitioner is required to produce under the Adjusted Standard; and

4. Subsections 845.810, except for purposes of 845.810(e), Petitioner shall be required to post to its CCR website only that information it is required to include in its facility operating record under Section I.h.3 above;

i. Nothing in this adjusted standard shall exempt Petitioner from applicable requirements contained in other state or federal laws.

II) **Pond B-3** shall be exempt from all requirements of 35 Ill. Admin. Code Part 845, except for the following requirements, which shall apply subject to any modifications described below.

a. All of Subpart A (General Provisions);

b. Subpart B (Permitting):

1. Subsection 845.220(a) and (c) (Construction Permit), to the extent petitioner initiates corrective action under Section II.e. below;

2. Subsection 845.230(d)(3) (Initial Operating Permit) modified so that an operating permit application for the unit must include the requirements set forth in this section and be submitted within 12 months after entry of this adjusted standard;

3. Sections 845.240–.280, to the extent petitioner initiates corrective action under Section II.e. below; and

4. Section 845.290 (Construction Quality Assurance Program);

c. Subpart D (Design Criteria):

1. Section 845.430 (Slope Maintenance);

d. Subpart E (Operating Criteria):

1. Section 845.520 (Emergency Action Plan); and

2. Section 845.550(e) (Annual Groundwater Monitoring and Corrective Action Report);

e. Subpart F (Groundwater Monitoring and Corrective Action):

1. Section 845.600 (Groundwater Protection Standards);

2. Subsections 845.610) (Groundwater Monitoring General Requirements);

3. Section 845.620 (Hydrogeologic Site Characterization);

4. Section 845.630 (Groundwater Monitoring Systems);

5. Section 845.640 (Groundwater Sampling and Analysis Requirements);

6. Subsection 845.650 (Groundwater Monitoring Program);

7. Section 845.660 (Assessment of Corrective Measures);

8. Subsection 845.670 (Corrective Action Plan); and

9. Subsection 845.680 (Implementation of the Corrective Action Plan);

f. Subpart G (Closure and Post-Closure Care):

1. Subsection 845.720(b) (Final Closure Plan) modified such that the Final Closure Plan will be submitted within 12 months of the effective date of this adjusted standard and will not be required to submitted along with a construction permit application. The Final Closure Plan shall set forth any additional steps that are necessary to complete and meet the Section 845.740 Closure by Removal performance standards for Pond B-3; and

2. Section 845.740 (Closure by Removal);

g. Subpart H (Recordkeeping):

1. Subsection 845.800(a), as it relates to the information Petitioner is required to produce under this adjusted standard;

2. Subsections 845.800(b), (c);

3. Subsections 845.800(d), as it relates to the information Petitioner is required to produce under this adjusted standard; and

4. Subsections 845.810(a)–(g), except for purposes of 845.810(e), Petitioner shall be required to post to its CCR website only that information it is required to include in its facility operating record under Section II.g.3 above;

h. Nothing in this adjusted standard shall exempt Petitioner from applicable requirements contained in other state or federal laws.

III) **Pond 4** shall be exempt from all requirements of 35 Ill. Admin. Code Part 845, except for the following requirements, which shall apply subject to any modifications described below.

a. All of Subpart A (General Provisions);

b. Subpart B (Permitting):

1. Subsection 845.200(a) and (b) (Permit Issuance Requirements);

2. Section 845.210 (Permitting General Provisions);

3. Subsection 845.220 (Construction Permit), except for Subsection 845.220(d)(1), and further modified such that Petitioner's construction permit application for closure or retrofit of Pond 4 shall be due to the Agency upon the earlier of the following two occurrences: (1) within 12 months of a finding that coal combustion residuals ("CCR") within Pond 4 are the source of groundwater contamination pursuant to Section III.f. below, or (2) the end of the life of the Marion Generating Station;

4. Subsection 845.230 (Operating Permit) modified such that Petitioner's initial operating permit application for Pond 4 shall be due to the Agency within 12 months after entry of this adjusted standard;

5. Section 845.240 (Pre-Application Public Notification and Public Meeting);

6. Section 845.250 (Tentative Determination and Draft Permit);

7. Section 845.260 (Draft Permit Public Notice and Participation);

8. Section 845.270 (Final Permit Determination and Appeal);

9. Section 845.280 (Transfer, Modification, and Renewal); and

10. Section 845.290 (Construction Quality Assurance Program);

c. All of Subpart C (Location Restrictions);

d. Subpart D (Design Criteria)—these criteria shall be applicable until the initiation of physical construction under an approved Part 845 closure construction permit:

    1. Subsections 845.440 (Hazard Potential Classification Assessment);

    2. Subsections 845.450 (Structural Stability Assessment); and

    3. Subsections 845.460 (Safety Factor Assessment);

e. All of Subpart E (Operating Criteria);

f. Subpart F (Groundwater Monitoring and Corrective Action):

    1. Section 845.600 (Groundwater Protection Standards);

    2. Subsections 845.610 (Groundwater Monitoring General Requirements);

    3. Section 845.620 (Hydrogeologic Site Characterization);

    4. Section 845.630 (Groundwater Monitoring Systems);

    5. Section 845.640 (Groundwater Sampling and Analysis Requirements);

    6. Subsection 845.650 (Groundwater Monitoring Program);

    7. Section 845.660 (Assessment of Corrective Measures);

    8. Subsection 845.670 (Corrective Action Plan); and

    9. Subsection 845.680 (Implementation of the Corrective Action Plan);

g. Subpart G (Closure and Post-Closure Care) modified such that Petitioner becomes subject to the requirements of Sections 845.720(b), 845.740, 845.750, and 845.770, as modified below, and is required to either initiate closure or begin retrofitting Pond 4, by way of submitting a construction permit application, upon the earlier of the following occurrences: (1) within 12 months of a finding that CCR within Pond 4 are the source of an exceedance of the 845.600 Groundwater Protection Standards pursuant to Section III.f. above, or (2) the end of the life of the Marion Power Plant:

    1. Section 845.710 (Closure Alternatives Assessment), however Petitioner's closure alternatives assessment shall discuss only closure by removal for the Pond;

2. Subsection 845.720(a) (Preliminary Closure Plan);

3. Subsection 845.720(b) (Final Closure Plan);

4. Section 845.740 (Closure by Removal); and

5. Section 845.770 (Retrofitting);

h. Subpart H (Recordkeeping):

1. Subsection 845.800(a), as it relates to the information Petitioner is required to produce under this Adjusted Standard;

2. Subsections 845.800(b), (c);

3. Subsections 845.800(d), as it relates to the information Petitioner is required to produce under this Adjusted Standard; and

4. Subsections 845.810(a)–(g), except for purposes of 845.810(e), Petitioner shall be required to post to its CCR website only that information it is required to include in its facility operating record under Section III.h.3 above;

i. Nothing in this adjusted standard shall exempt Petitioner from applicable requirements contained in other state or federal laws.

IV) The Former Landfill, including Initial Fly Ash Holding Area, Replacement Fly Ash Holding Area, Fly Ash Holding Area Extension, and Pond 6 (together the "Former Landfill Area") shall be closed as one unit and shall be exempt from all requirements of 35 Ill. Admin. Code Part 845, except for the following requirements, which shall apply subject to any modifications described below:

a. All of Subpart A (General Provisions);

b. Subpart B (Permitting):

1. Subsection 845.200 (Permit Issuance Requirements);

2. Section 845.210 (Permitting General Provisions);

3. Subsection 845.220 (Construction Permit), except Subsection 845.220(d)(1), and further modified such that Petitioner's initial closure construction permit application for the Former Landfill Area shall be due to the Agency within 18 months after the entry of this adjusted standard;

4. Subsection 845.230 (Operating Permit Submission), modified such that Petitioner's initial operating permit application for

Former Landfill Area shall be due to the Agency within 18 months after entry of this adjusted standard;

5. Section 845.240 (Pre-Application Public Notification and Public Meeting);
6. Section 845.250 (Tentative Determination and Draft Permit)
7. Section 845.260 (Draft Permit Public Notice and Participation);
8. Section 845.270 (Final Permit Determination and Appeal);
9. Section 845.280 (Transfer, Modification, and Renewal); and
10. Section 845.290 (Construction Quality Assurance Program);

c. Subpart C (Location Restrictions);

d. Subpart D (Design Criteria), these criteria shall be applicable until the initiation of physical construction under an approved Part 845 closure construction permit:

1. Subsections 845.440 (Hazard Potential Classification Assessment);
2. Subsections 845.450 (Structural Stability Assessment); and
3. Subsections 845.460 (Safety Factor Assessment);

e. All of Subpart E (Operating Criteria);

f. Subpart F (Groundwater Monitoring and Corrective Action):

1. Section 845.600 (Groundwater Protection Standards);
2. Subsections 845.610(a), (b)(1), (b)(3) (Groundwater Monitoring General Requirements).;
3. Subsection 845.610(c), (d);
4. Subsection 845.610(e);
5. Section 845.620 (Hydrogeologic Site Characterization);
6. Section 845.630 (Groundwater Monitoring Systems);
7. Section 845.640 (Groundwater Sampling and Analysis Requirements);

8. Subsection 845.650 (Groundwater Monitoring Program);

9. Section 845.660 (Assessment of Corrective Measures);

10. Subsection 845.670 (Corrective Action Plan); and

11. Subsection 845.680 (Implementation of the Corrective Action Plan);

g. Subpart G (Closure and Post-Closure Care):

1. Subsection 845.720(b) (Final Closure Plan), the Final Closure Plan shall be due within 18 months of the entry of this adjusted standard;

2. Section 845.740 (Closure by Removal);

3. Section 845.750 (Closure with a Final Cover System);

4. Petitioner shall be subject to the requirements of Sections 845.720(b), 845.740, and 845.750 and is required to initiate closure by way of submitting a construction permit application, along the following, modified timeframe:

i. Within 6 months of the entry of this adjusted standard, Petitioner must evaluate whether a market for beneficial use of the CCR in the Former Landfill Area exists;

ii. Within 8 months of the entry of this adjusted standard, if there is a market for the CCR, Petitioner may elect to provide a written demonstration to the Agency showing (1) a market exists for the materials to be taken for the "beneficial use of CCR" (as defined under Section 845.120), (2) Petitioner has a contract or the option to enter into a contract for the removal of the materials for the "beneficial use of CCR," and (3) the proposed location to which the material will be transferred for processing for beneficial use; and

iii. As indicated in Section IV.b.3. above, within 18 months of the entry of this adjusted standard, Petitioner must submit a closure construction permit application. If there is a market for the beneficial use of the CCR and Petitioner has made the written demonstration described in Section IV.g.4.ii. above, the closure construction permit application will include a closure plan for closure by removal in accordance with Section 845.740 with beneficial use of the CCR. If a market does not exist or Petitioner has not made the written demonstration described in IV.f.5.ii, the closure construction permit application will include a closure plan for closure with a final cover system in accordance with Section 845.750 for the entire area except Pond 6, which will be closed via removal in accordance with 845.740;

5. Section 845.760, except if closure by removal with beneficial use of CCR, as described in Section IV.g.4.iii. above, is the closure method selected. In that case, Petitioner may request additional time to complete closure, in two-year increments, for the material's continued beneficial use. In order to obtain an extension for the continued removal of CCR for beneficial use, Petitioner will provide a narrative demonstration to the Agency that includes (1) an explanation of why additional time is needed for CCR to be removed for the purpose of beneficial use, (2) a demonstration that the unit has remaining CCR that can be removed for the purpose of "beneficial use of CCR" (as defined under Section 845.120) during the extension period, (3) the estimated date upon which the beneficial use of CCR from the unit will no longer be viable:

    i. For each two-year extension sought, Petitioner must substantiate the factual circumstances demonstrating the need for the extension. No more than a total of five two-year extensions will be allowed;

    ii. Petitioner must provide, with the demonstration, the following statement signed by an authorized representative: "I certify under penalty of law that I have personally examined and am familiar with the information submitted in this demonstration and all attached documents, and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe that the submitted information is true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment"; and

    iii. If closure by removal with beneficial use of CCR, as described in Section IV.g.4.iii. above, is the closure method selected, Petitioner will submit semi-annual reports to IEPA documenting the amount of CCR removed for beneficial use during each preceding six-month period;

6. Section 845.780 (Post-Closure Care Requirements), to the extent Petitioner is conducting closure with a final cover system in accordance with Section 845.750;

h. Subpart H (Recordkeeping):

1. Subsection 845.800(a), as it relates to the information Petitioner is required to produce under this adjusted standard;

2. Subsections 845.800(b), (c);

3. Subsections 845.800(d), as it relates to the information Petitioner is required to produce under this adjusted standard; and

4. Subsections 845.810(a)–(g), except for purposes of 845.810(e), Petitioner shall be required to post to its CCR website only that information it is required to include in its facility operating record under Section IV.h.3 above and will further post any demonstrations submitted to the Agency pursuant to Section IV.g.5. above;

i. Nothing in this adjusted standard shall exempt Petitioner from applicable requirements contained in other state or federal laws.

SECOND AMENDED PET.
UPDATED EXHIBIT 1

DECLARATION OF WENDELL WATSON ON
BEHALF OF SOUTHERN ILLINOIS POWER COOPERATIVE

I, Wendell Watson, first being duly sworn on oath, depose and state as follows:

1. I am currently employed as Director of Environmental Services at Southern Illinois Power Cooperative ("SIPC"), which operates an electric power generating facility, located south of Marion, Illinois, in Williamson County ("Marion Station"). I am responsible for environmental compliance and fuel procurement at the Marion Station. I have worked for SIPC since June of 2018. I received a Bachelor's of Chemistry from Illinois State University in 1986. Prior to my current position at SIPC, I worked for over 30 years as an environmental manager for another company.

2. I participated in the preparation of the Petition of Southern Illinois Power Cooperative for an Adjusted Standard from 30 Ill. Adm. Code Part 845 or, in the Alternative, a Finding of Inapplicability ("Petition").

3. I have read the Petition and, based on my personal knowledge and belief, the facts stated in the following sections of the Petition are true and correct: Section II.A., the introductory paragraphs of Section II.B., IV.C.6., IV.D.6, and IV.E.2. regarding Marion Station and SIPC and its operation, business, and financing.

FURTHER, Declarant sayeth not.

Wendell Watson
Wendell Watson

Dated: this 19 day of December 2024.

SECOND AMENDED PET.
UPDATED EXHIBIT 17

FEDERAL REGISTER

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Part II

Environmental Protection Agency

40 CFR Parts 257 and 261

Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities; Final Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 257 and 261

[EPA–HQ–RCRA–2009–0640; FRL–9919–44–OSWER]

RIN–2050–AE81

Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: The Environmental Protection Agency (EPA or the Agency) is publishing a final rule to regulate the disposal of coal combustion residuals (CCR) as solid waste under subtitle D of the Resource Conservation and Recovery Act (RCRA). The available information demonstrates that the risks posed to human health and the environment by certain CCR management units warrant regulatory controls. EPA is finalizing national minimum criteria for existing and new CCR landfills and existing and new CCR surface impoundments and all lateral expansions consisting of location restrictions, design and operating criteria, groundwater monitoring and corrective action, closure requirements and post closure care, and recordkeeping, notification, and internet posting requirements. The rule requires any existing unlined CCR surface impoundment that is contaminating groundwater above a regulated constituent's groundwater protection standard to stop receiving CCR and either retrofit or close, except in limited circumstances. It also requires the closure of any CCR landfill or CCR surface impoundment that cannot meet the applicable performance criteria for location restrictions or structural integrity. Finally, those CCR surface impoundments that do not receive CCR after the effective date of the rule, but still contain water and CCR will be subject to all applicable regulatory requirements, unless the owner or operator of the facility dewaters and installs a final cover system on these inactive units no later than three years from publication of the rule. EPA is deferring its final decision on the Bevill Regulatory Determination because of regulatory and technical uncertainties that cannot be resolved at this time.

DATES: This final rule is effective on October 14, 2015.

ADDRESSES: EPA has established three dockets for this regulatory action under Docket ID No. EPA–HQ–RCRA–2009–0640, Docket ID No. EPA–HQ–RCRA–2011–0392, and Docket ID No. EPA–HQ–RCRA–2012–0028. All documents in these dockets are available at *http://www.regulations.gov*. Although listed in the index, some information is not publicly available, *e.g.*, Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are available either electronically in *http://www.regulations.gov* or in hard copy at the OSWER Docket, EPA/DC, WJC West Building, Room 3334, 1301 Constitution Ave. NW., Washington, DC 20460. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566–1744, and the telephone number for the OSWER Docket is 202–566–0276.

FOR FURTHER INFORMATION CONTACT: For questions on technical issues: Alexander Livnat, Office of Resource Conservation and Recovery, Environmental Protection Agency, 5304P; telephone number: (703) 308–7251; fax number: (703) 605–0595; email address: *livnat.alexander@epa.gov*, or Steve Souders, Office of Resource Conservation and Recovery, Environmental Protection Agency, 5304P; telephone number: (703) 308–8431; fax number: (703) 605–0595; email address: *souders.steve@epa.gov*. For questions on the regulatory impact analysis: Richard Benware, Office of Resource Conservation and Recovery, Environmental Protection Agency, 5305P; telephone number: (703) 308–0436; fax number: (703) 308–7904; email address: *benware.richard@epa.gov*. For questions on the risk assessment: Jason Mills, Office of Resource Conservation and Recovery, Environmental Protection Agency, 5305P; telephone number: (703) 305–9091; fax number: (703) 308–7904; email address: *mills.jason@epa.gov*.

For more information on this rulemaking please visit *http://www.epa.gov/epawaste/nonhaz/industrial/special/fossil/index.htm*.

SUPPLEMENTARY INFORMATION:

A. Does this action apply to me?

This rule applies to all coal combustion residuals (CCR) generated by electric utilities and independent power producers that fall within the North American Industry Classification System (NAICS) code 221112 and may affect the following entities: Electric utility facilities and independent power producers that fall under the NAICS code 221112. The industry sector(s) identified above may not be exhaustive; other types of entities not listed could also be affected. The Agency's aim is to provide a guide for readers regarding those entities that potentially could be affected by this action. To determine whether your facility, company, business, organization, etc., is affected by this action, you should refer to the applicability criteria discussed in Unit VI.A. of this document If you have any questions regarding the applicability of this action to a particular entity, consult the person listed in the preceding **FOR FURTHER INFORMATION CONTACT** section.

B. What actions are not addressed in this rule?

This rule does not address the placement of CCR in coal mines. The U.S. Department of Interior (DOI) and, as necessary, EPA will address the management of CCR in minefills in separate regulatory action(s), consistent with the approach recommended by the National Academy of Sciences, recognizing the expertise of DOI's Office of Surface Mining Reclamation and Enforcement in this area. See Unit VI of this document for further details. This rule does not regulate practices that meet the definition of a beneficial use of CCR. Beneficial uses that occur after the effective date of the rule need to determine if they comply with the criteria contained in the definition of ''beneficial use of CCRs.'' This rule does not affect past beneficial uses (*i.e.*, uses completed before the effective date of the rule.) See Unit VI of this document for further details on proposed clarifications of beneficial use. Furthermore, CCR from non-utility boilers burning coal are also not addressed in this final rule. EPA will decide on an appropriate action for these wastes through a separate rulemaking effort. See Unit IV of this document for further details. Finally, this rule does not apply to municipal solid waste landfills (MSWLFs) that receive CCR for disposal or use as daily cover.

C. The Contents of This Preamble Are Listed in the Following Outline

a result of this practice, and thus, EPA cannot classify this as either a proven or potential ''damage case.'' Nevertheless, the available facts illustrate several of the significant concerns associated with unencapsulated uses. Specifically, the AGREMAX was applied without appropriate engineering controls and in volumes that far exceeded the amounts necessary for the engineering use of the materials. Inspections of some of the sites where the material had been placed showed use in residential areas, and to environmentally vulnerable areas, including areas close to wetlands and surface waters and over shallow, sole-source drinking water aquifers. In addition, some sites appeared to have been abandoned.

Consistent with the proposed rule, EPA does not consider the practices described in this section to be beneficial use, but rather waste management that would be subject to the requirements of the final rule.

5. Alternatives to Current Disposal Methods, the Costs of Such Alternatives, and the Impact of Such Alternatives on the Use of Coal and Other Natural Resources

The beneficial use of CCR is a primary alternative to current disposal methods. And as EPA has repeatedly concluded, it is a method that, when performed correctly, can offer significant environmental benefits, including greenhouse gas (GHG) reduction, energy conservation, reduction in land disposal (along with the corresponding avoidance of potential CCR disposal impacts), and reduction in the need to mine and process virgin materials and the associated environmental impacts.

a. Greenhouse Gas and Energy Benefits

The beneficial use of CCR reduces energy consumption and GHG emissions in a number of ways. Three of the most widely recognized beneficial applications of CCR are the use of coal fly ash as a substitute for Portland cement in the manufacture of concrete, the use of FGD gypsum as a substitute for mined gypsum in the manufacture of wallboard, and the use of CCR as a substitute for sand, gravel, and other materials in structural fill. Reducing the amount of cement, mined gypsum, and virgin fill produced by substituting CCR leads to large supply chain-wide reductions in energy use and GHG emissions. Specifically, the RIA estimates three-year rolling average of 53,054,246 million British thermal units (MMBtu) per year in energy savings and 11,571,116 tons per year in GHG (*i.e.,* carbon dioxide and methane) emissions reductions in 2015. This estimate is likely to underestimate the total benefits that can be achieved from all beneficial uses. Furthermore, the use of fly ash generally makes concrete stronger and more durable. This results in a longer lasting material, thereby marginally reducing the need for future cement manufacturing and corresponding avoided emissions and energy use.

b. Benefits From Reducing the Need To Mine and Process Virgin Materials

CCR can be substituted for many virgin materials that would otherwise have to be mined and processed for use. These virgin materials include limestone to make cement, and Portland cement to make concrete; mined gypsum to make wallboard, and aggregate, such as stone and gravel for uses in concrete and road bed. Using virgin materials for these applications requires mining and processing, which can impair wildlife habitats and disturb otherwise undeveloped land. It is beneficial to use secondary materials—provided it is done in an environmentally sound manner—that would otherwise be disposed of, rather than to mine and process virgin materials, while simultaneously reducing waste and environmental footprints. Reducing mining, processing and transport of virgin materials also conserves energy, avoids GHG emissions, and reduces impacts on communities.

c. Benefits From Reducing the Disposal of CCR

Beneficially using CCR instead of disposing of it in landfills and surface impoundments also reduces the need for additional landfill space and any risks associated with their disposal. In particular, the United States disposed of over 57.8 million tons of CCR in landfills and surface impoundments in 2012, which is equivalent to the space required of 20,222 quarter-acre home sites under eight feet of CCR.

As discussed in the final rule RIA, the current beneficial use of CCR as a replacement for industrial raw materials (*e.g.,* Portland cement, virgin stone aggregate, lime, gypsum) provides substantial annual life cycle environmental benefits for these industrial applications. Specifically, the three-year rolling average of environmental benefits estimated for 2015 includes: (1) 53,054,246 MMBtu per year in energy savings; (2) 1,661,900 million gallons per year in water savings; (3) 11,571,116 tons per year in GHG (*i.e.,* carbon dioxide and methane) emissions reductions; (4) 45,770 tons of criteria air pollutant (*i.e.,* NO_X, SO_X, particulate matter, and CO) emissions reductions; and (5) 3,207 pounds of toxic air pollutant (*i.e.,* mercury and lead) emissions reductions. All together, the beneficial use of CCR in 2015 is estimated to provide over $2.3 billion in annual national environmental benefits. In addition, since EPA estimates annual baseline disposal costs of approximately $2.4 billion for the just over 50 percent of tons disposed each year, current beneficial use and minefilling also result in annual material and disposal cost savings of approximately $2 billion annually.

6. Current and Potential Utilization of CCR

In 2012, nearly 36 percent (39 million tons) of CCR were beneficially used (excluding minefill operations) and nearly 12 percent (12.8 million tons) were placed in minefills. (This compares to 23 percent of CCR that were beneficially used, excluding minefilling, at the time of the May 2000 Regulatory Determination, and represents a significant increase.)

7. Conclusions

On balance, after considering all of the available information, EPA has concluded that the most appropriate approach toward beneficial use is to retain the May 2000 Regulatory Determination that regulation under subtitle C of the beneficial use of CCR is not warranted. EPA has also determined that regulation under subtitle D is generally not necessary for these beneficial uses.

As discussed in the preceding section, the most important of the section 8002(n) factors are those relating to the potential risks to human health and the environment. See *e.g., Horsehead Resource Development Co.* v. *EPA*, 16 F.3d 1246, 1258 (D.C. Cir, 1994) (Upholding EPA's interpretation that wastes resulting from the combustion of mixtures of Bevill-exempt and non-exempt wastes could only retain Bevill-exempt status so long as the combustion waste remained of low toxicity); *EDF* v. *EPA*, 852 F.2d 1316, 1328–1329 (D.C. Cir. 1988) (Overturning EPA rule that included as Bevill exempt, wastes that were not of low toxicity). EPA is adopting this Regulatory Determination in recognition that many uses of CCR, such as encapsulated uses in concrete, and use as an ingredient in the manufacture of wallboard, provide environmental benefits and raise minimal health or environmental concerns. To date, the information available does not demonstrate the existence of any risks associated with encapsulated uses of CCR that merit from the MSWLF unit to the groundwater (*i.e.,* as would be the case if CCR was disposed in the MSWLF unit). In determining alternative parameters, the Director shall consider, among other things: (1) The types, quantities, and concentrations in wastes managed at the MSWLF unit; (2) the mobility, stability, and persistence of waste constituents or their reaction products in the unsaturated zone beneath the MSWLF unit; and (3) the detectability of indicator parameters, waste constituents, and reaction products in the groundwater. In situations where the MSWLF unit is receiving CCR for disposal and/or daily cover, EPA expects the controlled management of CCR in these units. Specifically, EPA expects State Directors to utilize the provisions in § 258.54(a)(2) to revise the detection monitoring constituents to include those constituents being promulgated in this rule under § 257.90. These detection monitoring constituents or inorganic indicator parameters are: boron, calcium, chloride, fluoride, pH, sulfate and total dissolved solids (TDS). These inorganic indicator parameters are known to be leading indicators of releases of contaminants associated with CCR and the Agency strongly recommends that State Directors add these constituents to the list of indicator parameters to be monitored during detection monitoring of groundwater if and when a MSWLF decides to accept CCR.

The Agency has concluded that CCR can readily be handled in permitted MSWLFs provided that they are evaluated for waste compatibility and placement as required under the part 258 requirements. Furthermore, consistent with the recordkeeping requirements in § 258.29, the Agency further expects State Directors to encourage MSWLF units receiving CCR after the effective date of this rule to do so pursuant to a ''CCR acceptance plan'' that is maintained in the facility operating record. This plan would assure that the MSWLF facility is aware of the physical and chemical characteristics of the waste received (*i.e.,* CCR) and handles it with the additional precautions necessary to avoid dust, maintain structural integrity, and avoid compromising the gas and leachate collection systems of the landfill so that human health and the environment are protected. While the Agency sees no need to impose duplicative requirements for MSWLFs that receive CCR for disposal or daily cover; development of these acceptance plans as well as a revised list of groundwater detection monitoring constituents will help ensure that CCR is being managed in the most protective manner consistent with the Part 258 requirements.

5. Inactive CCR Surface Impoundments

The final rule also applies to ''inactive'' CCR surface impoundments at any active electric utilities or independent power producers, regardless of the fuel currently being used to produce electricity; *i.e.,* surface impoundments at any active electric utility or independent power producer that have ceased receiving CCR or otherwise actively managing CCR. While it is true that EPA exempted inactive units from the part 258 requirements in 1990, the original subtitle D regulations at 40 CFR part 257 (which are currently applicable to CCR wastes) applied to ''all solid waste disposal facilities and practices'' except for eleven specifically enumerated exemptions (none of which are relevant). 40 CFR 257.1(c). See also, 40 CFR 257.1(a)(1)–(2). And as discussed in greater detail below, subtitle D of RCRA does not limit EPA's authority to active units—that is, units that receive or otherwise manage wastes after the effective date of the regulations. EPA has documented several damage cases that have occurred due to inactive CCR surface impoundments, including the release of CCR and wastewater from an inactive CCR surface impoundment into the Dan River which occurred since publication of the CCR proposed rule. As discussed in the proposal, the risks associated with inactive CCR surface impoundments do not differ significantly from the risks associated with active CCR surface impoundments; much of the risk from these units is driven by the hydraulic head imposed by impounded units. These conditions remain present in both active and inactive units, which continue to impound liquid along with CCR. For all these reasons, the Agency has concluded that inactive CCR surface impoundments require regulatory oversight.

The sole exception is for ''inactive'' CCR surface impoundments that have completed dewatering and capping operations (in accordance with the capping requirements finalized in this rule) within three years of the publication of this rule. EPA considers these units to be analogous to inactive CCR landfills, which are not subject to the final rule. As noted, EPA's risk assessment shows that the highest risks are associated with CCR surface impoundments due to the hydraulic head imposed by impounded water. Dewatered CCR surface impoundments will no longer be subjected to hydraulic head so the risk of releases, including the risk that the unit will leach into the groundwater, would be no greater than those from CCR landfills. Similarly, the requirements of this rule do not apply to inactive CCR landfills—which are CCR landfills that do not accept waste after the effective date of the regulations. The Agency is not aware of any damage cases associated with inactive CCR landfills, and as noted, the risks of release from such units are significantly lower than CCR surface impoundments or active CCR landfills. In the absence of this type of evidence, and consistent with the proposal, the Agency has decided not to cover these units in this final rule.

Under both the subtitle C and subtitle D options, EPA proposed to regulate ''inactive'' CCR surface impoundments that had not completed closure prior to the effective date of the rule. EPA proposed that if any inactive CCR surface impoundment had not met the interim status closure requirements (*i.e.,* dewatered and capped) by the effective date of the rule, the unit would be subject to all of the requirements applicable to CCR surface impoundments. Under the subtitle C option, those requirements would have included compliance with the interim status and permitting regulations. Under subtitle D, such units would have been required to comply with all of the criteria applicable to CCR surface impoundments that continued to receive wastes, including groundwater monitoring, corrective action, and closure.

EPA acknowledged that this represented a departure from the Agency's long-standing implementation of the regulatory program under subtitle C. While the statutory definition of ''disposal'' has been broadly interpreted to include passive leaking, historically EPA has construed the definition of ''disposal'' more narrowly for the purposes of implementing the subtitle C regulatory requirements. For examples see 43 FR 58984 (Dec. 18, 1978); and 45 FR 33074 (May 1980). Although in some situations, post-placement management has been considered to be disposal triggering RCRA subtitle C regulatory requirements, *e.g.,* dredging of impoundments or management of leachate, EPA has generally interpreted the statute to require a permit only if a facility treats, stores, or actively disposes of the waste after the effective date of its designation as a hazardous waste. EPA explained that relying on a broader interpretation was appropriate in this instance given that the substantial risks associated with currently operating CCR surface impoundments, *i.e.,* the potential for leachate and other releases to contaminate groundwater and the potential for catastrophic releases from structural failures, were not measurably different than the risks associated with ''inactive'' CCR surface impoundments that continued to impound liquid, even though the facility had ceased to place additional wastes in the unit. EPA noted as well that the risks are primarily driven by the older existing units, which are generally unlined.

In the section of the preamble discussing the subtitle D option, EPA did not expressly highlight the application of the rule to inactive CCR surface impoundments, but generally explained that EPA's approach to developing the proposed subtitle D requirements for surface impoundments (which are not addressed by the part 258 regulations that served as the model for the proposed landfill requirements) was to seek to be consistent with the technical requirements developed under the subtitle C option. (See 75 FR 35193.) (''In addition, EPA considered that many of the technical requirements that EPA developed to specifically address the risks from the disposal of CCR as part of the subtitle C alternative would be equally justified under a RCRA subtitle D regime . . . The factual record—*i.e.,* the risk analysis and the damage cases—supporting such requirements is the same, irrespective of the statutory authority under which the Agency is operating . . . Thus several of the provisions EPA is proposing under RCRA subtitle D either correspond to the provisions EPA is proposing to establish for RCRA subtitle C requirement. These provisions include the following regulatory provisions specific to CCR that EPA is proposing to establish: *Scope and applicability (i.e., who will be subject to the rule criteria/requirements*) . . .'') (emphasis added).

EPA received numerous comments on this aspect of the proposal. On the whole, the comments were focused on EPA's legal authority under subtitle C to regulate inactive and closed units, as well as inactive and closed facilities. One group of commenters, however, specifically criticized the proposed subtitle D regulation on the grounds that it failed to address the risks from inactive CCR surface impoundments. The majority of commenters, however, argued that RCRA does not authorize EPA to regulate inactive or closed surface impoundments. These commenters focused on two primary arguments: first, that RCRA's definition of ''disposal'' cannot be interpreted to include ''passive migration'' based on the plain language of the statute, and second, that such an interpretation conflicted with court decisions in several circuits, holding that under CERCLA ''disposal'' does not include passive leaking or the migration of contaminants.

In support of their first argument, commenters argued that the plain language of RCRA demonstrates that the requirements are ''prospective in nature'' and thus cannot be interpreted to apply to past activities, *i.e.,* the past disposals in inactive CCR units. They also argued that the absence of the word ''leaching'' from the definition of ''disposal'' clearly indicates that Congress did not intend to cover passive leaking or migration from CCR units. The commenters also selectively quoted portions of past EPA statements, claiming that these demonstrated that EPA had conclusively interpreted RCRA to preclude jurisdiction over inactive units and facilities. In particular, they pointed to EPA's decision in 1980 not to require permits for closed or inactive facilities.

Commenters cited several cases to support their second claim. These include *Carson Harbor Vill.* v. *Unocal Corp.,* 270 F.3d 863 (9th Cir. 2001); *United States* v. *150 Acres of Land,* 204 F.3d 698, 706 (2000); *ABB Industrial Systems* v. *Prime Technology,* 120 F.3d 351, 358 (2d Cir. 1997); *United States* v. *CMDG Realty Co.,* 96 F.3d 706, 711 (3rd Cir. 1996); *Joslyn Mfg. Co.* v. *Koppers Co.,* 40 F.3d 750, 762 (5th Cir. 1994); *Delaney* v. *Town of Carmel,* 55 F. Supp. 2d 237, 256 (S.D.N.Y. 1999); *see also Interfaith Cmty. Org.* v. *Honey-Well Intl Inc.,* 263 F. Supp. 2d 796, 846 n.10 (D.N.J. 2003). The commenters acknowledged that these cases were all decided under CERCLA, but claim that the cases are all equally dispositive with respect to RCRA's definition of disposal because CERCLA specifically incorporates by reference RCRA's statutory definition of disposal.

As an initial matter, it is important to correct certain misunderstandings contained throughout a number of the comments. First, EPA did propose to include inactive units under the subtitle D alternative. EPA clearly signaled its intent to cover the same universe of units and facilities covered under the subtitle C proposal. EPA did not include a corresponding discussion in its explanation of the subtitle D alternative because application of the criteria to inactive units did not represent such a significant departure from EPA's past practice or interpretation. As discussed in more detail below, the original subtitle D regulations applied to all existing disposal units. See 40 CFR 257.1(a)(1)–(2), (c) and 43 FR 4942–4943, 4944.

Second, several commenters criticized EPA's purported proposal to cover both ''closed'' and ''inactive'' surface impoundments, using the terms interchangeably. These same commenters also refer to both ''inactive facilities'' and ''inactive units.'' These are all different concepts, and EPA clearly distinguished between them.

EPA proposed to regulate only ''inactive'' surface impoundments that had not completed closure of the surface impoundment before the effective date. ''Inactive'' surface impoundments are those that contain both CCR and water, but no longer receive additional wastes. By contrast, a ''closed'' surface impoundment would no longer contain water, although it may continue to contain CCR (or other wastes), and would be capped or otherwise maintained. There is little difference between the potential risks of an active and inactive surface impoundment; both can leak into groundwater, and both are subject to structural failures that release the wastes into the environment, including catastrophic failures leading to massive releases that threaten both human health and the environment. This is clearly demonstrated by the recent spill in the Dan River in North Carolina, which occurred as the result of a structural failure at an inactive surface impoundment. Similarly, as demonstrated by the discovery of additional damage cases upon the recent installation of groundwater monitoring systems at existing CCR surface impoundments in Michigan and Illinois, many existing CCR surface impoundments are currently leaking, albeit currently undetected. These are the risks the disposal rule specifically seeks to address, and there is no logical basis for distinguishing between units that present the same risks.

EPA did not propose to require ''closed'' surface impoundments to ''reclose.'' Nor did EPA intend, as the same commenters claim, that ''literally hundreds of previously closed . . . surface impoundments—many of which were properly closed decades ago under state solid waste programs, have changed owners, and now have structures built on top of them—would be considered active CCR units.'' Accordingly, the final rule does not impose any requirements on any CCR surface impoundments that have in fact ''closed'' before the rule's effective date—*i.e.,* those that no longer contain water and can no longer impound liquid.

2. Definition of CCR Surface Impoundment

EPA proposed to define a CCR surface impoundment to mean a facility or part of a facility which is a natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials) which is designed to hold an accumulation of CCR containing free liquids, and which is not an injection well. Examples of CCR surface impoundments are holding, storage, settling, and aeration pits, ponds and lagoons. CCR surface impoundments are used to receive CCR that have been sluiced (flushed or mixed with water to facilitate movement), or wastes from wet air pollution control devices, often in addition to other solid wastes.

The Agency received many comments on the proposed definition of CCR surface impoundment. The majority of commenters argued that the definition was overly broad and would inappropriately capture surface impoundments that are not designed to hold an accumulation of CCR. Commenters were concerned that the proposed definition could be interpreted to include downstream secondary and tertiary surface impoundments, such as polishing, cooling, wastewater and holding ponds that receive only de minimis amounts of CCR. Commenters reasoned that these types of units in no practical or technical sense could be described as units ''used to receive CCR that has been sluiced.''

Other commenters raised concern that the definition did not differentiate between temporary and permanent surface impoundments. Commenters stated that many facilities rely on short-term processing and storage before moving CCR off-site for beneficial use or permanent disposal and that these units should not be required to comply with all of the technical criteria required for more permanent disposal impoundments.

Upon further evaluation of the comments, the Agency has amended the definition of CCR surface impoundment to clarify the types of units that are covered by the rule. After reviewing the comments, EPA reviewed the risk assessment and the damage cases to determine the characteristics of the surface impoundments that are the source of the risks the rule seeks to address. Specifically, these are units that contain a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants. These risks do not differ materially according to the management activity (*i.e.,* whether it was ''treatment,'' ''storage'' or ''disposal'') that occurred in the unit, or whether the facility someday intended to divert the CCR to beneficial use. However, EPA agrees with commenters that units containing only truly ''de minimis'' levels of CCR are unlikely to present the significant risks this rule is intended to address.

EPA has therefore revised the definition to provide that a CCR surface impoundment as defined in this rule must meet three criteria: (1) The unit is a natural topographic depression, man-made excavation or diked area; (2) the unit is designed to hold an accumulation of CCR and liquid; and (3) the unit treats, stores or disposes of CCR. These criteria correspond to the units that are the source of the significant risks covered by this rule, and are consistent with the proposed rule. EPA agrees with commenters that relying solely on the criterion from the proposed rule that the unit be designed to accumulate CCR could inadvertently capture units that present significantly lower risks, such as process water or cooling water ponds, because, although they will accumulate any trace amounts of CCR that are present, they will not contain the significant quantities that give rise to the risks modeled in EPA's assessment. By contrast, units that are designed to hold an accumulation of CCR and in which treatment, storage, or disposal occurs will contain substantial amounts of CCR and consequently are a potentially significant source of contaminants. However, EPA disagrees that impoundments used for ''short-term processing and storage'' should not be required to comply with all of the technical criteria applicable to CCR surface impoundments. By ''short-term,'' the commenters mean that some portion of the CCR is removed from the unit; however, in EPA's experience these units are never completely dredged free of CCR. But however much is present at any given time, over the lifetime of these ''temporary'' units, large quantities of CCR impounded with water under a hydraulic head will be managed for extended periods of time. This gives rise to the conditions that both promote the leaching of contaminants from the CCR and are responsible for the static and dynamic loadings that create the potential for structural instability. These units therefore pose the same risks of releases due to structural instability and of leachate contaminating ground or surface water as the units in which CCR are ''permanently'' disposed.

The final definition makes extremely clear the impoundments that are covered by the rule, so an owner or operator will be able to easily discern whether a particular unit is a CCR surface impoundment. CCR surface impoundments do not include units generally referred to as cooling water ponds, process water ponds, wastewater treatment ponds, storm water holding ponds, or aeration ponds. These units are not designed to hold an accumulation of CCR, and in fact, do not generally contain significant amounts of CCR. Treatment, storage, or disposal of accumulated CCR also does not occur in these units. Conversely, a constructed primary settling pond that receives sluiced CCR directly from the electric utility would meet the definition of a CCR surface impoundment because it meets all three criteria of the definition: It is a man-made excavation and it is designed to hold an accumulation of CCR (*i.e.,* directly sluiced CCR). It also engages in the treatment of CCR through its settling operation. The CCR may be subsequently dredged for disposal or beneficial use elsewhere, or it may be permanently disposed within the unit. Similarly, secondary or tertiary impoundments that receive wet CCR or liquid with significant amounts of CCR from a preceding impoundment (*i.e.,* from a primary impoundment in the case of a secondary impoundment, or from a secondary impoundment in the case of a tertiary impoundment), even if they are ultimately dredged for land disposal elsewhere are also considered CCR surface impoundments and are covered by the rule. To illustrate further, consider a diked area in which wet CCR is accumulated for future transport to a CCR landfill or beneficial use. The unit is accumulating CCR, while allowing for the evaporation or removal of liquid (no free liquids) to facilitate transport to a CCR landfill or for beneficial use. In this instance, the unit again meets all three definition criteria, it is a diked area (*i.e.,* there is an embankment), it is accumulating CCR for ultimate disposal or beneficial use; and it is removing any free liquids, (*i.e.,* treatment). As such, this unit would meet the definition of CCR surface impoundment. In all of these examples significant quantities of CCR are impounded with water under a hydraulic head that will be managed for extended periods of time. This gives rise to the conditions that both promote the leaching of contaminants from the CCR and are responsible for the static and dynamic loadings that create the potential for structural instability. These units therefore all pose the same risks of

EXHIBIT 32

Declaration of Jason McLaurin On Behalf of Southern Illinois Cooperative

I, Jason McLaurin, affirm and declare as follows:

1. I am currently employed as Environmental Coordinator at Southern Illinois Power Cooperative, which operates an electric power generating facility, located south of Marion, Illinois, in Williamson County ("Marion Station"). My responsibilities include overseeing environmental compliance and related activities at the Marion Station. I have been employed at SIPC since July 9, 2007. I have a degree in Plant & Soil Science from Southern Illinois University Carbondale.

2. The unit referred to as Pond 4 at Marion Station historically received decant water from Ponds 1 and 2, until they stopped operating in 2020. Pond 4 has also historically received and currently receives storm water runoff water from the coal pile at the Marion Station, which is located directly south of Pond 4. Pond 4 has also received decanted overflow water from Pond 6 for approximately 30 years.

3. During an outage that took place around September – October, 2010, Pond 4 was dewatered and cleaned to the clay as part of regular maintenance activities at the Marion Station.

4. Pond 4 was dewatered down to the mud. Upon completion of this dewatering, the unit consisted of two categories of materials. Dark and dry materials consisting predominantly of coal fines that had accumulated in the pond and muddy materials high in organic matter (such as leaves and algae) that often accumulate at the bottom of a ponded area.

5. The dark and dry materials, which consisted of at least approximately, 60-70% of the materials located in the pond upon dewatering, were loaded into trucks and transported to the coal yard at Marion Station. There, they were further dried and then burned as fuel in Unit 123.

6. The muddy materials were taken for disposal to the west side of the on-site landfill.

Date: 12|16|2024

[signature]
Jason McLaurin

Electronic Filing: Received, Clerk's Office 12/20/2024

EXHIBIT 33

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 9 and 257

[EPA–HQ–OLEM–2020–0107; FRL–7814–04–OLEM]

RIN 2050–AH14

Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments

AGENCY: Environmental Protection Agency (EPA).

ACTION: Final rule.

SUMMARY: On April 17, 2015, the Environmental Protection Agency (EPA or the Agency) promulgated national minimum criteria for existing and new coal combustion residuals (CCR) landfills and existing and new CCR surface impoundments. On August 21, 2018, the United States Court of Appeals for the District of Columbia Circuit vacated the exemption for inactive surface impoundments at inactive facilities (legacy CCR surface impoundments) and remanded the issue back to EPA to take further action consistent with its opinion in *Utility Solid Waste Activities Group, et al.* v. *EPA.* This action responds to that order and establishes regulatory requirements for legacy CCR surface impoundments. EPA is also establishing requirements for CCR management units at active CCR facilities and at inactive CCR facilities with a legacy CCR surface impoundment. Finally, EPA is making several technical corrections to the existing regulations, such as correcting certain citations and harmonizing definitions.

DATES: This final rule is effective on November 4, 2024.

ADDRESSES: EPA has established a docket for this action under Docket ID No. EPA–HQ–OLEM–2020–0107. All documents in the docket are listed on the *http://www.regulations.gov* website. Although listed in the index, some information is not publicly available, *e.g.,* CBI or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the internet and will be publicly available only in hard copy form. Publicly available docket materials are available electronically through *http://www.regulations.gov*.

FOR FURTHER INFORMATION CONTACT: For questions concerning this proposal, contact Michelle Lloyd, Office of Resource Conservation and Recovery, Materials Recovery and Waste Management Division, Environmental Protection Agency, 1200 Pennsylvania Avenue NW, MC: 5304T, Washington, DC 20460; telephone number: (202) 566–0560; email address: *Lloyd.Michelle@epa.gov,* or Taylor Holt, Office of Resource Conservation and Recovery, Materials Recovery and Waste Management Division, Environmental Protection Agency, 1200 Pennsylvania Avenue NW, MC: 5304T, Washington, DC 20460; telephone number: (202) 566–1439; email address: *Holt.Taylor@epa.gov.* For more information on this rulemaking, please visit *https://www.epa.gov/coalash*.

SUPPLEMENTARY INFORMATION:

Table of Contents

List of Acronyms

ACM Assessment of Corrective Measures
ANPRM Advance Notice of Proposed Rulemaking
ARAR applicable or relevant and appropriate requirements
ASD alternative source demonstration
CAA Clean Air Act
CBI Confidential Business Information
CBR closure by removal
CCR coal combustion residuals
CCRMU coal combustion residuals management unit
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
CIP closure in place
CFR Code of Federal Regulations
COALQUAL U.S. Geological Survey coal quality database
CWA Clean Water Act
DOE Department of Energy
EAP Emergency Action Plan
EIA Energy Information Administration
EIP Environmental Integrity Project
EJ environmental justice
ELG Effluent Limitation Guidelines
EPA Environmental Protection Agency
EPACMTP EPA Composite Model for Leachate Migration with Transformation Products
EPRI Electric Power Research Institute
FER Facility Evaluation Report
FERC Federal Energy Regulatory Commission
FGD flue gas desulfurization
FR Federal Register
GWMCA groundwater monitoring and corrective action
GWPS groundwater protection standard
HQ hazard quotient
HSWA Hazardous and Solid Waste Amendments
ICR Information Collection Request
IRIS Integrated Risk Information System
LEAF Leaching Environmental Assessment Framework
MCL maximum contaminant level
MDE Maryland Department of the Environment
MNA monitored natural attenuation
MODFLOW–USG Modular Three-Dimension Finite-Difference Ground-Water Flow Model
MSW Municipal Solid Waste
MW Megawatts
NAICS North American Industry Classification System
NERC North American Electric Reliability Corporation
NODA notice of data availability
NPDES National Pollution Discharge Elimination System
NPL National Priorities List
NTTAA National Technology Transfer and Advancement Act
OAFU Other Active Facilities
OLEM Office of Land and Emergency Management
OMB Office of Management and Budget
OSHA Occupational Safety and Health Administration

P.E. Professional Engineer
PM particulate matter
PRA Paperwork Reduction Act
PRG preliminary remediation goal
PUC Public Utility Commission
QA/QC quality assurance/quality control
RCRA Resource Conservation and Recovery Act
RIA Regulatory Impact Analysis
RME reasonable maximum exposure
RTO Regional Transmission Organizations
SMCL secondary maximum contaminant level
SSI statistically significant increase
SSL statistically significant level
TDS total dissolved solids
TSCA Toxic Substances Control Act
TSDF Transportation Storage and Disposal Facility
TVA Tennessee Valley Authority
UMRA Unfunded Mandates Reform Act
USGS U.S. Geological Survey
USWAG Utility Solid Waste Activities Group
WIIN Water Infrastructure Improvements for the Nation
WQC water quality criteria

I. General Information

A. Does this action apply to me?

This rule applies to and may affect all CCR generated by electric utilities and independent power producers that fall within the North American Industry Classification System (NAICS) code 221112. The reference to NAICS code 221112 is not intended to be exhaustive, but rather provides a guide for readers regarding entities likely to be regulated by this action. This discussion lists the types of entities that EPA is now aware could potentially be regulated by this action. Other types of entities not described here could also be regulated. To determine whether your entity is regulated by this action, you should carefully examine the applicability criteria found in 40 CFR 257.50 of title 40 of the Code of Federal Regulations. If you have questions regarding the applicability of this action to a particular entity, consult the person listed in the **FOR FURTHER INFORMATION CONTACT** section.

B. What action is the Agency taking?

EPA is amending the regulations governing the disposal of CCR in landfills and surface impoundments, codified in subpart D of part 257 of Title 40 of the Code of Federal Regulations (CFR) (CCR regulations). Specifically, the Agency is establishing regulatory requirements for inactive CCR surface impoundments at inactive utilities (''legacy CCR surface impoundment'' or ''legacy impoundment''). This action is being taken in response to the August 21, 2018, opinion by the U.S. Court of Appeals for the District of Columbia Circuit in *Utility Solid Waste Activities Group* v. *EPA,* 901 F.3d 414 (D.C. 2018) (''*USWAG* decision'' or ''*USWAG*'') that vacated and remanded the provision exempting legacy impoundments from the CCR regulations. This action includes adding a definition for legacy CCR surface impoundments and other terms relevant to this rulemaking. It also requires that legacy CCR surface impoundments comply with certain existing CCR regulations with tailored compliance deadlines.

While this action is responsive to the D.C. Circuit's order, it is also driven by the record, which clearly demonstrates that regulating legacy CCR surface impoundments will have significant quantified and unquantified public health and environmental benefits. As EPA concluded in 2015, the risks posed by unlined CCR surface impoundments are substantial, and the risks from legacy impoundments are at least as significant. EPA's 2014 Risk Assessment concluded that the cancer risks from unlined surface impoundments ranged from 3×10^{-4} for trivalent arsenic to 4×10^{-5} for pentavalent arsenic. Non-cancer risks from these same units also significantly exceeded EPA's level of concern, with estimated Hazard Quotients (HQ) of two for thallium, three for lithium, four for molybdenum and eight for trivalent arsenic. In addition, as described in Unit III.A.1 of this preamble, information obtained since 2015 indicates that the risks for legacy CCR surface impoundments are likely to be greater than EPA originally estimated. Finally, based on the demographic composition and environmental conditions of communities within one and three miles of legacy CCR surface impoundments, this final rule will reduce existing disproportionate and adverse effects on economically vulnerable communities, as well as those that currently face environmental burdens. For example, in Illinois the population living within one mile of legacy CCR surface impoundment sites is over three times as likely compared to the State average to have less than a high school education (35.66% compared to 10.10%, see Regulatory Impact Analysis (RIA) exhibit ES.14), and that population already experiences higher than average exposures to particulate matter, ozone, diesel emissions, lifetime air toxics cancer risks, and proximity to traffic, Superfund sites, Risk Management Plan sites, and hazardous waste facilities (see RIA exhibit ES.15). Consistent with the directive in section 4004(a) to ensure that the statutory standard is met at all regulated sites, including the most vulnerable, this final rule will help EPA further ensure that the communities and ecosystems closest to coal facilities are sufficiently protected from harm from groundwater contamination, surface water contamination, fugitive dust, floods and impoundment overflows, and threats to wildlife.

EPA is also establishing requirements to address the risks from currently exempt solid waste management that involves the direct placement of CCR on the land. EPA is extending a subset of the existing requirements in 40 CFR part 257, subpart D to CCR surface impoundments and landfills that closed prior to the effective date of the 2015 CCR Rule, inactive CCR landfills, and other areas where CCR is managed directly on the land. In this action, EPA refers to these as CCR management units, or CCRMU. The final rule expands the CCRMU requirements to a set of active facilities that were not regulated by the 2015 CCR rule because they had ceased disposing of CCR in their on-site disposal units, and they did not have an inactive surface impoundment. Accordingly, this rule applies to all CCRMU at active CCR facilities and inactive facilities with a legacy CCR surface impoundment.

EPA is also finalizing alternative closure provisions to allow a facility to complete the closure by removal in two stages: first, by completing all removal and decontamination procedures; and second, by completing all groundwater remediation in a separate post closure care period.

Finally, EPA is making a number of technical corrections to the existing regulations, such as correcting certain citations and harmonizing definitions.

EPA intends the provisions of the rule to be severable. In the event that any individual provision or part of the rule is invalidated, EPA intends that this would not render the entire rule invalid, and that any individual provisions that can continue to operate will be left in place. For example, EPA intends that the provisions governing each class of facilities—legacy CCR inactive surface impoundments, CCR management units, other active facility units, and regulated CCR landfills containing waste in contact with groundwater—to be independently severable from one another as each set of requirements operates independently from the other.

Likewise, the provisions regulating existing units at active facilities, including those units at non-fossil-fuel-fired facilities generating energy, are severable from the other substantive requirements—each provision may continue operating even if one of the others is invalidated. EPA also intends the proposed regulations would not provide regulated entities fair notice of what the regulations require.

Finally, EPA acknowledges that the reference in the proposal to evaporation ponds, or secondary or tertiary finishing ponds that have not been properly cleaned up as examples of potential CCRMU was a mistake. EPA agrees that these units would generally be expected to contain no more than a *de minimis* amount of CCR.

iv. Exemption for Beneficial Use of CCR

Several commenters stated that the CCRMU definition is too broad and does not account for the beneficial use of CCR. According to these commenters, the proposal to regulate CCRMU effectively revoked or amended the current exemption for beneficial use in § 257.50, and the broad CCRMU definition now requires previously approved beneficial uses to be reexamined for potential regulation. Several of these commenters criticized the agency for failing to address the issue in the proposal, and argued that the Agency lacked the authority to include such beneficial uses, either because neither RCRA section 1008(a)(3) nor section 4004(a) authorize EPA to regulate use or because such regulation would be inconsistent with the 2015 Regulatory Determination. These commenters recommended that the CCRMU definition be revised to exclude any beneficial use of CCR as defined by § 257.53 or as previously approved by State agencies.

By contrast, several commenters request EPA to prohibit the use of coal ash as fill unless full protective measures such as liners, monitoring, and caps are required everywhere it is placed. Commenters claimed that immediate attention to this recommendation will protect the health and environment of millions of U.S. residents by preventing the spread of toxic coal ash pollution.

EPA disagrees that the proposal to regulate CCRMU effectively revoked or amended the current exemption for beneficial use in § 257.50. The proposal merely accurately reflects the existing regulations, which these commenters have misunderstood.

Under the existing regulations, the direct placement of CCR on the land on site of a utility, with nothing to control releases is, by definition, a CCR pile and therefore not beneficial use. The examples of historical CCRMU discussed in the proposal, structural fill and CCR placed below currently regulated CCR units on-site of a utility also clearly fit that definition.

These are the same provisions that have been in place since 2015. The existing definition of a CCR pile is

> Any non-containerized accumulation of solid, non-flowing CCR that is placed on the land. CCR that is beneficially used *off-site* is not a CCR pile.

§ 257.53 (emphasis added). The second sentence expressly limits the beneficial use of CCR to ''off site,'' and thus any non-containerized CCR placed directly on the land on-site of a utility is not beneficial use.

EPA previously explained this in its August 14, 2019, proposal ''Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Enhancing Public Access to Information; Reconsideration of Beneficial Use Criteria and Piles'' to revise the definition of a CCR pile with respect to temporary piles. 84 FR 40353. Specifically, EPA proposed to establish a new set of requirements that would apply equally to temporary or ''storage piles'' located on-site and off-site of a utility. As part of the background to that proposal, EPA described the requirements under the existing regulation so that the public could fully understand what it was–and was not [139]—proposing to revise. The proposal reiterated the existing definition of a CCR pile in § 257.53, and explained that this definition closely mirrors the RCRA definition of disposal, which is defined in part as the ''placing of any solid waste or hazardous waste into or on any land or water so that such solid waste or hazardous waste or any constituent thereof may enter the environment or be emitted into the air or discharged into any waters, including ground waters.'' See 42 U.S.C. 6903(3). EPA further explained:

> Under this regulation, CCR piles constitute disposal and are consequently subject to all regulatory criteria applicable to CCR landfills. In contrast, activities that meet the definition of a beneficial use are not considered disposal, even if they involve the direct placement on the land of ''non-containerized'' CCR. See §§ 257.50(g) and 257.53 (definitions of CCR landfill and CCR pile); 80 FR 21327–30.
>
> The current regulation distinguishes piles of CCR on-site (at an electric utility or independent power producer site) from temporary piles of CCR off-site (at a beneficial use site), based on whether CCR from the pile could fairly be considered to be in the process of being beneficially used. See § 257.53 (definition of CCR pile); 80 FR 21356 (April 17, 2015). While the CCR from the pile on-site may someday be beneficially used, it is not currently in the process of being beneficially used . . . If CCR is not containerized, the pile is a CCR pile and subject to the same requirements as a CCR landfill. See Id.
>
> In contrast, the regulations treat CCR stored off-site at a beneficial use site in a temporary pile to be in the process of being beneficially used (even though a pile is not itself a beneficial use). If the CCR is temporarily placed at a beneficial use site and meets the regulatory definition of a beneficial use, the pile is not a CCR pile and is not subject to disposal requirements.
>
> . . . .
>
> In the current definition [of a CCR pile], EPA distinguishes between piles on-site (which were almost always regulated as landfills) and piles off-site, (which, if temporary, were generally considered to be beneficial use, subject only to the four criteria in the definition). The current regulation also distinguishes between on-site piles that are not containerized and those that are containerized. See 80 FR 21356 (April 17, 2017); § 257.53.

84 FR 40365.

Thus, under the 2015 CCR Rule the activities covered under the definition of a CCRMU (*i.e.,* permanent placement of CCR on the land, on-site of a utility, without controlling releases) were defined as disposal rather than beneficial use. In 2019, EPA did not propose to revise or reconsider that. Instead, EPA proposed to extend that existing requirement to permanent piles located off-site of a utility. EPA therefore declines to reconsider the issue here.

In the May 2023 proposed rule EPA expressly stated that it did not intend to reopen or reconsider any issue other than those on which the agency expressly solicited comment.

> In this proposal, EPA is not reconsidering, proposing to reopen, or otherwise soliciting comment on any other provisions of the existing CCR regulations beyond those specifically identified in this proposal. For the reader's convenience, EPA has provided a background description of existing requirements in several places throughout this preamble. In the absence of a specific request for comment and proposed change to the identified provisions, these descriptions do not reopen any of the described provisions.

88 FR 31984. EPA further advised the public that it would ''not respond to comments submitted on any issues other than those specifically identified in this proposal, and such comments will not be considered part of the rulemaking record.'' Id.

Nowhere in the May 2023 proposed rule did EPA solicit comment on or suggest that it was in any way reconsidering the existing definition of

[139] EPA expressly advised the public that it was ''not reconsidering, proposing to reopen, or otherwise soliciting comment on any other provisions of the final CCR rule beyond those specifically identified in this proposal.'' 84 FR 40355.

EXHIBIT 34

Frequent Questions on the Implementation of the Disposal of Coal Combustion Residuals (CCR) from Electric Utilities Final Rule

Scope and Purpose

1. **What is EPA's legal authority to regulate inactive surface impoundments under subtitle D of the Resource Conservation and Recovery Act (RCRA)?**

   RESPONSE: The final rule discusses in depth the specific legal authority on which the EPA is relying to support the regulation of inactive CCR surface impoundments under subtitle D of RCRA. See volume 80 of the *Federal Register (FR)* 21342-21347.

2. **Is CCR from a closed fossil fuel power plant that is sent for off-site waste management covered by the rule?**

   RESPONSE**:** Any disposal unit that receives CCR from an off-site electric utility or independent power producer, including from a closed fossil fuel power plant, is covered by the rule unless it is a municipal solid waste landfill. See title 40 of the Code of Federal Regulations (CFR) section 257.50(b).

3. **Is CCR generated at an active facility (i.e., part of the NAICS code 221112) but then sent for management at a facility no longer producing power regulated under the CCR rule?**

   RESPONSE: CCR generated at an active facility but then sent off-site for management at a facility no longer producing power is regulated under the rule. The rule at 40 CFR section 257.50(b) specifies that "this subpart applies to owners and operators of new and existing landfills and surface impoundments, including lateral expansions of such units, that dispose or otherwise engage in solid waste management of CCR generated from the combustion of coal at electric utilities and independent power producers." Even though the facility that owns the disposal unit may no longer be producing power, it owns and/or is operating an off-site CCR disposal unit. 40 CFR section 257.50(b) expressly clarifies that the requirements also apply to CCR disposal units located off-site of the electric utility or independent power producer.

4. **If an inactive utility begins to generate electricity by starting up a natural gas peaker plant that is located on-site, will the on-site CCR surface impoundments containing fly ash from previous coal-burning activities become subject to the rule?**

   RESPONSE: Yes. If the utility restarts the boilers to generate electricity, regardless of the fossil fuel used, any CCR surface impoundments at the facility can become subject to the rule.

5. **Is CCR from a facility that is no longer part of the NAICS code 221112 (Fossil Fuel Electric Power Generation) because the fossil fuel power plant has closed regulated under the rule if the CCR is sent for off-site management?**

   RESPONSE**:** Yes. The rule applies to the solid waste management and/or disposal of CCR generated by electric utilities and independent power producers. 40 CFR section 257.50(b). This includes disposal that occurs at (1) all electric utilities and independent power producers that produce electricity after the effective date of the rule, irrespective of the fuel used to produce the electricity; and (2) disposal that occurs off-site of the electric utility, except for disposal at a municipal solid waste landfill. 40 CFR section 257.50(e) applies to the electric utilities and independent power producers that have entirely ceased generating electricity (i.e., have closed) prior to the effective date of the rule, not to the CCR generated by such facilities.

6. **What requirements apply when CCR from an existing impoundment at an active power plant is dredged (i.e., pursuant to state legislation or other legal requirement) and the CCR is moved to a different unlined impoundment at the same site?**

   RESPONSE: In the situation described, both units would be defined as existing CCR surface impoundments subject to all the applicable provisions of the rule. The rule does not prohibit placement of the dredged material (CCR) in another existing unlined surface impoundment, provided the other unlined unit has not triggered closure by one of three specific provisions: (1) groundwater monitoring shows an exceedance of a groundwater protection standard; (2) the facility fails to demonstrate compliance with the minimum factors of safety to ensure structural stability of the unit; (3) the facility fails to demonstrate compliance with the location criteria. See 40 CFR section 257.101.

7. **Does the final rule address the status of non-slurried non-impounded coal ash that was formally and remains landfilled?**

   RESPONSE: CCR landfills that are "active" (i.e., receive CCR on or after the effective date) are subject to the requirements of the final CCR rule, and must comply with the requirements for "existing" CCR landfills. However, CCR landfills that do not receive any CCR on or after the effective date are considered to be "inactive" CCR landfills, and are not subject to the requirements of the final CCR rule.

8. **If a state-permitted Subtitle D solid waste landfill wants to permit an ash monofill cell to receive CCR waste as part of their state-permitted area, would the site also need to meet the CCR rules for that cell from a design, groundwater monitoring, and data publishing standpoint? Even if the ash cell would fall within the scope of the state permit and state regulations for a municipal solid waste landfill?**

   RESPONSE: If the landfill is a permitted municipal solid waste landfill, it is not subject to the requirements of the CCR rule. All other landfills that accept or manage CCR (e.g., an industrial solid waste landfill) are subject to all of the landfill requirements of the CCR rule, whether or not it has a state solid waste landfill permit.

9. **Do the regulations cover CCR landfills only onsite of an existing power plant, or does it regulate all CCR landfills, regardless if they are onsite of a power plant?**

   RESPONSE: With one exception, all operating or active CCR landfills are subject to the requirements of the rule whether they are on-site or off-site of the utility. See 40 CFR section 257.50(b). The sole exception is municipal solid waste landfills, which the regulation specifies are not subject to the rule. See 40 CFR section 257.50(i).

10. **Are small ponds containing CCR from uniquely associated wastes such as boiler washes, air preheater washes, or precipitator washes covered by the rule? If they are uniquely associated wastes, does that mean they cannot be CCR?**

    RESPONSE: Uniquely associated wastes, as defined in the revised 40 CFR section 261.4 (see pages 21500 and 21501 of the April 17, 2015 Federal Register Notice) are not CCR but are solid wastes covered by the Bevill exemption for fossil fuel combustion wastes at 40 CFR section 261.4(b)(4). Small ponds or impoundments that meet the definition of a CCR surface impoundment would be subject to the rule even if the CCR is co-disposed with other solid wastes, such as the uniquely associated wastes.

Beneficial Use

1. How does the CCR rule impact CCR that are beneficially used?

RESPONSE: The CCR final rule provides criteria that support and encourage the appropriate beneficial use of CCR. The final rule retains the Bevill Determination without revision and does not regulate CCR that are beneficially used. This rule provides a definition of beneficial use to distinguish between beneficial use and disposal. The rule clarifies that a use of a CCR that does not meet the definition of a beneficial use is disposal.

2. How will EPA work with state beneficial use programs and/or end users or generators of byproducts regarding interpreting the beneficial use criteria? Secondly, will EPA review evaluations of the criteria or offer opinions?

RESPONSE: EPA can provide assistance to state beneficial use programs and end users about how to interpret the beneficial use criteria. The Agency is working to provide tools to assist states and beneficial users with their beneficial use evaluations. EPA does not review or approve evaluations of the criteria conducted by others.

3. Where can the "Engineering and Environmental Guidance on the Beneficial Use of Coal Combustion Products in Engineered Structural Fill Projects" be obtained?

RESPONSE: The Utility Solid Waste Activities Group (USWAG) document, "Engineering and Environmental Guidance on the Beneficial Use of Coal Combustion Products in Engineered Structural Fill Projects," referenced in the preamble can be found in the docket to the rule at http://www.regulations.gov/#!documentDetail;D=EPA-HQ-RCRA-2009-0640-11969.

4. The preamble to the rule mentions that the EPA is developing a framework for assessing the risks associated with the beneficial use of unencapsulated CCR. When does the Agency anticipate completion of this framework?

RESPONSE: During the development of the framework to address the risks associated with the beneficial use of unencapsulated materials including CCR, the Agency determined that the principles outlined in the 2013 Methodology for Evaluating Encapsulated Beneficial Uses of Coal Combustion Residuals are also applicable and relevant to unencapsulated uses. Therefore, EPA combined the discussion of encapsulated and unencapsulated uses into a single document and renamed it the Methodology for Evaluating the Beneficial Use of Industrial Non-Hazardous Secondary Materials (BU Methodology) to reflect the broader scope.

5. Would a facility that stores piles of FGD on the ground for ultimate beneficial use as wallboard greater than the 12,400 ton CCR rule threshold have to meet the unencapsulated use requirements?

RESPONSE: As EPA noted on pages 21347-21348 of the final rule, in order to be subject to RCRA, the material must be a solid waste. The statute defines a solid waste as "any garbage, refuse….and other discarded material…" 42 U.S.C. 6903 (27). As EPA noted in the proposed and final rule:

> *"For some beneficial uses, CCR is a raw material used as an ingredient in a manufacturing process that have never been ''discarded,'' and thus, would not be considered solid wastes under the existing RCRA regulations. For example, synthetic gypsum is a product of the FGD process at coal-fired power plants. In this case, the utility designs and operates its air pollution control devices to produce an optimal product, including the oxidation of the FGD to produce synthetic gypsum. In this example, after its production, the utility treats FGD as a valuable input into a production process, i.e., as a product, rather than as something that is intended to be discarded. Wallboard plants are sited in close proximity to power plants for access to raw material, with a considerable investment involved. Thus, FGD gypsum used for wallboard manufacture is a product rather than a waste or discarded material. This use and similar uses of CCR that meet product specifications would not be regulated under the final rule."*

Note that whether the FGD gypsum is being managed as a "waste" or a "product" is a fact-specific determination. Indications that the FGD gypsum is being managed as a waste or a product by the utility include the rate at which the material is being used versus being added, and whether it is being managed as a valuable product (i.e., stored or protected in the same way virgin products are managed). For example, if more FGD gypsum is being added to a pile than can actually be used, and if the material is not being managed as a valuable product, then that would be an indication that it is it not being treated as a product; and would therefore be a "waste."

For those materials that are "wastes," a power-generating facility that stores piles of FGD on the ground on-site at the facility for ultimate beneficial use as wallboard greater than the 12,400 ton threshold would not have to meet the unencapsulated use requirements; however, the FGD piles must be "containerized" in order to not be considered a CCR Pile (and by definition, a CCR landfill). The use of the phrase "containerized" is not intended to require that all activities occur within tanks or containment structures, but merely that specific measures have been adopted to control exposures to human health and the environment. This could include placement of the CCR on an impervious base such as asphalt, concrete, or a geomembrane; leachate and run-off collection; and walls or wind barriers (see p. 21356 of the final rule).

6. **What if the facility storing the flue gas desulfurization (FGD) gypsum on the ground is not an electric utility?**

   RESPONSE: In this case, if the facility treats the FGD gypsum as a valuable input into a production process, i.e., as a product, rather than as something that is intended to be discarded, the use would not be regulated under the final rule (see above response). For those materials that are "wastes," FGD gypsum that is currently being used in compliance with the definition of beneficial use, including FGD gypsum stored in a temporary pile prior to being beneficially used, would not be subject to the CCR disposal regulations. As noted at 80 FR 21356 in the final rule preamble,

   > *"CCR that is currently being used beneficially—for example, fly ash that has been transferred to a cement manufacturer and that is stored off-site in a ''temporary pile,'' and that complies with all of the criteria in the definition to be considered a beneficial use including the fourth criterion relating to the placement of large quantities of unconsolidated CCR on the land— would not be subject to the regulations applicable to CCR disposal."*

   Although ultimately intended for encapsulated use in wallboard, a pile of FGD gypsum that is a "waste" is still considered an unencapsulated CCR until it is actually incorporated into the wallboard; therefore, if the amount of FGD gypsum in a pile awaiting beneficial use exceeds 12,400 tons, the facility also must comply with the fourth criterion pertaining to unencapsulated non-roadway uses. One way to ensure the fourth criterion is met is to containerize the pile; that is, adopt specific measures to control exposures to human health and the environment, such as placement of FGD gypsum on an impervious base, such as asphalt, concrete, or a geomembrane; leachate and run-off collection; and/or use of walls or wind barriers.

<u>Effective Date</u>

1. **What is the effective date of the rule? Some requirements state October 14, 2015 and others state October 19, 2015.**

   RESPONSE: The effective date of the rule is October 19, 2015. A technical correction was published in the Federal Register on July 2, 2015 (80 FR 37988) correcting the effective date and other associated dates.

2. **Will all CCR disposal sites be subject to the rule equally, or will there be a transition policy for some sites?**

   RESPONSE: There is no transition policy or any kind of "grandfathering" for particular sites or units. All CCR disposal units that are subject to the rule will be subject to the requirements on the effective date of the rule.

Applicability of Other Regulations (including tribal issues)

1. **A state has a CCR disposal facility that is located within a valley that was strip mined. The facility is regulated under a state wastewater collection, storage or treatment system permit and an NPDES Permit. The state will continue to regulate the facility. Will the CCR regulations apply to this site?**

   RESPONSE: If the facility is managing CCR in an active or inactive coal mine, it is not covered by the CCR rule. Placement in active or inactive underground or surface coal mines will be addressed under regulations being developed by the Office of Surface Mining of the Department of the Interior. However, placement of CCR or other management activities in any other mine would be considered to be disposal subject to the CCR requirements of part 257 unless the placement meets the criteria for defining beneficial use of CCR.

2. **How will the rule be implemented on tribal lands (i.e., at CCR disposal facilities located on tribal lands) or are there any differences in implementation?**

   RESPONSE: The requirements of part 257 apply directly to the facilities regardless of whether the facility is on state or tribal lands, so there will be few differences. Tribes, like states, can sue to enforce the rules by filing a citizen suit under RCRA 7002. In cases where notification is required, facility owners/operators should notify the tribal authorities. EPA's authority to oversee implementation of subtitle D regulations on tribal lands is limited; for example, EPA cannot approve a tribal Solid Waste Management Plan in the same manner as a state Solid Waste Management Plan, and therefore, compliance schedule adjustments under 4005(a) will not be available to facilities on tribal lands.

   EPA recognizes that there may be arrangements among tribal and state authorities and utility managers regarding oversight of utilities. Utility managers should work within these arrangements on CCR rule implementation.

3. **How do these "self-implementing" regulations fit within existing state permitting programs for these materials?**

   RESPONSE: The CCR rule applies directly to the facilities, and the facilities must be in compliance with those standards on the effective date, irrespective of state requirements. States may choose to adopt the federal requirements into their existing program or to impose more stringent standards, but the federal rule does not itself affect states' permitting programs. As part of their own programs under state law, states may choose to require permits for CCR disposal units, and may choose to adopt the federal requirements into their permits as permit conditions. However, a facility must still comply with the CCR rule requirements, even if the state has issued a permit that contains less stringent conditions or requirements than those in the CCR rule.

Definitions

1. **Does the rule apply to CCRs that are land applied outside a landfill or impoundment? If so, how does it apply?**

   RESPONSE: If the land application does not meet the criteria for beneficial use defined in 40 CFR section 257.53, the land application constitutes disposal and would be considered a landfill, subject to all of the requirements for CCR landfills. (See definition of CCR landfill in 40 CFR section 257.53).

2. **If a state has issued a construction permit for a CCR landfill prior to the effective date of the federal rule and this landfill has cells that are permitted for construction, but remain unconstructed after 180 days from the publication of the federal rule, are the unconstructed cells still considered to fall within the definition of "Existing CCR Landfill"?**

   RESPONSE: No. CCR landfill cells constructed after the effective date of the rule are considered to be new CCR landfills subject to the requirements for new CCR landfills.

3. **Do the new CCR landfill requirements apply to yet-to-be constructed cells of an existing multi-cell CCR landfill that have already been approved by a State regulatory agency but have yet to be constructed? Will the new CCR landfill requirements apply to the next new cell to be constructed, even if those future cells were approved as part of an overall plan of operation with defined design criteria?**

   RESPONSE: Yes. If continuous on-site, physical construction begins on a unit after the effective date of the rule, these are considered new CCR units (in this case, landfills) and will be subject to the requirements for new CCR units (here, those for new CCR landfills).

4. **The preamble of the CCR rule identifies certain impoundments as not being CCR surface impoundments – i.e., cooling water ponds, wastewater treatment ponds, storm water holding ponds, and aeration ponds. Are other types of ponds not specifically identified in the preamble but that similarly are not used to impound "significant quantities" of CCR considered not to be CCR surface impoundments?**

   RESPONSE: The final rule defines CCR surface impoundments as units that are designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR. Units that are not designed to hold an accumulation of CCR, and that do not treat, store, or dispose of CCR are not CCR surface impoundments. EPA provided examples in the preamble to the final rule of units that, in EPA's experience, typically would be expected to fall outside of that definition. These examples were not intended to be exclusive or definitive. There may well be additional units that do not meet the definition of a CCR surface impoundment. Similarly, there may be instances in which a particular "wastewater treatment pond" is in fact functioning as a CCR unit (e.g., a facility uses an existing CCR disposal unit for wastewater treatment without dredging the CCR out of the impoundment). Ultimately, the critical determinant of whether a unit is subject to the rule is whether it meets the criteria in the regulatory definition, rather than whether it was included as an example in the final rule preamble.

5. **Are coal ash leachate ponds subject to this rule?**

   RESPONSE: No. The rule regulates CCR landfills and CCR surface impoundments. CCR surface impoundments are defined as impoundments that are designed to hold an accumulation of CCR and liquids, and that treat, store, or dispose of CCR. A CCR leachate pond, or impoundment; i.e., an impoundment that only holds leachate from CCR landfills and not CCR, does not meet this definition.

6. **Are landfill stormwater run-off ponds outside the rule? We do not consider these to be CCR impoundments since they are not designed to hold an accumulation of CCR.**

   RESPONSE: The rule only regulates CCR landfills and CCR surface impoundments. CCR surface impoundments are defined as impoundments which are designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR. "Stormwater run-off ponds" would not generally be expected to meet the definition of CCR surface impoundment because CCR landfills, if designed in accordance with the requirements of 40 CFR section 257.81, should not contribute CCR material in stormwater run-off to CCR landfill stormwater ponds. CCR landfills must be designed to prevent the erosion and excessive volume of run-off to CCR stormwater ponds. If designed in accordance with the requirements of the final rule and if the only inflow to the unit is in fact stormwater run-off or direct precipitation, stormwater run-off from CCR landfills retained or detained by a CCR landfill stormwater pond should not include any CCR material.

7. **Are the following units subject to the CCR surface impoundment requirements?**
   - **Ponds that receive leachate and surface runoff and leachate from dry fly ash landfills,**
   - **Coal pile runoff ponds,**
   - **Impoundments that receive small amounts of CCR but whose primary function is not storage or disposal of CCR,**
   - **Evaporation ponds, or**
   - **Stormwater impoundments impacted by some CCR as runoff.**

RESPONSE: To be covered by the CCR rule, an impoundment must meet both of the following criteria: (1) was designed to hold an accumulation of CCR and liquid, and (2) treats, stores, or disposes of CCR. Surface runoff, coal pile runoff, CCR landfill leachate, stormwater and evaporation ponds would not generally be expected to meet the definition of a CCR surface impoundment, because based on their typical design and function, such units are not usually designed primarily to hold an accumulation of CCR and liquid and would not be expected to treat, store, or dispose of CCR. However, it is the responsibility of the owner/operator to evaluate the impoundments at his facility to determine whether or not they meet the definition of a CCR surface impoundment.

Location Restrictions

1. **When EPA proposed the application of location restrictions to existing surface impoundments, you acknowledged that these location restrictions would force a majority of the current impoundments to close. Do you have an estimate of how many will close?**

   RESPONSE: The final CCR rule contains five location restrictions that apply to new CCR units and selectively to existing CCR units. These restrictions include: (1) disposal within five feet of the uppermost aquifer; (2) disposal in wetlands; (3) disposal in unstable areas, including karst areas; (4) disposal near active fault zones; and (5) disposal in seismic impact zones. In addition, the current subtitle D regulation (40 CFR section 257.3-1) that applied to these units before the final rule was issued already restricts facilities that dispose of wastes in floodplains. For fault areas, seismic impact zones, and unstable areas (using karst areas as a proxy) the EPA's Regulatory Impact Analysis (RIA) projected that 51 of the 1045 waste management units would be subject to the location restrictions resulting in an estimated 26 waste management units closing and safely relocating off-site. The remaining waste management units are expected to make certifications either that they are not subject to these three location restrictions or that their continued operation in these areas is protective.

   EPA did not have sufficient data to evaluate the number of waste management units subject to the restrictions against disposal units located within five feet of the uppermost aquifer or in wetlands. However, in contrast to the proposed rule, the final rule allows owners or operators to certify that a waste management unit meets an alternate performance standard, even if it cannot meet the requirement in the proposed rule to demonstrate that it is five feet above the water table. Similarly, EPA notes that under the wetlands criterion, owners or operators have the option of purchasing offsets instead of closing existing units. Both the depth to groundwater and wetland location standards offer protective workable alternatives that facilities will have the option to consider. For these reasons, EPA does not believe that many (if any) facilities will close their waste management units in response to the location restrictions.

2. **What sort of reliability issues could be imposed on the electric grid as a result of the CCR final rule?**

   RESPONSE: Electricity market impacts presented in Appendix X of EPA's Regulatory Impact Analysis(RIA) were conducted using the Integrated Planning Model (IPM) and include the location restriction costs of the rule as discussed above. The results of this analysis show that there will be a negligible impact to the electric market.

Design Criteria

1. **If plans for a vertical expansion over an existing CCR landfill are approved after the 180 day deadline for defining new CCR landfills, would the vertical expansion be subject to the requirements for new CCR landfills?**

   RESPONSE: No. Vertical expansions of existing CCR landfills are not subject to the requirements for new CCR landfills.

Groundwater Monitoring and Corrective Action

1. **The final rule requires that if a constituent of concern is detected above a statistically significant level, that the groundwater protection standard must be set at either the Maximum Contaminant Level (MCL) or at the background concentration. Whereas, the proposed rule, like the municipal solid waste program, would have allowed the owner or operator to establish an alternative groundwater protection standard based on site-specific conditions. Has EPA considered whether this will impact future and on-going corrective action at coal ash disposal units in states that utilize risk-based decision making?**

   RESPONSE: If the Safe Drinking Water Act MCL or background-based cleanup levels are lower than a risk-based level the state has used, the federal regulations would require that the corrective action include treating the groundwater in the uppermost aquifer to a level lower than the risk-based level. If, however, the MCL or background-based cleanup levels in the federal rules are higher than a risk-based level the state has used, the state regulations would require that the corrective action achieve a level lower than the federal levels. In some cases, it is possible that the corrective action provisions in the final rule would require a more rigorous treatment than required under state law, and in other cases, less rigorous treatment than required under state law. The potential number of these scenarios occurring at corrective actions related to coal ash disposal units is unknown.

2. **If a state decides that there is no human receptor for the groundwater and that a cleanup standard above the MCL or background is appropriate, would that meet the minimum requirements of the rule?**

   RESPONSE: The rule requires that the groundwater protection standard (either the MCL or the background level, whichever is higher) must be met by the chosen corrective action remedy, in order to preserve the groundwater as a natural resource and for its potential future use as a source of drinking water.

Closure and Post-Closure

1. **A facility employs a wastewater treatment system design using multiple CCR surface impoundments configured in a series. Water and wastewater that enters the system moves by gravity and/or pumping from one impoundment to the next in the treatment system before being discharged from a National Pollutant Discharge Elimination System (NPDES) permitted outfall. The facility identified the surface impoundments separately under the CCR regulations because each has its own dam, but operated them collectively as a single wastewater treatment system. The facility intends to close all of the units within that system through closure by removal ("clean closure"), within the applicable time frames mandated in the CCR regulations.**

   After initiating closure and after initial dewatering has been completed, the impoundments will continue to be used to manage stormwater on site throughout the closure process, until closure is completed. Rainwater and non-contact stormwater from precipitation events, which will come into contact with the CCR that still remains in the units, will be pumped through the system (e.g., Impoundment 1 to Impoundment 2 to Impoundment 3, etc.). The material will be pumped from last impoundment in the series and treated in a wastewater treatment plant (WWTP) located near the outfall of the last impoundment in the series. The WWTP will discharge into the river in accordance with the terms and conditions of a NPDES permit. Do the CCR regulations allow the facility to continue to operate in this fashion throughout the closure process?

   RESPONSE: This question pertains to a situation where closure of multiple surface impoundments will be accomplished by removal of CCR from the surface impoundments, so EPA's response is limited to this situation. In addition, the response only addresses the situation in which the facility chooses to close all units within the system; the analysis would differ if the facility chose to close only some of the units within the system.

   The Title 40 Code of Federal Regulations (CFR) Part 257, Subpart D regulations do not contemplate a circumstance in which a unit would continue to receive wastes after closure has been initiated. See 40 CFR section 257.102(e)(1)(i); (e)(3). Moreover, a CCR unit that must close for cause, pursuant to 40 CFR section 257.101, is expressly prohibited from placing additional waste in the unit after a specified time. For example, an unlined CCR surface impoundment whose groundwater monitoring shows a statistically significant exceedance of a groundwater protection standard must "cease placing CCR and non-CCR wastestreams into such CCR surface impoundment and either retrofit or close the CCR unit" within six (6) months of making this determination. 40 CFR section 257.101(a)(1).

Normally EPA would consider that when a facility pumped wastewaters (i.e., the rainwater and non-contact stormwater from precipitation events, along with any CCR remaining in the unit) into subsequent impoundments, the facility would be "placing wastes" into the downstream units. However, in the situation described in the question, EPA would consider multiple impoundments that operate in a series to be a single "multi-unit system," and would consider the entire multi-unit system to be one CCR unit for purposes of closure. As a consequence, the pumping of the wastewaters from the first impoundment into subsequent impoundments that are configured in a series would be better characterized as the movement of waste within a disposal unit, which is generally not regulated under RCRA, rather than the movement between disposal units, which is typically regulated. Although the facility originally identified each surface impoundment in the series separately under the CCR regulations, they operated them collectively as a single wastewater treatment system, and most critically for purposes of this question, is in the process of closing them as a single unit (e.g., under the same time frames).

EPA's regulations already expressly provide for the situation in which a series of CCR units is considered to be a multi-unit system. See, e.g., 40 CFR section 257.53 (defining CCR unit to include a combination of more than one CCR unit); 40 CFR section 257.91(d)(multi-unit system for purposes of groundwater monitoring). While the closure regulations do not include specific requirements for such situations, they do not prohibit a facility from closing their multi-unit system as a single CCR unit, provided all applicable requirements and deadlines for closure are followed for the designated single CCR unit—i.e., all CCR units comprising the multi-unit wastewater treatment system. Thus, should the owner or operator elect to use this approach, for example, they would need to prepare a written closure plan that describes the steps necessary to close all of the impoundments that comprise the multi-unit system. After the CCR units comprising the multi-unit system are designated as a single CCR unit, the requirements specifying when closure activities must commence must be met for the entire multi-unit system. Similarly, closure of the entire system would need to be completed within the regulatory deadline for a single unit (40 CFR section 257.102(f)) (i.e., five years for a CCR surface impoundment); to qualify for any extensions of the closure time frames, the owner or operator would also need to make the necessary demonstration(s) for the entire unit, and the total amount of time available would be based on the aggregate size of the impoundments comprising the multi-unit system (e.g., if the aggregate size was greater than 40 acres, the time frames in 40 CFR section 257.102(f)(2)(ii)(B) would apply).

The regulations also specify that, in this situation, if the facility has installed a multi-unit groundwater monitoring system, all of the unlined impoundments in the system must close or retrofit under section 257.101(a). 40 CFR section 257.90(d)(2). Similarly, if the facility has decided to close its units as a multi-unit system as discussed above, in the event that closure for cause has been triggered under 40 CFR section 257.101(a) for one or more impoundments in the mulit-unit system, all CCR units within the multi-unit system (i.e., the designated single CCR unit) would be subject to the 6-month prohibition on receiving CCR and non-CCR wastestreams. This is because, as noted above, the entire multi-unit system would be considered one CCR unit for purposes of closure. Note that the regulations do not compel a facility to treat "connected" units as a single multi-unit system; rather this falls within the facility's discretion.

As a designated single CCR unit, however, the movement of CCR and other wastes between the individual units that make up that system would be permissible throughout the closure period during closure activities under 40 CFR section 257.101(a)(1); as noted previously, the movement of waste within a unit is generally not considered to be the "placement" of waste into a unit. For example, movement of CCR between impoundments within the multi-unit system to facilitate CCR dewatering and removal activities, even after the 6-month period would be permissible under this closure approach. Similarly, the continued pumping of the wastewaters through the multi-CCR unit system toward the NPDES-permitted outfall during closure (e.g., generated by precipitation or the release of interstitial water during CCR excavation) would also not be inconsistent with the placement prohibition under 40 CFR section 257.101(a)(1). However, the addition of CCR or other wastes from locations external to the multi-unit system would not be permissible, as this would constitute the placement of waste within the multi-unit system.

Implementation and Solid Waste Management Plans

1. **How long does EPA anticipate it will take to approve a state solid waste management plan (SWMP)?**

   RESPONSE: The requirements at 40 CFR Part 256 state that the EPA has six months from the time of the submittal of the revised plan to either approve or disapprove the SWMP.

2. **Please describe in detail the process that will be followed for approving the state plans.**

RESPONSE: EPA has been working to develop materials and an efficient process (consistent with the requirements of the 40 CFR Part 256 regulations) for the review/approval of state plans. The Agency has developed a checklist of relevant sections of 40 CFR Part 256 (Guidelines for the Development & Implementation of State Solid Waste Management Plans) that states will be able to consult.

EPA will review the state's plan to determine how it intends to regulate CCR facilities in the state. EPA has also developed a checklist of the technical requirements included in the CCR final rule that will be available for the states to consult in developing their revised plans. In order to approve a revised state SWMP, EPA must, among other things, determine that the state plan provides enforceable regulatory requirements for the closing or upgrading of CCR disposal facilities that constitute open dumps. If the state SWMP incorporates the federal requirements verbatim, it will be straightforward to approve. If the state requirements for CCR facilities are different from the federal regulations, EPA will compare them and determine if the alternative requirements are at least as protective of public health and the environment as the federal minimum requirements.

3. **Does EPA intend to delegate the authority to approve the revisions to the state plans to the Regional offices?**

   RESPONSE: EPA regional administrators have the authority to approve the revisions to SWMPs. Regions will consult with EPA headquarters to help ensure national consistency.

4. **Many states will need statutory or regulatory changes in order to open the SWMP to incorporate the final rule. How does EPA anticipate that states will be able to incorporate the requirements in time to meet the six month effective date of the final rule?**

   RESPONSE: EPA does not necessarily expect the revised plans to be submitted by states before the effective date of the rule which is October 19, 2015. The technical requirements of the rule that facilities must meet have varying timelines; and many of the most complex requirements are not immediately effective. For example, the groundwater monitoring requirements must be met within two years of the effective date. In addition, the EPA's current regulations do not preclude a state from submitting a SWMP for conditional approval based on anticipated regulatory or statutory revisions, or a partial SWMP to gain authority to extend compliance deadlines. However, note that where a partial SWMP is submitted, the regulations require EPA to establish a timetable for completion of the final plan in order to grant partial approval. 40 CFR section 256.04(f).

5. **The preamble to the final rule states that once "EPA has approved a SWMP that incorporates or goes beyond the minimum federal requirements, EPA expects**

that facilities will operate in compliance with that plan and the underlying state regulations." However, isn't it true that the federal requirements remain independently enforceable through federal citizen suits?

RESPONSE: Once a SWMP that incorporates or goes beyond the minimum federal requirements is approved, EPA believes that compliance with the state program would be considered as compliance with the federal CCR rule criteria. In addition, EPA anticipates that a facility that operates in accordance with an approved SWMP will be able to beneficially use that fact in a citizen suit brought to enforce the federal criteria. EPA believes a court will accord substantial weight to the fact that a facility is operating in accordance with an EPA-approved SWMP. Finally, we note that RCRA section 7002 requires a citizen group to provide 60 days notification to the EPA and the state prior to filing a suit to enforce the requirements of the CCR rule. States can take a number of actions in response to this notification, including: (a) intervening in the suit; or (b) filing their own action to enforce compliance with the rule, which would preempt the citizen's action.

6. **How will the experience of states implementing the final rule inform EPA's future analysis? The final rule also identified the possibility that concentrations of hazardous contaminants in coal ash may rise in the near future.**

RESPONSE: EPA recognizes the critical role that our state partners play in the implementation and ensuring compliance with the regulations, and the Agency expects that states will be active partners in overseeing the regulation of CC R landfills and CCR surface impoundments. Any future analysis will account for the states' implementation of the final rule, including any revisions to state programs adopted in response to the final rule. In this regard, EPA is strongly encouraging states to adopt these federal minimum criteria into their regulations and revise their SWMPs to incorporate these federal requirements. For those states that choose to submit revised SWMPs, EPA will review and approve those revised SWMPs, provided they demonstrate that the minimum federal requirements have been met. EPA expects that the information developed as part of this process will help the Agency better understand the full extent of a state's regulatory authority over the disposal of CCR and the manner in which states will implement this oversight.

7. **What is the relationship between the EPA and the states in regard to implementation of the CCR rule?**

RESPONSE: The final rule establishes self-implementing requirements -- primarily performance standards -- that owners or operators of regulated units can implement without any interaction with regulatory officials. These requirements apply directly to the facilities, and facilities must be in compliance with the rule on its effective date, irrespective of state requirements. States may choose to adopt the federal requirements into their existing program or to impose more stringent standards, but they are not required to adopt or implement these regulations, develop a permit program, or submit a program covering these units to EPA for approval and there is no mechanism for EPA to officially approve or authorize a State program to operate "in lieu of" the federal regulations.

In order to ease implementation the regulatory requirements for CCR landfills and CCR surface impoundments, EPA strongly encourages the States to adopt at least the federal minimum criteria into their regulations.

The federal requirements are independent of state requirements and do not preempt them. EPA recognizes that some states have already adopted requirements that go beyond the minimum federal requirements; for example, some states currently impose financial assurance requirements for CCR units, and require a permit for some or all of these units. This rule will not affect these state requirements. The federal criteria are minimum requirements and do not preclude states' from adopting more stringent requirements where they deem to be appropriate.

8. **Is there any incentive for states to adopt the rule?**

   RESPONSE: If a state adopts the rule and EPA approves the state's solid waste management plan, the state may extend compliance times for "open dumps" that meet the criteria in RCRA 4005; e.g., times to complete structural stability measures.

9. **What are the consequences if a state does not adopt the rule?**

   RESPONSE: None. Owners and operators of CCR disposal units are required to comply with the EPA's CCR rule irrespective of state action or requirements.

Miscellaneous

1. **EPA is required, under the Bevill Amendment, to consider specific factors in determining whether to regulate coal ash under subtitle C of RCRA: (1) the source and volumes of material generated per year; (2) present disposal and utilization practices; (3) potential danger, if any, to human health and the environment from the disposal and reuse of such materials; (4) documented cases in which danger to human health or the environment from surface run-off or leachate has been proved; (5) alternatives to current disposal methods; (6) the costs of such alternatives; (7) the impact of those alternatives on the use of coal and other natural resources; and (8) the current and potential utilization of such materials (42 U.S.C. § 6982(n)). EPA revisited these eight study factors in the coal ash final rule. What process did EPA use to gather this information and what did EPA find?**

RESPONSE: In the proposed rule, EPA re-examined the eight Bevill study factors in section 8002(n) of RCRA, and solicited comment on its analysis. As discussed in both the proposed and final rules, the key elements (i.e., factors) of the analysis were EPA's risk assessment, the assessment of state programs and EPA's compilation of CCR damage cases. In response to the proposed rule, the Agency received significant comments on the various elements of the analysis and consequently published several Notices of Data Availability (NODAs) presenting new data and possible revisions to the analysis.

However, as discussed at length in the preamble to the final rule, critical information necessary to a final Regulatory Determination is still lacking on a number of key technical and policy questions. This includes information needed to quantify the risks of CCR disposal, and the potential impacts of recent Agency regulations on the chemical composition of CCR. The Agency also needs further information on the adequacy of the state programs.

In the absence of this information, EPA is unable to reach a conclusion on the issue that is central to a Bevill Determination: whether the risks presented by the management of CCR waste streams can only be adequately mitigated through regulation under RCRA subtitle C. Therefore, EPA deferred a final Regulatory Determination for these wastes. It is worth noting however that CCRs, both those disposed and beneficially used, remain Bevill exempt from RCRA subtitle C regulation and will remain so until EPA changes this determination. EPA will provide the public with an additional opportunity to comment on any proposed Regulatory Determination prior to issuing a final Regulatory Determination. (See 80 FR at 21327, April 17, 2015.)

2. **What factors weighed most heavily on EPA's decision? The final rule identified technical uncertainties that cannot be resolved, including the extent to which risks are managed sufficiently under the final rule.**

   RESPONSE: Of the eight statutory Bevill study factors assessed, three weighed the most heavily in the Agency's decision to defer a final Regulatory Determination: (1) the extent of the risks posed by mismanagement of CCR; (2) the adequacy of state programs to ensure proper management of CCR; and (3) the extent and nature of damage cases.

3. **What information will EPA gather over the next several years to resolve these technical uncertainties?**

   RESPONSE: Over the next several years, electric utilities will be moving forward in the implementation of this rule as well as the Effluent Limitations Guidelines and Standards for the Steam Electric Power Generating Point Source Category (the ELG rule) and the Carbon Pollution Emission Guidelines for Existing Stationary Sources; Electric Utility Generating Units Clean Power Plant rules.

Until these regulatory requirements are implemented, it is premature to define a path forward for resolving the technical uncertainties identified in the final rule. A reasonable course, however, would be to follow the groundwater monitoring data and other information being posted to companies' websites to see what facilities, CCR landfills, and CCR surface impoundments continue operating, whether liners are leaking, and what concentration of contaminants we are observing. Any information that the EPA gathers in the future will be announced to the public and offered for public comment.

4. **The final rule identified the possibility that concentrations of hazardous contaminants in coal ash may rise in the near future. Why might that happen? What actions might be necessary if that happens?**

   RESPONSE: In the final rule, EPA specifically noted that there were uncertainties regarding the evolving characterization and composition of CCR due to electric utility upgrades and retrofits of multi-pollutant control technologies and raised concern that these advances in human health and environmental protection could present new or otherwise unforeseen changes in CCR. Therefore, if the Agency determines at some future time that significant changes have occurred in the characterization or composition of CCR as a result of these increased air pollution control efforts, EPA will then make a determination on how state programs are addressing those risks and whether additional risk analyses are warranted. This determination may be strongly influenced by the monitoring of facility groundwater data to determine if the controls the Agency has put in place as a result of this rule are providing the necessary environmental protections. Any action that the Agency may consider in the future will be announced to the public and offered for public comment.

EXHIBIT 35

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Part 257

[EPA–HQ–OLEM–2020–0107; FRL–7814–02–OLEM]

RIN 2050–AH14

Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments

AGENCY: Environmental Protection Agency (EPA).

ACTION: Proposed rule.

SUMMARY: On April 17, 2015, the Environmental Protection Agency (EPA or the Agency) promulgated national minimum criteria for existing and new coal combustion residuals (CCR) landfills and existing and new CCR surface impoundments. On August 21, 2018, the United States Court of Appeals for the District of Columbia Circuit vacated the exemption for inactive surface impoundments at inactive facilities and remanded the issue back to EPA to take further action consistent with the opinion in *Utility Solid Waste Activities Group, et al.* v. *EPA.* The Agency is proposing to establish regulatory requirements for inactive surface impoundments at inactive facilities (legacy CCR surface impoundments). EPA is also proposing to establish groundwater monitoring, corrective action, closure, and post-closure care requirements for all CCR management units (regardless of how or when that CCR was placed) at regulated CCR facilities. EPA is also proposing several technical corrections to the existing regulations, such as correcting certain citations and harmonizing definitions.

DATES:

Comments due: Comments must be received on or before July 17, 2023.

Public Hearing: EPA will hold an in-person public hearing on June 28, 2023 and a virtual public hearing on July 12, 2023. Please refer to the **SUPPLEMENTARY INFORMATION** section for additional information on the public hearing.

ADDRESSES: You may send comments, identified by Docket ID No. EPA–HQ–OLEM–2020–0107, by any of the following methods:

• *Federal eRulemaking Portal: https://www.regulations.gov/* (our preferred method). Follow the online instructions for submitting comments.

• *Mail:* U.S. Environmental Protection Agency, EPA Docket Center, Office of Land and Emergency Management (OLEM) Docket, Mail Code 28221T, 1200 Pennsylvania Ave. NW, Washington, DC 20460.

• *Hand Delivery or Courier (by scheduled appointment only):* EPA Docket Center, WJC West Building, Room 3334, 1301 Constitution Avenue NW, Washington, DC 20004. The Docket Center's hours of operations are 8:30 a.m.–4:30 p.m., Monday–Friday (except Federal Holidays).

Instructions: All submissions received must include the Docket ID No. for this rulemaking. Comments received may be posted without change to *https://www.regulations.gov/,* including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the ''Public Participation'' heading of the **SUPPLEMENTARY INFORMATION** section of this document.

FOR FURTHER INFORMATION CONTACT: For questions concerning this proposal, contact Michelle Lloyd, Office of Resource Conservation and Recovery, Materials Recovery and Waste Management Division, Environmental Protection Agency, 1200 Pennsylvania Avenue NW, MC: 5304T, Washington, DC 20460; telephone number: (202) 566–0560; email address: *Lloyd.Michelle@epa.gov.* For more information on this rulemaking please visit *https://www.epa.gov/coalash.*

SUPPLEMENTARY INFORMATION:

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List of Acronyms

ACM Assessment of Corrective Measures
ANPRM Advance Notice of Proposed Rulemaking
ASD alternative source demonstration
CAA Clean Air Act
CBI Confidential Business Information
CCR coal combustion residuals
CCRMU coal combustion residuals management unit
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act
CFR Code of Federal Regulations
CWA Clean Water Act
EAP Emergency Action Plan
EJ environmental justice
ELG Effluent Limitation Guidelines
EPA Environmental Protection Agency
EPRI Electric Power Research Institute
FR Federal Register
GWMCA groundwater monitoring and corrective action
GWPS groundwater protection standard
HQ hazard quotient
HSWA Hazardous and Solid Waste Amendments
ICR Information Collection Request
LEAF Leaching Environmental Assessment Framework
MCL maximum contaminant level
NAICS North American Industry Classification System
NPDES National Pollution Discharge Elimination System
NPL National Priorities List
NTTAA National Technology Transfer and Advancement Act
OMB Office of Management and Budget
OSHA Occupational Safety and Health Administration
PM particulate matter
PRA Paperwork Reduction Act
PUC Public Utility Commission
QA/QC quality assurance/quality control
RCRA Resource Conservation and Recovery Act
RIA Regulatory Impact Analysis
SSI statistically significant increase
SSL statistically significant level
TDS total dissolved solids
TSCA Toxic Substances Control Act
TSDF Transportation Storage and Disposal Facility
USGS U.S. Geological Survey
USWAG Utility Solid Waste Activities Group
WIIN Water Infrastructure Improvements for the Nation

I. Public Participation

A. Written Comments

Submit your comments, identified by Docket ID No. EPA–HQ–OLEM–2020–0107, at *https://www.regulations.gov* (our preferred method), or the other methods identified in the **ADDRESSES** section. Once submitted, comments cannot be edited or removed from the docket. EPA may publish any comment received to its public docket. Do not submit to EPA's docket at *https://www.regulations.gov* any information you consider to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Multimedia submissions (audio, video, etc.) must be accompanied by a written comment.

TABLE 2—PROPOSED COMPLIANCE TIMEFRAMES FOR CCRMU IN MONTHS AFTER EFFECTIVE DATE OF THE FINAL RULE—Continued

Proposed compliance timeframes for CCRMU			
40 CFR Part 257, Subpart D requirement	Description of requirement to be completed	Proposed deadline (months after effective date of the final rule)	Notes
GWMCA (§ 257.91)	Install the groundwater monitoring system.	6	Prerequisite requirements: Facility Evaluation Report. Subsequent requirements: Groundwater sampling and analysis program; Initiate detection and assessment monitoring; Annual GWMCA report.
GWMCA (§ 257.93)	Develop the groundwater sampling and analysis program.	6	Prerequisite requirements: Install groundwater monitoring system. Subsequent requirements: Initiate detection monitoring and assessment monitoring; Annual GWMCA report.
GWMCA (§ 257.90(e))	Annual GWMCA report	January 31 of the year following GWM system install.	Prerequisite requirements: Install groundwater monitoring system; Groundwater sampling and analysis plan.
Closure (§ 257.102)	Prepare written closure plan.	12	Subsequent requirements: Initiate closure.
Post-Closure Care (§ 257.104).	Prepare written post-closure care plan.	12	Prerequisite requirements: Written closure plan.
Closure and Post-Closure Care (§ 257.101).	Initiate closure	12	Prerequisite requirements: Written closure plan.
GWMCA (§§ 257.90–257.95)	Initiate the detection monitoring and assessment monitoring. Begin evaluating the groundwater monitoring data for SSI over background levels and SSL over GWPS.	24	Prerequisite requirements: Install groundwater monitoring system; Groundwater sampling and analysis plan.

4. Applicability and Definitions Related to CCR Management Units

EPA is proposing to amend § 257.50 by adding a new paragraph (j) to specify that subpart D applies to CCRMU. EPA is also proposing to add a new definition and revise 11 existing definitions in § 257.53 to implement the proposed criteria for CCRMU.

a. Definition of CCR Management Unit

EPA is proposing to define a *CCR management unit* to capture the solid waste management practices that have been demonstrated in the risk assessment and the damage cases to have the potential to contaminate groundwater. EPA is proposing to define a CCRMU as any area of land on which any non-containerized accumulations of CCR are received, placed, or otherwise managed, that is not a CCR unit. This definition is based on the current definitions of a CCR pile—which is currently regulated as a CCR landfill—and of a CCR surface impoundment, which both rely on the concept of ''accumulations of CCR.'' See, 40 CFR 257.53.

EPA is proposing that CCRMU would include historical solid waste management units such as CCR landfills and surface impoundments that closed under then-existing law prior to the effective date of the 2015 CCR Rule, as well as inactive CCR landfills (including abandoned piles). It would also include any other areas where the solid waste management of CCR on the ground has occurred, such as structural fill sites, CCR placed below currently regulated CCR units, evaporation ponds, or secondary or tertiary finishing ponds that have not been properly cleaned up, and haul roads made of CCR if the use does not meet the definition of beneficial use. All of these examples involve the direct placement of CCR on the land, in sufficient quantities to raise concern about releases of hazardous constituents, and—in most, if not all cases—with no measures in place to effectively limit the contact between the CCR and liquids, and subsequent generation and release of any leachate.

EPA recognizes that this is a broad definition, but the Agency does not intend that the placement of any amount of CCR would necessarily constitute a CCRMU. Accordingly, EPA is proposing that the following would not be considered CCRMU: consistent with the current regulations, closed or inactive process water ponds, cooling water ponds, wastewater treatment ponds, and storm water holding ponds or aeration ponds. These units are not designed to hold an accumulation of CCR, and in fact, do not generally contain a significant amount of CCR. See, 80 FR 21357. In addition, consistent with the existing regulations, neither an area or unit at which exclusively non-CCR waste is managed, nor any containerized CCR, such as a silo, would be considered CCRMU. See, Id. at 21356. Neither of these units present conditions that give rise to the risks modeled in EPA's assessment or identified in the damage cases.

For similar reasons, the Agency is proposing that any CCR used in roadbed and associated embankments would not be considered CCRMU. As EPA explained in the 2015 rule the methods of application are sufficiently different from CCR landfills that EPA cannot extrapolate from the available risk information to determine whether these activities present similar risks. Roadways are subject to engineering specifications that generally specify CCR to be placed in a thin layer (*e.g.,* six to 12 inches) under a road. The placement under the surface of the road limits the degree to which rainwater can influence the leaching of the CCR. There are also significant differences between the manner in which roadways and landfills can potentially impact groundwater. These include the nature of mixing in the media, the leaching patterns, and how input infiltration rates are generated. First, CCR landfills are typically a homogenously mixed system, and as a result, there are no spatial variations of the chemical and physical properties of the media (for

EXHIBIT 36

Support for the Petition of an Adjusted Standard for Pond 4, Ponds 3 and 3A, Pond S-6, Former Pond B-3, and South Fly Ash Pond at the Marion Generating Station

Prepared by

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Prepared for

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December 20, 2024

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Abbreviations

CCR	Coal Combustion Residuals
CM	Conceptual Model
COI	Constituent of Interest
ESV	Ecological Screening Value
FGD	Flue Gas Desulfurization
GHG	Greenhouse Gas
GWPS	Groundwater Protection Standard
HTC	Human Threshold Criteria
IEPA	Illinois Environmental Protection Agency
MGS	Marion Power Generating Station
PLM	Polarized Light Microscopy
PWS	Public Water Supply
SIPC	Southern Illinois Power Cooperative
SWQS	Surface Water Quality Standard
US EPA	United States Environmental Protection Agency

Executive Summary

Southern Illinois Power Cooperative (SIPC) owns and operates the Marion Power Generating Station (MGS), a gas and coal-fired power generating facility located in Marion, Illinois. The station began operations in 1963 and features several waste and water storage areas (including storage ponds[1]) that were utilized to support the station's operations. Some of these areas were specifically designed to store coal combustion residuals (CCR) produced from burning coal; these include Pond A-1, Former Fly Ash Holding Units, and Former Fly Ash Holding Areas. Other storage areas, including some storage ponds, were utilized for different operational purposes, such as wastewater storage or overflow and run-off management. The storage ponds in the latter category include:

- Pond 4
- Pond 3 and Pond 3A
- Pond S-6
- Former Pond B-3
- South Fly Ash Pond

These storage ponds (hereafter referred to as "storage ponds of interest") received negligible amounts of CCR over their operational history and, consequently, do not carry the same human health risk and environmental risk as posed by the CCR storage units that are subject to federal regulations regarding the disposal of CCR in surface impoundments (*i.e.*, the 2015 CCR Rule by the United States Environmental Protection Agency [US EPA]) or Illinois State CCR Regulations (*i.e.*, Illinois Administrative Code Part 845 [Part 845] by Illinois Environmental Protection Agency [IEPA]), which is fundamentally based on the 2015 US EPA CCR Rule.

The US EPA established national regulations for CCR management in 2015 (US EPA, 2015), which included requirements for both existing surface impoundments and landfills. The clear differences between the storage ponds of interest at MGS compared to surface impoundments that are subject to federal and state CCR regulations can be established based on the definitions for surface impoundment offered in the 2015 CCR Rule, the human health and ecological risk assessment (2014 CCR Risk Assessment) that supports the 2015 CCR Rule; the history of use and investigations conducted at the storage ponds of interest; and a site-specific risk assessment based on the groundwater and surface water data collected at MGS. Based on this information, I can conclude the following:

- The storage ponds of interest at MGS are not considered primary storage units for CCR; the small amounts of CCR present in these storage ponds are *de minimis*, placing the storage ponds of interest outside the regulatory requirements of state and federal regulations.
- Due to the minimal quantity of CCR in the MGS storage ponds of interest, the risk assessment conducted by US EPA in support of the CCR Rule is not applicable to the MGS storage units of interest.

[1] When referring to waste disposal, the terms "pond" and "surface impoundment" are often used interchangeably.

- A site-specific risk assessment has confirmed that the 2014 US EPA risk assessment does not adequately characterize the conditions at MGS and has demonstrated that the storage ponds of interest at MGS do not pose a risk to human health or the environment.

For these reasons, the storage ponds of interest at MGS do not qualify as surface impoundments as intended by the federal and state CCR Rules and are eligible for a petition for an adjusted standard under Part 845.

1 Introduction

In 2015, the United States Environmental Protection Agency (US EPA) promulgated national standards for the regulation of coal combustion residuals (CCR) disposal units (US EPA, 2015). The 2015 CCR Rule (formally known as "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities") set forth a nationally consistent standard for the current and future management of CCR disposal units (surface impoundments and landfills) (US EPA, 2015). The Rule put forth a number of key provisions related to location, liner design, structural integrity, operating criteria related to controlling run-off and fugitive dust, and recordkeeping for CCR disposal units. Some of the most consequential requirements, however, relate to the establishment of a groundwater monitoring system at the waste containment boundary to detect exceedances of groundwater protection standards (GWPSs) of CCR-related constituents. If monitoring indicates that any of the identified constituents in CCR exceed the GWPSs, potential closure and corrective action must be initiated.

In the preamble to the Rule, US EPA justifies its regulatory determination based on three key reasons (US EPA, 2015):

- "EPA had completed a quantitative risk assessment that estimated significant risks to human health and the environment."
- "…consideration related to how effectively state regulatory programs address the risks associated with the improper management of these wastes…" and "lack of substantial details regarding the full extent of state regulatory authority over the disposal of these materials, and the manner in which states have, in practice, implemented this oversight."
- "…information documenting continued instances involving the contamination of ground or surface water from the management of these wastes."[2]

Following the promulgation of the CCR Rule, several states initiated or enhanced existing CCR management programs, including Illinois. In 2021, Illinois established 35 Illinois Administrative Code Part 845 (Part 845), which put forth "rules for the design, construction, operation, corrective action, closure and post-closure care of surface impoundments containing CCR at power plants" (IEPA, 2021). Part 845 shares many features of the 2015 CCR Rule but is solely focused on the regulation of surface impoundments, including the need to initiate corrective action in response to a GWPS exceedance. Importantly, Part 845 has retained US EPA's definition of a surface impoundment as "a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR" (IEPA, 2021).

Based on the information that was provided to me, it is my understanding that the Illinois Environmental Protection Agency (IEPA) has taken the position that the CCR storage ponds of interest at MGS are "surface impoundments" and within the scope of the 2015 CCR Rule and Part 845. Several of the storage ponds, however, are inconsistent with the definition of a surface impoundment. In particular, the CCR storage ponds of interest at MGS were never designed to routinely receive sluiced CCR or other significant CCR from plant operations. Consequently, the storage ponds contain negligible amounts of CCR that would qualify them as "de minimis" ponds. As noted by US EPA, "de minimis" levels of CCR in a pond are

[2] This justification specifically relates to cases proven as potential "damage cases," which is a regulatory designation given by US EPA indicating proven or potential damage to human health or the environment.

unlikely to present a significant risk to human health or the environment and are out of the scope of the CCR Rule (US EPA, 2015).

In the following sections, I present several lines of evidence demonstrating that the storage ponds of interest at MGS do not meet the definition of a surface impoundment as specified in Part 845. These storage ponds of interest are fundamentally different from the CCR storage units that US EPA associated with risks in its risk assessment supporting the 2015 CCR Rule and, which was used to support the promulgation of Part 845 and, thus, should not be the target of Part 845 regulation.

Additionally, I will summarize the findings of a recent site-specific risk assessment evaluating potential human health and environmental risks from the storage ponds of interest at MGS. The results confirm that the storage ponds in question are significantly different from those evaluated by US EPA in its risk assessment in support of 2015 CCR Rule and relied upon to promulgate Part 845. Moreover, the findings demonstrate that these storage ponds do not pose a substantial or significant adverse threat to human health or the environment that warrant regulation under Part 845.

2 Qualifications

I am a Principal at Gradient, an environmental consulting firm located in Boston, Massachusetts, with a Master's degree in environmental toxicology. I have over 20 years of professional experience in toxicology and risk assessment. In this capacity, I lead a variety of projects, including product safety evaluations, regulatory comments, green chemistry assessments, and technical support for the utility and mining industries. Recently, I have served on two US EPA Science Advisory Panels in support of developing technical, risk-based tools to support environmental justice assessments. I have particular expertise in evaluating the potential human health and environmental risks of CCR. Example projects and activities have included providing congressional testimony on the risk assessments of CCR; providing regulatory comment on risk assessment-related aspects of national CCR rules; participating as a member of the National Ash Management Advisory Board; and providing ongoing support for utilities with CCR storage units subject to the state and federal CCR rules. I have given dozens of presentations related to CCR risk at national conferences and was the lead author of the book chapter, "Storage of Coal Combustion Products in the United States: Perspectives on Potential Human Health and Environmental Risk" in the book *Coal Combustion Products (CCPs): Characteristics, Utilization, and Beneficiation.* My full *Curriculum Vitae* is in Attachment B.

3 The MGS storage ponds of interest qualify as *de minimis* and are outside the regulatory requirements of the CCR Rule

Part 845 requirements are applicable to CCR units that qualify as surface impoundments. The sections below provide support that the storage ponds of interest at MGS (the South Fly Ash Pond, Ponds 3 and3A,[3] Pond S-6, Pond 4, and Former Pond B-3) do not meet the intended definition of a CCR surface impoundment as specified under Part 845 (*i.e.*, an impoundment "designed to hold an accumulation of CCR and liquids, and the surface impoundment treats, stores, or disposes of CCR"; IEPA, 2021). In summary, none of these ponds were designed to treat, store, or dispose of CCR; principally, these ponds only indirectly received small amounts of CCR *via* overflow from other areas or process wastewater discharge. While some CCR are present in these ponds as a result of these activities, the amount of CCR in these ponds is negligible, and a small fraction of what would be expected in an impoundment intended to directly receive CCR from coal-burning operations. The evidence presented collectively indicates that the ponds of interest at MGS are not subject to regulation under Part 845. Further detailed information supporting this conclusion is provided below.

3.1 The regulatory definition of "de minimis" is presented by US EPA in the 2015 CCR Rule and has been adopted by IEPA under Part 845

As noted in Section 1, in 2015, the US EPA promulgated comprehensive regulations for the management of CCR disposal units, including surface impoundments and landfills. As part of these regulations, US EPA needed to clearly define what qualifies as a CCR storage unit. In its initial draft, US EPA defined a surface impoundment as "natural topographic depression, man-made excavation, or diked area formed primarily of earthen materials (although it may be lined with man-made materials) which is designed to hold an accumulation of CCR containing free liquids, and which is not an injection well" (US EPA, 2015). Public commenters on the Rule reasoned that this definition was overly broad because it would include "downstream" impoundments (*e.g.*, wastewater and holding ponds) that contained *de minimis* (*i.e.*, inconsequential) amounts of CCR (US EPA, 2015).

In response to the comments, US EPA acknowledged that a change in definition was needed and introduced a new definition of a surface impoundment in the final Rule:

> [A] CCR surface impoundment as defined in this rule must meet three criteria: (1) The unit is a natural topographic depression, manmade excavation or diked area; (2) the unit is designed to hold an accumulation of CCR and liquid; and (3) the unit treats, stores or disposes of CCR (US EPA, 2015).

This definition is functionally identical to the definition adopted in Part 845:

[3] Pond 3 was initially built in 1979, but in 1982 a berm was built to divide the pond into ponds 3 and 3A (SIPC, 2021; Kleinfelder Inc., 2013).

> "CCR surface impoundment" or "impoundment" means a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the surface impoundment treats, stores, or disposes of CCR (IEPA, 2021).

While Part 845 does not provide any specific language or more specific criteria that qualifies a surface impoundment for regulation, the CCR Rule, on which Part 845 is based, provides further clarification on the type of units covered. US EPA states:

> [A] constructed primary settling pond that receives sluiced CCR directly from the electric utility would meet the definition of a CCR surface impoundment because it meets all three criteria of the definition: It is a man-made excavation and it is designed to hold an accumulation of CCR (*i.e.,* directly sluiced CCR). It also engages in the treatment of CCR through its settling operation (US EPA, 2015; emphasis added).
>
> Similarly, secondary or tertiary impoundments that receive wet CCR or liquid with significant amounts of CCR from a preceding impoundment (*i.e.,* from a primary impoundment in the case of a secondary impoundment, or from a secondary impoundment in the case of a tertiary impoundment), even if they are ultimately dredged for land disposal elsewhere are also considered CCR surface impoundments and are covered by the rule (US EPA, 2015; emphasis added).

This definition emphasizes that a surface impoundment was meant to represent a unit that received and stored significant amounts of CCR, most typically in the form of sluiced CCR.

On the other hand, US EPA notes that:

> [U]nits containing only truly "de minimis" levels of CCR are unlikely to present the significant risks this rule is intended to address (US EPA, 2015).

While a quantitative definition of "de minimis levels of CCR" was not provided in the rule, US EPA clarifies the following characteristics for units that are not covered by the 2015 CCR Rule:

> CCR surface impoundments do not include units generally referred to as cooling water ponds, process water ponds, wastewater treatment ponds, storm water holding ponds, or aeration ponds. These units are not designed to hold an accumulation of CCR, and in fact, do not generally contain significant amounts of CCR. Treatment, storage, or disposal of accumulated CCR also does not occur in these units (US EPA, 2015; emphasis added).
>
> [U]nits that present significantly lower risks, such as process water or cooling water ponds, [are not meant to be covered by the rule] because, although they will accumulate any trace amounts of CCR that are present, they will not contain the significant quantities that give rise to the risks modeled in EPA's assessment (US EPA, 2015).

US EPA's acknowledgement that *de minimis* units will not "give rise to the risks modeled in EPA's risk assessment" is particularly key, because as further detailed in Sections 4 and 5, the surface impoundments modeled in US EPA's risk assessment are not characteristic of the storage ponds of interest at MGS.

In addition to these points, the sections below provide detailed support for why the storage ponds of interest at the MGS have characteristics similar to those of units excluded from the 2015 CCR Rule. Consequently, the storage ponds of interest should be exempt from complying with federal and state regulations.

3.2 The history of use of the MGS storage ponds of interest places them outside the definition of a CCR surface impoundment

The MGS property features a series of ponds that have been utilized for the management and treatment of site-related waste (see Figure 3.1). Some of these ponds (*e.g.*, Pond A-1), were specifically designed to "treat, store, and dispose" CCR, while others serve different operational purposes, including the storage and treatment of wastewater. Below, I provide descriptions of the ponds that did not directly receive CCR, which are the focus of this petition. See also Table 3.1.

- South Fly Ash Pond: The South Fly Ash Pond, which covers an area of approximately 12.2 acres, was constructed in 1989 and was originally intended to be a replacement for Pond A-1, which was designed to directly accept and store CCR (Figure 3.1; SIPC, 2021). Ultimately, Pond A-1 did not need to be replaced. Thus, the South Fly Ash Pond was only used to receive decant water from the Former Emery Pond[4] while it was operational. No CCR was ever directly sent to or disposed of in the South Fly Ash Pond (SIPC, 2021).
- Ponds 3/3A: Ponds 3 and 3A, with approximate areas of 1.9 and 1.7 acres, respectively, were secondary ponds that received overflow from the Fly Ash Holding Areas[5] (Figure 3.1; SIPC, 2021). They also received stormwater runoff, coal pile runoff, and water from the facility floor drains. In approximately 1982, Pond 3A was separated from Pond 3 by construction of an internal berm, and Pond 3A received some overflow from the Former Fly Ash Holding Units.[6] All sediment and debris were removed from Pond 3 in 2006 and 2011. All sediment and debris were removed from Pond 3A in 2014. Subsequently, no CCR was ever directly sent to or disposed in Ponds 3 or 3A. Currently, water from the South Fly Ash Pond flows into Pond 3 (SIPC, 2021).
- Pond S-6: Pond S-6 was originally built to manage stormwater associated with the Former Landfill[7] (Figure 3.1; SIPC, 2021). Initially, water in Pond S-6 discharged to the Little Saline Creek through Outfall 001; however, in approximately 1993, water from Pond S-6 was pumped to Pond 4. Pond S-6 is expected to receive non-CCR runoff from the Former Landfill in the future. No CCR was ever directly sent to or disposed in Pond S-6 (SIPC, 2021).
- Pond 4: Pond 4, which was built in 1979 and covers an area of approximately 3.7 acres, historically received decant water from Ponds 1 and 2[8] for secondary treatment and runoff from the coal pile (Figure 3.1; Kleinfelder Inc., 2013; SIPC, 2021). No CCR was ever directly sent to or disposed in the Pond 4. All sediment and debris were removed from Pond 4 in 2012 (SIPC, 2021). Currently, Pond 4 receives overflow from Pond S-6; water in Pond 4 discharges into the Little Saline Creek *via* Outfall 002 (Kleinfelder Inc., 2013; SIPC, 2021).
- Former Pond B-3: Pond B-3, which was built in 1985 and approximately covers 6.4 acres, was primarily used as a secondary pond that received water from Pond A-1 (Figure 3.1; SIPC, 2021). During shutdowns of Pond A-1, Pond B-3 may have received short-term discharges of fly ash.

[4] The Former Emery Pond was constructed in the late 1980s. It received process wastewater (including flue gas desulfurization [FGD] decant excess water and air heater wash water) and stormwater from areas of the MGS. The Former Emery Pond stopped receiving process wastewater discharges in 2020, and its closure is ongoing (SIPC, 2021).

[5] The Former Fly Ash Holding Areas and Extension (Figure 3.1) were used to store fly ash before the construction of Pond A-1 in 1985 (SIPC, 2021).

[6] The Former Fly Ash Holding Units are three former fly ash ponds that were closed and dewatered "decades ago" (SIPC, 2021).

[7] The Former Landfill is a permit-exempt landfill that received scrubber sludge mixed with fly ash. It was built in the early 1990s on top of the Former Fly Ash Holding Units and also partially covered the Former Fly Ash Holding Areas and Extension after they were drained (Figure 3.1). The Former Landfill stopped accepting wastes in 2015, and a closure plan was submitted to IEPA (SIPC, 2021).

[8] Ponds 1 and 2 received sluiced bottom ash, which was later removed for beneficial use. These ponds are not currently in use and are being closed (SIPC, 2021).

These shut-downs were very infrequent and for very short periods of time. Specifically, Pond A-1 was taken off-line approximately 3 to 4 times between 1985 and 2003, each lasting about 2 weeks. In 2017, Pond B-3 was dewatered and all sediment and CCR were excavated (SIPC, 2021).

Table 3.1 History of Use for the Storage Ponds of Interest

Ponds	Year Built	Duration of Operation	Uses
South Fly Ash Pond	1989	Approximately 30 years	- Built as potential replacement for Pond A-1 but was not needed. - Received decant water from Former Emery Pond.
Pond 3	1979	10-12 years	Received wastewater from multiple sources: - overflow from the Fly Ash Holding Areas; - stormwater runoff; - coal pile runoff; and - water from floor drains. Currently receives water from the South Fly Ash Pond.
Pond 3A	1982	8-10 years	Received wastewater from multiple sources: - overflow from the Former Fly Ash Holding Units; - stormwater; and - potential overflow from the South Fly Ash Pond.
Pond S-6	1988	Approximately 30 years	- Developed to manage stormwater from the Former Landfill. - Expected to receive non-CCR runoff from the Former Landfill in the future.
Pond 4	1979	Approximately 30 years	Received wastewater from multiple sources: - decant water from Ponds 1 and 2 until 2020; - water from the South Fly Ash Pond; and - coal pile runoff starting in 2003. Currently receives overflow from Pond S-6 and discharges into the Little Saline Creek.
Former Pond B-3	1985	18 years	- Used as a secondary pond to Pond A-1 (which received fly ash and coal pile runoff until 2003) - Received short-term discharges of fly ash during periodic outages of Pond A-1 (outages occurred 3-4 times between 1985 and 2003, two weeks at a time).

Notes:
CCR = Coal Combustion Residuals.
Source: SIPC (2021); Kleinfelder Inc. (2013).

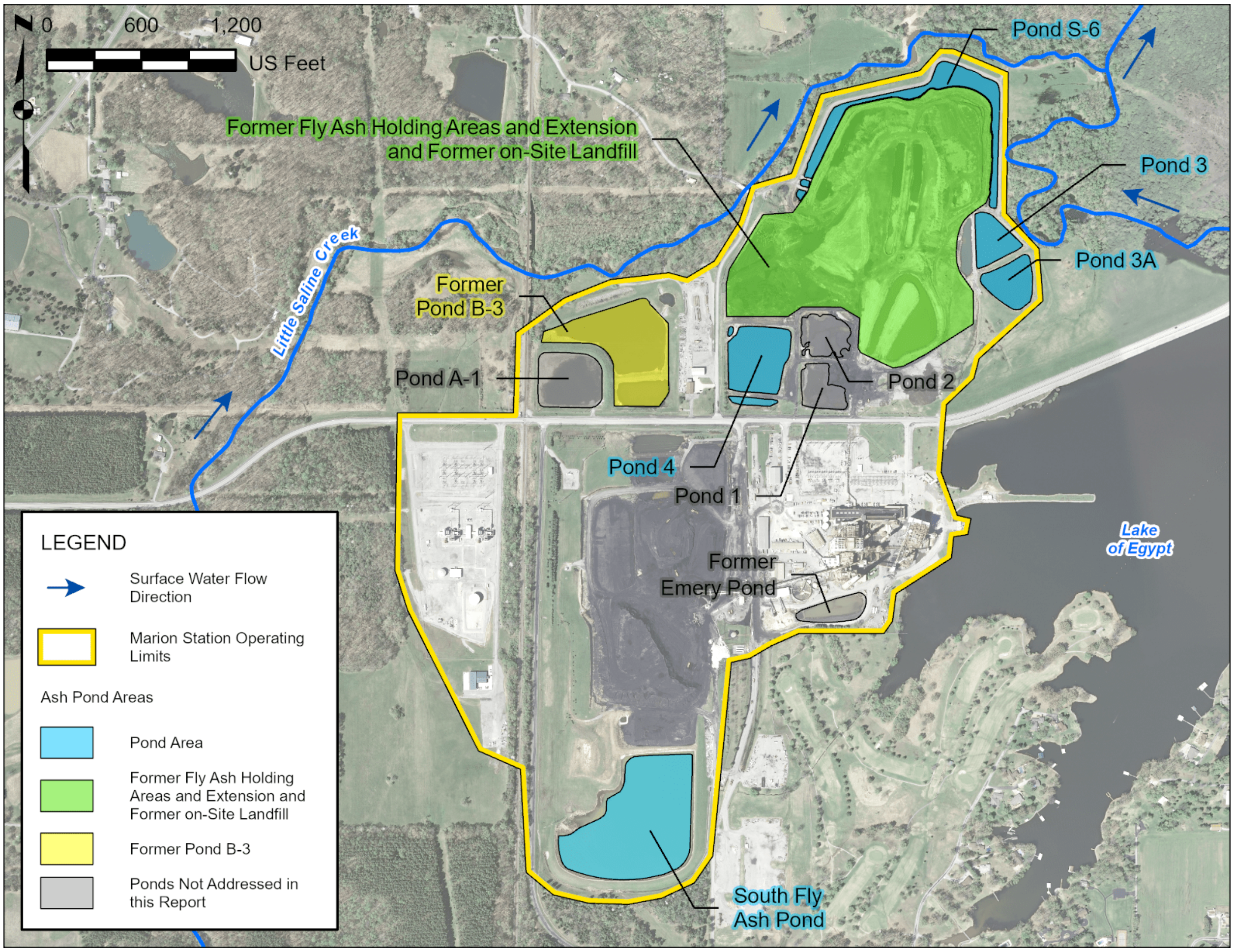

Figure 3.1 Marion Power Generating Station Layout. Sources: Golder Associates Inc. (2021); USGS (2022, 2011); Andrews Engineering (2021); SIPC (2021).

3.3 Investigations at MGS show that the storage ponds of interest contain minimal amounts of CCR

As discussed above, the South Fly Ash Pond, Ponds 3 and 3A, Pond S-6, and Pond 4 were never used to store or dispose CCR (*i.e.*, they did not receive sluiced CCR directly). While Former Pond B-3 did receive 3-4 short-term discharges of fly ash over 18 years (Table 3.1), the amount of fly ash that it received would be very small in comparison to CCR surface impoundments that routinely received sluiced CCR. As a result, the amount of CCR in these impoundments is a small fraction of what would be expected in an impoundment intended to directly receive CCR from coal burning operations. The *de minimis* amounts of CCR present in the storage ponds of interest would put them outside the intent of the state and federal CCR regulations.

To further support the position that the storage ponds of interest contain *de minimis* amounts of CCR, Haley & Aldrich, Inc., characterized the CCR present (if any) in the storage ponds of interest[9] in 2021 (Haley & Aldrich, Inc., 2021). This investigation included the following:

[9] Former Pond B-3 was dewatered in 2017, and sediments were removed from it (SIPC, 2021). Thus, Haley & Aldrich, Inc. (2021) did not investigate the Former Pond B-3.

- A bathymetric survey to determine the sediment thickness in each pond;
- A polarized light microscopy (PLM) analysis[10] to estimate the CCR content in each sediment sample; and
- A carbon content analysis (Haley & Aldrich, Inc., 2021).

The results from Haley & Aldrich, Inc. (2021) are presented in Tables 3.2 and 3.3. One of the key parameters evaluated was the sediment thickness in each pond. For the storage ponds of interest, the sediment is expected to contain CCR that may have settled out of the wastewater, as well as other mineral and organic matter typically found in surface water bodies (*e.g.*, soil, decomposed leaves, branches). The analysis found that the total sediment thickness in each surface impoundment was minimal, ranging from 0.84 feet to 1.67 feet (*i.e.*, 10-20 inches). While this level of sediment, in and of itself, is not typical for a surface impoundment designated to directly receive CCR, the analysis further assessed the fraction of the sediment that could be conclusively attributed to CCR. As shown in Table 3.2, the percentage of CCR in the sediment samples collected from the storage ponds of interest ranged between 10% and 68%, with the average for each pond ranging between 27% and 54%. This translates to a CCR thickness of 0.35 to 0.90 feet (*i.e.*, 4.2 to 10.8 inches) if the CCR are assumed to be present as a layer within the sediment (instead of being vertically interspersed in the sediment). For perspective, in the nationwide survey that US EPA conducted, surveyed surface impoundments contained between 0.5 and 190 feet of wet CCR (see Section 4.3 for more details; US EPA, 2014).

Table 3.2 Measured Total Sediment Thickness and Estimated CCR in Sediment

Pond	Mean Sediment Thickness (feet)	Slag + Fly Ash + Bottom Ash (*i.e.*, CCR)	Coal[a]	Other[b]	Maximum Estimated CCR Thickness (feet)[c]
South Fly Ash Pond	1.57	10-64% (40%)	1-6% (3.5%)	34-84% (56.5%)	0.63
Pond 3	1.38	23-34% (28.5%)	4-7% (5.5%)	62-70% (66%)	0.39
Pond 3A	1.45	20-34% (27%)	13-48% (30.5%)	18-67% (42.5%)	0.39
Pond S-6	0.84	30-53% (41.5%)	0-2% (1%)	47-68% (57.5%)	0.35
Pond 4	1.67	25-68% (54%)	0-23% (6%)	32-52% (40%)	0.90

Notes:
CCR = Coal Combustion Residuals; FGD = Flue Gas Desulfurization; PLM = Polarized Light Microscopy.
The average amount of CCR, coal, and other materials is indicated in parentheses.
(a) The results of the PLM analysis of pond sediment samples were compared with the results of some control samples, including a coal sample. Thus, some fraction of the sediments were identified as coal in this analysis.
(b) Haley & Aldrich, Inc., noted that other materials in the sediment samples could include scrubber sludge or FGD material, but the amount of such materials in the pond sediments was likely to be small because scrubber sludge was not sent to the ponds for disposal.
(c) Calculated using the mean sediment thickness and the average amount of CCR in each pond.
Sources: Haley & Aldrich, Inc. (2021); SIPC (2021).

[10] Haley & Aldrich, Inc., noted that "PLM is an optical microscopy method … [that] can be used to distinguish particles of coal ash from other dust particles, and … [is] able to estimate the abundance of CCR materials in a sample" (Haley & Aldrich, Inc., 2021).

Haley & Aldrich, Inc., also measured the sediment volume and the total volume for each pond. As shown in Table 3.3, when using the total sediment depth as a worst-case scenario, Haley & Aldrich, Inc.'s results showed that the sediment volume as a fraction of the pond volume ranged between 8.2% and 21.8% for the storage ponds of interest[11] (Haley & Aldrich, Inc., 2021). A more refined analysis that considers only the CCR fraction of the sediment demonstrates that the amount of CCR in these ponds is only 2.6% to 7.6% of the total volume.

Table 3.3 Estimated CCR Volume as a Fraction of the Total Pond Volume

Pond	Sediment Volume (cubic feet)	Pond Volume (cubic feet)	Area (acres)	Estimated Pond Depth[a] (feet)	Sediment Volume as Fraction of Pond Volume	Estimated CCR Volume as Fraction of Pond Volume
South Fly Ash Pond	563,055	2,944,553	12.2	5.5	19.1%[b]	7.6%
Pond 3	83,988	936,162	1.9	11.3	9%	2.6%
Pond 3A	95,666	717,739	1.7	9.7	13.3%	3.6%
Pond S-6	103,453	1,264,398	3.4	8.5	8.2%	3.4%
Pond 4	91,077	1,370,059	3.7	8.5	6.6%[c]	3.6%

Notes:
CCR = Coal Combustion Residuals.
(a) Mean pond depth was estimated as the ratio of the pond volume to its area.
(b) Based on the sediment and pond volumes reported by Haley & Aldrich, Inc. (2021), the sediment volume in the South Fly Ash Pond is 19.1% of its total volume. But Haley & Aldrich, Inc. (2021) reported a value of 21.8%.
(c) Based on the sediment and pond volumes reported by Haley & Aldrich, Inc. (2021), the sediment volume in Pond 4 is 6.6% of its total volume. But Haley & Aldrich, Inc. (2021) reported a value of 10.9% instead.
Sources: Haley & Aldrich, Inc. (2021); SIPC (2021).

The amounts of CCR that have settled in the storage ponds of interest throughout MGS's operational life are inconsistent with what would be expected from a surface impoundment designed to store, treat, and dispose of CCR. On the contrary, the low amounts of CCR in these ponds are consistent with receiving discharges of decant water or other wastewaters rather than significant CCR deposits. While Pond B-3 did receive some direct CCR, this activity occurred infrequently – only three times for about 2 weeks over several years. Moreover, this pond was dewatered and sediments were excavated in 2017. The presence of such minimal amounts of CCR in the storage ponds of interest and the fact that they were not designed to treat, store, or dispose of CCR puts these ponds squarely in US EPA's category of units that contain *de minimis* amounts of CCR. And units with "de minimis" CCR are out of the scope of CCR regulatory requirements.

[11] For the South Fly Ash Pond and Pond 4, the values of the sediment volume as a fraction of the pond volume reported by Haley & Aldrich, Inc. (2021) did not equal the ratio of the sediment volume to the pond volume (Table 3.2).

4 The risk assessment conducted by US EPA in support of the CCR Rule is not applicable to the MGS storage units of interest

A human health or environmental risk assessment is often needed to support regulatory determinations made by US EPA and other state environmental agencies. After initial drafts in 2007 and 2010, in 2014 US EPA published its final risk assessment titled, "Human Health and Ecological Risk Assessment of Coal Combustion Residuals" (US EPA, 2014). As previously mentioned, the findings of this risk assessment were one of the key underpinnings for the 2015 CCR Rule (US EPA, 2015). This is evident in the preamble to the CCR Rule, which states, "[t]he available information demonstrates that the risks posed to human health and the environment by certain CCR management units warrant regulatory controls" (US EPA, 2015). The US EPA 2014 CCR Risk assessment was a large undertaking involving the collection and analysis of data from 734 surface impoundments and 309 landfills across the US.

4.1 Risks from the 2014 CCR Risk Assessment were limited to surface impoundments at the 90th percentile (high-end CCR management scenarios); surface impoundments with more typical features and all landfills posed no risk

CCR stored in units can potentially reach human and ecological receptors in various ways. The CCR Risk Assessment was designed to characterize the full range of possible risks to human health posed by CCR disposal units across the US. Key human health exposure pathways that were addressed included the following (pathways indicated in bold were evaluated in an initial screening assessment and carried forward into a more refined risk assessment):

- **The ingestion of drinking water from groundwater impacted by CCR**
- Direct contact during showering and bathing with groundwater impacted by CCR
- **Ingestion of fish from surface water affected by groundwater impacted by CCR**
- Direct contact from surface water affected by groundwater impacted by CCR
- Inhalation of windblown CCR dust
- The incidental ingestion of soil impacted by CCR windblown dust and runoff
- The ingestion of produce, dairy products, and beef from soil impacted by CCR

Key ecological pathways that were addressed included:

- Aquatic receptors exposed to wastewater
- Aquatic receptors exposed from soil impacted by CCR runoff
- Terrestrial receptors exposed from soil impacted by CCR runoff

- **Aquatic receptors exposed to sediment affected by groundwater impacted by CCR**
- **Aquatic receptors exposed to surface water affected by groundwater impacted by CCR**

The pathways were evaluated during an initial screening phase that used high-end, worst-case exposure assumptions. In this phase, pathways that did not pose a risk were eliminated from further consideration. The exposures that did present a risk were carried forward and assessed using more refined exposure assumptions and risk assessment approach. In the list above, the pathways in bold were retained for further evaluation, while the others were determined to be low risk, even under extreme high-end exposure assumptions, and were not evaluated further. In general, the pathways that were retained focused on exposures related to the groundwater pathway. More specifically, from a human health perspective, the risk concern related to the potential for CCR constituents to leach from the landfill or surface impoundment into groundwater and migrate to drinking water wells off-site or into surface water bodies that could affect fish that humans could consume

US EPA employed a probabilistic risk assessment methodology for the more refined assessment focused on the groundwater pathway. This means that US EPA identified a full range of CCR management scenarios and unit characteristics to calculate a distribution of potential risks. Using this approach, US EPA presented a typical CCR management risk (50^{th} percentile) and a high-end CCR management risk (90^{th} percentile). The approach was designed to characterize the potential risks associated with CCR storage nationwide and did not reflect the risks at any specific individual facility.

A large number of factors were considered in the risk assessment to build the CCR risk model, which accounts for the full range of potential risks associated with CCR storage units. Some factors pertained to the characteristics of the storage units, such as the size of the storage unit, the concentrations of CCR constituents in the leachate, the type of waste, and the presence of a liner. Other factors related to how the CCR constituents leached out of the unit and traveled through the environment. Additionally, factors concerning the nature of the exposed population, the proximity to drinking water wells, and the proximity to surface water bodies were also taken into account.

The risk assessment concluded several key findings:

- For the ingestion of drinking water from groundwater impacted by CCR
  - At the 50^{th} percentile, no human health risks for landfills or impoundments
  - At the 90^{th} percentile, no human health risks for landfills, except when restricted to unlined units only
  - At the 90^{th} percentile, some human health risk exceedances associated with arsenic (III and V), lithium, and molybdenum *via* drinking water ingestion for impoundments. When restricted to an assessment of unlined units only, there were also risk exceedances for thallium.
- For the ingestion of fish from surface water affected by groundwater impacted by CCR
  - No risk at the 50^{th} or 90^{th} percentile for surface impoundments or landfills
- No risk to aquatic organisms for landfills or impoundments

The specific quantitative risk findings for the human health assessment for surface impoundments, which are most relevant to the storage ponds of interest at MGS, are shown in the table below. In this table, cancer risk above 1×10^{-5} and noncancer risk above 1 are considered unacceptable risks by US EPA.

Table 4.1 50th and 90th Percentile Risks for Surface Impoundments (All Units) from the 2014 CCR Risk Assessment

CCR Constituent	Groundwater Ingestion		Fish Ingestion	
	50th Percentile	90th Percentile	50th Percentile	90th Percentile
Cancer Risk				
Arsenic III	No risk	2×10^{-4}	No Risk	No Risk
Arsenic V		1×10^{-5}		
Chromium VI		No Risk		
Noncancer Risk				
Arsenic III	No Risk	5	No Risk	No Risk
Arsenic V		No Risk		
Boron		No Risk		
Cadmium		No Risk		
Cobalt		No Risk		
Fluoride		No Risk		
Lead		No Risk		
Lithium		2		
Mercury		No Risk		
Molybdenum		2		
Selenium IV		No Risk		
Selenium VI		No Risk		
Thallium		No Risk		

Notes:
CCR = Coal Combustion Residuals.
No Risk = No risk exceedance or not evaluated.

The finding that only surface impoundments present a risk, and only at the 90th percentile, is particularly significant concerning the storage ponds of interest at MGS. If only surface impoundments with high-end exposure characteristics pose a risk to human health or the environment, this implies that the vast majority of CCR storage units, particularly those with lower risk characteristics such as containing *de minimis* amounts of CCR, do not present an unreasonable risk to human health and the environment.

4.2 The surface impoundments modeled in the 2014 CCR Risk Assessment were conceptually different than the storage ponds of interest at MGS

An initial step in a risk assessment is developing a conceptual model (CM). To assess the potential risk to groundwater from surface impoundments, US EPA needed to develop a conceptual model that could represent potential releases from surface impoundments and examine the downstream fate and transport, and ultimately risk, of CCR constituents. US EPA (2014) described the surface impoundment model as follows:

> Surface impoundments are conceptualized as square units that are constructed anywhere from entirely above grade to entirely below ground surface. <u>During operation, a surface impoundment receives waste sluiced from the facility.</u> Over time, impoundment water may be lost to some combination of infiltration, evaporation, and controlled discharges to other impoundments and nearby water bodies, while the CCR solids either accumulate until the surface impoundment's capacity is reached or are periodically dredged for final disposition elsewhere. To reflect that the majority of impoundments are periodically dredged, the conceptual model assumes that dredging losses are balanced out by continued loading from

> the facility, resulting in a constant ponding depth over the operational life (US EPA, 2014; emphasis added).

As described in detail in Section 3, the storage ponds of interest differ significantly from the surface impoundments that were the focus of the 2014 CCR Risk Assessment. Most notably, the storage ponds did not receive sluiced CCR from the facility. Sluiced CCR refers to the practice of mixing CCR generated at the coal-burning facility with water for the purpose of transport to the surface impoundment. The assumption that surface impoundments used to model risk were receiving large volumes of CCR mixed with water is essential. As noted in the 2015 CCR Rule, "units that contain a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants," which, in turn, will drive risk.

Additionally, the conceptual model presented by US EPA suggests that the CCR solids accumulate "until the surface impoundment capacity was reached, at which point they are periodically dredged for final disposition elsewhere." While some of the storage ponds of interest were dredged, this process was not conducted regularly or because the CCR was "at capacity." As indicated in Table 4.2, some of the storage ponds of interest never had CCR removed (except in a 2003 cleaning event when the MGS switched to full dry-handling of fly ash), while others had CCR (mainly sediment and other debris) removed only once or twice throughout their operational lifespan, or only had sediment removed when the pond was closed (SIPC, 2021).

Table 4.2 Dredging and Cleaning Activities at the Storage Ponds of Interest

Ponds	Dredging or Cleaning Activities[a]
South Fly Ash Pond	Debris/sediment removed in 2003.
Pond 3	Debris/sediment removed in 2003, 2006, and 2011.
Pond 3A	Debris/sediment removed in 2003. Water drained and sediment cleaned in 2014.
Pond S-6	Debris/sediment removed in 2003.
Pond 4	Debris/sediment removed in 2003 and 2012.
Former Pond B-3	Debris/sediment removed in 2003. Dewatered and cleaned down to the clay in 2017.

Notes:
CCR = Coal Combustion Residuals.
(a) When MGS switched to full dry-handling of fly ash in 2003, all of the storage ponds of interest had debris (and any CCR) cleaned (SIPC, 2021).
Source: SIPC, 2021.

4.3 The depth of CCR in the ponds of interest at MGS were significantly smaller than the surface impoundments modeled in the 2014 CCR Risk Assessment

Due to the probabilistic design of the 2014 CCR Risk Assessment, it is challenging to determine where the storage ponds of interest at MGS fit within the nationwide distribution of CCR storage conditions that form the basis of the risk assessment. However, an important factor influencing risk is the amount of CCR stored in the surface impoundments. The depth and volume of the sediment/CCR mixture (including an estimate of CCR only) for each storage pond of interest at MGS is presented in Section 3.3. These values are also replicated below in Table 4.4. The 2014 CCR Risk Assessment does not explicitly provide the CCR volume in each impoundment. Instead, it presents the total depth of the surface impoundments based on a nationwide survey (US EPA, 2014). The total surface impoundment depth data, which ranged from 0.5 to 190 feet (Table 4.3), serve as a proxy for the depth (*i.e.*, thickness) of the CCR-water mixture (*i.e.*, sluiced CCR) in each impoundment.

Table 4.3 Depth of Surface Impoundments (in Feet) Presented in the 2014 CCR Risk Assessment

Minimum	50th Percentile	90th Percentile	Maximum
0.5	13.6	36.6	190.1

Source: US EPA (2014).

Table 4.4 provides a comparison of the depth of CCR at the storage ponds of interest at MGS compared to the surface impoundments evaluated in the 2014 CCR Risk Assessment (US EPA, 2014). Because the information available for the MGS storage ponds of interest varies slightly from the data used by US EPA, several comparisons are presented.

- Using the estimated thickness of CCR: The MGS storage ponds of interest have a CCR thickness less than all surface impoundments across the US, with the exception of the South Fly Ash Pond and Pond 4, which both have a CCR thickness less than 99% of all of the nationwide surface impoundments that were modeled as part of this risk assessment.
- Using the estimated thickness of sediment: When using a more conservative approach that considered the total measured thickness of the sediment/CCR mixture, the MGS storage ponds of interest still have a CCR thickness that is less than 98%-99% of surface impoundments across the US.

Table 4.4 Comparison of Thicknesses with SI Depth Distribution

Storage Pond	CCR Thickness (ft)	Sediment Thickness (ft)	CCR Thickness as Percentile of Depth Distribution of SI in 2014 CCR Risk Assessment	Sediment Thickness as Percentile of Depth Distribution of SI in 2014 CCR Risk Assessment
South Fly Ash Pond	0.63	1.57	1%	2%
Pond 3	0.39	1.38	< Minimum SI Depth	1%
Pond 3A	0.39	1.45	< Minimum SI Depth	2%
Pond S-6	0.35	0.84	< Minimum SI Depth	1%
Pond 4	0.90	1.67	1%	2%

Notes:
CCR = Coal Combustion Residuals; SI = Surface Impoundment.
Source: Haley & Aldrich, Inc. (2021); US EPA (2014).

4.4 The US EPA risk assessment was broadly applied even though most impoundments would not be expected to pose a risk

Although risk to human health was observed for 90th percentile for surface impoundments only, the CCR Rule was applied to all existing CCR disposal units. US EPA's rationale around this point was that it did not have direct authority to enforce the CCR Rule when it was established. Consequently, the requirements developed would need to be protected against the highest-risk CCR disposal scenarios. This intention is clearly expressed in the Rule:

> …the regulatory structure under which this rule is issued effectively limits the Agency's ability to develop the type of requirements that can be individually tailored to accommodate particular site conditions. Under sections 1008(a) and 4004(a), EPA must establish national criteria that will operate effectively in the absence of any guaranteed regulatory oversight (i.e., a permitting program), to achieve the statutory standard of 'no reasonable probability of adverse effects on health or the environment' at all sites subject to the standards. EPA

> was unable to develop a performance standard that would allow for alternatives to closure, but would also be sufficiently objective and precise to minimize the potential for abuse (US EPA, 2015).

Further to this point, as noted in the Introduction, one of the main reasons US EPA determined that CCR regulations were necessary is that state CCR management programs were inconsistent or, in some cases, nonexistent. This inconsistency meant that US EPA could not be assured that states had adequate programs to ensure that CCR units did not pose a risk to human health and the environment. However, Illinois has established a robust CCR regulatory program that allows for differentiation between surface impoundments with "a reasonable probability of adverse effects on health or the environment" and those ponds containing "de minimis" amounts of CCR that are materially different from the surface impoundments evaluated in the 2014 CCR Risk Assessment, and do not pose a risk. Indeed, as summarized in Section 5 and detailed in Attachment A, a risk assessment conducted at MGS has demonstrated that the storage ponds of interest do not pose a risk to human health or the ecological receptors in the environment.

5 A site-specific risk assessment has confirmed that the US EPA risk assessment does not adequately characterize the conditions at MGS and has demonstrated that the CCR storage ponds of interest at MGS do not pose a risk to human health or the environment

The primary directive of Part 845 is to ensure that existing or inactive surface impoundments "do not pose a reasonable probability of adverse effects on health or the environment" (IEPA, 2021). To evaluate this important criterion, Gradient conducted a risk assessment to evaluate the potential human health and environmental risks associated with the storage ponds of interest at the MGS site (Gradient, 2024a). This assessment was performed using widely accepted scientific methods, models, and approaches that align with the guidance provided by IEPA and US EPA, while also considering the federal CCR Rule.

Gradient relied on groundwater data collected between 2018 and 2023, surface water data from the Lake of Egypt (from June 2020, and 2018-2023), and modeled surface water and sediment data for the Little Saline Creek. The assessment focused on how CCR constituents measured in the groundwater at and near the site could impact human receptors in the vicinity, based on site-specific groundwater characteristics.

The evaluation focused on the storage ponds of interest, specifically those that contain minimal amounts of CCR. Because different storage ponds are located in various areas of the property and are influenced by different groundwater flow patterns, the South Fly Ash Pond was assessed separately from Pond 4, Pond S-6, Pond 3/3A, and Former Pond B-3. It is important to consider the risk assessment as a screening assessment. Some of the exposure assumptions used, such as using the maximum groundwater constituent concentration instead of a central tendency or a value that better reflects specific receptor locations, may result in an overestimation of risk.

The full risk assessment can be found in Attachment A, but a summary of our approach, as well as key observations and conclusions from the risk evaluation, are highlighted below.

Conceptual Site Model

- The uppermost water-bearing zone (*i.e.*, the Unlithified Unit) at the MGS is a shallow, hydraulically perched layer consisting of fill and residuum (silts and clays), with a saturated thickness of up to 10 feet approximately (Hanson Professional Services Inc., 2021). Groundwater (and CCR-related constituents originating from the MGS) may migrate vertically downward through the Unlithified Unit and migrate away from the impoundments.
- Groundwater at the MGS generally flows northeast toward the Little Saline Creek. However, south of the Lake of Egypt Road, groundwater has an eastern flow component toward the Lake of Egypt (SIPC, 2007).

Data Used to Characterize Risk to Human Health and the Environment

- Monitoring data (2018-2023) from two different sets of wells were collected to characterize the groundwater in the vicinity of the impoundments of interest. Samples were analyzed for metals specified in Part 845.600 (IEPA, 2021), as well as for general water quality parameters, including pH, chloride, fluoride, sulfate, and total dissolved solids.
  - Wells C-1, C-2, C-3, and well EBG were used to characterize groundwater quality near the South Fly Ash Pond.
  - Wells S-1, S-2, S-3, S-4, S-5, and S-6 were used to characterize groundwater quality near Pond 4, Ponds 3 and 3A, Pond S-6, and Former Pond B-3.
- Surface water samples were collected from five locations in the Lake of Egypt in June 2020. Analyses were performed on a variety of metals as outlined in Part 845.600 (IEPA, 2021), along with several general water quality parameters. The risk assessment also used surface water data obtained from the public water supply (PWS) intake on the Lake of Egypt for 2018-2023.
- No surface water or sediment data were available for Little Saline Creek; therefore, Gradient estimated (*i.e.*, modeled) concentrations of both media in the Little Saline Creek using the data from the groundwater monitoring wells located in the north portion of the site (*i.e.*, S-wells) and assuming that all the impacted groundwater flows to the Little Saline Creek. Gradient ignored any adsorption by subsurface soil and conservatively assumed that the groundwater concentrations were uniformly equal to the maximum detected concentration of each individual constituent.

Human Health Risk Evaluation

- The human health risk evaluation considered risks for all receptors potentially exposed to CCR constituents *via* impacted groundwater related to the storage ponds of interest including nearby residents using groundwater and surface water for drinking water; recreators using the Lake of Egypt for boating, swimming, and fishing; and recreators using the Little Saline Creek for fishing.
- To evaluate human health risks, maximum concentrations of CCR-related constituents in the groundwater were compared to Part 845 GWPSs to identify human health constituents of interest (COIs).
- Using this approach, the COIs for the South Fly Ash Pond based on data from the C-wells and EBG well included boron, cadmium, cobalt, and thallium. The COIs associated with the remaining storage ponds of interest (Pond 3, Pond S-6, Ponds 3/3A, and Former Pond B-3) based on data from the S-wells included arsenic, beryllium, boron, cadmium, cobalt, lead, and thallium.
- Based on the screening approach and principles and procedures consistent with IEPA (*e.g.*, IEPA, 2013, 2019) and the US EPA guidance (US EPA, 1989), Gradient concluded that none of the COIs evaluated pose a risk concern to residents or recreators impacted by CCR constituents. More details on the risk evaluation for each receptor group are discussed below.
  - <u>Groundwater Used for Drinking Water</u>: A survey of potential drinking water wells identified four private water wells within 1,000 meters of the facility, although the use of these wells for drinking water has not been confirmed. These wells were not considered part of a complete exposure pathway. One private well is located upgradient of the facility, while the other three wells are situated side-gradient. As a result, it is unlikely that these wells will be affected by any CCR constituents in groundwater originating from the storage ponds of interest. Additionally, the private wells are significantly deeper than the monitoring wells used to assess

groundwater quality around the impoundments, with depths ranging from 95 to 260 feet compared to depths ranging from 12 to 28 feet for the monitoring wells.

- Surface Water Used for Drinking Water: The Lake of Egypt serves as a public water supply (IEPA, 2024). There have been no exceedances of the Illinois GWPSs. Consequently, using surface water from the Lake of Egypt for residential drinking water does not present an unacceptable risk to residents.
- Lake of Egypt Recreators: Measured concentrations of COIs in surface water were compared to the calculated Illinois human threshold criteria (HTC) values (IEPA, 2019). These values are designed to protect against recreational exposure through water and/or fish ingestion. All surface water concentrations were below the benchmarks, indicating that recreational exposure to COIs is not expected to pose an unacceptable risk.
- Little Saline Lake Recreators: Modeled concentrations of COIs in surface water were compared to the calculated Illinois HTC values. All surface water concentrations were below the benchmarks, indicating that recreational exposure to COIs is not expected to pose an unacceptable risk.

Environmental Risk Evaluation

- The environmental risk evaluation considered risks to aquatic ecological receptors (*i.e.,* ecological risk) in Little Saline Creek. Both direct toxicity as well as secondary toxicity *via* bioaccumulation were evaluated.
- Although ecological receptors are not exposed to groundwater, groundwater can migrate into the adjacent surface water and impact ecological receptors. To identify ecological receptor COIs, maximum concentrations of CCR-related constituents in the groundwater (as measured in the S-wells) were compared to ecological surface water benchmarks protective of aquatic life (*i.e.*, IEPA [2019] surface water quality standards [SWQSs], US EPA Region IV [2018] surface water Ecological Screening Values [ESVs]).
- Using this approach, the ecological COIs were cadmium, cobalt, lead, and thallium.
- Based on the screening approach and principles and procedures consistent with IEPA (*e.g.*, IEPA, 2013, 2019) and the US EPA guidance (US EPA, 1989), Gradient concluded that none of the COIs evaluated to pose a risk concern to ecological receptors impacted by CCR constituents. More specifically with regard to specific media:
  - The maximum modeled COI concentrations in surface water were compared to the benchmarks protective of aquatic life. The modeled surface water concentrations for the COIs were below their respective benchmarks. Thus, none of the COIs evaluated are expected to pose an unacceptable risk to aquatic life in the Little Saline Creek from surface water exposure.
  - The maximum modeled COI sediment concentrations were below their respective sediment screening benchmarks. Thallium did not have a sediment screening level, but the modeled thallium sediment concentration was below the soil ESV value protective for ecological receptors. Thus, none of the COIs evaluated are expected to pose an unacceptable risk to aquatic life in the Little Saline Creek from sediment exposure.
  - None of the COIs – cadmium, cobalt, lead, and thallium – are considered bioaccumulative.

Based on the available data, the results of the site-specific risk assessment at MGS confirm that there is no unacceptable risk to human health or the environment from CCR constituents that may have migrated to groundwater. These findings indicate that the storage ponds of interest do not present the same level of risk as the surface impoundments evaluated in the US EPA CCR risk assessment, particularly the high-end (90^{th} percentile) risks that served as basis for the 2015 CCR Rule. Notably, there were no human health risks from arsenic, lithium, or boron, as observed in the US EPA's risk assessment. The site-specific environmental risks at MGS were consistent with the 2014 US EPA CCR risk assessment, which also showed no risk, even at the 90^{th} percentile. Taken together, the MGS risk assessment findings satisfy the overarching principle of Part 845, which states that "CCR surface impoundments [should] not pose a reasonable probability of adverse effects on health or the environment."

The lack of current risk at MGS suggests that granting a petition for an adjusted standard exempting the storage ponds of interest from the requirements of Part 845 will not change risks to human health or the environment; that is, subjecting the storage ponds of interest to Part 845 requirements will not result in a meaningful reduction in risk. In contrast, it is possible that some remediation activities, including those involving closure-by-removal, may lead to short-term impacts on air quality, increased greenhouse gas (GHG) emissions, and heightened energy consumption. Additionally, these activities could lead to a rise in worker injuries, increased accidents, and greater traffic and noise disturbances for nearby communities. The absence of a clear risk-benefit was specifically demonstrated in the impact assessment for Pond 4 (Gradient, 2024b) and may also be absent for the other storage ponds of interest at MGS.

6 Conclusions

Based on my understanding of the 2015 CCR Rule, the 2014 CCR Risk Assessment by US EPA in support of the Rule, as well as the history of operations of the ponds of interest at MGS, I conclude that the MGS ponds qualify as ponds containing minimal amounts of CCR and should not be regulated as surface impoundments under Part 845. This conclusion is supported by the following key evidence:

- US EPA's definition of a surface impoundment, which as adopted by Part 845, excludes surface impoundments with *de minimis* CCR, noting that "[U]nits containing only truly 'de minimis' levels of CCR are unlikely to present the significant risks this rule is intended to address" (US EPA, 2015).
- The MGS ponds in question were never used to store or dispose of wet CCR; they did not receive sluiced CCR directly. Any amount of CCR that entered these ponds was minimal compared to CCR surface impoundments that received sluiced CCR over an extended period. Consequently, the amount of CCR present in these ponds is only a small fraction of what would be expected in an impoundment designed to receive CCR from coal-burning operations directly. Instead, the use of these storage ponds – such as for wastewater management and run-off control – is consistent with practices that would result in *de minimis* CCR levels.
- The minimal amount of CCR in the storage ponds of interest has been quantified, confirming that the amount of CCR is *de minimis*; the estimated amount of CCR in almost all the MGS storage ponds of interest is lower than all of the CCR surface impoundments evaluated in US EPA's 2014 CCR Risk Assessment in support of the 2015 CCR Rule.
- The surface impoundments evaluated in US EPA's 2014 CCR Risk Assessment were fundamentally different from the storage ponds at MGS. Specifically, US EPA's risk assessment assumed that the surface impoundments received high volumes of sluiced CCR, which required periodic dredging. In contrast, the ponds at MGS did not regularly receive wet CCR, except for one pond on three to four isolated occasions. As a result, periodic CCR removal was not necessary. Any CCR removal that did occur was minimal and limited to those isolated instances.
- A risk assessment conducted at MGS has demonstrated that the storage ponds of interest do not pose a risk to human health or the environment. This finding confirms that the storage ponds of interest are unlike the 90^{th} percentile surface impoundments that formed the risk-basis of the 2015 CCR Rule. The MGS risk assessment supports the Part 845 directive that requires that "CCR surface impoundments do not pose a reasonable probability of adverse effects on health or the environment."

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Attachment A

Human Health and Ecological Risk Assessment, Marion Power Station, Southern Illinois Power Cooperative, Marion, Illinois

Human Health and Ecological Risk Assessment
Marion Power Station
Southern Illinois Power Cooperative
Marion, Illinois

Prepared by

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Principal

December 20, 2024

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Abbreviations

ADI	Acceptable Daily Intake
BCF	Bioconcentration Factor
CCR	Coal Combustion Residuals
CEM	Conceptual Exposure Model
COI	Constituent of Interest
COPC	Constituent of Potential Concern
CSM	Conceptual Site Model
GWPS	Groundwater Protection Standard
GWQS	Groundwater Quality Standard
HTC	Human Threshold Criteria
ID	Identification
IEPA	Illinois Environmental Protection Agency
ISGS	Illinois State Geological Survey
K_d	Equilibrium Partitioning Coefficient
MCL	Maximum Contaminant Level
MGS	Marion Power Generating Station
NRWQC	National Recommended Water Quality Criteria
ORNL RAIS	Oak Ridge National Laboratory's Risk Assessment Information System
pCi/L	Picocuries per Liter
PRG	Preliminary Remediation Goal
RfD	Reference Dose
RME	Reasonable Maximum Exposure
RSL	Regional Screening Level
SIPC	Southern Illinois Power Cooperative
SWQS	Surface Water Quality Standard
US EPA	United States Environmental Protection Agency

1 Introduction

Southern Illinois Power Cooperative (SIPC) owns and operates the Marion Power Generating Station (MGS), a gas and coal-fired electric power generating facility in Marion, Illinois. The MGS is located in Williamson County, approximately eight miles south of Marion, Illinois, on the northwestern bank of the Lake of Egypt (Figure 1.1). The MGS began operation in 1963. The area surrounding the facility is a rural agricultural community (Kleinfelder, 2013). The MGS has several surface impoundments that have been used for storage of coal combustion residuals (CCR) and several impoundments that were used to support other operational purposes (*e.g.*, wastewater storage, surface water run-off collection). This report addresses potential impacts from the surface impoundments (*i.e.*, storage ponds) that did not routinely receive CCRs and consequently contain a *de minimis* amount of CCRs. These storage ponds include:

- Pond 4
- Pond 3 and Pond 3A
- Pond S-6
- Pond B-3
- South Fly Ash Pond

This report presents the results of an evaluation that characterizes potential risk to human and ecological receptors that may be exposed to CCR constituents in environmental media originating from the storage ponds listed above. This risk evaluation was performed to support a petition for relief from the closure schedule required under the Illinois coal ash rule (IEPA, 2021). Human health and ecological risks were evaluated for Site-specific constituents of interest (COIs). The conceptual site model (CSM) assumed that Site-related COIs in groundwater may migrate to the Lake of Egypt or to Little Saline Creek and affect surface water in the vicinity of the Site.

Consistent with United States Environmental Protection Agency (US EPA) guidance (US EPA, 1989), this report used a tiered approach to evaluate potential risks, which included the following steps:

1. Identify complete exposure pathways and develop a conceptual exposure model (CEM).
2. Identify Site-related COIs: Constituents detected in groundwater were considered COIs if their maximum detected concentration over the period from 2018 to 2023 exceeded a groundwater protection standard (GWPS) identified in Part 845.600 (IEPA, 2021), or a relevant surface water quality standard (SWQS) (IEPA, 2019).
3. Perform screening-level risk analysis: Compare maximum measured or modeled COI concentrations in surface water and sediment to conservative, health-protective benchmarks in order to determine constituents of potential concern (COPCs).
4. Perform refined risk analysis: If COPCs are identified, perform a refined analysis to evaluate potential risks associated with the COPCs.
5. Formulate risk conclusions and discuss any associated uncertainties.

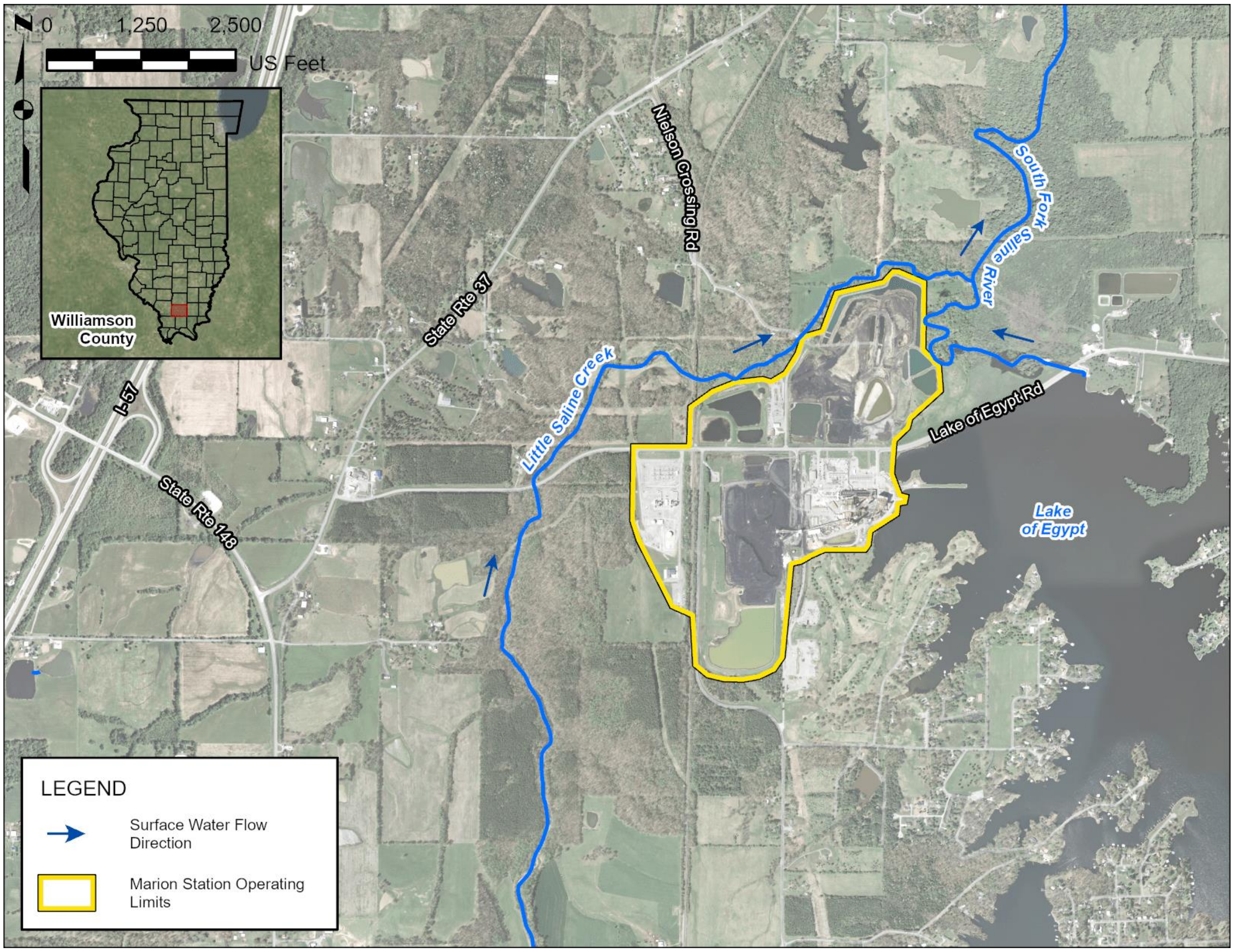

Figure 1.1 Site Location Map. Sources: Golder Associates Inc., 2021; USGS, 2022; US Census Bureau, 2016; USGS, 2011.

This assessment relies on a conservative (*i.e.*, health-protective) approach and is consistent with the risk approaches outlined in US EPA guidance (US EPA, 1989; US EPA, 2004; US EPA [Region IV], 2018). Specifically, we considered evaluation criteria detailed in Illinois Environment Protection Agency (IEPA) guidance documents (*e.g.*, IEPA, 2013, 2019), incorporating principles and assumptions consistent with the Federal CCR Rule (US EPA, 2015a) and US EPA's "Human and Ecological Risk Assessment of Coal Combustion Residuals" (US EPA, 2014).

US EPA has established acceptable risk metrics. Risks above these US EPA-defined metrics are termed potentially "unacceptable risks." Based on the evaluation presented in this report, no unacceptable risks to human or ecological receptors resulting from CCR exposures associated with the ponds listed above were identified. This means that the risks from the Site are likely indistinguishable from normal background risks. Specific risk assessment results include the following:

- No completed exposure pathways were identified for any groundwater receptors; consequently, no risks were identified relating to the use of groundwater for drinking water and other household purposes.
- No unacceptable risks were identified for the use of Lake of Egypt surface water as drinking water.
- No unacceptable risks were identified for recreators boating in Lake of Egypt.

- No unacceptable risks were identified for anglers consuming locally-caught fish.
- No unacceptable risks were identified for ecological receptors exposed to surface water or sediment.
- No bioaccumulative ecological risks were identified.

It should be noted that this evaluation incorporates a number of conservative assumptions that tend to overestimate exposure and risk (discussed in Section 3.5).

2 Site Overview

2.1 Site Description

The MGS is located in Williamson County, approximately eight miles south of Marion, Illinois, on the northwestern bank of the Lake of Egypt. The MGS facility is bordered to the east by Lake of Egypt, to the southeast by a golf course (Lake of Egypt Country Club), and to the south, west, and north by farmland (Figure 2.1). Little Saline Creek is located just north of the MGS facility boundary; it flows northeast and joins the South Fork Saline River about 600 feet east of the facility boundary (Figure 2.1).

Only "relatively small amounts of fly ash" were produced at the Site (SIPC, 2021a). Fly ash that was generated was transported and stored in the Initial Fly Ash Holding Area, Replacement Fly Ash Holding Area, Pond A-1, or the Former On-Site Landfill (SIPC, 2021a). The former Fly Ash Holding Areas are within the cover area for the Former On-Site Landfill (SIPC, 2021a). Other ponds located on Site (Figure 2.1) and a description of their historic and current operation are described below.

- Ponds 1 and 2 received sluiced bottom ash from power generation units 1, 2, 3, and 4 (Figure 1.1; SIPC, 2021a). During the entire pond operational life, bottom ash was removed from Ponds 1 and 2, and sold for beneficial reuse to shingle manufacturers, grit blasting companies, and local highway departments. Decanted water from Ponds 1 and 2 flowed into Pond 4.
- The Former Emery Pond was constructed in the late 1980s to hold stormwater drainage from the generating station (Figure 1.1; SIPC, 2021a). All CCRs in Emery Pond have been removed and the pond has been closed (SIPC, 2021a). Groundwater corrective action is currently on-going (Hanson Professional Services Inc., 2021).
- South Fly Ash Pond was constructed in 1989 and was originally intended to be a replacement for Pond A-1 (Figure 1.1; SIPC, 2021a). Ultimately, Pond A-1 did not need to be replaced. Thus, the South Fly Ash Pond was only used to receive decant water from the Former Emery Pond while it was operational. No CCRs were ever directly sent to or disposed of in the South Fly Ash Pond (SIPC, 2021a).
- Ponds 3 and 3-A were secondary ponds that received overflow from the fly ash holding areas (Figure 1.1; SIPC, 2021a). They also received storm water runoff, coal pile runoff, and water from the facility floor drains. In approximately 1982, Pond 3-A was separated from Pond 3 by construction of an internal berm. All sediment and debris were removed from Pond 3 in 2006 and 2011. All sediment and debris were removed from Pond 3-A in 2014. Subsequently, no CCRs were ever directly sent to or disposed in Ponds 3 or 3-A. Currently, water from the South Fly Ash Pond flows into Pond 3 (SIPC, 2021a).
- Pond S-6 was originally built to manage stormwater associated with the Former Landfill (Figure 1.1; SIPC, 2021b). Initially, water in Pond S-6 discharged to Little Saline Creek through Outfall 001; however, in approximately 1993, water from Pond S-6 was pumped to Pond 4. No CCRs were ever directly sent to or disposed in the Pond S-6 (SIPC, 2021a).
- Pond B-3 was built in 1985 and was primarily used as a secondary pond that received water from Pond A-1 (Figure 1.1; SIPC, 2021a). During periodic shutdowns of Pond A-1, Pond B-3 may have received some short-term discharges of fly ash from Unit 1, 2, and 3 prior to their shutdown (SIPC, 2021a). In 2017, Pond B-3 was dewatered and all sediment and CCR were excavated.

- Pond 4 was built in 1979 and historically received decant water from Ponds 1 and 2 for secondary treatment and received runoff from the coal pile (Figure 1.1; Kleinfelder, 2013; SIPC, 2021 a,b). No CCRs were ever directly sent to or disposed in the Pond 4. All sediment and debris were removed from Pond 4 in 2012. Currently, Pond 4 receives overflow from Pond S-6; water in Pond 4 discharges into the Little Saline Creek *via* Outfall 002 (Kleinfelder, 2013; SIPC, 2021a).

The ponds are shown in Figure 2.1. This Risk Assessment focuses on the storage ponds that supported operations but never directly received CCRs on a routine basis. These storage ponds include: Pond 4, Pond 3 and 3A, Pond S-6, Pond B-3, and the South Fly Ash Pond.

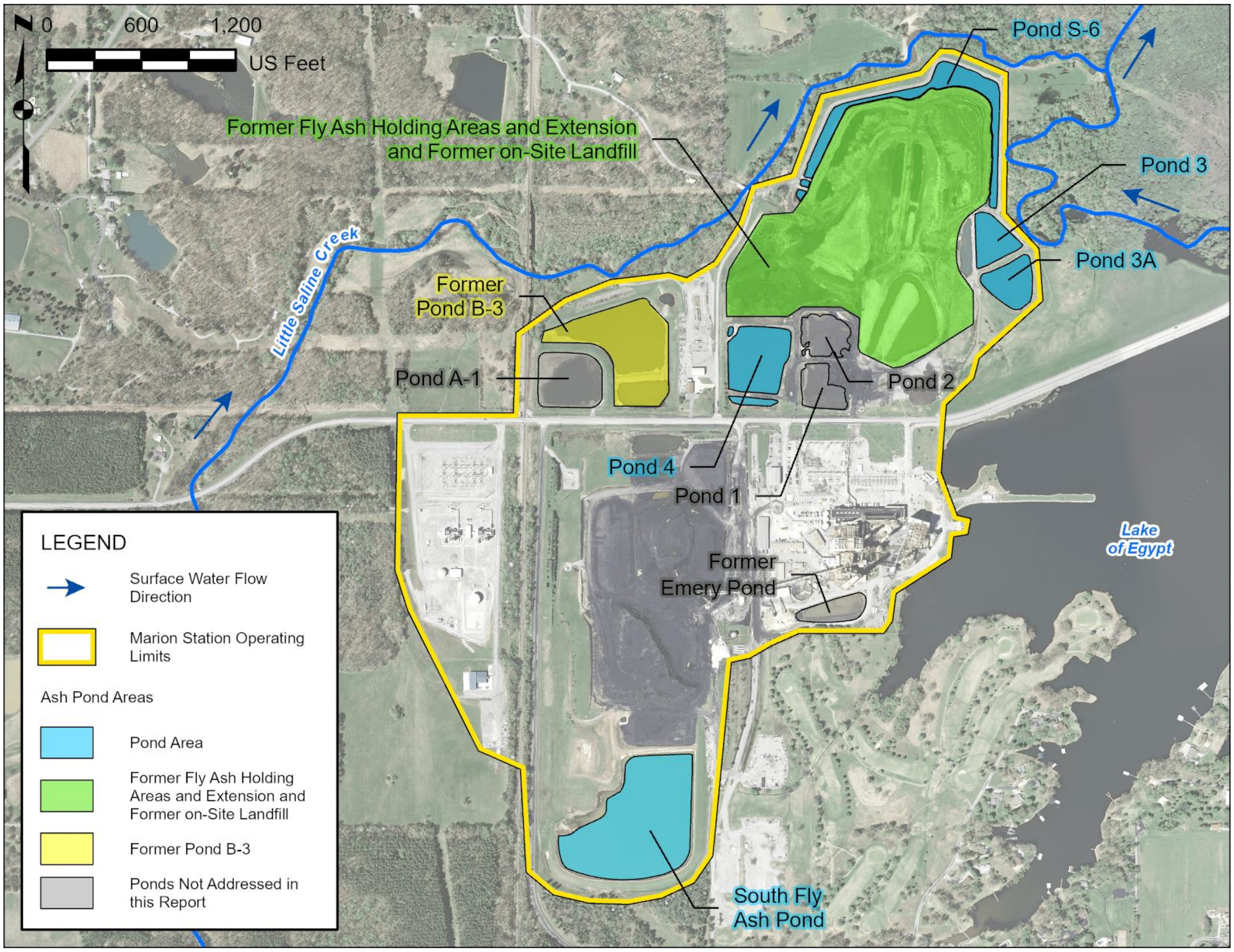

Figure 2.1 Site Layout. Sources: Golder Associates Inc., 2021; USGS, 2022; Andrews Engineering, 2021; SIPC, 2021a; USGS, 2011.

2.2 Geology/Hydrogeology

The Site is located at the southern edge of the Illinois Basin in the Shawnee Hills Section of the Interior Low Plateaus physiographic province (Golder Associates Inc., 2021). The Illinois Basin is a depositional and structural basin composed of sedimentary rocks ranging in age from Cambrian to Permian. The southern portion of the basin is characterized by extensive faulting, and some of these faults host commercially significant fluorite vein deposits (Golder Associates Inc., 2021). The regional stratigraphic sequence includes the following, from the surface downward (Golder Associates Inc., 2021):

- The Caseyville/Tradewater Formation: consists of lenticular, vertically and horizontally interbedded layers of sandstone, siltstone, and shale beneath a relatively thin layer of unconsolidated materials. It ranges from 190 to 500 feet in thickness.
- The Kinkaid Formation: consists of limestone, shale, claystone, and sandstone. It is separated from the overlying Pennsylvanian rocks of the Caseyville Formation by a laterally extensive unconformity. It ranges from 120 to 160 feet in thickness.
- The Degonia Formation: consists of thin, very-fine grained sandstone, siltstone, shale, and irregular chert beds. It ranges from 20 to 64 feet in thickness.
- The Clore Formation: consists of sandstone, shale and limestone, which sporadically outcrops at the surface. It ranges from 110 to 155 feet in thickness.

On Site, soils overlying the Caseyville/Tradewater Formation consist of glacial and alluvial deposits including layers of silty clay, clayey silt, silty sand and clayey sand (Kleinfelder, 2013). Table 2.1 provides a detailed summary of the Site lithology for the upper 50 feet (Golder Associates Inc., 2021).

Table 2.1 Site Geology

Lithology	Description
Peoria/Roxana Silt	Light yellow-tan to gray, fine sandy silt
Glasford Formation	Silty/sandy diamictons with thin lenticular bodies of silt, sand, and gravel
Caseyville Formation/Bedrock	Sedimentary rocks including sandstone, limestone, and shales

Source: Golder Associates, Inc., 2021; Kleinfelder, 2013.

The Site is located within the South Fork Saline River/Lake Egypt watershed. Groundwater in the southern/eastern portion of the Site flows toward and discharges into the Lake of Egypt; groundwater throughout the rest of property flows in a northeasterly direction toward Little Saline Creek (Figure 3.3; SIPC, 2007). The uppermost water-bearing zone (*i.e.*, the Unlithified Unit) is a shallow, hydraulically perched layer consisting of fill and residuum (silts and clays), with a saturated thickness of approximately up to 10 feet (Hanson Professional Services Inc., 2021). The average horizontal hydraulic conductivity is estimated to be approximately 1.5×10^{-4} cm/s in the Unlithified Unit (Golder Associates Inc., 2021). The hydraulic gradient was estimated to be 0.019 based on measured groundwater elevations at monitoring wells S-3 and S-6 (SIPC, 2007).

2.3 Conceptual Site Model

A CSM describes sources of contamination, the hydrogeological units, and the physical processes that control the transport of water and solutes. In this case, the CSM describes how groundwater underlying the MGS migrates and potentially interacts with surface water and sediment in the Lake of Egypt and Little

Saline Creek. The CSM was developed using site-specific hydrogeologic data, including information on groundwater flow and surface water characteristics.

Groundwater (and CCR-related constituents originating from the MGS) may migrate vertically downward through the Unlithified Unit. As noted in Section 2.2, the dominant groundwater flow direction at the Site is to the northeast toward Little Saline Creek. However, south of Lake of Egypt Road, groundwater has an eastern flow component toward the Lake of Egypt (SIPC, 2007). Dissolved constituents in groundwater that flows into these two water bodies may partition between sediment and surface water.

2.4 Groundwater Monitoring

Data from the following monitoring wells were included in this risk assessment, as they are used to monitor groundwater quality downgradient and upgradient of the MGS (Figure 2.3):

- Wells C-1, C-2, C-3 and Well EBG; these wells were used to characterize groundwater quality near the South Fly Ash Pond.
- Wells S-1, S-2, S-3, S-4, S-5, S-6; these wells were used to characterize groundwater quality near the Pond 4, Pond 3 and 3A, Pond S-6, and Pond B-3.

The monitoring well construction details are presented in Table 2.2. The analyses presented in this report rely on the available data from these wells collected between 2018 and 2023. Groundwater samples were analyzed for a suite of total metals, specified in Illinois CCR Rule Part 845.600 (IEPA, 2021),[1] as well as general water quality parameters (pH, chloride, fluoride, sulfate, and total dissolved solids). A summary of the groundwater data used in this risk evaluation is presented in Tables 2.3a and 2.3b. The use of groundwater data in this risk evaluation does not imply that detected constituents are associated with operations at MGS or that they have been identified as potential groundwater exceedances.

[1] Samples were analyzed for a longer list of inorganic constituents and general water quality parameters (chloride, fluoride, sulfate, and total dissolved solids), but these constituents were not evaluated in the risk evaluation.

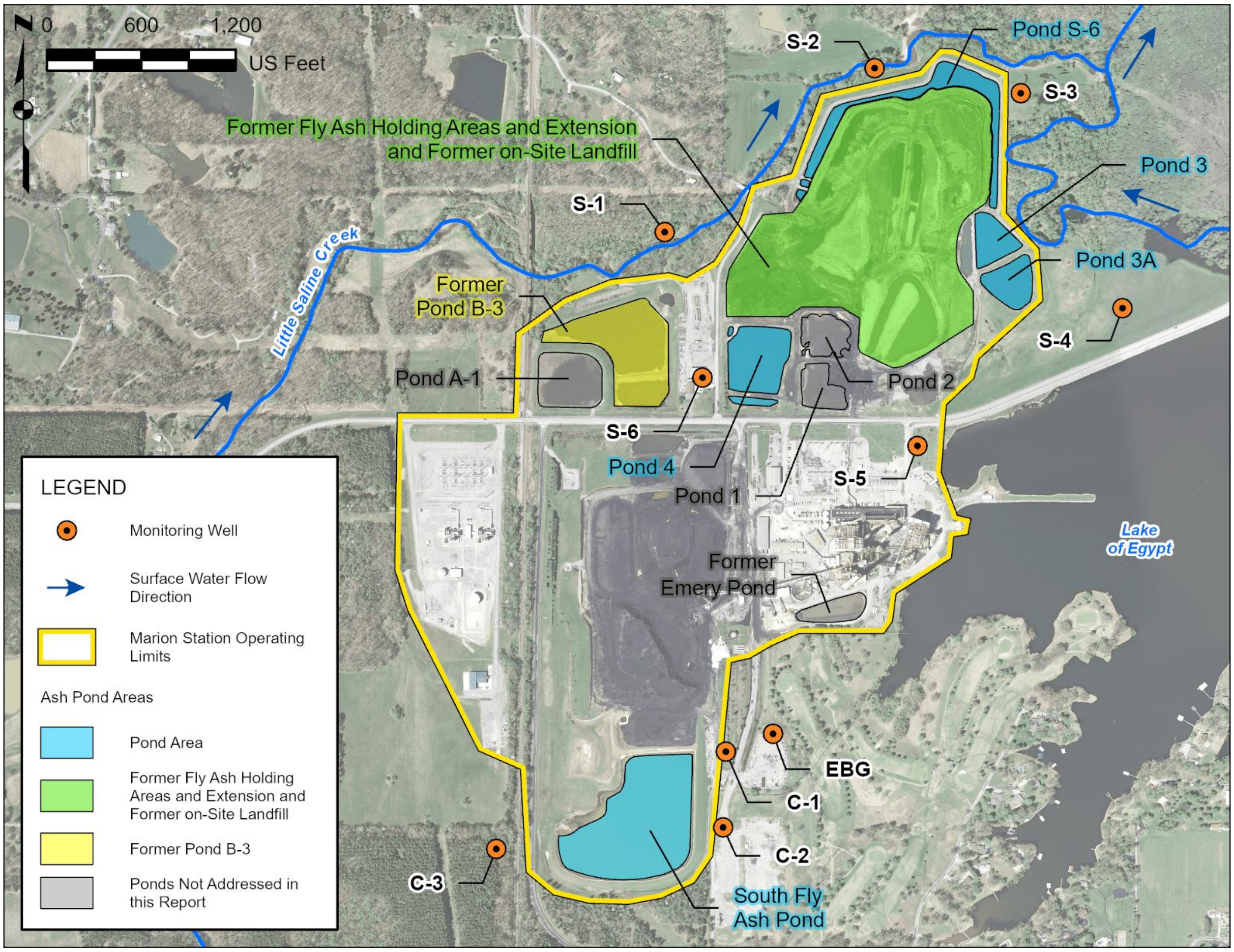

Figure 2.2 Monitoring Well Locations. Sources: Golder Associates Inc., 2021; USGS, 2022; SIPC, 2007; Andrews Engineering, 2021; SIPC, 2021a; USGS, 2011.

Table 2.2 Groundwater Monitoring Wells

Well	Date Constructed	Screen Top Depth (ft bgs)	Screen Bottom Depth (ft bgs)	Well Depth (ft bgs)	Hydrostratigraphic Unit (Screened Interval)
C-1	2/16/2010	5	15	15	Unlithified Unit/Bedrock
C-2	2/16/2010	2	12	12	Unlithified Unit/Bedrock
C-3	(no info)	(no info)			Unlithified Unit/Bedrock
EBG	2/8/2017	18	28	28	Unlithified Unit/Bedrock
S-1	9/20/1993	15	25	25	Unlithified Unit/Bedrock
S-2	2/18/2010	16	26	27.5	Unlithified Unit/Bedrock
S-3	9/20/1993	15	25	25	Unlithified Unit/Bedrock
S-4	9/21/1993	8	18	18	Unlithified Unit/Bedrock
S-5	9/20/1993	12	22	22	Unlithified Unit/Bedrock
S-6	9/20/1993	12	22	22	Unlithified Unit/Bedrock

Notes:
bgs = Below Ground Surface; ft = Feet; EBG = Emery Pond Background Well.

Table 2.3a Groundwater Data Summary (2018-2023) for C-Wells + EBG

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Total Metals (mg/L)					
Antimony	0	20	ND	ND	0.030
Arsenic	7	20	0.00040	0.0075	0.10
Barium	19	20	0.012	0.20	0.0050
Beryllium	3	21	0.00038	0.00060	0.020
Boron	36	81	0.011 J	12 J	0.50
Cadmium	5	77	0.00066	0.013	0.020
Chromium	8	21	0.00070	0.0042	0.030
Cobalt	13	21	0.00020 J	0.29 J	0.020
Lead	3	21	0.0011	0.0031	0.050
Lithium	8	13	0.014	0.024	0.060
Mercury	1	19	0.000070	0.000070	0.00020
Molybdenum	8	14	0.0012 J	0.015	0.040
Selenium	11	21	0.00060	0.033	0.025
Thallium	2	21	0.0012	0.031	0.040
Dissolved Metals (mg/L)					
Boron	12	24	0.040	0.92	0.50
Cadmium	0	24	ND	ND	0.0010
Radionuclides (pCi/L)					
Radium 226 + 228	9	11	0.12	2.7	0.33
Other (mg/L or SU)					
Chloride	61	63	2.4	570	20
Fluoride	19	24	0.10	0.68	0.50
pH	47	47	5.8	7.0	0
Sulfate	81	81	49	670	123
Total Dissolved Solids	51	51	100	4000	16

Notes:
EBG = Emery Pond Background Well; J = Estimated Value; mg/L = Milligrams per Liter; ND = Not Detected; pCi/L = Picocuries per Liter; SU = Standard Unit.
Blank cells indicate constituent not detected.

Table 2.3b Groundwater Data Summary (2018-2023) for S-Wells

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Total Metals (mg/L)					
Antimony	0	12	ND	ND	0.0050
Arsenic	3	12	0.0089	0.12	0.050
Barium	12	12	0.020	1.5	NA
Beryllium	1	12	0.0081	0.0081	0.0050
Boron	35	126	0.0041	2.8	0.50
Cadmium	12	126	0.00068	0.055	0.002
Chromium	9	12	0.0014	0.069	0.0050
Cobalt	5	12	0.0012	0.054	0.010
Lead	7	12	0.0027	0.080	0.0050
Mercury	0	12	ND	ND	0.00020

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Selenium	3	12	0.0021	0.017	0.025
Thallium	1	12	0.046	0.046	0.025
Dissolved Metals (mg/L)					
Boron	14	48	0.0051	3.1	0.50
Cadmium	0	48	ND	ND	0.001
Other (mg/L or SU)					
Chloride	88	90	6.1	480	20
Fluoride	6	12	0.062	0.18	0.50
pH	66	66	5.7	6.9	NA
Sulfate	122	126	2.6	310	20
Total Dissolved Solids	66	66	78	4500	NA

Notes:
mg/L = Milligrams per Liter; NA = Not Available; ND = Not Detected; SU = Standard Unit.
Blank cells indicate constituent not detected.

2.5 Surface Water Monitoring

Surface water samples were collected by MGS from five locations in Lake of Egypt in June 2020. The sample locations are listed in Table 2.4, are shown in Figure 2.2, and the sampling results are summarized in Table 2.5. Surface water data are also available from the Lake of Egypt public water district as part of routine monitoring. The data used in this report were collected 2018-2023, and the sampling results are summarized in Table 2.6.

Table 2.4 Lake of Egypt Sample Locations

Sample ID	Description
LE-u	Upstream sample
LE-d	Spillway sample
LE-in	Public water supply intake
LE-b1	Bay sample #1
LE-b2	Bay sample #2

Figure 2.3 Surface Water Sample Locations. Source: Hanson (2021)

Table 2.5 Surface Water Data Summary for Lake of Egypt Samples

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Total Metals (mg/L)					
Arsenic	0	5	ND	ND	0.025
Barium	5	5	0.00227	0.00265	NA
Boron	0	5	ND	ND	0.02
Cadmium	0	5	ND	ND	0.001
Chromium	0	5	ND	ND	0.005
Cobalt	0	5	ND	ND	0.005
Lead	0	5	ND	ND	0.001
Mercury	0	5	ND	ND	0.2
Selenium	0	5	ND	ND	0.001
Thallium	0	5	ND	ND	0.002
Other (mg/L)					
Chloride	1	5	4	4	4
Fluoride	0	5	ND	ND	0.1
pH	5	5	6.57	7.25	NA
Sulfate	5	5	16	17	NA
Total Dissolved Solids	5	5	44	60	NA

Notes:
mg/L = Milligrams per Liter; NA = Not Available; ND = Not Detected; SU = Standard Unit.
Blank cells indicate constituent was not detected.
Data collected on 6/1/2020.

Table 2.6 Surface Water Data Summary for Lake of Egypt Public Water District Data

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Total Metals (mg/L)					
Antimony	0	6	ND	ND	0.003
Arsenic	0	6	ND	ND	0.001
Barium	6	6	0.021	0.0263	NA
Beryllium	0	6	ND	ND	0.001
Cadmium	0	6	ND	ND	0.003
Chromium	0	6	ND	ND	0.005
Mercury	0	6	ND	ND	0.0002
Selenium	1	6	0.0024	0.0024	0.002
Thallium	0	6	ND	ND	0.002
Radionuclides (pCi/L)					
Radium 226 + 228	1	1	1.03	1.03	NA
Other (mg/L)					
Chloride	6	6	10.4	23	NA
Fluoride	6	6	0.553	0.73	NA
Sulfate	6	6	34.6	51.7	NA
Total Dissolved Solids	6	6	87	158	NA

Notes:
mg/L = Milligrams per Liter; NA = Not Available; ND = Not Detected; pCi/L = Picocuries per Liter.
Data collected 2018-2023.

3 Risk Evaluation

3.1 Risk Evaluation Process

A risk evaluation was conducted to determine whether constituents present in groundwater underlying and downgradient of the MGS have the potential to pose adverse health effects to human and ecological receptors. The risk evaluation is consistent with the principles of risk assessment established by US EPA and has considered evaluation criteria detailed in Illinois guidance documents (*e.g.*, IEPA, 2013, 2019).

The general risk evaluation approach is summarized in Figure 3.1 and discussed below.

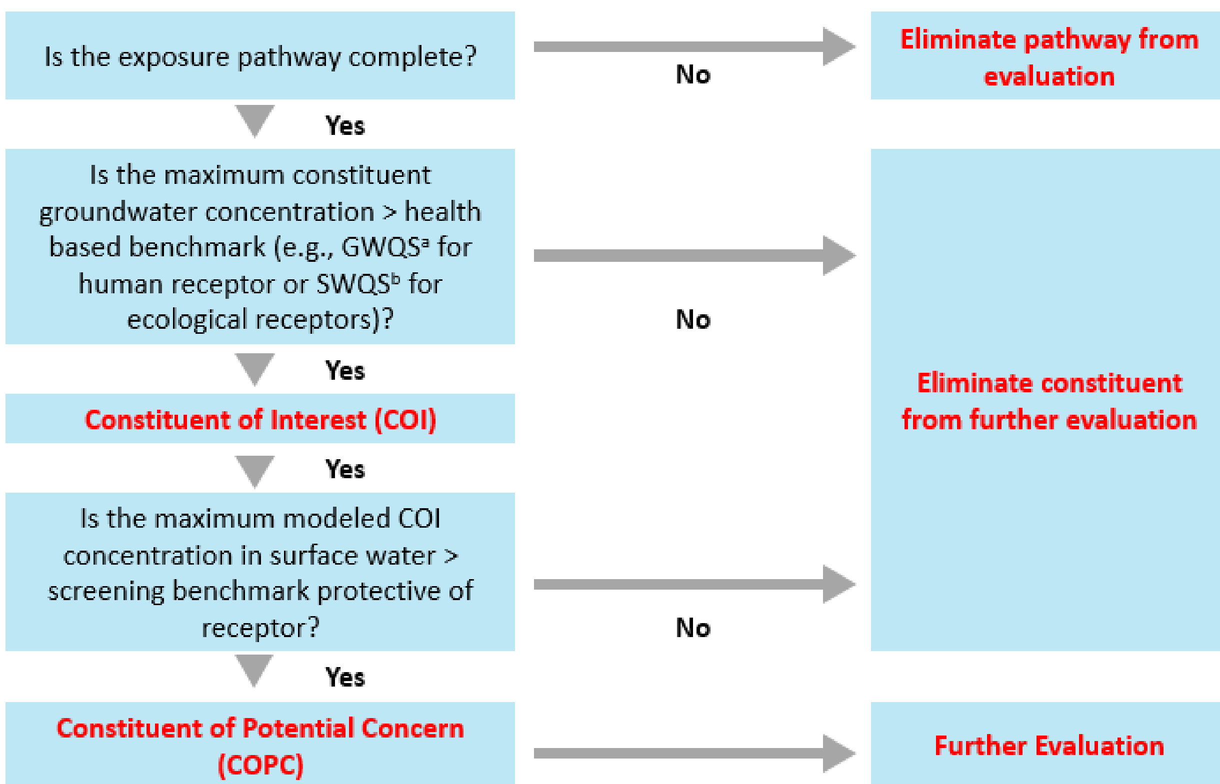

Figure 3.1 Overview of Risk Evaluation Methodology. IEPA = Illinois Environmental Protection Agency; GWQS = IEPA Groundwater Quality Standards; SWQS = IEPA Surface Water Quality Standards. (a) The IEPA Part 845 Groundwater Protection Standards (GWPS) were used to identify COIs. (b) IEPA SWQS protective of chronic exposures to aquatic organisms were used to identify ecological COIs. In the absence of an SWQS, US EPA Region IV Ecological Screening Values (ESVs) were used.

The first step in the risk evaluation was to develop the CEM and identify complete exposure pathways. All potential receptors and exposure pathways based on groundwater use and surface water use in the vicinity of the Site were considered. Exposure pathways that are incomplete were excluded from the evaluation.

Groundwater data were used to identify COIs. COIs were identified as constituents with maximum concentrations in groundwater in excess of groundwater quality standards (GWQS)[2] for human receptors, and SWQS for ecological receptors. Based on the CSM (Section 2.2), groundwater in the south half of the Site, on the west side of the South Fly Ash Pond, has the potential to interact with surface water in the Lake of Egypt. Therefore, potential facility-related constituents in groundwater may potentially flow toward and into surface water in the Lake of Egypt. Surface water samples have been collected from the Lake of Egypt adjacent to the Site, and Gradient used the measured surface data to evaluate potential risks to receptors in using the lake for recreation and as a source of drinking water.

Groundwater in the northern portion of the Site, near Pond 4, Pond 3 and 3A, Pond S-6, and Pond B-3 and in the northern portion of the South Fly Ash pond has the potential to interact with surface water in Little Saline Creek. No surface water has been collected from Little Saline Creek, therefore, Gradient modeled the COI concentrations in Little Saline Creek based on the groundwater data from the groundwater monitoring wells located in this portion of the Site (*i.e.*, S-wells). The measured and modeled COI concentrations in surface water and sediment were compared to conservative, generic risk-based screening benchmarks for human health and ecological receptors. These generic screening benchmarks rely on default assumptions with limited consideration of site-specific characteristics. Human health benchmarks are receptor-specific values calculated for each pathway and environmental medium that are designed to be protective of human health. Human health and ecological screening benchmarks are inherently conservative because they are intended to screen out chemicals that are of no concern with a high level of confidence. Therefore, a measured or modeled COI concentration exceeding a screening benchmark does not indicate an unacceptable risk, but only that further risk evaluation is warranted. COIs with maximum concentrations exceeding a conservative screening benchmark are identified as COPCs requiring further evaluation.

As described in more detail below, this evaluation relied on the screening assessment to demonstrate that constituents present in groundwater underlying the facility do not pose an unacceptable human health or ecological risk. That is, after the screening step, no COPCs were identified and further assessment was not warranted.

3.2 Human and Ecological Conceptual Exposure Models

A CEM provides an overview of the receptors and exposure pathways requiring risk evaluation. The CEM describes the source of the contamination, the mechanism that may lead to a release of contamination, the environmental media to which a receptor may be exposed, the route of exposure (exposure pathway), and the types of receptors that may be exposed to these environmental media.

3.2.1 Human Conceptual Exposure Model

The human CEM for the Site depicts the relationships between the off-Site environmental media potentially impacted by constituents in groundwater and human receptors that could be exposed to these media. Figure 3.2 presents a human CEM for the Site. It considers a human receptor who could be exposed to COIs hypothetically released into groundwater and surface water. The following human receptors and exposure pathways were evaluated for inclusion in the Site-specific CEM.

[2] As discussed further in Section 3.3.2, GWQS are protective of human health and not necessarily of receptors. While receptors are not exposed to groundwater, groundwater can potentially enter into the adjacent surface water and impact receptors. Therefore, two sets of COIs were identified: one for humans and another for receptors.

- Residents – exposure to groundwater/surface water as drinking water;
- Residents – exposure to groundwater/surface water used for irrigation;
- Recreators in the Lake of Egypt to the east of the Site:
  - Boaters – exposure to surface water while boating;
  - Swimmers – exposure to surface water while swimming;
  - Anglers – exposure to surface water and consumption of locally caught fish.
- Recreators in Little Saline Creek to the north of the Site:[3]
  - Anglers – exposure to surface water and consumption of locally caught fish.

All of these exposure pathways were considered to be complete, except for residential exposure to groundwater used for drinking water or irrigation, and exposure to sediment. Section 3.2.1.1 explains why the residential drinking water and irrigation pathways are incomplete for groundwater. Section 3.2.1.2 discusses the use of surface water as a drinking water source. Section 3.2.1.3 provides additional description of the recreational exposures.

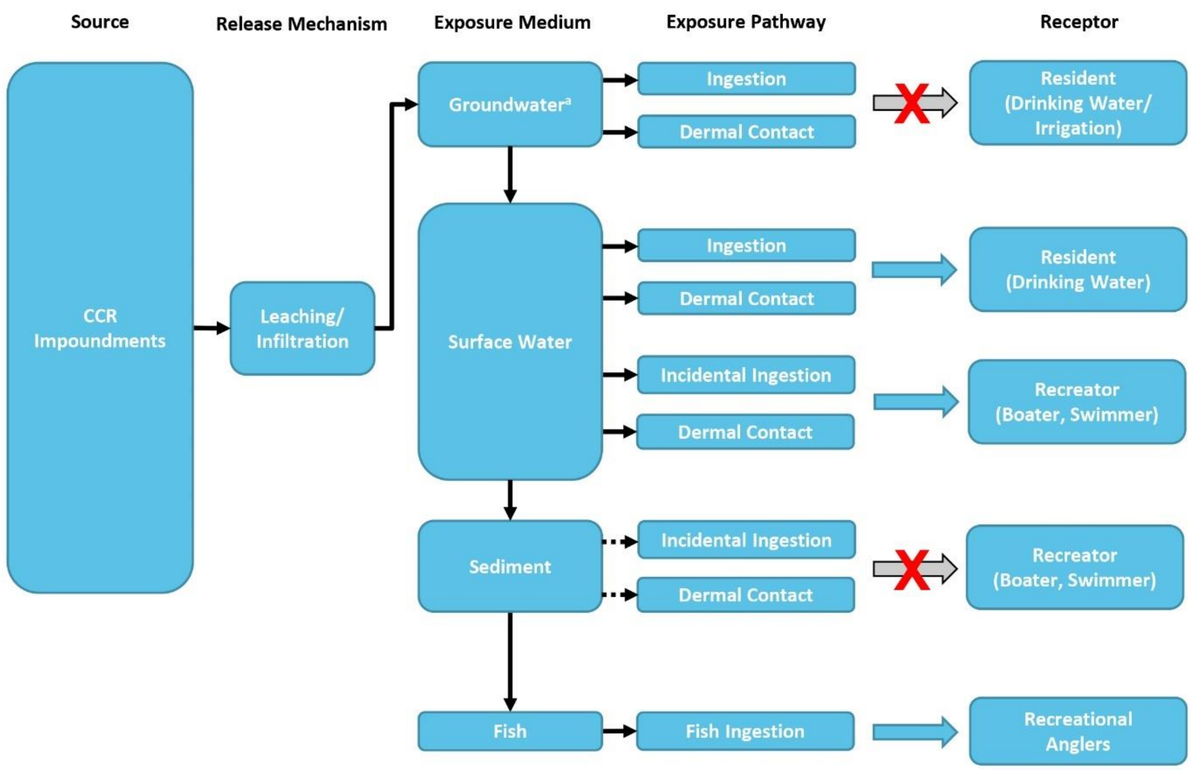

Figure 3.2 Human Conceptual Exposure Model. CCR = Coal Combustion Residuals. Dashed line/Red X = Incomplete or insignificant exposure pathway. (a) Groundwater in the vicinity of the Site is not used as a drinking water or irrigation source.

[3] Boating and swimming are assumed not to occur in Little Saline Creek due to its small size.

3.2.1.1 Groundwater as a Drinking Water/Irrigation Source

Groundwater beneath the facility generally flows northeast towards the Little Saline Creek (SIPC, 2007). However, in the southern section of the Site, there is a component of groundwater flow that is to the east toward the Lake of Egypt (SIPC, 2007). Gradient conducted a receptor survey in 2024 to identify potential users of groundwater in the vicinity of the facility. Specific sources that were used in this survey include the Illinois State Geological Survey (ISGS) ILWATER database (ISGS, 2024). Four private water wells were identified within 1,000 meters of the facility (Table 3.1, Figure 3.3). One private well (121990235000) is upgradient of the facility, and the other three wells are sidegradient of the facility, such that these wells are not expected to be impacted by any CCR constituents in groundwater that originate from any of the ponds that are being evaluated (Figure 3.3). Further, wells are screened in the sandstone or lime sandstone water bearing unit and range in depth from 95 to 260 ft bgs, far below the depths of the monitoring wells at the site (12-28 feet bgs) where impacts, if any, from site-related activities would be observed. Moreover, three of the private wells are on the opposite side of Little Saline Creek, which provides hydraulic separation from any potential impacts at the site since shallow groundwater is likely to discharge into the creek rather than flow underneath it.

Table 3.1 Summary of Water Wells Within 1,000 Meters of the MGS

Well Number	Type	Date Drilled	Owner	Depth (ft)	Formation	Latitude	Longitude
121990235000	Water Well	2/29/1968	Morganthaler, Carrol	95	Sandstone	37.612148	-88.968285
121990235100	Water Well	4/30/1968	Propes, Charlie	98	Sandstone	37.611752	-88.950049
121990252500	Water Well	10/31/1971	Fisher, William	150	Sandstone	37.628378	-88.962144
121992397400[a]	Water Well	7/20/2003	Gordon, Steve	260	Lime Sandstone	37.628378	-88.962144

Notes:
ft = Feet; MGS = Marion Power Generating Station..
(a) This well, drilled in 2003, listed a pumping rate of 20 gallons per minute (gpm), while the well at the same location (121990252500), drilled in 1971 listed a pumping rate of 7 gpm. It is not known whether the 1971 is still in use.
Source: ISGS (2024).

3.2.1.2 Surface Water as a Drinking Water Source

The Lake of Egypt is used as a public water supply (IEPA, 2024a). The intake for the Lake of Egypt Public Water District (Facility ID IL1995200) is located at the northeast corner of the Lake of Egypt (Figure 3.3). The Lake of Egypt Public Water District serves a population of 11,368 (IEPA, 2024a) and supplies "approximately 1 million gallons per day of drinking water to Union, Jackson, and Williamson Counties" (SIPC, 2018a).

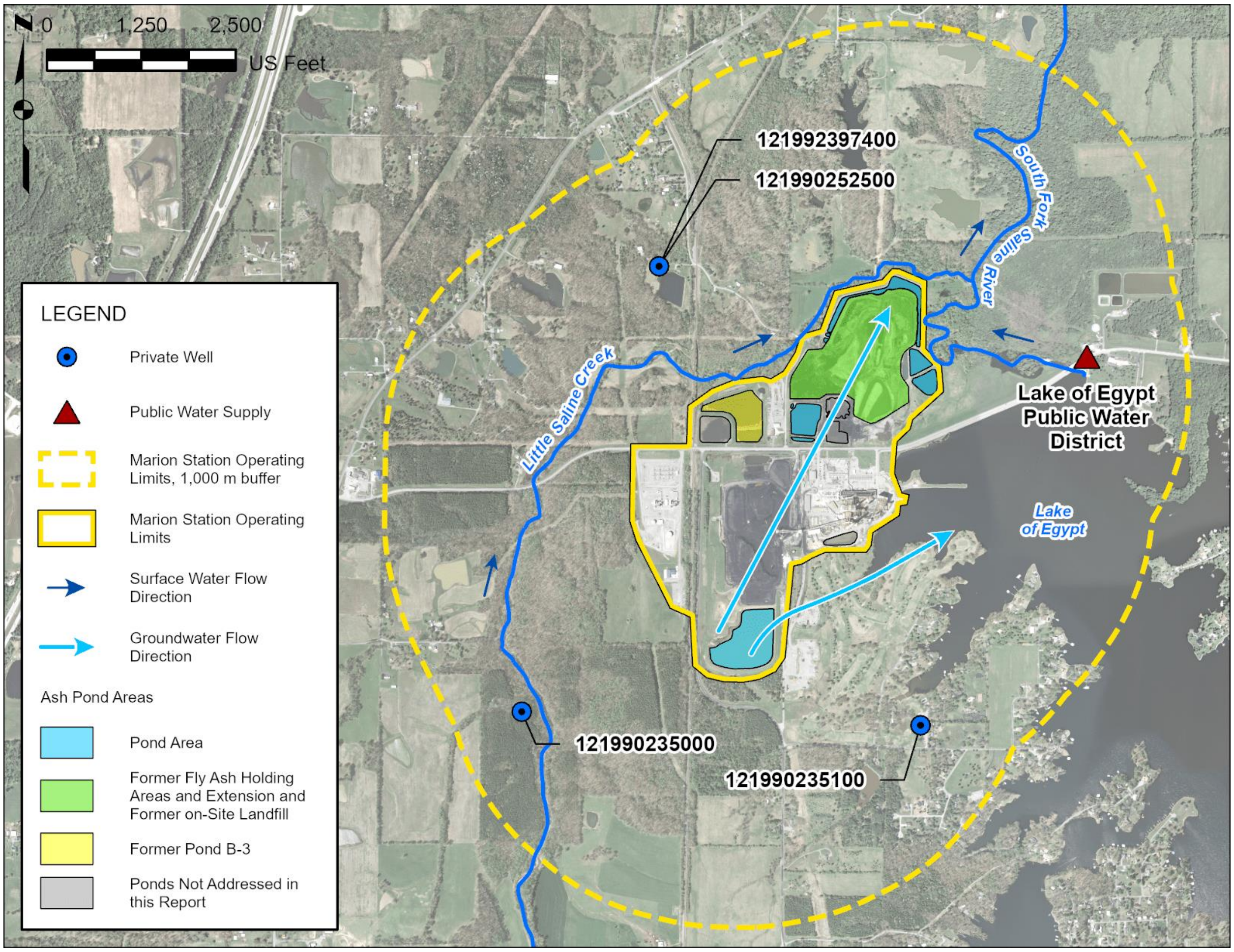

Figure 3.3 Water Wells Within 1,000 Meters of the Facility. Sources: Golder Associates Inc., 2021; USGS, 2022; Andrews Engineering, 2021; ISGS, 1909-2023; IEPA, 2024b; SIPC, 2007; USGS, 2011.

3.2.1.3 Recreational Exposures

Lake of Egypt, located to the east of the MGS facility, is a private lake owned by SIPC which allows the lake to be used for recreation. The lake is approximately 2,300 acres in size, and has an average depth of 18 feet and a maximum depth of 52 feet (SIPC, 2018a). The recreational uses of the Lake of Egypt include fishing, boating, swimming, and water sports such as water skiing (SIPC, 2018b). SIPC notes that "swimming is prohibited except at approved beaches marked by buoys" (SIPC, 2018b). Recreational exposure to surface water may occur during activities such as boating or fishing in the lake. Recreational anglers may also consume locally caught fish from the lake. The northwest bay of the lake (nearest the MGS) is a restricted area (SIPC, 2018b). Due to the depth of the lake, sediment exposure was not evaluated in Lake of Egypt.

Little Saline Creek is located immediately to the north of the Site. Gradient estimated the average creek width as 26 feet (based on measurements from an aerial photo), and the depth to be approximately 5 feet (based on a Google Earth photo from February 2020 in which bottom sediments were visible). Recreators in the Little Saline Creek may include anglers who could be exposed to surface water and consume locally caught fish. It is assumed that boating and swimming do not occur in Little Saline Creek due to its small size, and the availability of recreation areas at Lake of Egypt to the east.

3.2.2 Ecological Conceptual Exposure Model

The ecological CEM for the Site depicts the relationships between off-Site environmental media (surface water and sediment) potentially impacted by COIs in groundwater and ecological receptors that may be exposed to these media. The ecological risk evaluation considered both direct toxicity as well as secondary toxicity *via* bioaccumulation. Due to the fact that the dominant groundwater flow direction is to the northeast, and the relatively small size of Little Saline Creek, this surface waterbody has a higher potential to be influenced by CCR constituents. Given these factors, Little Saline Creek was identified as the primary focus for evaluating environmental risks for ecological receptors. Figure 3.4 presents the ecological CEM for the Site. The following ecological receptor groups and exposure pathways were considered:

- **Ecological Receptors Exposed to Surface Water:**
  - Aquatic plants, amphibians, reptiles, and fish.
- **Ecological Receptors Exposed to Sediment:**
  - Benthic invertebrates (*e.g.*, insects, crayfish, mussels).
- **Ecological Receptors Exposed to Bioaccumulative COIs:**
  - Higher trophic level wildlife (avian and mammalian) *via* direct exposures (surface water and sediment exposure) and secondary exposures through the consumption of prey (*e.g.*, plants, invertebrates, small mammals, fish).

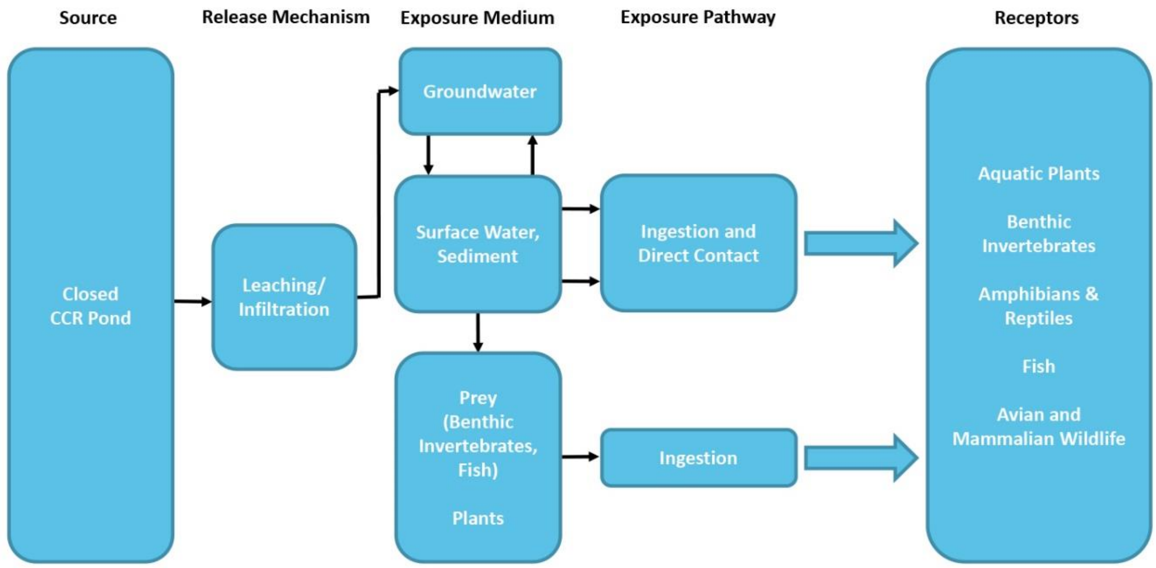

Figure 3.4 Ecological Conceptual Exposure Model. CCR = Coal Combustion Residuals.

3.3 Identification of Constituents of Interest

Risks were evaluated for COIs. A constituent was considered a COI if the maximum detected constituent concentration in groundwater exceeded a health-based benchmark. According to US EPA risk assessment guidance (US EPA, 1989), this screening step is designed to reduce the number of constituents carried through the risk evaluation that are anticipated to have a minimal contribution to the overall risk.

Identified COIs are the constituents that are most likely to pose a risk concern in the surface water adjacent to the Site.

3.3.1 Human Health Constituents of Interest

For the human health risk evaluation, COIs were conservatively identified as constituents with maximum concentrations in groundwater above the GWPS listed in the Illinois CCR Rule Part 845.600 (IEPA, 2021). The COIs were determined separately for the wells monitoring north and south of Lake of Egypt Road (the S-wells in the north that characterize groundwater quality near Pond 4, Pond 3 and 3A, Pond S-6, and Pond B-3, and the C-wells plus EBG well in the south that characterize groundwater quality near the South Fly Ash Pond). Gradient used the maximum detected concentrations from groundwater samples collected from these two groups of wells, regardless of hydrostratigraphic unit. The use of groundwater data in this risk evaluation does not imply that detected constituents are associated with the facility or that they have been identified as potential groundwater exceedances. Using this approach, the COIs that were identified from the S-wells included arsenic, beryllium, boron, cadmium, cobalt, lead, and thallium (Table 3.2). For the S-wells, the maximum concentrations for arsenic, beryllium, cadmium, cobalt, and lead were detected in well S-1; the maximum concentrations for boron and thallium were detected in well S-2. The COIs that were identified from the C-wells+EBG included boron, cadmium, cobalt, and thallium (Table 3.3). For the C-wells, the maximum concentrations were detected in well EBG for boron and cobalt, well C-3 for cadmium, and well C-2 for thallium. Although these constituents were identified as COIs, it's important to re-emphasize that this identification was based solely on whether their maximum concentration exceeded the GWPS. We did not take into account overall temporal or spatial patterns, nor did we consider how these concentrations related to natural background levels or potential contamination from non-CCR sources.

The water quality parameters that exceeded the GWPS included chloride and total dissolved solids in the S-wells, and chloride, sulfate, and total dissolved solids in the C-wells. However, these constituents were not included in the risk evaluation because the GWPS is based on aesthetic quality and there is an absence of studies regarding toxicity to human health. The US EPA secondary maximum contaminant levels (MCLs) for chloride, sulfate, and total dissolved solids are based on aesthetic quality. The secondary MCLs for chloride and sulfate (250 mg/L) are based on salty taste (US EPA, 2021). The secondary MCL for total dissolved solids (500 mg/L) is based on hardness, deposits, colored water, staining, and salty taste (US EPA, 2021). Given that these parameters are not likely to pose a human health risk concern in the event of exposure, they were not considered to be human health COIs.

Table 3.2 Human Health Constituents of Interest Based on Groundwater for S-Wells - Near Pond 4, Pond 3 and 3A, Pond S-6, and Pond B-3 (2018-2022)

Constituent[a]	Detected Maximum[b]	GWPS[c]	Human Health COI[d]
Total Metals (mg/L)			
Antimony	*0.0050*	0.0060	No
Arsenic	0.12	0.010	Yes
Barium	1.5	2.0	No
Beryllium	0.0081	0.0040	Yes
Boron	2.8	2.0	Yes
Cadmium	0.055	0.005	Yes
Chromium	0.069	0.10	No
Cobalt	0.054	0.0060	Yes
Lead	0.080	0.0075	Yes
Mercury	*0.0002*	0.0020	No
Selenium	0.017	0.050	No
Thallium	0.046	0.0020	Yes

Constituent[a]	Detected Maximum[b]	GWPS[c]	Human Health COI[d]
Dissolved Metals (mg/L)			
Boron	3.1	2.0	Yes
Cadmium	*0.001*	0.005	No
Other (mg/L or SU)			
Chloride	480	200	No[e]
Fluoride	0.18	4.0	No
pH	6.9	9.0	No
Sulfate	310	400	No
Total Dissolved Solids	4500	1200	No[e]

Notes:
COI = Constituent of Interest; GWPS = Groundwater Protection Standard; IL = Illinois; mg/L = Milligrams per Liter; SU = Standard Units.
Italics indicate constituent was not detected; the value reported is the maximum detection limit.
Shaded cell indicates a compound identified as a COI.
(a) The constituents are those listed in the IL Part 845.600 GWPS (IEPA, 2021).
(b) The maximum detected groundwater concentration was used to identify COIs.
(c) The IL Part 845.600 GWPS (IEPA, 2021) were used to identify COIs.
(d) COIs are constituents for which the maximum concentration exceeds the groundwater standard.
(e) Maximum exceeds the GWPS but analyte is not considered to be a COI because the GWPS is based on aesthetic quality.

Table 3.3 Human Health Constituents of Interest Based on Groundwater for C-Wells - Near the South Fly Ash Pond (2018-2023)

Constituent[a]	Maximum Groundwater Concentration[b]	GWPS[c]	Human Health COI[d]
Total Metals (mg/L)			
Antimony	*0.030*	0.0060	No[e]
Arsenic	0.0075	0.010	No
Barium	0.20	2.0	No
Beryllium	0.00060	0.0040	No
Boron	12	2.0	Yes
Cadmium	0.013	0.0050	Yes
Chromium	0.0042	0.10	No
Cobalt	0.29	0.0060	Yes
Lead	0.0031	0.0075	No
Lithium	0.024	0.040	No
Mercury	0.000070	0.0020	No
Molybdenum	0.015	0.10	No
Selenium	0.033	0.050	No
Thallium	0.031	0.0020	Yes
Dissolved Metals (mg/L)			
Boron	0.92	2.0	No
Cadmium	*0.0010*	0.0050	No
Radionuclides (pCi/L)			
Radium 226 + Radium 228	2.7	5.0	No
Other (mg/L or SU)			
Chloride	570	200	No[f]
Fluoride	0.68	4.0	No
pH	7.0	9.0	No
Sulfate	670	400	No[f]
Total Dissolved Solids	4000	1200	No[f]

Table 3.3 Notes:
COI = Constituent of Interest; GWPS = Groundwater Protection Standard; IL = Illinois; mg/L = Milligrams per Liter; pCi/L = Picocuries per Liter; SU = Standard Units.
Italics indicate constituent was not detected; the value reported is the maximum detection limit.
Shaded cell indicates a compound identified as a COI.
(a) The constituents are those listed in the IL Part 845.600 GWPS (IEPA, 2021).
(b) The maximum detected groundwater concentration was used to identify COIs.
(c) The IL Part 845.600 GWPS (IEPA, 2021) were used to identify COIs.
(d) COIs are constituents for which the maximum concentration exceeds the groundwater standard.
(e) Antimony was not detected in 32 groundwater samples. Only 2 of the 32 samples had detection limits above the GWPS; most of the DLs ranged from 0.001 to 0.005 mg/L and thus were below the GWPS of 0.006 mg/L. Thus antimony was not considered a COI.
(f) Maximum exceeds the GWPS but analyte is not considered to be a COI because the GWPS is based on aesthetic quality.

3.3.2 Ecological Constituents of Interest

The Illinois GWPS, as defined in IEPA's guidance, were developed to protect human health but not necessarily ecological receptors. While ecological receptors are not exposed to groundwater, groundwater can potentially migrate into the adjacent surface water and impact ecological receptors. Therefore, to identify ecological COIs, the maximum concentrations of constituents detected in groundwater were compared to ecological surface water benchmarks protective of aquatic life.

The surface water screening benchmarks for freshwater organisms were obtained from the following hierarchy of sources:

- IEPA (2019) SWQS. IEPA SWQS are health-protective benchmarks for aquatic life exposed to surface water on a long-term basis (*i.e.*, chronic exposure). The SWQS for several metals are hardness dependent (cadmium, chromium, and lead). Screening benchmarks for these constituents were calculated assuming US EPA's default hardness of 100 mg/L (US EPA, 2022), due to an absence of hardness data for Little Saline Creek.[4]
- US EPA Region IV (2018) surface water Ecological Screening Values (ESVs) for hazardous waste sites.

Consistent with the human health risk evaluation, Gradient used the maximum detected concentrations from groundwater samples collected from the S-wells without considering spatial or temporal representativeness for ecological receptor exposures. The use of the maximum constituent concentrations in this evaluation is designed to conservatively identify COIs that warrant further investigation. The COIs identified for ecological receptors include cadmium, cobalt, lead, and thallium (Table 3.4).

[4] Hardness data are available from the South Fork Saline River near Carrier Mills, Illinois (USGS Site No. 03382100), approximately 26 miles downstream of the MGS. Based on 208 samples collected from October 1976 to April 1997, the average hardness at this location was 438 mg/L (USGS, 2024c). Due to the age of the samples and the distance from the site, the US EPA (2022) default hardness of 100 mg/L was used. Use of a higher hardness value would result in less stringent screening values, thus, use of the US EPA default hardness is conservative.

Table 3.4 Ecological Constituents of Interest Based on Groundwater for S-Wells (2018-2022)

Constituent[a]	Maximum Detected Groundwater Concentration	Ecological Benchmark[b]	Basis	Ecological COI[c]
Total Metals (mg/L)				
Antimony	ND	0.19	EPA R4 ESV	No
Arsenic	0.12	0.19	IEPA SWQC	No
Barium	1.5	5.0	IEPA SWQC	No
Beryllium	0.0081	0.064	EPA R4 ESV	No
Boron	2.8	7.6	IEPA SWQC	No
Cadmium	0.055	0.0011	IEPA SWQC	Yes
Chromium	0.069	0.21	IEPA SWQC	No
Cobalt	0.054	0.019	EPA R4 ESV	Yes
Lead	0.080	0.020	IEPA SWQC	Yes
Mercury	ND	0.0011	IEPA SWQC	No
Selenium	0.017	1.0	IEPA SWQC	No
Thallium	0.046	0.0060	EPA R4 ESV	Yes
Dissolved Metals (mg/L)				
Boron	3.1	7.6	IEPA SWQC	No
Cadmium		0.00093	IEPA SWQC	No
Other (mg/L or SU)				
Chloride	480	500	IEPA SWQC	No
Fluoride	0.18	4.0	IEPA SWQC	No
Sulfate	310	NA	NA	No
Total Dissolved Solids	4500	NA	NA	No
pH	6.9	NA	NA	No

Notes:
Blank cells indicate constituent was not detected.
Shaded cell indicates a compound identified as a COI.
COI = Constituent of Interest; EPA R4 = United States Environmental Protection Agency Region IV; ESV = Ecological Screening Value; IEPA = Illinois Environmental Protection Agency; NA = Not Applicable; ND = Not Detected; SWQC = Surface Water Quality Criteria.
(a) The constituents are those listed in the IL Part 845.600 GWPS (IEPA, 2021) that were detected in at least one groundwater sample from the S-wells.
(b) Ecological benchmarks are from: IEPA SWQC (IEPA, 2019); EPA R4 ESV (US EPA Region IV, 2018).
(c) Constituents with maximum detected concentrations exceeding a benchmark protective of surface water exposure are considered ecological COIs.

3.3.3 Surface Water and Sediment Modeling

Surface water sampling has not been conducted in Little Saline Creek to the north of the Site. To estimate the potential contribution to surface water from groundwater specifically associated with the Site, Gradient modeled concentrations in Little Saline Creek surface water from groundwater flowing into the Creek for the detected human and ecological COIs. This is because the constituents detected in groundwater above a health-based benchmark are most likely to pose a risk concern in the adjacent surface water. Gradient modeled COI concentrations in the surface water using a mass balance calculation based on the surface water and groundwater mixing. The model assumes a well-mixed groundwater-surface water location.

The maximum detected concentrations in groundwater from the S-wells from 2018 to 2022 were conservatively used to model COI concentrations in surface water. For COIs that were measured as both total and dissolved fractions, we used the maximum of the total and dissolved COI concentrations for the modeling. For most metals, the maximum concentration was from the total fraction. Use of the total metal concentration for these COIs may overestimate surface water concentrations because dissolved concentrations, which are lower than total concentrations, represent the mobile fractions of constituents that could likely flow into and mix with surface water.

The modeling approach does not account for geochemical transformations that may occur during groundwater mixing with surface water. Gradient assumed that predicted surface water concentrations were influenced only by the physical mixing of groundwater as it enters the surface water and were not further influenced by the geochemical reactions in the water and sediment, such as precipitation. In addition, the model only predicts surface water concentrations as a result of the potential migration of COIs in Site-related groundwater and does not account for background concentrations in surface water.

For this evaluation, Gradient adapted a simplified and conservative form of US EPA's indirect exposure assessment methodology (US EPA, 1998) that was used in US EPA's coal combustion waste risk assessment (US EPA, 2014). The model is a mass balance calculation based on surface water and groundwater mixing and the concept that the dissolved and sorbed concentrations can be related through an equilibrium partitioning coefficient (K_d). The model assumes a well-mixed groundwater-surface water location, with partitioning among total suspended solids, dissolved water column, sediment pore water, and solid sediments.

Sorption to soil and sediment is highly dependent on the surrounding geochemical conditions. To be conservative, we ignored the natural attenuation capacity of soil and sediment and estimated the surface water concentration based only on the physical mixing of groundwater and surface water (*i.e.*, dilution) at the point where groundwater flows into surface water.

The aquifer properties used to estimate the volume of groundwater flowing into Little Saline Creek and surface water concentrations are presented in Table 3.5. The surface water and sediment properties used in the modeling are presented in Tables 3.6 and 3.7. In the absence of Site-specific information for Little Saline Creek, Gradient used default assumptions (*e.g.*, depth of the upper benthic layer and bed sediment porosity) to model sediment concentrations. The modeled surface water and sediment concentrations are presented in Table 3.8. These modeled concentrations reflect conservative contributions from groundwater. A description of the modeling and the detailed results are presented in Appendix A.

Table 3.5 Groundwater Properties Used in Modeling

Parameter	Value	Units	Notes
Aquifer thickness	3	m	Thickness of the groundwater unit at the interface of unlithified deposits and bedrock (10 ft or 3 m) (SIPC, 2021b).
Length of River	840	m	Length of river receiving potentially-impacted groundwater (estimated using Google Earth).
Cross-Sectional Area	2560	m^2	Length × thickness
Hydraulic Gradient	0.019	m/m	Average hydraulic gradient (estimated using groundwater elevation in wells S3 and S6; SIPC, 2007).
Hydraulic Conductivity	1.50E-04	cm/sec	Average hydraulic conductivity (assumed to be the same as that for Emery Pond wells; Golder Associates Inc., 2021).
COI Concentration	Constituent specific	mg/L	Maximum detected concentration in groundwater.

Notes:
COI = Constituent of Interest
(a) The cross-sectional area represents the area through which groundwater flows from the unlithified unit to Little Saline Creek.

Table 3.6 Surface Water Properties Used in Modeling

Parameter	Value	Unit	Notes/Source
Flow rate in little saline creek	2.5×10^{11}	L/yr	Average of peak flows 1959-1980 for Little Saline Creek Tributary Near Goreville, IL (USGS, 2024a)
Total suspended solids (TSS)	49	mg/L	Average TSS concentration for South Fork Saline River, Carrier Mills, IL (USGS, 2024b)
Depth of water column	1.5	m	Mean depth of Little Saline Creek estimated from Google Earth photos.
Suspended Sediment to Water Partition Coefficient	Constituent specific	mg/L	Values based on US EPA (2014).

Notes:
IL = Illinois; US EPA = United States Environmental Protection Agency; USGS = United States Geological Survey.

Table 3.7 Sediment Properties Used in Modeling

Parameter	Value	Unit	Notes/Source
Depth of Upper Benthic Layer	0.03	m	Default (US EPA, 2014).
Depth of Water Column	1.5	m	Mean depth of Little Saline Creek estimated from Google Earth photos.
Bed Sediment Particle Concentration	1	g/cm^3	Default (US EPA, 2014).
Bed Sediment Porosity	0.6	–	Default (US EPA, 2014).
Total Suspended Solids (TSS) Mass per Unit Area	0.075	kg/m^2	Depth of water column × TSS × conversion factors (10^{-6} kg/mg and 1,000 L/m^3).
Sediment Mass per Unit Area	30	kg/m^2	Depth of upper benthic layer × bed sediment particulate concentration × conversion factors (0.001 kg/g and 10^6 cm^3/m^3).
Sediment to Water Partitioning Coefficients	Constituent specific	mg/L	Values based on US EPA (2014).

Note:
US EPA = United States Environmental Protection Agency.

Table 3.8 Surface Water and Sediment Modeling Results for Little Saline Creek

COI	Maximum Measured Groundwater Concentration (mg/L)	Modeled Surface Water Concentration (mg/L)	Modeled Sediment Concentration (mg/kg)
Arsenic	0.12	1.37E-09	2.48E-07
Beryllium	0.0081	9.27E-11	3.29E-08
Boron	3.1	3.55E-08	1.61E-07
Cadmium	0.055	6.30E-10	2.57E-07
Cobalt	0.054	6.18E-10	1.90E-07
Lead	0.08	9.16E-10	1.43E-06
Thallium	0.046	5.27E-10	6.50E-09

Notes:
COI = Constituent of Interest; mg/L = Milligrams per Liter.

3.4 Human Health Risk Evaluation

The section below presents the results of the human health risk evaluation for recreators (boaters, swimmers, and anglers) in the Lake of Egypt to the east of the Site, and anglers in the Little Saline Creek to the north of the Site. Risks were assessed using the maximum measured COIs in Lake of Egypt, and the modeled COIs in the Little Saline Creek.

3.4.1 Recreators Exposed to Surface Water

Screening Exposures: In Lake of Egypt, recreators could be exposed to surface water *via* incidental ingestion and dermal contact while boating or swimming, and anglers could consume fish caught in the lake. In Little Saline Creek, it is assumed that anglers could consume fish caught in the creek. Measured concentrations were used in Lake of Egypt, and modeled concentrations were used for Little Saline Creek due to lack of sampling data. The maximum measured or modeled COI concentrations in surface water were used as conservative upper-end estimates of the COI concentrations to which a recreator might be exposed directly (incidental ingestion of COIs in surface water while boating) and indirectly (consumption of locally caught fish exposed to COIs in surface water).

Screening Benchmarks: Illinois surface water criteria (IEPA, 2019), known as human threshold criteria (HTC), are based on incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities, as well as the consumption of fish. The HTC values were calculated from the following equation (IEPA, 2019):

$$\mathrm{HTC} = \frac{\mathrm{ADI}}{\mathrm{W} + (\mathrm{F} \times \mathrm{BCF})}$$

where:

HTC = Human health protection criterion in milligrams per liter (mg/L)
ADI = Acceptable daily intake (mg/day)
W = Water consumption rate (L/day)
F = Fish consumption rate (kg/day)
BCF = Bioconcentration factor (L/kg tissue)

Illinois defines the acceptable daily intake (ADI) as the "maximum amount of a substance which, if ingested daily for a lifetime, results in no adverse effects to humans" (IEPA, 2019). US EPA defines its chronic reference dose (RfD) as an "estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure for a chronic duration (up to a lifetime) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime" (US EPA, 2011). Illinois lists methods to derive an ADI from the primary literature (IEPA, 2019). In accordance with Illinois guidance, Gradient derived an ADI by multiplying the MCL by the default water ingestion rate of 2 L/day (IEPA, 2019). In the absence of an MCL, Gradient applied the RfD used by US EPA to derive its Regional Screening Levels (RSLs) (US EPA, 2024) as a conservative estimate of the ADI. The RfDs are given in mg/kg-day, while the ADIs are given in mg/day; thus, Gradient multiplied the RfD by a standard body weight of 70 kg to obtain the ADI in mg/day. The calculation of the HTC values is shown in Appendix B, Table B.1.

Gradient used bioconcentration factors (BCFs) from a hierarchy of sources. The primary BCFs were those that US EPA used to calculate the National Recommended Water Quality Criteria (NRWQC) for human health (US EPA, 2002). Other sources included BCFs used in the US EPA coal combustion ash risk assessment (US EPA, 2014) and BCFs reported by Oak Ridge National Laboratory's Risk Assessment

Information System (ORNL RAIS) (ORNL, 2020).[5] Lithium did not have a BCF value available from any authoritative source; therefore, the water quality criterion for lithium was calculated assuming a BCF of 1. This is a conservative assumption, as lithium does not readily bioaccumulate in the aquatic environment (ECHA, 2020a,b; ATSDR, 2010).

Illinois recommends a fish consumption rate of 0.020 kg/day (20 g/day) for an adult weighing 70 kg (IEPA, 2019). Illinois recommends a water consumption rate of 0.01 L/day for "incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities" (IEPA, 2019). Appendix B, Table B.1 presents the calculated HTC for fish and water and for fish consumption only.

The HTC for fish consumption for radium 226+228 was calculated as follows:

$$\text{HTC} = \frac{\text{TCR}}{(\text{SF} \times \text{BAF} \times \text{F})}$$

where:

HTC	=	Human health protection criterion in picoCuries per liter (pCi/L)
TCR	=	Target cancer risk (1×10^5)
SF	=	Food ingestion slope factor (risk/pCi)
BAF	=	Bioaccumulation factor (L/kg tissue)
F	=	Fish consumption rate (kg/day)

The food ingestion slope factor (lifetime excess total cancer risk per unit exposure, in risk/pCi) used to calculate the HTC was the highest value of those for radium 226 (Ra226), radium 228 (Ra228), and "Ra228+D" (US EPA, 2001). According to US EPA (2001), "+D" indicates that "the risks from associated short-lived radioactive decay products (*i.e.*, those decay products with radioactive half-lives less than or equal to 6 months) are also included."

Screening Risk Evaluation, Lake of Egypt: The four COIs were not detected in the surface water data available from Lake of Egypt, therefore, Gradient used half of the maximum detection limit as the exposure concentration. The COI concentrations in surface water were compared to the calculated Illinois HTC values (Table 3.8). All surface water concentrations, all of which were non-detect, were below their respective benchmarks. The HTC values are protective of recreational exposure *via* water and/or fish ingestion and do not account for dermal exposures to COIs in surface water while boating. However, given that the measured COI surface water concentrations are well below HTC protective of water and/or fish ingestion, dermal exposures to COIs are not expected to be a risk concern. Moreover, the dermal uptake of metals is considered to be minimal and only a small proportion of ingestion exposures. Thus, none of the COIs evaluated pose an unacceptable risk to recreators exposed to surface water while boating and anglers consuming fish caught in the Lake of Egypt.

[5] Although recommended by US EPA (2015b), US EPA EpiSuite 4.1 (US EPA, 2019) was not used as a source of BCFs because inorganic compounds are outside the estimation domain of the program.

Table 3.9 Risk Evaluation for Recreators Exposed to Surface Water in Lake of Egypt

COI	Maximum Surface Water Concentration (Measured)[a]	HTC for Water and Fish	HTC for Water Only	HTC for Fish Only	COPC
Total Metals (mg/L)					
Boron	*0.01*	467	1400	700	No
Cadmium	*0.0015*	0.0019	1.0	0.0019	No
Cobalt	*0.0025*	0.0035	2.1	0.0035	No
Thallium	*0.001*	0.0017	0.40	0.0017	No

Notes:
COI = Constituent of Interest; COPC = Constituent of Potential Concern; HTC = Human Threshold Criteria; mg/L = Milligrams per Liter.
Concentrations are listed only for the constituents identified as COIs in the C-wells.
(a) Concentrations in italics were not detected; half the detection limit was used for non-detects.

Screening Risk Evaluation, Little Saline Creek: The modeled COI concentrations in surface water were compared to the calculated Illinois HTC values (Table 3.10). All surface water concentrations were below their respective benchmarks. Thus, none of the COIs evaluated pose an unacceptable risk for anglers consuming fish caught in Little Saline Creek.

Table 3.10 Risk Evaluation for Recreators Exposed to Surface Water in Little Saline Creek

COI	Maximum Surface Water Concentration (Modeled)	HTC for Water and Fish	HTC for Water Only	HTC for Fish Only	COPC
Total Metals (mg/L)					
Arsenic	1.37E-09	2.25E-02	2.00E+00	2.27E-02	No
Beryllium	9.27E-11	2.05E-02	8.00E-01	2.11E-02	No
Boron	3.55E-08	4.67E+02	1.40E+03	7.00E+02	No
Cadmium	6.30E-10	1.85E-03	1.00E+00	1.85E-03	No
Cobalt	6.18E-10	3.49E-03	2.10E+00	3.50E-03	No
Lead	9.16E-10	1.00E-02	1.00E-02	1.00E-02	No
Thallium	5.27E-10	1.72E-03	4.00E-01	1.72E-03	No

Notes:
COI = Constituent of Interest; COPC = Constituent of Potential Concern; HTC = Human Threshold Criteria; mg/L = Milligrams per Liter.
Concentrations are listed only for the constituents identified as COIs in the S-wells.
Modeled concentrations represent the potential effect on surface water quality resulting from the measured groundwater concentrations.

3.4.2 Use of Surface Water as Drinking Water

The Lake of Egypt is used as a public water supply (IEPA, 2024a). Gradient compared the maximum detected concentrations (or the maximum detection limit) from the available public water supply data (2018-2023) to the Illinois Class I GWPS (Table 3.11). There were no exceedances of the IL GWPS, therefore the use of surface water from the Lake of Egypt for residential drinking water does not pose an unacceptable risk to residents.

Table 3.11 Lake Public Water Supply Data Compared to GWPS (2018-2023)

Constituent[a]	Number of Detects	Number of Samples	Detected Minimum	Detected Maximum[b]	Maximum Laboratory Detection Limit	GWPS[c]	Exceedance
Total Metals							
Antimony	0	6			0.003	0.006	No
Arsenic	0	6			0.001	0.01	No
Barium	6	6	0.021	0.0263	NA	2	No
Beryllium	0	6			0.001	0.004	No
Cadmium	0	6			0.003	0.005	No
Chromium	0	6			0.005	0.1	No
Mercury	0	6			0.0002	0.002	No
Selenium	1	6	0.0024	0.0024	0.002	0.05	No
Thallium	0	6			0.002	0.002	No
Other							
Chloride	6	6	10.4	23	NA	200	No
Fluoride	6	6	0.553	0.73	NA	4	No
Sulfate	6	6	34.6	51.7	NA	400	No
Total Dissolved Solids	6	6	87	158	NA	1200	No
Radionuclides							
Radium 226 + Radium 228	1	1	1.03	1.03	NA	5	No

Notes:
GWPS = Groundwater Protection Standard; NA = Not Available.

3.5 Ecological Risk Evaluation

Based on the ecological CEM (Figure 3.4), ecological receptors could be exposed to surface water and dietary items (*i.e.*, prey and plants) potentially impacted by identified COIs.

3.5.1 Ecological Receptors Exposed to Surface Water in Little Saline Creek

Screening Exposures: The ecological evaluation considered aquatic communities in Little Saline Creek potentially impacted by identified ecological COIs. Modeled surface water concentrations were compared to risk-based ecological screening benchmarks.

Screening Benchmarks: Surface water screening benchmarks protective of aquatic life were obtained from the following hierarchy of sources:

- IEPA SWQS (IEPA, 2019), regulatory standards that are intended to protect aquatic life exposed to surface water on a long-term basis (*i.e.*, chronic exposure). For cadmium, the surface water benchmark is hardness dependent and calculated using a default hardness of 100 mg/L (US EPA, 2022);[6]
- US EPA Region IV (2018) surface water ESVs for hazardous waste sites.

[6] Conservatisms associated with using a default hardness value are discussed in Section 3.6.

Risk Evaluation: The maximum modeled COI concentrations in surface water were compared to the benchmarks protective of aquatic life (Table 3.12). The modeled surface water concentrations for the COIs were below their respective benchmarks. Thus, none of the COIs evaluated are expected to pose an unacceptable risk to aquatic life in Little Saline Creek.

Table 3.12 Risk Evaluation for Ecological Receptors Exposed to Surface Water in Little Saline Creek

COI	Maximum Surface Water Concentration (modeled)	Ecological Freshwater Benchmark	Basis	COPC
Cadmium	6.30E-10	1.13E-03	IEPA SWQC	No
Cobalt	6.18E-10	1.90E-02	EPA R4 ESV	No
Lead	9.16E-10	2.01E-02	IEPA SWQC	No
Thallium	5.27E-10	6.00E-03	EPA R4 ESV	No

Notes:
COI = Constituent of Interest; COPC = Constituent of Potential Concern; ESV = Ecological Screening Value; IEPA = Illinois Environmental Protection Agency; SWQC = Surface Water Quality Criteria; US EPA = United States Environmental Protection Agency.
Criteria sources: IEPA SWQC: IEPA (2019a); EPA R4 ESV: US EPA Region IV (2018)

3.5.2 Ecological Receptors Exposed to Sediment in Little Saline Creek

Screening Exposures: COIs in impacted groundwater flowing into Little Saline Creek can sorb to sediments *via* chemical partitioning. In the absence of sediment data, sediment concentrations were modeled using maximum detected groundwater concentrations. Therefore, the modeled COI sediment concentrations reflect the potential maximum Site-related sediment concentration originating from groundwater.

Screening Benchmarks: Sediment screening benchmarks were obtained from US EPA Region IV (2018). The majority of the sediment ESVs are based on threshold effect concentrations (TECs) from MacDonald *et al.* (2000), which provide consensus values that identify concentrations below which harmful effects on sediment-dwelling organisms are unlikely to be observed. The benchmarks used in this evaluation are listed in Table 3.13.

Screening Risk Results: The maximum modeled COI sediment concentrations were below their respective sediment screening benchmarks (Table 3.13). The modeled sediment concentrations attributed to potential contributions from Site groundwater for all COIs were less than 1% of the sediment screening benchmark. Although thallium does not have an ESV, the modeled concentration is well below the soil ESV of 0.05 mg/kg (US EPA Region IV, 2018); therefore, thallium does not present an unacceptable risk to ecological receptors. Thus, the modeled sediment concentrations attributed to potential contributions from Site groundwater are not expected to significantly contribute to ecological exposures in Little Saline Creek adjacent to the Site.

Table 3.13 Risk Evaluation for Ecological Receptors Exposed to Sediment in Little Saline Creek

COI	Modeled Sediment Concentration (mg/kg)	ESV[a] (mg/kg)	COPC	% of Benchmark
Cadmium	2.6E-07	1.0E+00	No	0.00003
Cobalt	1.9E-07	5.0E+01	No	0.0000004
Lead	1.4E-06	3.6E+01	No	0.000004
Thallium	6.5E-09	NA	No	NA

Notes:
COI = Constituent of Interest; COPC = Constituent of Potential Concern; ESV = Ecological Screening Value; NA = Not Available; US EPA = United States Environmental Protection Agency.
(a) ESV from US EPA Region IV (2018).

3.5.3 Ecological Receptors Exposed to Bioaccumulative Constituents of Interest

Screening Exposures: COIs with bioaccumulative properties can impact higher trophic level wildlife exposed to these COIs *via* direct exposures (surface water and sediment exposure) and secondary exposures through the consumption of dietary items (*e.g.*, plants, invertebrates, small mammals, and fish).

Screening Benchmark: US EPA Region IV (2018) and IEPA SWQS (IEPA, 2019) guidance were used to identify constituents with potential bioaccumulative effects.

Risk Evaluation: The ecological COIs (cadmium, cobalt, lead, and thallium) were not identified as having potential bioaccumulative effects. Therefore, these COIs are not considered to pose an ecological risk *via* bioaccumulation. IEPA (2019) identifies mercury as the only metal with bioaccumulative properties, however, mercury was not considered an ecological COI. US EPA Region IV (2018) identifies selenium as having potential bioaccumulative effects; although selenium was detected in groundwater, it was not considered an ecological COI.

3.6 Uncertainties and Conservatisms

A number of uncertainties and their potential impact on the risk evaluation are discussed below. Wherever possible, conservative assumptions were used in an effort to minimize uncertainties and overestimate rather than underestimate risks.

Exposure Estimates:

- The risk evaluation included the IL Part 845.600 constituents detected in groundwater samples (above GWPS) collected from wells associated with the MGS facility. However, it is possible that not all of the detected constituents are related specifically to the MGS facility.
- The human health and ecological risk characterization was based on the maximum measured or modeled COI concentrations, rather than on averages. Thus, the variability in exposure concentrations was not considered. Assuming continuous exposure to the maximum concentration overestimates human and ecological exposures, given that receptors are mobile and concentrations change over time. For example, US EPA guidance states that risks should be estimated using average exposure concentrations as represented by the 95% upper confidence limit on the mean (US EPA, 1992). Given that exposure estimates based on the maximum concentrations did not exceed risk benchmarks, Gradient has greater confidence that there is no risk concern.

- Only constituents detected in groundwater were used to identify COIs and model COI concentrations in surface water. For the constituents that were not detected in facility groundwater, the detection limits were below the IL Part 845.600 GWPS for all constituents except antimony, and thus do not require further evaluation. (Antimony was not detected in 32 groundwater samples from 2018 to 2023; 30 of the detection limits ranged from 0.001 to 0.005 mg/L, thus were below the GWPS of 0.006 mg/L.)
- There are limited groundwater data available that have been analyzed for Appendix IV constituents to specifically characterize the ponds of interest. If additional data are collected, the new data could lead to different risk estimates (either increased or decreased risk).
- COI concentrations in Little Saline Creek were modeled using the maximum detected total COI concentrations in groundwater from the S-wells. Modeling surface water concentrations using total metal concentrations may overestimate surface water concentrations because dissolved concentrations, which are lower than total concentrations, represent the mobile fractions of constituents that could likely flow into and mix with surface water.
- The COIs identified in this evaluation also occur naturally in the environment. Contributions to exposure from natural or other non-MGS-related sources were not considered in the evaluation of modeled concentrations; only exposure contributions potentially attributable to Site groundwater mixing with surface water were evaluated. While not quantified, exposures from potential MGS-related groundwater contributions are likely to represent only a small fraction of the overall human and ecological exposure to COIs that also have natural or non-MGS-related sources.
- Screening benchmarks for human health were developed using exposure inputs based on US EPA's recommended values for reasonable maximum exposure (RME) assessments (Stalcup, 2014). RME is defined as "the highest exposure that is reasonably expected to occur at a site but that is still within the range of possible exposures" (US EPA, 2004). US EPA states the "intent of the RME is to estimate a conservative exposure case (*i.e.*, well above the average case) that is still within the range of possible exposures" (US EPA, 1989). US EPA also notes that this high-end exposure "is the highest dose estimated to be experienced by some individuals, commonly stated as approximately equal to the 90th percentile exposure category for individuals" (US EPA, 2015c). Thus, most individuals will have lower exposures than those presented in this risk assessment.

Toxicity Benchmarks:

- Screening-level ecological benchmarks were compiled from IEPA and US EPA guidance and designed to be protective of the majority of Site conditions, leaving the option for Site-specific refinement. In some cases, these benchmarks may not be representative of the Site-specific conditions or receptors found at the Site, or may not accurately reflect concentration-response relationships encountered at the Site. For example, the ecological benchmark for cadmium is hardness dependent, and Gradient relied on US EPA's default hardness of 100 mg/L. Use of a higher hardness value would increase the cadmium SWQS because benchmarks become less stringent with higher levels of hardness. Regardless of the hardness, the maximum modeled cadmium concentration is orders of magnitude below the SWQS.
- In addition, for the ecological evaluation, Gradient conservatively assumed all constituents to be 100% bioavailable. Modeled COI concentrations in surface water are considered total COI concentrations. In addition, the measured surface water data used in this report represent total concentrations. US EPA recommends using dissolved metals as a measure of exposure to ecological receptors because it represents the bioavailable fraction of metal in water (US EPA, 1993). Therefore, the modeled surface water COI concentrations may be an overestimation of exposure concentrations to ecological receptors.

- In general, it is important to appreciate that the human health toxicity factors used in this risk evaluation are developed to account for uncertainties, such that safe exposure levels used as benchmarks are often many times lower (even orders of magnitude lower) than the levels that cause effects that have been observed in human or animal studies. For example, toxicity factors incorporate a 10-fold safety factor to protect sensitive subpopulations. This means that a risk exceedance does not necessarily equate to actual harm.

4 Summary and Conclusions

A screening-level risk evaluation was performed for Site-related constituents in groundwater at the MGS in Marion, Illinois. The CSM developed for the Site indicates that groundwater beneath the facility may flow into the Lake of Egypt to the east of the Site, or into Little Saline Creek to the north of the Site, and may potentially impact surface water.

CEMs were developed for human and ecological receptors. In the Lake of Egypt, the complete exposure pathways for humans include recreators (boaters) in the who are exposed to surface water, and anglers who consume locally caught fish. The use of surface water from the Lake of Egypt as a drinking water source was also evaluated as a complete pathway. The complete exposure pathway for humans in Little Saline Creek includes anglers who consume locally caught fish. Based on the local hydrogeology, residential exposure to groundwater used for drinking water or irrigation is not a complete pathway and was not evaluated. The complete exposure pathways for ecological receptors include aquatic life (including aquatic and marsh plants, amphibians, reptiles, and fish) exposed to surface water; benthic invertebrates exposed to sediment; and avian and mammalian wildlife exposed to bioaccumulative COIs in surface water, sediment, and dietary items.

Groundwater data collected from 2018 to 2023 were used to estimate exposures. The surface water data collected from the Lake of Egypt (in 2020) were also evaluated. Surface water concentrations were modeled in Little Saline Creek using the maximum detected groundwater concentration in the S-wells from the northern portion of the Site. Surface water exposure estimates were screened against benchmarks protective of human health and ecological receptors for this risk evaluation.

US EPA has established acceptable risk metrics. Risks above these US EPA-defined metrics are termed potentially "unacceptable risks." Based on the evaluation presented in this report, no unacceptable risks to human or ecological receptors resulting from CCR exposures associated with the Site were identified. This means that the risks from the Site are likely indistinguishable from normal background risks. Specific risk assessment results include the following:

- For recreators exposed to surface water, all COIs were below the conservative risk-based screening benchmarks. Therefore, none of the COIs evaluated in surface water are expected to pose an unacceptable risk to recreators in the Lake of Egypt.
- For anglers consuming locally caught fish, the modeled concentrations of all COIs in surface water (as well as the measured data) were below conservative benchmarks protective of fish consumption. Therefore, none of the COIs evaluated are expected to pose an unacceptable risk to anglers consuming fish caught from the Lake of Egypt or Little Saline Creek.
- For Lake of Egypt surface water used as a public drinking water supply, all COIs were below the Illinois Class I GWPS, thus no unacceptable risks were identified for the use of Lake of Egypt surface water as drinking water.
- Groundwater downgradient of the Site is not being used as a drinking water, thus the use of groundwater is not a complete exposure pathway.
- Ecological receptors exposed to surface water in Little Saline Creek include aquatic and marsh plants, amphibians, reptiles, and fish. The risk evaluation showed that none of the modeled COIs in Little Saline Creek exceeded protective screening benchmarks. Ecological receptors exposed to

sediment include benthic invertebrates. The modeled sediment COIs did not exceed the conservative screening benchmarks; therefore, none of the COIs evaluated in sediment are expected to pose an unacceptable risk to ecological receptors in Little Saline Creek.

- Ecological receptors were also evaluated for exposure to bioaccumulative COIs. This evaluation considered higher trophic level wildlife with direct exposure to surface water and sediment and secondary exposure through the consumption of dietary items (*e.g.*, plants, invertebrates, small mammals, fish). None of the ecological COIs were identified as having potential bioaccumulative effects. Overall, this evaluation demonstrated that none of the COIs evaluated are expected to pose an unacceptable risk to ecological receptors.

It should be noted that this evaluation incorporates a number of conservative assumptions that tend to overestimate exposure and risk. The risk evaluation was based on the maximum detected COI concentration; however, US EPA guidance states that risks should be based on a representative average concentration such as the 95% upper confidence limit on the mean; thus, using the maximum concentration tends to overestimate exposure. Although the COIs identified in this evaluation also occur naturally in the environment, the contributions to exposure from natural background sources and nearby industry were not considered; thus, CCR-related exposures were likely overestimated. Exposure estimates assumed 100% metal bioavailability, which likely results in overestimates of exposure and risks. Exposure estimates were based on inputs to evaluate the "reasonable maximum exposure"; thus, most individuals will have lower exposures than those estimated in this risk assessment.

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Appendix A

Surface Water Modeling

List of Tables

Gradient modeled concentrations of constituents of interest (COIs) in the Little Saline Creek surface water based on available groundwater data. First, we estimated the flow rate of COIs flowing into the Little Saline Creek *via* groundwater. Then, we adapted United States Environmental Protection Agency (US EPA) indirect exposure assessment methodology (US EPA, 1998) in order to model surface water concentrations in the Little Saline Creek.

Model Overview

The groundwater flow to the creek is represented by a one-dimensional, steady-state model. In this model, the groundwater plume from the northern portion of the Site migrates horizontally in the uppermost water-bearing unit prior to flowing to Little Saline Creek. The groundwater flow entering the creek is the flow going through a cross-sectional area that has a length equal to the length of the creek adjacent to the Site with potential impacts from the ponds system and a height equal to the thickness of the uppermost water-bearing unit. It was assumed that all the groundwater flowing through this layer would ultimately discharge to Little Saline Creek. The length of the groundwater discharge zone was estimated using Google Earth Pro (Google, LLC, 2022).

The groundwater flow to Little Saline Creek mixes with the surface water in the creek. The COIs entering the creek *via* groundwater dissolve into the water column, sorb to suspended sediments, or sorb to benthic sediments. Using US EPA's indirect exposure assessment methodology (US EPA, 1998), the model evaluates the surface water COI concentrations at a location downstream of the groundwater discharge point, assuming a well-mixed water column.

Groundwater Discharge Rate

The groundwater flow rate was evaluated using conservative assumptions. Gradient conservatively assumed that the groundwater concentrations were uniformly equal to the maximum detected concentration of each individual COI. Further, Gradient ignored adsorption by subsurface soil and assumed that all the groundwater flowing through the aquifer and intersecting the creek was flowing into the creek.

For each groundwater unit, the groundwater flow rate into the creek was derived using Darcy's Law:

$$Q = K \times i \times A$$

where:

Q	=	Groundwater flow rate (m^3/s)
K	=	Hydraulic conductivity (m/s)
i	=	Hydraulic gradient (m/m)
A	=	Cross-sectional area (m^2)

For each COI, the mass discharge rate into the creek was then calculated by:

$$m_c = C_c \times Q \times CF$$

where:

m_c	=	Mass discharge rate of the COI (mg/year)
C_c	=	Maximum groundwater concentration of the COI (mg/L)
Q	=	Groundwater flow rate (m^3/s)
CF	=	Conversion factors: 1,000 L/m^3 and 31,557,600 s/year

The values of the aquifer parameters used for these calculations are provided in Table A.1. The calculated mass discharge rates were then used as inputs for the surface water model.

The length of the discharge zone was estimated to be approximately 840 m and the height of the discharge zone was estimated to be 3 m; thus, the cross-sectional area was estimated to be 2,560 m^2 (SIPC, 2021). The average horizontal hydraulic gradient was 0.019 m/m (estimated using groundwater elevation in wells S3 and S6; SIPC, 2007). The average horizontal hydraulic conductivity was 1.5×10^{-4} cm/s (Golder Associates Inc., 2021).

Surface Water Concentration

Groundwater that flows into the creek will be diluted with the surface water flow. Constituents transported by groundwater into the surface water migrate into the water column and the bed sediments. The surface water model Gradient used to estimate the surface water concentrations is a steady-state model described in US EPA's indirect exposure assessment methodology (US EPA, 1998) and also used in US EPA's "Human and Ecological Risk Assessment of Coal Combustion Residuals," referred to herein as the CCR risk assessment (US EPA, 2014). This model describes the partitioning of constituents between surface water, suspended sediments, and benthic sediments based on equilibrium partition coefficients (K_d values). It estimates the concentrations of constituents in surface water, suspended sediments, and benthic sediments at steady-state equilibrium at a theoretical location downstream of the discharge point after complete mixing of the water column. In our analysis, we used the K_d values provided in the US EPA CCR risk assessment for all of the COIs (US EPA, 2014, Table J1). These coefficients are presented in Table A.2.

To be conservative, Gradient assumed that the constituents were not affected by dissipation or degradation once they entered the water body. The total water body concentration of the COI was calculated as follows (US EPA, 1998):

$$C_{wtot} = \frac{m_c}{V_f \times f_{water}}$$

where:

C_{wtot}	=	Total water body concentration of the COI (mg/L)
m_c	=	Mass discharge rate of the COI (mg/year)
V_f	=	Water body annual flow (L/year)
f_{water}	=	Fraction of the COI in the water column (unitless)

For the Little Saline Creek annual flow rate, Gradient used the average peak-flow discharge rate of about 279 cubic feet per second (cfs), or 2.5×10^{11} L/year, based on the discharge rates measured at the United States Geological Survey (USGS) gauging station near Goreville, Illinois (USGS Station 03382025) between 1959 and 1980[7] (USGS, 2024a). The surface water parameters are presented in Table A.3.

The fraction of COIs in the water column was calculated for each COI using the sediment/water and suspended solids/water partition coefficients (US EPA, 2014). The fraction of COIs in the water column is defined as follows (US EPA, 2014):

$$f_{water} = \frac{(1 + [K_{dsw} \times TSS \times 0.000001]) \times \frac{d_w}{d_z}}{\left([1 + (K_{dsw} \times TSS \times 0.000001)] \times \frac{d_w}{d_z}\right) + ([bsp + K_{dbs} \times bsc] \times \frac{d_b}{d_z})}$$

[7] The available data were for the years 1959 to 1980.

where:

K_{dsw}	=	Suspended sediment-water partition coefficient (mL/g)
K_{dbs}	=	Sediment-water partition coefficient (mL/g)
TSS	=	Total suspended solids in the surface water body (mg/L). Assumed equal to 49 mg/L based on the average suspended sediment concentration measured in South Fork Saline River at the USGS gauging station at Carrier Mills, Illinois (USGS Station 03382100) between 1976 and 1997 (USGS, 2024b).
0.000001	=	Units conversion factor
d_w	=	Depth of the water column (m). The depth of the water column was estimated as 1.52 m from Google Earth photos.
d_b	=	Depth of the upper benthic layer (m). Set equal to 0.03 m (US EPA, 2014).
d_z	=	Depth of the water body (m). Calculated as $d_w + d_b$. Set equal to 1.55 m.
bsp	=	Bed sediment porosity (unitless). Set equal to 0.6 (US EPA, 2014).
bsc	=	Bed sediment particle concentration (g/cm^3). Set equal to 1.0 g/cm^3 (US EPA, 2014).

The fraction of COIs dissolved in the water column (f_d) is calculated as follows (US EPA, 2014):

$$f_d = \frac{1}{1 + K_{dsw} \times TSS \times 0.000001}$$

The values for the fraction of COI in the water column and other calculated parameters are presented in Table A.4.

The total water column concentration (C_{wcTot}) of the COIs, comprising both the dissolved and suspended sediment phases, is then calculated as follows (US EPA, 2014):

$$C_{wcTot} = C_{wtot} \times f_{water} \times \frac{d_z}{d_w}$$

Finally, the dissolved water column concentration (C_{dw}) for the COIs is calculated as follows (US EPA, 2014):

$$C_{dw} = f_d \times C_{wcTot}$$

The dissolved water column concentration (C_{dw}) was then used to calculate the concentration of COIs sorbed to suspended solids in the water column (US EPA, 1998):

$$C_{sw} = C_{dw} \times K_{dsw}$$

where:

C_{sw}	=	Concentration sorbed to suspended solids (mg/kg)
C_{dw}	=	Concentration dissolved in the water column (mg/L)
K_{dsw}	=	Suspended solids/water partition coefficient (mL/g)

In the same way, using the total water body concentration and the fraction of COI in the benthic sediments, the model derives the total concentration in benthic sediments (US EPA, 2014):

$$C_{bstot} = f_{benth} \times C_{wtot} \times \frac{d_z}{d_b}$$

where:

C_{bstot} = Total COI concentration in bed sediment (mg/L or g/m^3)
C_{wtot} = Total water body COI concentration (mg/L)
f_{benth} = Fraction of COI in benthic sediments (unitless)
d_b = Depth of the upper benthic layer (m)
d_z = Depth of the water body (m). Calculated as $d_w + d_b$.

This value can be used to calculate dry weight sediment concentration as follows:

$$C_{seddw} = \frac{C_{bstot}}{bsc}$$

where:

C_{seddw} = Dry weight sediment concentration (mg/kg)
C_{bstot} = Total sediment concentration (mg/L)
bsc = Bed sediment bulk density. Used the default value of 1 g/cm^3 from US EPA (2014).

The total sediment concentration is composed of the sum of the COI concentration dissolved in the bed sediment pore water (equal to the concentration dissolved in the water column) and the COI concentration sorbed to benthic sediments (US EPA, 1998).

The COI concentration sorbed to benthic sediments was calculated as follows (US EPA, 1998):

$$C_{sb} = C_{dbs} \times K_{dbs}$$

where:

C_{sb} = Concentration sorbed to bottom sediments (mg/kg)
C_{dbs} = Concentration dissolved in the sediment pore water (mg/L)
K_{dbs} = Sediments/water partition coefficient (mL/kg)

For each COI, the modeled total water column concentration, dry weight sediment concentration, and concentration sorbed to sediment are presented in Table A.5.

Table A.1 Parameters Used to Estimate Groundwater Discharge to Surface Water

Parameter	Name	Value	Unit
A	Cross-Sectional Area	2,560	m^2
i	Hydraulic Gradient	0.019	m/m
K	Hydraulic Conductivity	1.50E-04	cm/s

Sources: SIPC, 2021; SIPC, 2007; Golder Associates Inc., 2021.

Table A.2 Partition Coefficients

Constituent	Mean Sediment-Water Partition Coefficient (K_{dbs})		Mean Suspended Sediment-Water Partition Coefficient (K_{dsw})	
	Value ($\log_{10}$) (mL/g)	Value (mL/g)	Value ($\log_{10}$) (mL/g)	Value (mL/g)
Metals				
Arsenic	2.4	2.51E+02	3.9	7.94E+03
Beryllium	2.8	6.31E+02	4.2	1.58E+04
Boron	0.8	6.31E+00	3.9	7.94E+03
Cadmium	3.3	2.00E+03	4.9	7.94E+04
Cobalt	3.1	1.26E+03	4.8	6.31E+04
Lead	4.6	3.98E+04	5.7	5.01E+05
Thallium	1.3	2.00E+01	4.1	1.26E+04

Notes:
mL/g = Milliliters per Gram.
Source: US EPA, 2014.

Table A.3 Surface Water Parameters

Parameter	Name	Value	Unit
TSS	Total Suspended Solids	49	mg/L
V_{fx}	Surface Water Flow Rate	2.5×10^{11}	L/year
d_b	Depth of Upper Benthic Layer (default)	0.03	m
d_w	Depth of Water Column	1.52	m
d_z	Depth of Water Body	1.55	m
bsc	Bed Sediment Bulk Density (default)	1	g/cm^3
bsp	Bed Sediment Porosity (default)	0.6	–
M_{TSS}	TSS Mass per Unit Area[a]	0.075	kg/m^2
M_S	Sediment Mass per Unit Area[b]	30	kg/m^2

Notes:
CF = Conversion Factor.
Source of default values: US EPA, 2014.
(a) $M_{TSS} = TSS \times d_w \times CF1 \times CF2$.
(b) $M_S = d_b \times bsc \times CF3 \times CF4$.
CF1 = 1,000 L/m^3; CF2 = 1E06 mg/kg; CF3 = 1E+06 cm^3/m^3; CF4 = 0.001 kg/g.

Table A.4 Calculated Parameters

COI	Fraction of COI in the Water Column (f_{water})	Fraction of COI in the Benthic Sediments ($f_{benthic}$)	Fraction of COI Dissolved in the Water Column ($f_{dissolved}$)
Metals			
Arsenic	0.219	0.781	0.720
Beryllium	0.1250	0.8750	0.5629
Boron	0.9108	0.0892	0.7198
Cadmium	0.1107	0.8893	0.2044
Cobalt	0.142	0.858	0.244
Lead	0.032	0.968	0.039
Thallium	0.800	0.200	0.618

Note:
COI = Constituent of Interest.

Table A.5 Surface Water Modeling Results for Little Saline Creek

COI	Maximum Measured Groundwater Concentration (mg/L)	Modeled Surface Water Concentration (mg/L)
Arsenic	1.20E-01	1.37E-09
Beryllium	8.10E-03	9.27E-11
Boron	3.10E+00	3.55E-08
Cadmium	5.50E-02	6.30E-10
Cobalt	5.40E-02	6.18E-10
Lead	8.00E-02	9.16E-10
Thallium	4.60E-02	5.27E-10

Notes:
COI = Constituent of Interest; mg/L = Milligrams per Liter.

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Appendix B

Screening Benchmarks

Table B.1 Calculated Water Quality Standards Protective of Incidental Ingestion and Fish Consumption

Human Health COI	Bioconcentration Factor (BCF)		Average Daily Intake (ADI)			Human Threshold Criteria (HTC)		
	BCF[a] (L/kg-tissue)	Basis	MCL (mg/L)	RfD (mg/kg-d)	ADI[b] (mg/day)	Water & Fish (mg/L)	Water Only (mg/L)	Fish Only (mg/L)
Arsenic	44	NRWQC (2002)	0.01	0.0003	0.02	0.022	2.0	0.023
Beryllium	19	NRWQC (2002)	0.004	0.002	0.008	0.021	0.80	0.021
Boron	1	(d)	NC	0.2	14	467	1400	700
Cadmium	270	US EPA (2014)	0.005	0.0001	0.01	0.0018	1.0	0.0019
Cobalt	300	ORNL (2023)	NC	0.0003	0.021	0.0035	2.1	0.0035
Lead	46	US EPA (2014)	0.01	NC	0.02	0.01	0.01	0.01
Thallium	116	NRWQC (2002)	0.002	0.00001	0.004	0.0017	0.40	0.0017

Notes:

ADI = Average Daily Intake; BCF = Bioconcentration Factor; COI = Constituent of Interest; F = Fish Consumption Rate; HTC = Human Threshold Criteria; MCL = Maximum Contaminant Level; NA = BCF Not Available and Therefore, WQC for Fish Only Not Calculated; NC = No Criterion Available; NRWQC = National Recommended Water Quality Criteria; ORNL = Oak Ridge National Laboratory; RfD = Reference Dose; W = Water Consumption Rate; WQC = Water Quality Criteria; SWQC = Surface Water Quality Criteria; US EPA = United States Environmental Protection Agency.

(a) BCFs from the following hierarchy of sources:

NRWQC (2002). National Recommended Water Quality Criteria: 2002. Human Health Criteria Calculation Matrix.

US EPA (2014). Human and Ecological Risk Assessment of Coal Combustion Residuals.

ORNL (2023). Risk Assessment Information System (RAIS) Chemical Toxicity Values.

(b) ADI based on the MCL is calculated as the MCL (mg/L) multiplied by a water ingestion rate of 2 L/day. In the absence of an MCL, the ADI was calculated as the RfD (mg/kg-d) multiplied by the body weight (70 kg).

(c) SWQC based on US EPA's action level.

(d) BCF of 1 was used as a conservative assumption, due to lack of published BCF.

Consumption of Water and Fish

$$HTC = \frac{ADI}{W + (F \times BCF)}$$

Consumption of Water Only

$$HTC = \frac{ADI}{W}$$

Consumption of Fish Only

$$HTC = \frac{ADI}{F \times BCF}$$

Where:

Human Threshold Criteria (HTC)	Chemical-specific	mg/L
Acceptable Daily Intake (ADI)	Chemical-specific	mg/day
Fish Consumption Rate (F)	0.02	kg/day
Bioconcentration Factor (BCF)/ Bioaccumulation Factor (BAF)	Chemical-specific	L/kg-tissue
Water Consumption Rate (W)	0.01	L/day
Body Weight	70	kg
Target Cancer Risk (TCR)	1.0E-05	unitless

Attachment B

Curriculum Vitae **of Ari Lewis, M.S.**

GRADIENT

Ari S. Lewis, M.S.
Principal
Ari.Lewis@gradientcorp.com

Areas of Expertise

Human health risk assessment, hazard assessment, product safety evaluations, metals toxicology, molecular toxicology, natural product toxicity assessment.

Education

M.S., Environmental Toxicology (Cellular and Molecular Toxicology and Risk Analysis), Cornell University, 2002

B.A., Biology and Environmental Sciences, University of Pennsylvania, 1995

Professional Experience

2002 – Present GRADIENT, Boston, MA
Provides expertise in toxicology to oversee projects evaluating potential human health hazards and risks from environmental and product exposures, with an emphasis on risks from industrial chemicals.

1999 – 2002 CORNELL UNIVERSITY, Ithaca, NY
Research Assistant. Developed an *in vivo* system to study the developmental toxicity of environmental agents at the cellular and molecular level. Investigated the tissue-specific responses to sodium arsenite and heat shock by examining the associations between stress protein induction, molecular signal transduction, and sensitivity to stress-induced cell death.

2001 – 2002 ASSOCIATION OF COMPARATIVE AND ENVIRONMENTAL TOXICOLOGY, Ithaca, NY
President. Organized educational and social events to promote the integration of Cornell graduate students within the research-diverse program of Environmental Toxicology.

1994 – 1995 UNIVERSITY OF PENNSYLVANIA, Philadelphia, PA
Research Assistant. Designed and executed a clinical research project to collect, clone, and express Canine Tumor Necrosis Factor (TNF) protein for the purpose of developing an Enzyme-linked Immunosorbent Assay (ELISA) to evaluate TNF levels in septic canines.

Awards/Honors

Society of Chemical Hazard Communication Outstanding Volunteer Award, 2023
National Institute of Environmental Health Sciences, Research Training Fellowship, 1999-2002
Cornell Institute of Comparative and Environmental Toxicology, Travel Award, 2001

Professional Affiliations

US EPA Science Advisory Board Environmental Justice Science and Analysis Review Panel (Member), 2024
US EPA Science Advisory Board EJScreen Review Panel (Member), 2023
Society for Chemical Hazard Communication (Program Committee)
Product Stewardship Society (Program Committee)
Society of Toxicology (Associate Member)
Past GreenScreen Advanced Training (Guest Lecturer, Acute Mammalian Toxicity and Systemic Toxicity)

Testimony

Lewis, AS. "Comments on H.R. Bill 1391 on Recycling Coal Combustion Residuals Accessibility Act of 2011." Presented to the House Subcommittee on Energy and the Environment, Washington, DC, April 14, 2011.

Example Projects

Environmental Justice Screening Analysis in Canada: For a multi-national food manufacturer, Gradient researched available socioeconomic, health, and environmental justice (EJ) screening factors for Ontario, Canada.

Propylene Glycol Scientific Review: On behalf of a trade organization, Gradient derived an acceptable daily intake (ADI) of propylene glycol by proposing a mode of action of toxicity.

Survey of Exposure to Quantify General Population Exposure: On behalf of a trade organization, developed state-of-the-science report regarding assessment of human far-field exposures to chemicals in commerce (including fenceline exposures) in the context of TSCA risk evaluations.

Data Availability and Initial Screening Assessment of Endocrine Disruption Properties for Petroleum-Related Substances: Gradient compiled relevant information regarding the endocrine disruption potential of hydrocarbons and petroleum substances, following guidance from the European Chemicals Agency (ECHA)/European Food Safety Authority (EFSA).

Toxicology Screening of Constituents Associated with Post-Combustion, Amine-Based Carbon Capture: Used toxicity and regulatory databases to screen chemicals in carbon capture waste streams for potential human health and environmental risk concerns. Intended to further research and data gaps for future risk assessment.

Recommended Best Practices for Assessing Risks in Baby Products: On behalf of a personal care product company, partnered with a global safety certification company to develop recommended best practices for assessing chemical risks associated with personal care products, focusing on those used in infant care.

State of Environmental Justice Screening Tools: Provided comprehensive assessment of EJSCREEN and other state environmental justice screening tools. Also included assessment of current environmental justice initiatives and intersection with chemical industry.

TSCA Fenceline Risk Assessment Comments: Provided comments on EPA's proposed approach to assess fenceline risks from facilities manufacturing or using priority chemicals.

Hazard and Risk Assessment of Surface Coating: On behalf of chemical working group, conducted weight-of-evidence evaluation of compound with suspected reproductive toxicity potential. Also conducted risk assessment for downstream workers and consumers.

1,4- Dioxane Assessment: For consumer product company evaluated presence of 1,4-dioxane in US groundwater and surface water supplies.

GHS Hazard Assessment: On behalf of a global oil and gas company, led project conducting GHS-based hazard assessments for a chemical portfolio consisting of more than 1,600 chemicals used in the formulation of tens of thousands of products. The hazard assessments were used to understand product-level hazards and update US and international Safety Data Sheets (SDSs) to meet GHS compliance requirements.

Risk Assessment of Contaminant in Baby Formula: On behalf of consumer products company, performed a risk assessment of cleaning fluids that accidentally leaked into powdered infant formula during the formulation process.

Development of Occupational Exposure Limits: After a change in harmonized hazard assignment, led project developing safe worker exposure levels to several fragrance substances for global fragrance company.

Risk Assessment for Hazardous Food Ingredient: On behalf of a food service client, Gradient evaluated the safety of a flavoring ingredient. We conducted a comprehensive hazard and risk assessment using data reported in the scientific literature and accepted risk assessment methodologies to determine whether there could be health risks for children or adults from regular consumption of food products containing this ingredient. The clients used our reports for their risk communication efforts.

Toxicity and Epidemiology of a Commercial Product: Provided litigation support for project involving the safety of a commercial product. Primary efforts included evaluating the toxicological and epidemiologic information of several different compounds used in commercial products.

Green Chemistry Assessment: Led toxicology of an alternatives assessment for a product using criteria outlined in US EPA's Design for the Environment (DfE) program. The assessment was submitted to US EPA for acceptance under this "green" chemistry program.

State-of-Knowledge Assessment of Hazards of New Technologies for Grid-Scale Battery Storage: Identified and evaluated potential health risks associated with the life cycle of batteries used for energy storage applications. We examined the chemical composition and life cycle risks associated with the production and disposal of a variety of battery types (*e.g.*, lithium ion, nickel cadmium, vanadium redox).

Risk Assessment Workshop: Invited instructor for risk assessment workshop focused on the derivation of health-based benchmarks for contaminants in drinking water. Workshop conducted for the utility industry.

Safety Data Sheet (SDS) for Metal Industry: On behalf of a trade association led a project developing a detailed, OSHA-compliant safety data sheet (SDS) for the manufacture and use of a metal in the United States (US). We performed a comprehensive toxicological and ecological hazard review of the metal and incorporated US-specific regulatory information.

Product Safety: Provided an in-depth review of lead exposure and toxicology issues. Findings were presented in a report that was used by the industry group as a basis to make informed decisions about design modification and safety testing of plumbing products.

Review of Antimicrobials: Oversaw project involving the extensive toxicology and regulatory review of various anti-microbial substances that are banned or under consideration for banning by the US Food and Drug Administration (US FDA).

Chemical Compliance: For a multinational chemicals company, led project registering and classifying hazards of chemical products to satisfy global regulatory requirements.

Product Stewardship: Led project providing ongoing support for a printer ink company. Work involves hazards assessment, registration support, and internal product standard development.

TSCA Support (PMN): For a large multinational chemicals company, led project providing technical expertise to fulfill regulatory requirements under the Toxic Substances Control Act (TSCA). Our expertise in read-across and complex chemistries, thorough analysis of exemptions, and careful documentation helped the client avoid unnecessary PMNs and create sustainable compliance strategies.

TSCA Support (Test Waivers): Oversaw project evaluating the scientific credibility of a US EPA Significant New Use Rule (SNUR) for a chemical of interest to an advanced materials manufacturer. The collective toxicity dataset and in silico models were used to support an argument against the scientific need for the EPA SNUR toxicity test requests.

Toxicity Assessment using Predictive Toxicology: On behalf of an office supply company, led project assessing toxicity of a newly developed compound. Because no existing toxicity information was available on the compound, we identified chemical surrogates expected to have a similar toxicological profile and conducted a structural alert analysis to better understand potential human health hazards.

Safety Data Sheet for Flavor Manufacturer: Led project involving SDS Requirements for natural food colorant products according to OSHA 2012 Haz Com Standard.

Coal Ash Regulatory Comment: In response to a Notice of Data Availability (NODA), Gradient assessed the potential impact of new data on US EPA's draft risk assessment of coal combustion waste (CCW). Our assessment was used by the client to propose revisions and additions to the US EPA's analysis.

Assessment of Coal Ash Surface Impoundment Closure Options: As a form of reliance material for a legal action, led an assessment of two closure scenarios for surface impoundments containing coal combustion residual (CCR) at an electric power utility.

Development of Coal Ash Surface Impoundment Closure Decision Framework: Served a principal investigation on project for Electric Power Research Institute supporting development of a comprehensive Framework that enables coal-fired utilities to evaluate the potential human health and environmental impacts associated with two closure options for surface impoundments (SI) containing coal combustion residual (CCR).

Constituent Profiles and Risk Issues: On behalf of a research organization sponsored by the power utility companies, oversaw a series of technical briefing documents providing an overview of the environmental fate and transport, human health and ecological risks associated with arsenic and selenium.

Development of a No Significant Risk Level: To comply with provisions of California's Proposition 65, developed a no significant risk level (NSRL) for an animal carcinogen that could volatilize from a consumer product.

Inhalation Criteria Development: Developed a series of health-based inhalation criteria (HBIC) for several different organic compounds present in printer cartridges. In some cases, derivation of the HBIC required surrogate selection, route-to-route extrapolation, and animal-to-human pharmacokinetic adjustments.

Risk Assessment of Emerging Chemicals: Provided technical oversight of a large risk assessment evaluating potential drinking water risks for emerging contaminants, a majority of which did not have established toxicity criteria. Researched and developed quantitative toxicity information that could be used to estimate potential risks.

Toxicity and Epidemiology of a Commercial Product: Provided litigation support for project involving the safety of a commercial product. Primary efforts included evaluating the toxicological and epidemiologic information of several different compounds used in commercial products.

Regulatory Comment on Coal Combustion Product Risk Assessment: Led evaluation of US EPA's technical approach for assessing human health and ecological risks associated with the storage of coal combustion products. Evaluations occurred in 2007 and on an updated version of the risk assessment in 2010. Our evaluations were provided to US EPA during a public comment period.

Overview Reports on Chemical Constituents in Coal Combustion Products: Lead author on a series of chapters summarizing the human health and ecological health effects of several metals found in coal combustion products, focusing on the use of this information in risk assessment and current regulatory standards and criteria. Metals included arsenic, thallium, selenium, and molybdenum.

Molybdenum Groundwater Limit: For an on-going project, leading effort to develop an alternative health-based guideline for molybdenum in drinking water.

Ecological Effects of Coal Combustion Products: Conducted literature review to evaluate the ecological effects of unintended releases of coal combustion products (CCPs), focusing effects on the growth, survival, reproduction, and population characteristics of aquatic and terrestrial organisms.

Mercury Risks from the Use of Coal Ash in Building Materials: Evaluated potential inhalation risks from mercury associated with the beneficial use of coal combustion products in wallboard, concrete, and structural fill.

Arsenic Content in Dietary Supplement: Evaluated whether the amount of inorganic arsenic in a dietary supplement product line would constitute an unacceptable inorganic arsenic exposure if products were taken individually or as part of a multi-product program. Estimated exposure from supplements and compared to international guidelines for arsenic in food, typical inorganic arsenic exposure in the US diet, and levels that are known to cause adverse effects in humans.

History of Use of a Dietary Ingredient (Toxic Tort): In the absence of extensive information on the toxicology of the ingredient *Hoodia gordonii*, researched its history of safe use as an appetite suppressant to refute a claim that a particular dietary supplement caused adverse health effects in an individual.

Toxic Tort Involving Dietary Supplement: Managed toxic tort project evaluating the claim that a dietary supplement containing multiple herbal ingredients was the cause of a stroke. Reviewed the health effects literature on the ingredients in the supplement, medical records of the plaintiff, and the risk factors for stroke.

Toxic Tort Involving Dietary Supplement: For a litigation project, assessed likelihood that a multi-ingredient dietary supplement was the cause of elevated liver enzymes and migraine headaches in a plaintiff. The evaluation involved examination of health information on the various ingredients in the product and examination of the plaintiff's medical records.

Evaluation of Structure-Function Claims: Evaluated several different structure-function claims for a product line for a major dietary supplement company. Activities included a comprehensive literature search, article summary, and a weight-of-evidence evaluation to determine if available science supported structure-function claims.

Toxic Tort Involving Pesticide Exposure: In the context of litigation, analyzed whether pesticide exposure was the cause of a specific birth defect. The evaluation involved a review of toxicological and epidemiological literature, as well as a reconstruction of potential dose *via* complex exposure pathways.

Arsenic Bioavailability Assessment: Led project providing input on a university study to evaluate the bioavailability of arsenic in soil with and without soil amendments aimed at reducing bioavailability.

PFC Regulatory Comments: Provided comments to a state agency regarding the toxicological significance of exposure to PFOA and PFOS *via* drinking water.

Class Action Determination for PFC Exposure: Assisted law firm to assess validity of a class action involving perfluorinated chemical exposure.

Residential Exposure Evaluation: Performed a risk evaluation in a community claiming that illegally disposed manufactured gas plant waste was a public health concern and decreased property values. The analysis was used as part of expert testimony.

Arsenic Exposure Assessment: Performed in-depth review of the relationship between exposure to arsenic in soil and the effect on arsenic body burden and health. Results were provided to client as part of a litigation effort.

Metal Risk Assessment: Interpreted the results of a metal bioassay and potential regulatory implications. Proposed experimental approach to establish chemical mode of action and human relevance of rodent bioassay results.

Human Health Risk Assessment: Provided input as a third-party consultant on a risk assessment of former chemical manufacturing plant. Role also included responding to community concerns.

Pesticide Re-registration of an Arsenic-based Pesticide: Managed a multi-faceted project in support of the re-registration of organic arsenic herbicides. This project included several presentations and technical submissions to US EPA regarding relevance of cancer data from animals to human risk, as well as directed responses to US EPA-issued risk assessments.

Lead Exposure and Toxicology: Assessed the validity of a tax allocation based on the contribution of historic gasoline emissions to current lead exposures in California. The findings were presented in a report that described the relative contribution of various lead sources to children's blood lead levels.

Arsenic Risk Assessment: Contributed to an expert report in a toxic tort case involving exposure to arsenic in a residential area. The report critically evaluated toxicological information regarding the carcinogenic effects of arsenic and the plausibility of health claims.

Arsenic Risk Assessment: Provided litigation support in lawsuit alleging that the presence of arsenic in a residential town caused a decrease in property value. The evaluation involved comparing levels of arsenic found in the town (in soil, water, dust, *etc.*) and arsenic exposures associated with adverse health effects.

Evaluation of Chemical Toxicity: Contributed to a weight-of-evidence evaluation of the low dose effects of Bisphenol A (BPA). The results were published in a peer-reviewed journal.

Arsenic Risk Assessment: Provided litigation support by evaluating the biological plausibility of the association between low level arsenic exposure and various health endpoints.

Manufactured Gas Plants: Contributed to an expert report that assessed the state of toxicological knowledge of contaminants released at a former MGP site.

Chromium Risk Assessment: Evaluated the feasibility of a nonlinear dose-response relationship between chromium and adverse health effects in litigation that involved occupational exposure to chromium(III).

Arsenic Risk Assessment: Provided litigation support in toxic tort case involving exposure to arsenic in a residential area. Assessed the strength of an association between arsenic exposure and several different health endpoints.

Regulatory Comment for Arsenic Risk Assessment: Contributed to an evaluation of the technical soundness of US EPA's risk assessment of chromated copper arsenate (CCA) treated wood.

Regulatory Comment for Arsenic Risk Assessment: Provided technical support to a consortium of registrants evaluating the technical validity of US EPA's approach to develop a cancer potency factor (CPF) for inorganic arsenic. The evaluation was presented in a technical white paper submitted to US EPA.

Human Health Risk Assessment: Prepared Method 3 risk characterizations in accordance with Massachusetts Contingency Plan (MCP) regulations for petroleum-impacted sites in Massachusetts.

Arsenic Risk Assessment: Provided information on inorganic arsenic's nonlinear dose-response relationship in response to a US EPA risk assessment of an industrial site with arsenic contamination.

Articles

Lewis, A; Dubé, EM; Bittner, A. 2017. "Key role of leachate data in evaluating CCP beneficial use." *ASH at Work* (Issue 1):32-34.

Kneeland, JM; Zhang, J; Lewis, AS. 2016. "The new TSCA: Greater certainty for safer chemicals." *ABA Environ. Disclosure Committee Newsl*. 14(2):11-14.

Lewis, A; Bittner, A. 2016. "Methods of closing CCR surface impoundments: Holistic assessment key to developing effective plans." *ASH at Work* (Issue 2):6-9.

Mayfield, DB; Lewis, AS. 2013. "Coal ash: A resource for rare earth and strategic elements." *ASH at Work* (Issue 1):17-21.

Mayfield, DB; Lewis, AS. 2013. "Coal ash recycling: A rare opportunity." *Waste Manag. World* 14(5).

Publications

Lewis, AS. 2023 (Fall). "Cumulative risk assessment and environmental justice: A growing partnership." *Gradient Trends – Environmental Justice* 88.

Bittner, A; Lewis, A. 2020 (Winter). "Beneficial use assessment of building materials containing CCPs." *Gradient Trends - Risk Science & Application* 77 3,5.

Boroumand, A; Greenberg, G; Herman, K; Lewis A. 2017. "Incorporating green and sustainable remediation analysis in coal combustion residuals (CCR) surface impoundment closure decision making." *Remediation* 27(4):29-38.

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Lewis, A; Bittner, A; Radloff, K; Hensel, B. 2017. "Storage of coal combustion products in the United States: Perspectives on potential human health and environmental risks." In *Coal Combustion Products (CCP's): Characteristics, Utilization and Beneficiation.* (Eds.: Robl, T; Oberlink, A; Jones, R), Woodhead Publishing, Duxford, United Kingdom, p481-507.

Hower, JC; Granite, EJ; Mayfield, DB; Lewis, AS; Finkelman, RB. 2016. "Notes on contributions to the science of rare earth element enrichment in coal and coal combustion byproducts." *Minerals* 6(2):32.

Lewis, A; Seeley, M; Pizzurro, D; Sharma, M; Flewelling, S. 2015. "A hierarchical framework for the selection and development of toxicity criteria for the evaluation of potential drinking water risks from hydraulic fracturing fluids." *Toxicologist* 144(1):49. Presented at the Society of Toxicology (SOT) 54th Annual Meeting, San Diego, CA, March 22-26.

Rohr, AC; Campleman, SL; Long, CM; Peterson, MK; Weatherstone, S; Quick, W; Lewis, AS. 2015. "Potential Occupational Exposures and Health Risks Associated with Biomass-Based Power Generation." *Int. J. Environ. Res. Public Health* 12:8542-8605.

Lewis, AS; Beyer, LA; Zu, K. 2015. "Considerations in deriving quantitative cancer criteria for inorganic arsenic exposure *via* inhalation." *Environ. Int*. 74:258-273.

Mayfield, DB; Lewis, AS; Bailey, LA; Beck, BD. 2014. "Properties and effects of metals." In *Principles of Toxicology: Environmental and Industrial Applications Third Edition*. (Eds.: Roberts, SM; James, RC; Williams, PL), Wiley, p283-307.

Lynch, HN; Greenberg, GI; Pollock, MC; Lewis, AS. 2014. "A comprehensive evaluation of inorganic arsenic in food and considerations for dietary intake analyses." *Sci. Total Environ*. 496:299-313.

Lewis, AS; Reid, KR; Pollock, MC; Campleman, SL. 2012. "Speciated arsenic in air: Measurement methodology and risk assessment considerations." *J. Air Waste Manage. Assoc.* 62(1):2-17.

Hughes, MF; Beck, BD; Chen, Y; Lewis, AS; Thomas, DJ. 2011. "Arsenic exposure and toxicology: A historical perspective." *Toxicol. Sci.* 123(2):305-32.

Lewis, AS; Sax, SN; Wason, SC; Campleman, SL. 2011. "Non-chemical stressors and cumulative risk assessment: An overview of current initiatives and potential air pollutant interactions." *Int. J. Environ. Res. Public Health*. 8(6):2020-2073.

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****Awarded Top 10 Best Published Paper Demonstrating Application of Risk Assessment by the Society of Toxicology Risk Assessment Specialty Section.**

Posters and Presentations

Kondziolka, JM; Lewis, AS. 2024. "Corrective Action Sustainability: Holistic Decision Support Tool." Presented at Southern Company Professional Development Meeting, Birmingham, AL, October 24.

Lewis, AS. 2024. "The Intersection of Environmental Justice Initiatives Coal Combustion Products." Presented at Southern Company Professional Development Meeting. 22p. September 26.

Lewis, AS. 2024. "Screening, Testing, and Assessing Ingredient Portfolios for Endocrine Disruption." Presented at the 2024 Society for Chemical Hazard Communication (SCHC) Annual Meeting, Charlotte, NC. 30p. September 24.

Lewis, AS. 2024. "Coal Transport and Environmental Justice: Two Trains on the Same Track." Presented at the National Coal Transportation Association (NCTA) 50th Annual Business Meeting and Conference, Tucson, AZ. 22p. September 11.

Kondziolka, J; Lewis, A. 2024. "Corrective Action Sustainability: Holistic Decision Support Tool." Presented at World of Coal Ash (WOCA) 2024, Grand Rapids, MI, May 14.

Lewis, A; Kondziolka, J; Biega, M; Tentori, E; Zhang, Q; Shrivastava, I; Hensel, B. 2024 "Example Application of a Holistic Decision Support Tool Used for Selecting Corrective Actions at Coal Combustion Product Sites." Abstract/Poster #: 182. Presented at World of Coal Ash (WOCA) 2024, Grand Rapids, MI, May 13-16.

Hensel, B; Lewis, A; Kondziolka, J. [Electric Power Research Institute (EPRI); Gradient]. 2023. "Decision Support Tool for Selecting Corrective Actions Considering Principles of Sustainability." Presented at National Groundwater Association (NGWA)'s Groundwater Week 2023, Las Vegas, NV. 18p. December 5.

Verslycke, T; Lewis, AS; Manidis, T; Lyon, D; Synhaeve, N; Hinkal, G; Saunders, L; Villalobos, SA; Colvin, K. 2023. "Screening Assessment of Endocrine Disruption Properties of a Large Portfolio of Petroleum-Related UVCB Substances." Poster # 1.06.P-Mo-006. Presented at the SETAC North America 44th Annual Meeting, Louisville, KY, November 12-16.

Verslycke, T; Lewis, AS. 2023. "Screening, Testing, and Assessing Ingredient Portfolios for Endocrine Disruption." Presented at the Personal Care Product Council Science Symposium, Arlington, VA, October 24-25, 35p.

Lewis, AS. 2023. "Update on US EPA Environmental Justice Policies: A Survey of Federal Activities." Presented at the Association of Battery Recyclers (ABR) Fall Meeting, Las Vegas, NV, October 19, 27p.

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Lewis, AS. 2022. "Evaluating Exposure and Risk in Fenceline Communities: The Uses and Limitations of Publicly Available Geographic Information System (GIS)-Based Tools." Presented at the SETAC North America 43rd Annual Meeting, Pittsburgh, PA, November 14.

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Pouncey, GL Jr.; Fotouhi, D; Lewis, AS. 2021. "Environmental Regulation: Enforcement Priorities and Compliance: Issues to Watch Out For." 33p. Presented at the Knowledge Group Webcast. July 26.

Lewis, AS. 2021. "The Intersection of Environmental Justice and Risk Science." 23p. Presented at the EPRI Virtual Coal Combustion Products (CCP) P241 and P242 Summer 2021 Meeting: Session 2: CCP Site Characterization and Risk. July 21.

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Reid, KR; Mattuck, RL; Kagel, C; Lewis, AS [Moderator]. 2019. "From 60 Day Notice to Compliance: Navigating Prop 65 Testing and Exposure Assessment Challenges." Presented at the Product Stewardship Conference, Columbus, OH. September 10-12.

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Lewis, A. 2019. "Regulatory Updates For Key Metals." Presented at the EPRI GWRC Risk Assessment Workshop, Pensacola, FL. February 7.

Lewis, A. 2019. "Environmental Safety Benchmarks: Putting the Pieces Together." Presented at the EPRI GWRC Risk Assessment Workshop, Pensacola, FL. February 7.

Lewis, A. 2019. "Risk-Based Approaches for Establishing Alternative Groundwater Protection Standards." Presented at the EPRI Remediation Workshop, Pensacola, FL. February 5.

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Lewis, AS; LaMotte, R. 2018. "The Big Reveal: Preparing for Increased Ingredient Transparency." Presented at the Product Stewardship Conference, Washington DC, September 27-19.

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Lewis, A. 2018. "Coal Ash Management and Beneficial Use: What's Happening in the US?". Presented at the Ash Development Association of Australia National Technical and Education Committee Workshop, Sydney, Australia, July 16, 41p.

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EXHIBIT 37

Human Health and Ecological Risk Assessment
Marion Power Station
Southern Illinois Power Cooperative
Marion, Illinois

Prepared by

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Principal

December 20, 2024

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Abbreviations

ADI	Acceptable Daily Intake
BCF	Bioconcentration Factor
CCR	Coal Combustion Residuals
CEM	Conceptual Exposure Model
COI	Constituent of Interest
COPC	Constituent of Potential Concern
CSM	Conceptual Site Model
GWPS	Groundwater Protection Standard
GWQS	Groundwater Quality Standard
HTC	Human Threshold Criteria
ID	Identification
IEPA	Illinois Environmental Protection Agency
ISGS	Illinois State Geological Survey
K_d	Equilibrium Partitioning Coefficient
MCL	Maximum Contaminant Level
MGS	Marion Power Generating Station
NRWQC	National Recommended Water Quality Criteria
ORNL RAIS	Oak Ridge National Laboratory's Risk Assessment Information System
pCi/L	Picocuries per Liter
PRG	Preliminary Remediation Goal
RfD	Reference Dose
RME	Reasonable Maximum Exposure
RSL	Regional Screening Level
SIPC	Southern Illinois Power Cooperative
SWQS	Surface Water Quality Standard
US EPA	United States Environmental Protection Agency

1 Introduction

Southern Illinois Power Cooperative (SIPC) owns and operates the Marion Power Generating Station (MGS), a gas and coal-fired electric power generating facility in Marion, Illinois. The MGS is located in Williamson County, approximately eight miles south of Marion, Illinois, on the northwestern bank of the Lake of Egypt (Figure 1.1). The MGS began operation in 1963. The area surrounding the facility is a rural agricultural community (Kleinfelder, 2013). The MGS has several surface impoundments that have been used for storage of coal combustion residuals (CCR) and several impoundments that were used to support other operational purposes (*e.g.*, wastewater storage, surface water run-off collection). This report addresses potential impacts from the surface impoundments (*i.e.*, storage ponds) that did not routinely receive CCRs and consequently contain a *de minimis* amount of CCRs. These storage ponds include:

- Pond 4
- Pond 3 and Pond 3A
- Pond S-6
- Pond B-3
- South Fly Ash Pond

This report presents the results of an evaluation that characterizes potential risk to human and ecological receptors that may be exposed to CCR constituents in environmental media originating from the storage ponds listed above. This risk evaluation was performed to support a petition for relief from the closure schedule required under the Illinois coal ash rule (IEPA, 2021). Human health and ecological risks were evaluated for Site-specific constituents of interest (COIs). The conceptual site model (CSM) assumed that Site-related COIs in groundwater may migrate to the Lake of Egypt or to Little Saline Creek and affect surface water in the vicinity of the Site.

Consistent with United States Environmental Protection Agency (US EPA) guidance (US EPA, 1989), this report used a tiered approach to evaluate potential risks, which included the following steps:

1. Identify complete exposure pathways and develop a conceptual exposure model (CEM).
2. Identify Site-related COIs: Constituents detected in groundwater were considered COIs if their maximum detected concentration over the period from 2018 to 2023 exceeded a groundwater protection standard (GWPS) identified in Part 845.600 (IEPA, 2021), or a relevant surface water quality standard (SWQS) (IEPA, 2019).
3. Perform screening-level risk analysis: Compare maximum measured or modeled COI concentrations in surface water and sediment to conservative, health-protective benchmarks in order to determine constituents of potential concern (COPCs).
4. Perform refined risk analysis: If COPCs are identified, perform a refined analysis to evaluate potential risks associated with the COPCs.
5. Formulate risk conclusions and discuss any associated uncertainties.

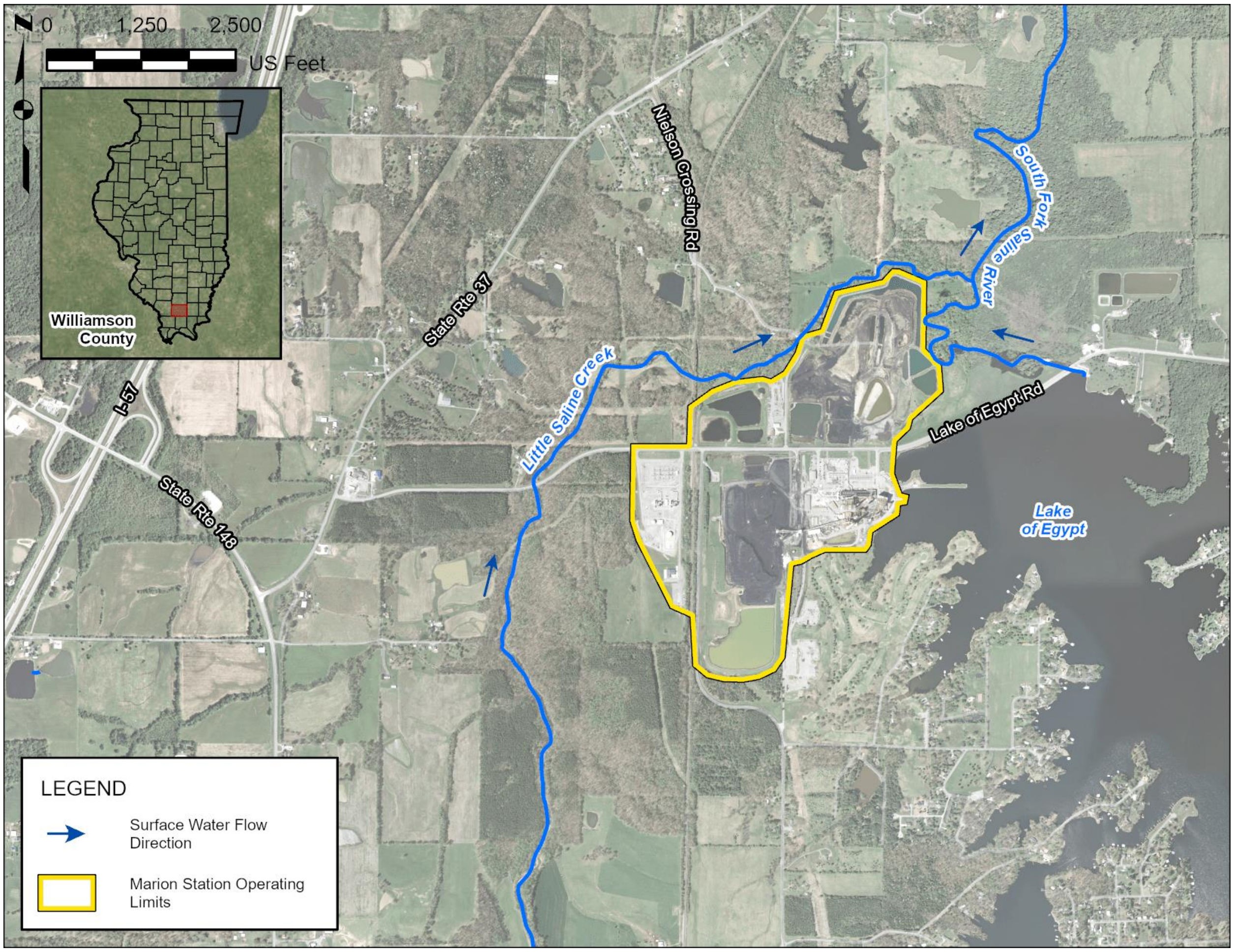

Figure 1.1 Site Location Map. Sources: Golder Associates Inc., 2021; USGS, 2022; US Census Bureau, 2016; USGS, 2011.

This assessment relies on a conservative (*i.e.*, health-protective) approach and is consistent with the risk approaches outlined in US EPA guidance (US EPA, 1989; US EPA, 2004; US EPA [Region IV], 2018). Specifically, we considered evaluation criteria detailed in Illinois Environment Protection Agency (IEPA) guidance documents (*e.g.*, IEPA, 2013, 2019), incorporating principles and assumptions consistent with the Federal CCR Rule (US EPA, 2015a) and US EPA's "Human and Ecological Risk Assessment of Coal Combustion Residuals" (US EPA, 2014).

US EPA has established acceptable risk metrics. Risks above these US EPA-defined metrics are termed potentially "unacceptable risks." Based on the evaluation presented in this report, no unacceptable risks to human or ecological receptors resulting from CCR exposures associated with the ponds listed above were identified. This means that the risks from the Site are likely indistinguishable from normal background risks. Specific risk assessment results include the following:

- No completed exposure pathways were identified for any groundwater receptors; consequently, no risks were identified relating to the use of groundwater for drinking water and other household purposes.
- No unacceptable risks were identified for the use of Lake of Egypt surface water as drinking water.
- No unacceptable risks were identified for recreators boating in Lake of Egypt.

- No unacceptable risks were identified for anglers consuming locally-caught fish.
- No unacceptable risks were identified for ecological receptors exposed to surface water or sediment.
- No bioaccumulative ecological risks were identified.

It should be noted that this evaluation incorporates a number of conservative assumptions that tend to overestimate exposure and risk (discussed in Section 3.5).

2 Site Overview

2.1 Site Description

The MGS is located in Williamson County, approximately eight miles south of Marion, Illinois, on the northwestern bank of the Lake of Egypt. The MGS facility is bordered to the east by Lake of Egypt, to the southeast by a golf course (Lake of Egypt Country Club), and to the south, west, and north by farmland (Figure 2.1). Little Saline Creek is located just north of the MGS facility boundary; it flows northeast and joins the South Fork Saline River about 600 feet east of the facility boundary (Figure 2.1).

Only "relatively small amounts of fly ash" were produced at the Site (SIPC, 2021a). Fly ash that was generated was transported and stored in the Initial Fly Ash Holding Area, Replacement Fly Ash Holding Area, Pond A-1, or the Former On-Site Landfill (SIPC, 2021a). The former Fly Ash Holding Areas are within the cover area for the Former On-Site Landfill (SIPC, 2021a). Other ponds located on Site (Figure 2.1) and a description of their historic and current operation are described below.

- Ponds 1 and 2 received sluiced bottom ash from power generation units 1, 2, 3, and 4 (Figure 1.1; SIPC, 2021a). During the entire pond operational life, bottom ash was removed from Ponds 1 and 2, and sold for beneficial reuse to shingle manufacturers, grit blasting companies, and local highway departments. Decanted water from Ponds 1 and 2 flowed into Pond 4.
- The Former Emery Pond was constructed in the late 1980s to hold stormwater drainage from the generating station (Figure 1.1; SIPC, 2021a). All CCRs in Emery Pond have been removed and the pond has been closed (SIPC, 2021a). Groundwater corrective action is currently on-going (Hanson Professional Services Inc., 2021).
- South Fly Ash Pond was constructed in 1989 and was originally intended to be a replacement for Pond A-1 (Figure 1.1; SIPC, 2021a). Ultimately, Pond A-1 did not need to be replaced. Thus, the South Fly Ash Pond was only used to receive decant water from the Former Emery Pond while it was operational. No CCRs were ever directly sent to or disposed of in the South Fly Ash Pond (SIPC, 2021a).
- Ponds 3 and 3-A were secondary ponds that received overflow from the fly ash holding areas (Figure 1.1; SIPC, 2021a). They also received storm water runoff, coal pile runoff, and water from the facility floor drains. In approximately 1982, Pond 3-A was separated from Pond 3 by construction of an internal berm. All sediment and debris were removed from Pond 3 in 2006 and 2011. All sediment and debris were removed from Pond 3-A in 2014. Subsequently, no CCRs were ever directly sent to or disposed in Ponds 3 or 3-A. Currently, water from the South Fly Ash Pond flows into Pond 3 (SIPC, 2021a).
- Pond S-6 was originally built to manage stormwater associated with the Former Landfill (Figure 1.1; SIPC, 2021b). Initially, water in Pond S-6 discharged to Little Saline Creek through Outfall 001; however, in approximately 1993, water from Pond S-6 was pumped to Pond 4. No CCRs were ever directly sent to or disposed in the Pond S-6 (SIPC, 2021a).
- Pond B-3 was built in 1985 and was primarily used as a secondary pond that received water from Pond A-1 (Figure 1.1; SIPC, 2021a). During periodic shutdowns of Pond A-1, Pond B-3 may have received some short-term discharges of fly ash from Unit 1, 2, and 3 prior to their shutdown (SIPC, 2021a). In 2017, Pond B-3 was dewatered and all sediment and CCR were excavated.

- Pond 4 was built in 1979 and historically received decant water from Ponds 1 and 2 for secondary treatment and received runoff from the coal pile (Figure 1.1; Kleinfelder, 2013; SIPC, 2021 a,b). No CCRs were ever directly sent to or disposed in the Pond 4. All sediment and debris were removed from Pond 4 in 2012. Currently, Pond 4 receives overflow from Pond S-6; water in Pond 4 discharges into the Little Saline Creek *via* Outfall 002 (Kleinfelder, 2013; SIPC, 2021a).

The ponds are shown in Figure 2.1. This Risk Assessment focuses on the storage ponds that supported operations but never directly received CCRs on a routine basis. These storage ponds include: Pond 4, Pond 3 and 3A, Pond S-6, Pond B-3, and the South Fly Ash Pond.

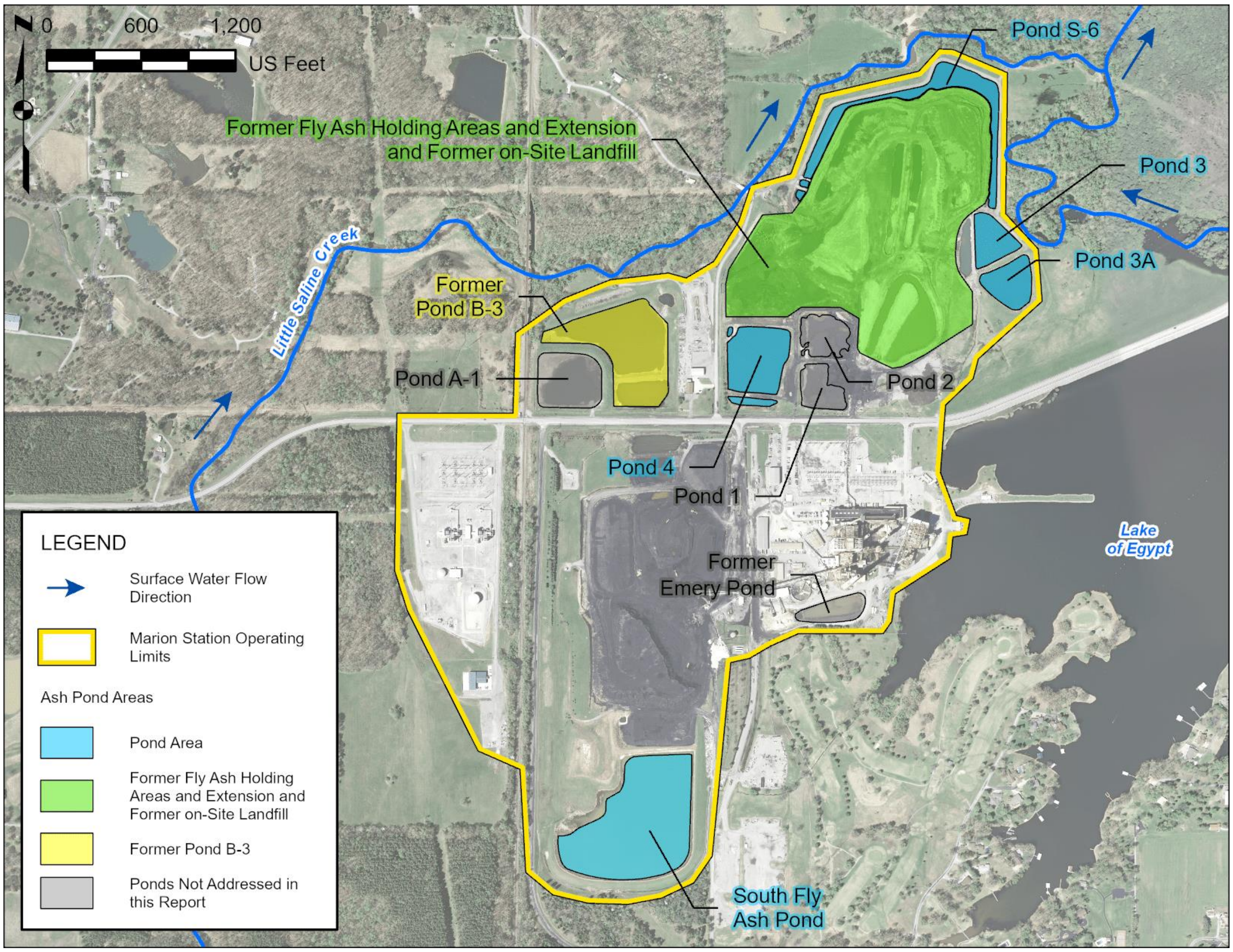

Figure 2.1 Site Layout. Sources: Golder Associates Inc., 2021; USGS, 2022; Andrews Engineering, 2021; SIPC, 2021a; USGS, 2011.

2.2 Geology/Hydrogeology

The Site is located at the southern edge of the Illinois Basin in the Shawnee Hills Section of the Interior Low Plateaus physiographic province (Golder Associates Inc., 2021). The Illinois Basin is a depositional and structural basin composed of sedimentary rocks ranging in age from Cambrian to Permian. The southern portion of the basin is characterized by extensive faulting, and some of these faults host commercially significant fluorite vein deposits (Golder Associates Inc., 2021). The regional stratigraphic sequence includes the following, from the surface downward (Golder Associates Inc., 2021):

- The Caseyville/Tradewater Formation: consists of lenticular, vertically and horizontally interbedded layers of sandstone, siltstone, and shale beneath a relatively thin layer of unconsolidated materials. It ranges from 190 to 500 feet in thickness.
- The Kinkaid Formation: consists of limestone, shale, claystone, and sandstone. It is separated from the overlying Pennsylvanian rocks of the Caseyville Formation by a laterally extensive unconformity. It ranges from 120 to 160 feet in thickness.
- The Degonia Formation: consists of thin, very-fine grained sandstone, siltstone, shale, and irregular chert beds. It ranges from 20 to 64 feet in thickness.
- The Clore Formation: consists of sandstone, shale and limestone, which sporadically outcrops at the surface. It ranges from 110 to 155 feet in thickness.

On Site, soils overlying the Caseyville/Tradewater Formation consist of glacial and alluvial deposits including layers of silty clay, clayey silt, silty sand and clayey sand (Kleinfelder, 2013). Table 2.1 provides a detailed summary of the Site lithology for the upper 50 feet (Golder Associates Inc., 2021).

Table 2.1 Site Geology

Lithology	Description
Peoria/Roxana Silt	Light yellow-tan to gray, fine sandy silt
Glasford Formation	Silty/sandy diamictons with thin lenticular bodies of silt, sand, and gravel
Caseyville Formation/Bedrock	Sedimentary rocks including sandstone, limestone, and shales

Source: Golder Associates, Inc., 2021; Kleinfelder, 2013.

The Site is located within the South Fork Saline River/Lake Egypt watershed. Groundwater in the southern/eastern portion of the Site flows toward and discharges into the Lake of Egypt; groundwater throughout the rest of property flows in a northeasterly direction toward Little Saline Creek (Figure 3.3; SIPC, 2007). The uppermost water-bearing zone (*i.e.*, the Unlithified Unit) is a shallow, hydraulically perched layer consisting of fill and residuum (silts and clays), with a saturated thickness of approximately up to 10 feet (Hanson Professional Services Inc., 2021). The average horizontal hydraulic conductivity is estimated to be approximately 1.5×10^{-4} cm/s in the Unlithified Unit (Golder Associates Inc., 2021). The hydraulic gradient was estimated to be 0.019 based on measured groundwater elevations at monitoring wells S-3 and S-6 (SIPC, 2007).

2.3 Conceptual Site Model

A CSM describes sources of contamination, the hydrogeological units, and the physical processes that control the transport of water and solutes. In this case, the CSM describes how groundwater underlying the MGS migrates and potentially interacts with surface water and sediment in the Lake of Egypt and Little

Saline Creek. The CSM was developed using site-specific hydrogeologic data, including information on groundwater flow and surface water characteristics.

Groundwater (and CCR-related constituents originating from the MGS) may migrate vertically downward through the Unlithified Unit. As noted in Section 2.2, the dominant groundwater flow direction at the Site is to the northeast toward Little Saline Creek. However, south of Lake of Egypt Road, groundwater has an eastern flow component toward the Lake of Egypt (SIPC, 2007). Dissolved constituents in groundwater that flows into these two water bodies may partition between sediment and surface water.

2.4 Groundwater Monitoring

Data from the following monitoring wells were included in this risk assessment, as they are used to monitor groundwater quality downgradient and upgradient of the MGS (Figure 2.3):

- Wells C-1, C-2, C-3 and Well EBG; these wells were used to characterize groundwater quality near the South Fly Ash Pond.
- Wells S-1, S-2, S-3, S-4, S-5, S-6; these wells were used to characterize groundwater quality near the Pond 4, Pond 3 and 3A, Pond S-6, and Pond B-3.

The monitoring well construction details are presented in Table 2.2. The analyses presented in this report rely on the available data from these wells collected between 2018 and 2023. Groundwater samples were analyzed for a suite of total metals, specified in Illinois CCR Rule Part 845.600 (IEPA, 2021),[1] as well as general water quality parameters (pH, chloride, fluoride, sulfate, and total dissolved solids). A summary of the groundwater data used in this risk evaluation is presented in Tables 2.3a and 2.3b. The use of groundwater data in this risk evaluation does not imply that detected constituents are associated with operations at MGS or that they have been identified as potential groundwater exceedances.

[1] Samples were analyzed for a longer list of inorganic constituents and general water quality parameters (chloride, fluoride, sulfate, and total dissolved solids), but these constituents were not evaluated in the risk evaluation.

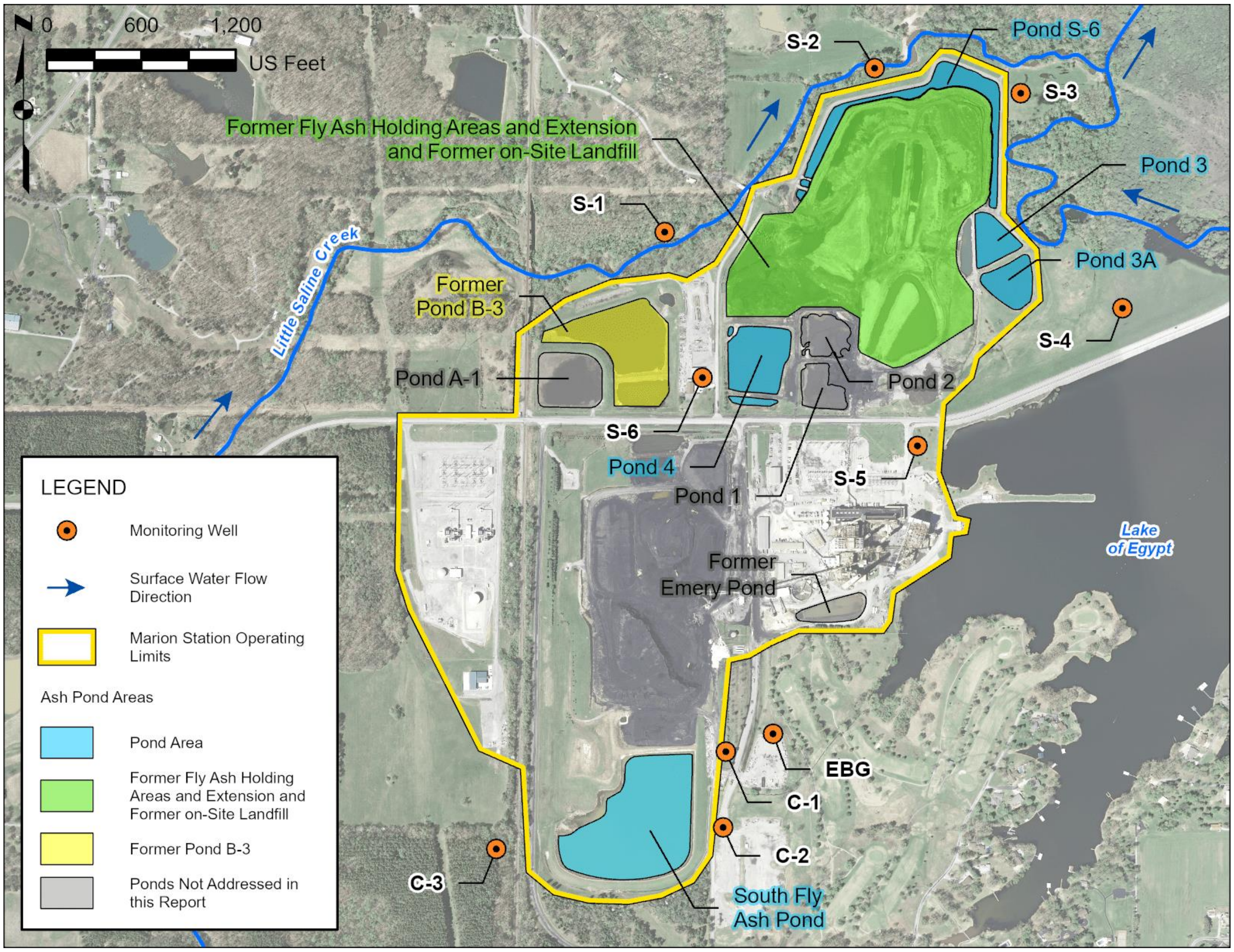

Figure 2.2 Monitoring Well Locations. Sources: Golder Associates Inc., 2021; USGS, 2022; SIPC, 2007; Andrews Engineering, 2021; SIPC, 2021a; USGS, 2011.

Table 2.2 Groundwater Monitoring Wells

Well	Date Constructed	Screen Top Depth (ft bgs)	Screen Bottom Depth (ft bgs)	Well Depth (ft bgs)	Hydrostratigraphic Unit (Screened Interval)
C-1	2/16/2010	5	15	15	Unlithified Unit/Bedrock
C-2	2/16/2010	2	12	12	Unlithified Unit/Bedrock
C-3	(no info)	(no info)			Unlithified Unit/Bedrock
EBG	2/8/2017	18	28	28	Unlithified Unit/Bedrock
S-1	9/20/1993	15	25	25	Unlithified Unit/Bedrock
S-2	2/18/2010	16	26	27.5	Unlithified Unit/Bedrock
S-3	9/20/1993	15	25	25	Unlithified Unit/Bedrock
S-4	9/21/1993	8	18	18	Unlithified Unit/Bedrock
S-5	9/20/1993	12	22	22	Unlithified Unit/Bedrock
S-6	9/20/1993	12	22	22	Unlithified Unit/Bedrock

Notes:
bgs = Below Ground Surface; ft = Feet; EBG = Emery Pond Background Well.

Table 2.3a Groundwater Data Summary (2018-2023) for C-Wells + EBG

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Total Metals (mg/L)					
Antimony	0	20	ND	ND	0.030
Arsenic	7	20	0.00040	0.0075	0.10
Barium	19	20	0.012	0.20	0.0050
Beryllium	3	21	0.00038	0.00060	0.020
Boron	36	81	0.011 J	12 J	0.50
Cadmium	5	77	0.00066	0.013	0.020
Chromium	8	21	0.00070	0.0042	0.030
Cobalt	13	21	0.00020 J	0.29 J	0.020
Lead	3	21	0.0011	0.0031	0.050
Lithium	8	13	0.014	0.024	0.060
Mercury	1	19	0.000070	0.000070	0.00020
Molybdenum	8	14	0.0012 J	0.015	0.040
Selenium	11	21	0.00060	0.033	0.025
Thallium	2	21	0.0012	0.031	0.040
Dissolved Metals (mg/L)					
Boron	12	24	0.040	0.92	0.50
Cadmium	0	24	ND	ND	0.0010
Radionuclides (pCi/L)					
Radium 226 + 228	9	11	0.12	2.7	0.33
Other (mg/L or SU)					
Chloride	61	63	2.4	570	20
Fluoride	19	24	0.10	0.68	0.50
pH	47	47	5.8	7.0	0
Sulfate	81	81	49	670	123
Total Dissolved Solids	51	51	100	4000	16

Notes:
EBG = Emery Pond Background Well; J = Estimated Value; mg/L = Milligrams per Liter; ND = Not Detected; pCi/L = Picocuries per Liter; SU = Standard Unit.
Blank cells indicate constituent not detected.

Table 2.3b Groundwater Data Summary (2018-2023) for S-Wells

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Total Metals (mg/L)					
Antimony	0	12	ND	ND	0.0050
Arsenic	3	12	0.0089	0.12	0.050
Barium	12	12	0.020	1.5	NA
Beryllium	1	12	0.0081	0.0081	0.0050
Boron	35	126	0.0041	2.8	0.50
Cadmium	12	126	0.00068	0.055	0.002
Chromium	9	12	0.0014	0.069	0.0050
Cobalt	5	12	0.0012	0.054	0.010
Lead	7	12	0.0027	0.080	0.0050
Mercury	0	12	ND	ND	0.00020

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Selenium	3	12	0.0021	0.017	0.025
Thallium	1	12	0.046	0.046	0.025
Dissolved Metals (mg/L)					
Boron	14	48	0.0051	3.1	0.50
Cadmium	0	48	ND	ND	0.001
Other (mg/L or SU)					
Chloride	88	90	6.1	480	20
Fluoride	6	12	0.062	0.18	0.50
pH	66	66	5.7	6.9	NA
Sulfate	122	126	2.6	310	20
Total Dissolved Solids	66	66	78	4500	NA

Notes:
mg/L = Milligrams per Liter; NA = Not Available; ND = Not Detected; SU = Standard Unit.
Blank cells indicate constituent not detected.

2.5 Surface Water Monitoring

Surface water samples were collected by MGS from five locations in Lake of Egypt in June 2020. The sample locations are listed in Table 2.4, are shown in Figure 2.2, and the sampling results are summarized in Table 2.5. Surface water data are also available from the Lake of Egypt public water district as part of routine monitoring. The data used in this report were collected 2018-2023, and the sampling results are summarized in Table 2.6.

Table 2.4 Lake of Egypt Sample Locations

Sample ID	Description
LE-u	Upstream sample
LE-d	Spillway sample
LE-in	Public water supply intake
LE-b1	Bay sample #1
LE-b2	Bay sample #2

Figure 2.3 Surface Water Sample Locations. Source: Hanson (2021)

Table 2.5 Surface Water Data Summary for Lake of Egypt Samples

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Total Metals (mg/L)					
Arsenic	0	5	ND	ND	0.025
Barium	5	5	0.00227	0.00265	NA
Boron	0	5	ND	ND	0.02
Cadmium	0	5	ND	ND	0.001
Chromium	0	5	ND	ND	0.005
Cobalt	0	5	ND	ND	0.005
Lead	0	5	ND	ND	0.001
Mercury	0	5	ND	ND	0.2
Selenium	0	5	ND	ND	0.001
Thallium	0	5	ND	ND	0.002
Other (mg/L)					
Chloride	1	5	4	4	4
Fluoride	0	5	ND	ND	0.1
pH	5	5	6.57	7.25	NA
Sulfate	5	5	16	17	NA
Total Dissolved Solids	5	5	44	60	NA

Notes:
mg/L = Milligrams per Liter; NA = Not Available; ND = Not Detected; SU = Standard Unit.
Blank cells indicate constituent was not detected.
Data collected on 6/1/2020.

Table 2.6 Surface Water Data Summary for Lake of Egypt Public Water District Data

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Total Metals (mg/L)					
Antimony	0	6	ND	ND	0.003
Arsenic	0	6	ND	ND	0.001
Barium	6	6	0.021	0.0263	NA
Beryllium	0	6	ND	ND	0.001
Cadmium	0	6	ND	ND	0.003
Chromium	0	6	ND	ND	0.005
Mercury	0	6	ND	ND	0.0002
Selenium	1	6	0.0024	0.0024	0.002
Thallium	0	6	ND	ND	0.002
Radionuclides (pCi/L)					
Radium 226 + 228	1	1	1.03	1.03	NA
Other (mg/L)					
Chloride	6	6	10.4	23	NA
Fluoride	6	6	0.553	0.73	NA
Sulfate	6	6	34.6	51.7	NA
Total Dissolved Solids	6	6	87	158	NA

Notes:
mg/L = Milligrams per Liter; NA = Not Available; ND = Not Detected; pCi/L = Picocuries per Liter.
Data collected 2018-2023.

3 Risk Evaluation

3.1 Risk Evaluation Process

A risk evaluation was conducted to determine whether constituents present in groundwater underlying and downgradient of the MGS have the potential to pose adverse health effects to human and ecological receptors. The risk evaluation is consistent with the principles of risk assessment established by US EPA and has considered evaluation criteria detailed in Illinois guidance documents (*e.g.*, IEPA, 2013, 2019).

The general risk evaluation approach is summarized in Figure 3.1 and discussed below.

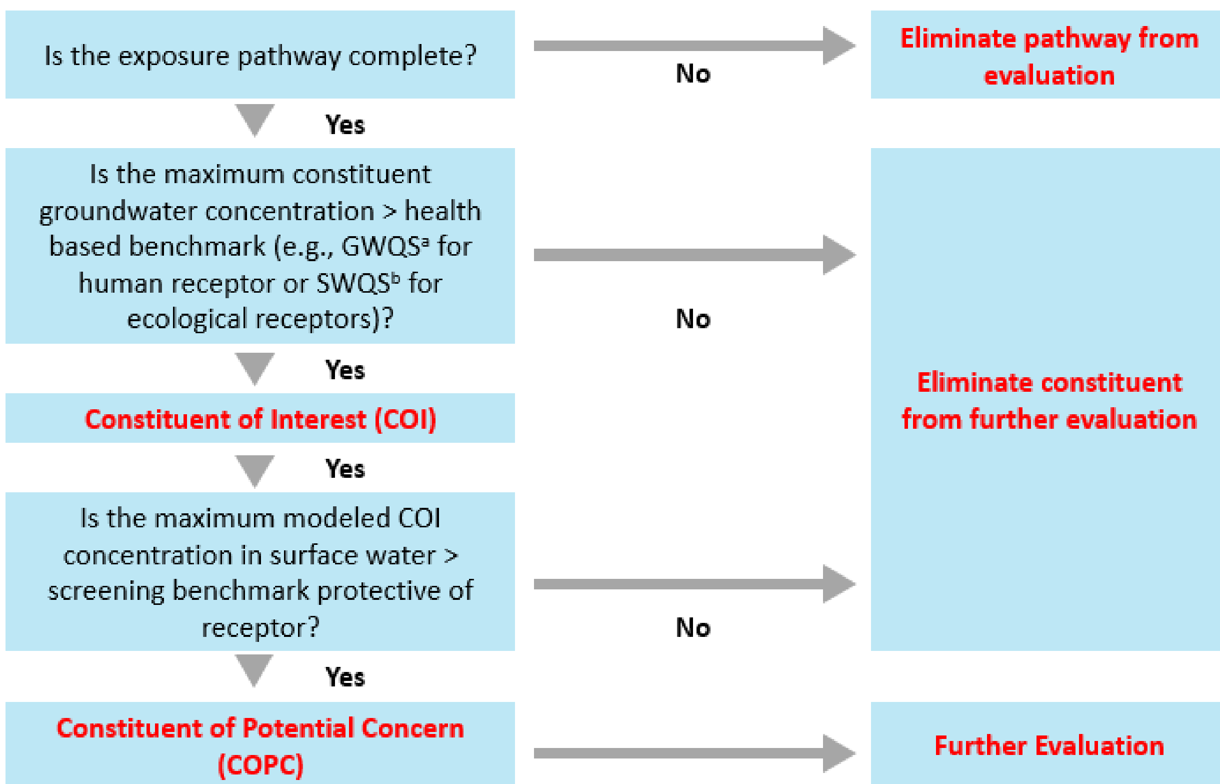

Figure 3.1 Overview of Risk Evaluation Methodology. IEPA = Illinois Environmental Protection Agency; GWQS = IEPA Groundwater Quality Standards; SWQS = IEPA Surface Water Quality Standards. (a) The IEPA Part 845 Groundwater Protection Standards (GWPS) were used to identify COIs. (b) IEPA SWQS protective of chronic exposures to aquatic organisms were used to identify ecological COIs. In the absence of an SWQS, US EPA Region IV Ecological Screening Values (ESVs) were used.

The first step in the risk evaluation was to develop the CEM and identify complete exposure pathways. All potential receptors and exposure pathways based on groundwater use and surface water use in the vicinity of the Site were considered. Exposure pathways that are incomplete were excluded from the evaluation.

Groundwater data were used to identify COIs. COIs were identified as constituents with maximum concentrations in groundwater in excess of groundwater quality standards (GWQS)[2] for human receptors, and SWQS for ecological receptors. Based on the CSM (Section 2.2), groundwater in the south half of the Site, on the west side of the South Fly Ash Pond, has the potential to interact with surface water in the Lake of Egypt. Therefore, potential facility-related constituents in groundwater may potentially flow toward and into surface water in the Lake of Egypt. Surface water samples have been collected from the Lake of Egypt adjacent to the Site, and Gradient used the measured surface data to evaluate potential risks to receptors in using the lake for recreation and as a source of drinking water.

Groundwater in the northern portion of the Site, near Pond 4, Pond 3 and 3A, Pond S-6, and Pond B-3 and in the northern portion of the South Fly Ash pond has the potential to interact with surface water in Little Saline Creek. No surface water has been collected from Little Saline Creek, therefore, Gradient modeled the COI concentrations in Little Saline Creek based on the groundwater data from the groundwater monitoring wells located in this portion of the Site (*i.e.*, S-wells). The measured and modeled COI concentrations in surface water and sediment were compared to conservative, generic risk-based screening benchmarks for human health and ecological receptors. These generic screening benchmarks rely on default assumptions with limited consideration of site-specific characteristics. Human health benchmarks are receptor-specific values calculated for each pathway and environmental medium that are designed to be protective of human health. Human health and ecological screening benchmarks are inherently conservative because they are intended to screen out chemicals that are of no concern with a high level of confidence. Therefore, a measured or modeled COI concentration exceeding a screening benchmark does not indicate an unacceptable risk, but only that further risk evaluation is warranted. COIs with maximum concentrations exceeding a conservative screening benchmark are identified as COPCs requiring further evaluation.

As described in more detail below, this evaluation relied on the screening assessment to demonstrate that constituents present in groundwater underlying the facility do not pose an unacceptable human health or ecological risk. That is, after the screening step, no COPCs were identified and further assessment was not warranted.

3.2 Human and Ecological Conceptual Exposure Models

A CEM provides an overview of the receptors and exposure pathways requiring risk evaluation. The CEM describes the source of the contamination, the mechanism that may lead to a release of contamination, the environmental media to which a receptor may be exposed, the route of exposure (exposure pathway), and the types of receptors that may be exposed to these environmental media.

3.2.1 Human Conceptual Exposure Model

The human CEM for the Site depicts the relationships between the off-Site environmental media potentially impacted by constituents in groundwater and human receptors that could be exposed to these media. Figure 3.2 presents a human CEM for the Site. It considers a human receptor who could be exposed to COIs hypothetically released into groundwater and surface water. The following human receptors and exposure pathways were evaluated for inclusion in the Site-specific CEM.

[2] As discussed further in Section 3.3.2, GWQS are protective of human health and not necessarily of receptors. While receptors are not exposed to groundwater, groundwater can potentially enter into the adjacent surface water and impact receptors. Therefore, two sets of COIs were identified: one for humans and another for receptors.

- Residents – exposure to groundwater/surface water as drinking water;
- Residents – exposure to groundwater/surface water used for irrigation;
- Recreators in the Lake of Egypt to the east of the Site:
  - Boaters – exposure to surface water while boating;
  - Swimmers – exposure to surface water while swimming;
  - Anglers – exposure to surface water and consumption of locally caught fish.
- Recreators in Little Saline Creek to the north of the Site:[3]
  - Anglers – exposure to surface water and consumption of locally caught fish.

All of these exposure pathways were considered to be complete, except for residential exposure to groundwater used for drinking water or irrigation, and exposure to sediment. Section 3.2.1.1 explains why the residential drinking water and irrigation pathways are incomplete for groundwater. Section 3.2.1.2 discusses the use of surface water as a drinking water source. Section 3.2.1.3 provides additional description of the recreational exposures.

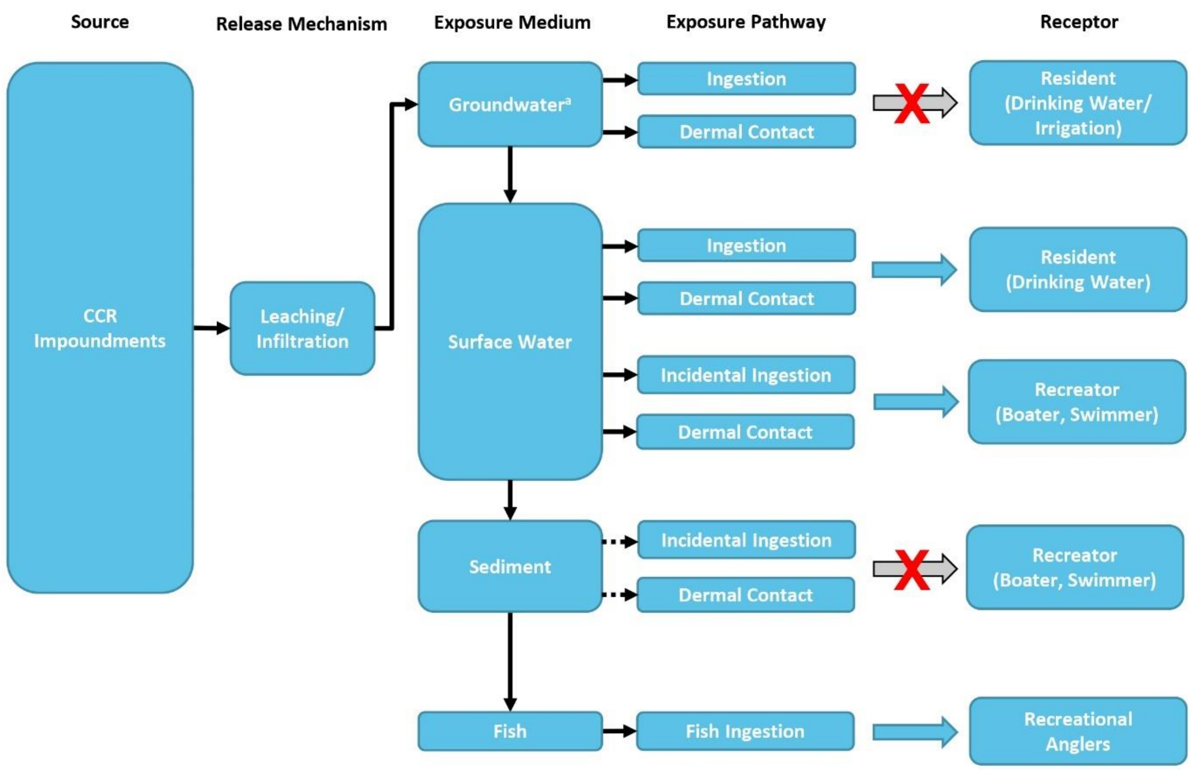

Figure 3.2 Human Conceptual Exposure Model. CCR = Coal Combustion Residuals. Dashed line/Red X = Incomplete or insignificant exposure pathway. (a) Groundwater in the vicinity of the Site is not used as a drinking water or irrigation source.

[3] Boating and swimming are assumed not to occur in Little Saline Creek due to its small size.

3.2.1.1 Groundwater as a Drinking Water/Irrigation Source

Groundwater beneath the facility generally flows northeast towards the Little Saline Creek (SIPC, 2007). However, in the southern section of the Site, there is a component of groundwater flow that is to the east toward the Lake of Egypt (SIPC, 2007). Gradient conducted a receptor survey in 2024 to identify potential users of groundwater in the vicinity of the facility. Specific sources that were used in this survey include the Illinois State Geological Survey (ISGS) ILWATER database (ISGS, 2024). Four private water wells were identified within 1,000 meters of the facility (Table 3.1, Figure 3.3). One private well (121990235000) is upgradient of the facility, and the other three wells are sidegradient of the facility, such that these wells are not expected to be impacted by any CCR constituents in groundwater that originate from any of the ponds that are being evaluated (Figure 3.3). Further, wells are screened in the sandstone or lime sandstone water bearing unit and range in depth from 95 to 260 ft bgs, far below the depths of the monitoring wells at the site (12-28 feet bgs) where impacts, if any, from site-related activities would be observed. Moreover, three of the private wells are on the opposite side of Little Saline Creek, which provides hydraulic separation from any potential impacts at the site since shallow groundwater is likely to discharge into the creek rather than flow underneath it.

Table 3.1 Summary of Water Wells Within 1,000 Meters of the MGS

Well Number	Type	Date Drilled	Owner	Depth (ft)	Formation	Latitude	Longitude
121990235000	Water Well	2/29/1968	Morganthaler, Carrol	95	Sandstone	37.612148	-88.968285
121990235100	Water Well	4/30/1968	Propes, Charlie	98	Sandstone	37.611752	-88.950049
121990252500	Water Well	10/31/1971	Fisher, William	150	Sandstone	37.628378	-88.962144
121992397400[a]	Water Well	7/20/2003	Gordon, Steve	260	Lime Sandstone	37.628378	-88.962144

Notes:
ft = Feet; MGS = Marion Power Generating Station..
(a) This well, drilled in 2003, listed a pumping rate of 20 gallons per minute (gpm), while the well at the same location (121990252500), drilled in 1971 listed a pumping rate of 7 gpm. It is not known whether the 1971 is still in use.
Source: ISGS (2024).

3.2.1.2 Surface Water as a Drinking Water Source

The Lake of Egypt is used as a public water supply (IEPA, 2024a). The intake for the Lake of Egypt Public Water District (Facility ID IL1995200) is located at the northeast corner of the Lake of Egypt (Figure 3.3). The Lake of Egypt Public Water District serves a population of 11,368 (IEPA, 2024a) and supplies "approximately 1 million gallons per day of drinking water to Union, Jackson, and Williamson Counties" (SIPC, 2018a).

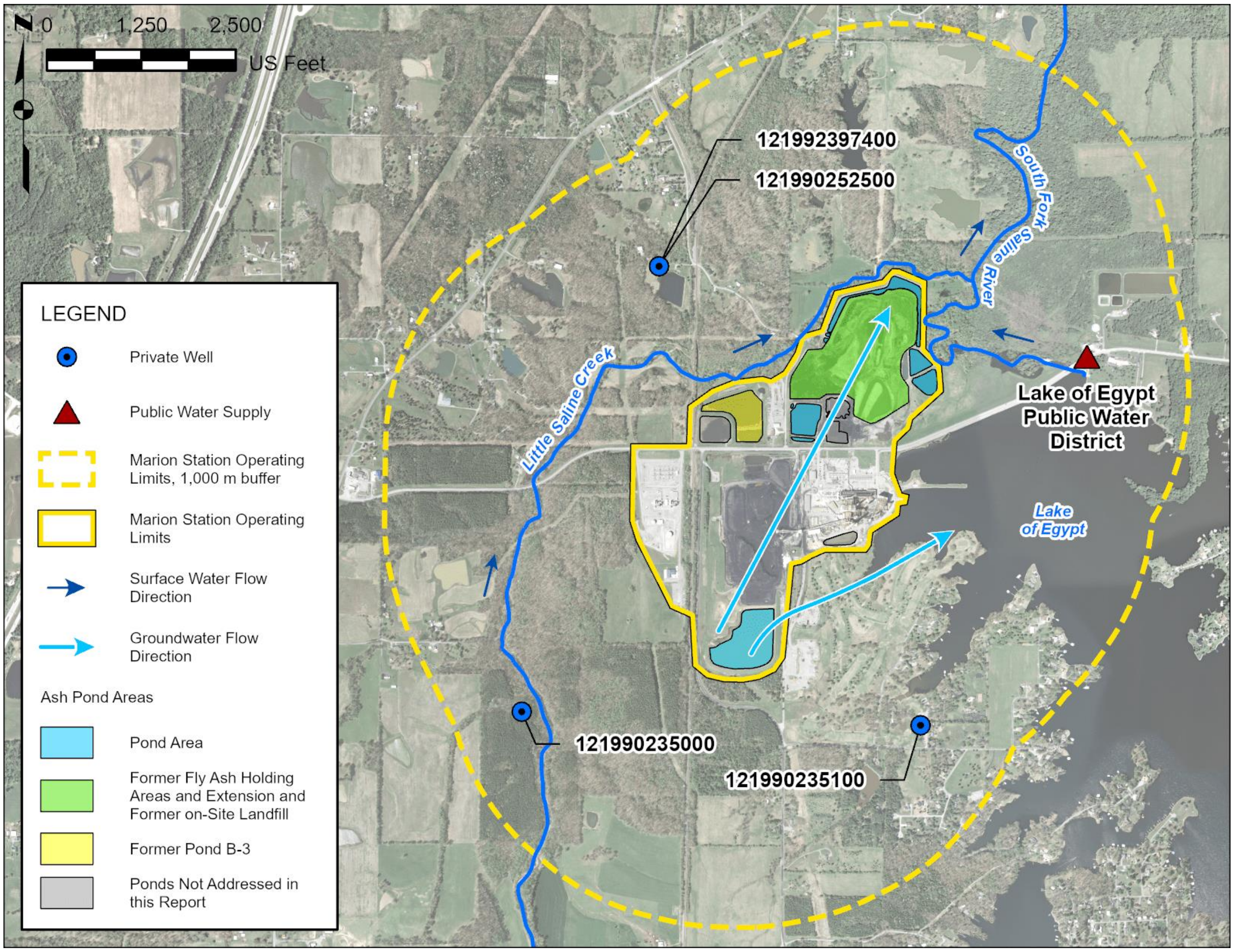

Figure 3.3 Water Wells Within 1,000 Meters of the Facility. Sources: Golder Associates Inc., 2021; USGS, 2022; Andrews Engineering, 2021; ISGS, 1909-2023; IEPA, 2024b; SIPC, 2007; USGS, 2011.

3.2.1.3 Recreational Exposures

Lake of Egypt, located to the east of the MGS facility, is a private lake owned by SIPC which allows the lake to be used for recreation. The lake is approximately 2,300 acres in size, and has an average depth of 18 feet and a maximum depth of 52 feet (SIPC, 2018a). The recreational uses of the Lake of Egypt include fishing, boating, swimming, and water sports such as water skiing (SIPC, 2018b). SIPC notes that "swimming is prohibited except at approved beaches marked by buoys" (SIPC, 2018b). Recreational exposure to surface water may occur during activities such as boating or fishing in the lake. Recreational anglers may also consume locally caught fish from the lake. The northwest bay of the lake (nearest the MGS) is a restricted area (SIPC, 2018b). Due to the depth of the lake, sediment exposure was not evaluated in Lake of Egypt.

Little Saline Creek is located immediately to the north of the Site. Gradient estimated the average creek width as 26 feet (based on measurements from an aerial photo), and the depth to be approximately 5 feet (based on a Google Earth photo from February 2020 in which bottom sediments were visible). Recreators in the Little Saline Creek may include anglers who could be exposed to surface water and consume locally caught fish. It is assumed that boating and swimming do not occur in Little Saline Creek due to its small size, and the availability of recreation areas at Lake of Egypt to the east.

3.2.2 Ecological Conceptual Exposure Model

The ecological CEM for the Site depicts the relationships between off-Site environmental media (surface water and sediment) potentially impacted by COIs in groundwater and ecological receptors that may be exposed to these media. The ecological risk evaluation considered both direct toxicity as well as secondary toxicity *via* bioaccumulation. Due to the fact that the dominant groundwater flow direction is to the northeast, and the relatively small size of Little Saline Creek, this surface waterbody has a higher potential to be influenced by CCR constituents. Given these factors, Little Saline Creek was identified as the primary focus for evaluating environmental risks for ecological receptors. Figure 3.4 presents the ecological CEM for the Site. The following ecological receptor groups and exposure pathways were considered:

- **Ecological Receptors Exposed to Surface Water:**
  - Aquatic plants, amphibians, reptiles, and fish.
- **Ecological Receptors Exposed to Sediment:**
  - Benthic invertebrates (*e.g.*, insects, crayfish, mussels).
- **Ecological Receptors Exposed to Bioaccumulative COIs:**
  - Higher trophic level wildlife (avian and mammalian) *via* direct exposures (surface water and sediment exposure) and secondary exposures through the consumption of prey (*e.g.*, plants, invertebrates, small mammals, fish).

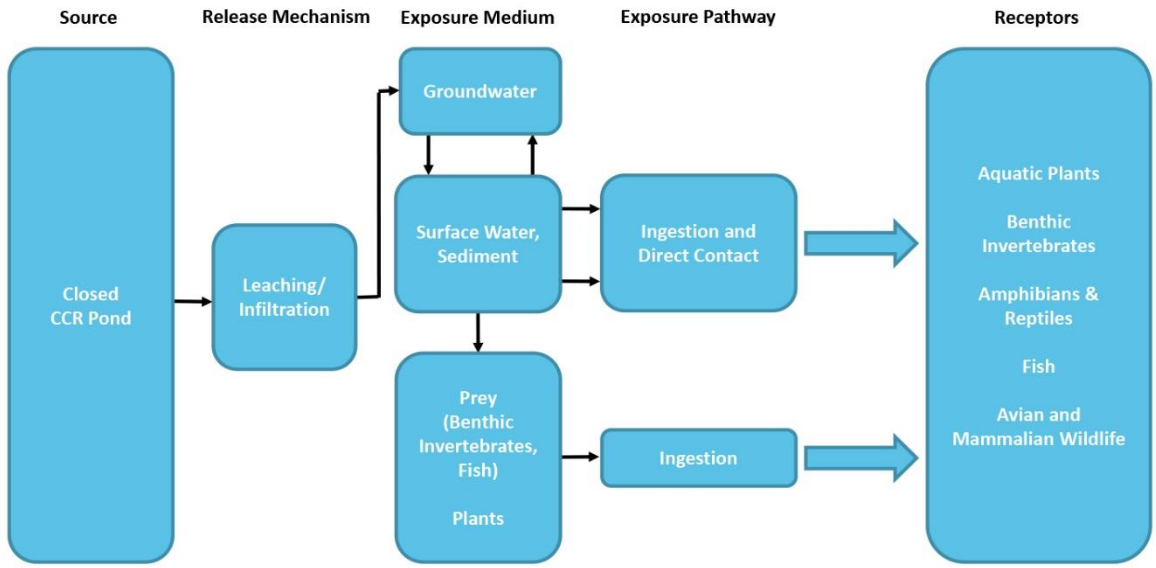

Figure 3.4 Ecological Conceptual Exposure Model. CCR = Coal Combustion Residuals.

3.3 Identification of Constituents of Interest

Risks were evaluated for COIs. A constituent was considered a COI if the maximum detected constituent concentration in groundwater exceeded a health-based benchmark. According to US EPA risk assessment guidance (US EPA, 1989), this screening step is designed to reduce the number of constituents carried through the risk evaluation that are anticipated to have a minimal contribution to the overall risk.

Identified COIs are the constituents that are most likely to pose a risk concern in the surface water adjacent to the Site.

3.3.1 Human Health Constituents of Interest

For the human health risk evaluation, COIs were conservatively identified as constituents with maximum concentrations in groundwater above the GWPS listed in the Illinois CCR Rule Part 845.600 (IEPA, 2021). The COIs were determined separately for the wells monitoring north and south of Lake of Egypt Road (the S-wells in the north that characterize groundwater quality near Pond 4, Pond 3 and 3A, Pond S-6, and Pond B-3, and the C-wells plus EBG well in the south that characterize groundwater quality near the South Fly Ash Pond). Gradient used the maximum detected concentrations from groundwater samples collected from these two groups of wells, regardless of hydrostratigraphic unit. The use of groundwater data in this risk evaluation does not imply that detected constituents are associated with the facility or that they have been identified as potential groundwater exceedances. Using this approach, the COIs that were identified from the S-wells included arsenic, beryllium, boron, cadmium, cobalt, lead, and thallium (Table 3.2). For the S-wells, the maximum concentrations for arsenic, beryllium, cadmium, cobalt, and lead were detected in well S-1; the maximum concentrations for boron and thallium were detected in well S-2. The COIs that were identified from the C-wells+EBG included boron, cadmium, cobalt, and thallium (Table 3.3). For the C-wells, the maximum concentrations were detected in well EBG for boron and cobalt, well C-3 for cadmium, and well C-2 for thallium. Although these constituents were identified as COIs, it's important to re-emphasize that this identification was based solely on whether their maximum concentration exceeded the GWPS. We did not take into account overall temporal or spatial patterns, nor did we consider how these concentrations related to natural background levels or potential contamination from non-CCR sources.

The water quality parameters that exceeded the GWPS included chloride and total dissolved solids in the S-wells, and chloride, sulfate, and total dissolved solids in the C-wells. However, these constituents were not included in the risk evaluation because the GWPS is based on aesthetic quality and there is an absence of studies regarding toxicity to human health. The US EPA secondary maximum contaminant levels (MCLs) for chloride, sulfate, and total dissolved solids are based on aesthetic quality. The secondary MCLs for chloride and sulfate (250 mg/L) are based on salty taste (US EPA, 2021). The secondary MCL for total dissolved solids (500 mg/L) is based on hardness, deposits, colored water, staining, and salty taste (US EPA, 2021). Given that these parameters are not likely to pose a human health risk concern in the event of exposure, they were not considered to be human health COIs.

Table 3.2 Human Health Constituents of Interest Based on Groundwater for S-Wells - Near Pond 4, Pond 3 and 3A, Pond S-6, and Pond B-3 (2018-2022)

Constituent[a]	Detected Maximum[b]	GWPS[c]	Human Health COI[d]
Total Metals (mg/L)			
Antimony	*0.0050*	0.0060	No
Arsenic	0.12	0.010	Yes
Barium	1.5	2.0	No
Beryllium	0.0081	0.0040	Yes
Boron	2.8	2.0	Yes
Cadmium	0.055	0.005	Yes
Chromium	0.069	0.10	No
Cobalt	0.054	0.0060	Yes
Lead	0.080	0.0075	Yes
Mercury	*0.0002*	0.0020	No
Selenium	0.017	0.050	No
Thallium	0.046	0.0020	Yes

Constituent[a]	Detected Maximum[b]	GWPS[c]	Human Health COI[d]
Dissolved Metals (mg/L)			
Boron	3.1	2.0	Yes
Cadmium	*0.001*	0.005	No
Other (mg/L or SU)			
Chloride	480	200	No[e]
Fluoride	0.18	4.0	No
pH	6.9	9.0	No
Sulfate	310	400	No
Total Dissolved Solids	4500	1200	No[e]

Notes:
COI = Constituent of Interest; GWPS = Groundwater Protection Standard; IL = Illinois; mg/L = Milligrams per Liter; SU = Standard Units.
Italics indicate constituent was not detected; the value reported is the maximum detection limit.
Shaded cell indicates a compound identified as a COI.
(a) The constituents are those listed in the IL Part 845.600 GWPS (IEPA, 2021).
(b) The maximum detected groundwater concentration was used to identify COIs.
(c) The IL Part 845.600 GWPS (IEPA, 2021) were used to identify COIs.
(d) COIs are constituents for which the maximum concentration exceeds the groundwater standard.
(e) Maximum exceeds the GWPS but analyte is not considered to be a COI because the GWPS is based on aesthetic quality.

Table 3.3 Human Health Constituents of Interest Based on Groundwater for C-Wells - Near the South Fly Ash Pond (2018-2023)

Constituent[a]	Maximum Groundwater Concentration[b]	GWPS[c]	Human Health COI[d]
Total Metals (mg/L)			
Antimony	*0.030*	0.0060	No[e]
Arsenic	0.0075	0.010	No
Barium	0.20	2.0	No
Beryllium	0.00060	0.0040	No
Boron	12	2.0	Yes
Cadmium	0.013	0.0050	Yes
Chromium	0.0042	0.10	No
Cobalt	0.29	0.0060	Yes
Lead	0.0031	0.0075	No
Lithium	0.024	0.040	No
Mercury	0.000070	0.0020	No
Molybdenum	0.015	0.10	No
Selenium	0.033	0.050	No
Thallium	0.031	0.0020	Yes
Dissolved Metals (mg/L)			
Boron	0.92	2.0	No
Cadmium	*0.0010*	0.0050	No
Radionuclides (pCi/L)			
Radium 226 + Radium 228	2.7	5.0	No
Other (mg/L or SU)			
Chloride	570	200	No[f]
Fluoride	0.68	4.0	No
pH	7.0	9.0	No
Sulfate	670	400	No[f]
Total Dissolved Solids	4000	1200	No[f]

Table 3.3 Notes:
COI = Constituent of Interest; GWPS = Groundwater Protection Standard; IL = Illinois; mg/L = Milligrams per Liter; pCi/L = Picocuries per Liter; SU = Standard Units.
Italics indicate constituent was not detected; the value reported is the maximum detection limit.
Shaded cell indicates a compound identified as a COI.
(a) The constituents are those listed in the IL Part 845.600 GWPS (IEPA, 2021).
(b) The maximum detected groundwater concentration was used to identify COIs.
(c) The IL Part 845.600 GWPS (IEPA, 2021) were used to identify COIs.
(d) COIs are constituents for which the maximum concentration exceeds the groundwater standard.
(e) Antimony was not detected in 32 groundwater samples. Only 2 of the 32 samples had detection limits above the GWPS; most of the DLs ranged from 0.001 to 0.005 mg/L and thus were below the GWPS of 0.006 mg/L. Thus antimony was not considered a COI.
(f) Maximum exceeds the GWPS but analyte is not considered to be a COI because the GWPS is based on aesthetic quality.

3.3.2 Ecological Constituents of Interest

The Illinois GWPS, as defined in IEPA's guidance, were developed to protect human health but not necessarily ecological receptors. While ecological receptors are not exposed to groundwater, groundwater can potentially migrate into the adjacent surface water and impact ecological receptors. Therefore, to identify ecological COIs, the maximum concentrations of constituents detected in groundwater were compared to ecological surface water benchmarks protective of aquatic life.

The surface water screening benchmarks for freshwater organisms were obtained from the following hierarchy of sources:

- IEPA (2019) SWQS. IEPA SWQS are health-protective benchmarks for aquatic life exposed to surface water on a long-term basis (*i.e.*, chronic exposure). The SWQS for several metals are hardness dependent (cadmium, chromium, and lead). Screening benchmarks for these constituents were calculated assuming US EPA's default hardness of 100 mg/L (US EPA, 2022), due to an absence of hardness data for Little Saline Creek.[4]
- US EPA Region IV (2018) surface water Ecological Screening Values (ESVs) for hazardous waste sites.

Consistent with the human health risk evaluation, Gradient used the maximum detected concentrations from groundwater samples collected from the S-wells without considering spatial or temporal representativeness for ecological receptor exposures. The use of the maximum constituent concentrations in this evaluation is designed to conservatively identify COIs that warrant further investigation. The COIs identified for ecological receptors include cadmium, cobalt, lead, and thallium (Table 3.4).

[4] Hardness data are available from the South Fork Saline River near Carrier Mills, Illinois (USGS Site No. 03382100), approximately 26 miles downstream of the MGS. Based on 208 samples collected from October 1976 to April 1997, the average hardness at this location was 438 mg/L (USGS, 2024c). Due to the age of the samples and the distance from the site, the US EPA (2022) default hardness of 100 mg/L was used. Use of a higher hardness value would result in less stringent screening values, thus, use of the US EPA default hardness is conservative.

Table 3.4 Ecological Constituents of Interest Based on Groundwater for S-Wells (2018-2022)

Constituent[a]	Maximum Detected Groundwater Concentration	Ecological Benchmark[b]	Basis	Ecological COI[c]
Total Metals (mg/L)				
Antimony	ND	0.19	EPA R4 ESV	No
Arsenic	0.12	0.19	IEPA SWQC	No
Barium	1.5	5.0	IEPA SWQC	No
Beryllium	0.0081	0.064	EPA R4 ESV	No
Boron	2.8	7.6	IEPA SWQC	No
Cadmium	0.055	0.0011	IEPA SWQC	Yes
Chromium	0.069	0.21	IEPA SWQC	No
Cobalt	0.054	0.019	EPA R4 ESV	Yes
Lead	0.080	0.020	IEPA SWQC	Yes
Mercury	ND	0.0011	IEPA SWQC	No
Selenium	0.017	1.0	IEPA SWQC	No
Thallium	0.046	0.0060	EPA R4 ESV	Yes
Dissolved Metals (mg/L)				
Boron	3.1	7.6	IEPA SWQC	No
Cadmium		0.00093	IEPA SWQC	No
Other (mg/L or SU)				
Chloride	480	500	IEPA SWQC	No
Fluoride	0.18	4.0	IEPA SWQC	No
Sulfate	310	NA	NA	No
Total Dissolved Solids	4500	NA	NA	No
pH	6.9	NA	NA	No

Notes:
Blank cells indicate constituent was not detected.
Shaded cell indicates a compound identified as a COI.
COI = Constituent of Interest; EPA R4 = United States Environmental Protection Agency Region IV; ESV = Ecological Screening Value; IEPA = Illinois Environmental Protection Agency; NA = Not Applicable; ND = Not Detected; SWQC = Surface Water Quality Criteria.
(a) The constituents are those listed in the IL Part 845.600 GWPS (IEPA, 2021) that were detected in at least one groundwater sample from the S-wells.
(b) Ecological benchmarks are from: IEPA SWQC (IEPA, 2019); EPA R4 ESV (US EPA Region IV, 2018).
(c) Constituents with maximum detected concentrations exceeding a benchmark protective of surface water exposure are considered ecological COIs.

3.3.3 Surface Water and Sediment Modeling

Surface water sampling has not been conducted in Little Saline Creek to the north of the Site. To estimate the potential contribution to surface water from groundwater specifically associated with the Site, Gradient modeled concentrations in Little Saline Creek surface water from groundwater flowing into the Creek for the detected human and ecological COIs. This is because the constituents detected in groundwater above a health-based benchmark are most likely to pose a risk concern in the adjacent surface water. Gradient modeled COI concentrations in the surface water using a mass balance calculation based on the surface water and groundwater mixing. The model assumes a well-mixed groundwater-surface water location.

The maximum detected concentrations in groundwater from the S-wells from 2018 to 2022 were conservatively used to model COI concentrations in surface water. For COIs that were measured as both total and dissolved fractions, we used the maximum of the total and dissolved COI concentrations for the modeling. For most metals, the maximum concentration was from the total fraction. Use of the total metal concentration for these COIs may overestimate surface water concentrations because dissolved concentrations, which are lower than total concentrations, represent the mobile fractions of constituents that could likely flow into and mix with surface water.

The modeling approach does not account for geochemical transformations that may occur during groundwater mixing with surface water. Gradient assumed that predicted surface water concentrations were influenced only by the physical mixing of groundwater as it enters the surface water and were not further influenced by the geochemical reactions in the water and sediment, such as precipitation. In addition, the model only predicts surface water concentrations as a result of the potential migration of COIs in Site-related groundwater and does not account for background concentrations in surface water.

For this evaluation, Gradient adapted a simplified and conservative form of US EPA's indirect exposure assessment methodology (US EPA, 1998) that was used in US EPA's coal combustion waste risk assessment (US EPA, 2014). The model is a mass balance calculation based on surface water and groundwater mixing and the concept that the dissolved and sorbed concentrations can be related through an equilibrium partitioning coefficient (K_d). The model assumes a well-mixed groundwater-surface water location, with partitioning among total suspended solids, dissolved water column, sediment pore water, and solid sediments.

Sorption to soil and sediment is highly dependent on the surrounding geochemical conditions. To be conservative, we ignored the natural attenuation capacity of soil and sediment and estimated the surface water concentration based only on the physical mixing of groundwater and surface water (*i.e.*, dilution) at the point where groundwater flows into surface water.

The aquifer properties used to estimate the volume of groundwater flowing into Little Saline Creek and surface water concentrations are presented in Table 3.5. The surface water and sediment properties used in the modeling are presented in Tables 3.6 and 3.7. In the absence of Site-specific information for Little Saline Creek, Gradient used default assumptions (*e.g.*, depth of the upper benthic layer and bed sediment porosity) to model sediment concentrations. The modeled surface water and sediment concentrations are presented in Table 3.8. These modeled concentrations reflect conservative contributions from groundwater. A description of the modeling and the detailed results are presented in Appendix A.

Table 3.5 Groundwater Properties Used in Modeling

Parameter	Value	Units	Notes
Aquifer thickness	3	m	Thickness of the groundwater unit at the interface of unlithified deposits and bedrock (10 ft or 3 m) (SIPC, 2021b).
Length of River	840	m	Length of river receiving potentially-impacted groundwater (estimated using Google Earth).
Cross-Sectional Area	2560	m^2	Length × thickness
Hydraulic Gradient	0.019	m/m	Average hydraulic gradient (estimated using groundwater elevation in wells S3 and S6; SIPC, 2007).
Hydraulic Conductivity	1.50E-04	cm/sec	Average hydraulic conductivity (assumed to be the same as that for Emery Pond wells; Golder Associates Inc., 2021).
COI Concentration	Constituent specific	mg/L	Maximum detected concentration in groundwater.

Notes:
COI = Constituent of Interest
(a) The cross-sectional area represents the area through which groundwater flows from the unlithified unit to Little Saline Creek.

Table 3.6 Surface Water Properties Used in Modeling

Parameter	Value	Unit	Notes/Source
Flow rate in little saline creek	2.5×10^{11}	L/yr	Average of peak flows 1959-1980 for Little Saline Creek Tributary Near Goreville, IL (USGS, 2024a)
Total suspended solids (TSS)	49	mg/L	Average TSS concentration for South Fork Saline River, Carrier Mills, IL (USGS, 2024b)
Depth of water column	1.5	m	Mean depth of Little Saline Creek estimated from Google Earth photos.
Suspended Sediment to Water Partition Coefficient	Constituent specific	mg/L	Values based on US EPA (2014).

Notes:
IL = Illinois; US EPA = United States Environmental Protection Agency; USGS = United States Geological Survey.

Table 3.7 Sediment Properties Used in Modeling

Parameter	Value	Unit	Notes/Source
Depth of Upper Benthic Layer	0.03	m	Default (US EPA, 2014).
Depth of Water Column	1.5	m	Mean depth of Little Saline Creek estimated from Google Earth photos.
Bed Sediment Particle Concentration	1	g/cm^3	Default (US EPA, 2014).
Bed Sediment Porosity	0.6	–	Default (US EPA, 2014).
Total Suspended Solids (TSS) Mass per Unit Area	0.075	kg/m^2	Depth of water column × TSS × conversion factors (10^{-6} kg/mg and 1,000 L/m^3).
Sediment Mass per Unit Area	30	kg/m^2	Depth of upper benthic layer × bed sediment particulate concentration × conversion factors (0.001 kg/g and 10^6 cm^3/m^3).
Sediment to Water Partitioning Coefficients	Constituent specific	mg/L	Values based on US EPA (2014).

Note:
US EPA = United States Environmental Protection Agency.

Table 3.8 Surface Water and Sediment Modeling Results for Little Saline Creek

COI	Maximum Measured Groundwater Concentration (mg/L)	Modeled Surface Water Concentration (mg/L)	Modeled Sediment Concentration (mg/kg)
Arsenic	0.12	1.37E-09	2.48E-07
Beryllium	0.0081	9.27E-11	3.29E-08
Boron	3.1	3.55E-08	1.61E-07
Cadmium	0.055	6.30E-10	2.57E-07
Cobalt	0.054	6.18E-10	1.90E-07
Lead	0.08	9.16E-10	1.43E-06
Thallium	0.046	5.27E-10	6.50E-09

Notes:
COI = Constituent of Interest; mg/L = Milligrams per Liter.

3.4 Human Health Risk Evaluation

The section below presents the results of the human health risk evaluation for recreators (boaters, swimmers, and anglers) in the Lake of Egypt to the east of the Site, and anglers in the Little Saline Creek to the north of the Site. Risks were assessed using the maximum measured COIs in Lake of Egypt, and the modeled COIs in the Little Saline Creek.

3.4.1 Recreators Exposed to Surface Water

Screening Exposures: In Lake of Egypt, recreators could be exposed to surface water *via* incidental ingestion and dermal contact while boating or swimming, and anglers could consume fish caught in the lake. In Little Saline Creek, it is assumed that anglers could consume fish caught in the creek. Measured concentrations were used in Lake of Egypt, and modeled concentrations were used for Little Saline Creek due to lack of sampling data. The maximum measured or modeled COI concentrations in surface water were used as conservative upper-end estimates of the COI concentrations to which a recreator might be exposed directly (incidental ingestion of COIs in surface water while boating) and indirectly (consumption of locally caught fish exposed to COIs in surface water).

Screening Benchmarks: Illinois surface water criteria (IEPA, 2019), known as human threshold criteria (HTC), are based on incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities, as well as the consumption of fish. The HTC values were calculated from the following equation (IEPA, 2019):

$$\mathrm{HTC} = \frac{\mathrm{ADI}}{\mathrm{W} + (\mathrm{F} \times \mathrm{BCF})}$$

where:

HTC = Human health protection criterion in milligrams per liter (mg/L)
ADI = Acceptable daily intake (mg/day)
W = Water consumption rate (L/day)
F = Fish consumption rate (kg/day)
BCF = Bioconcentration factor (L/kg tissue)

Illinois defines the acceptable daily intake (ADI) as the "maximum amount of a substance which, if ingested daily for a lifetime, results in no adverse effects to humans" (IEPA, 2019). US EPA defines its chronic reference dose (RfD) as an "estimate (with uncertainty spanning perhaps an order of magnitude) of a daily oral exposure for a chronic duration (up to a lifetime) to the human population (including sensitive subgroups) that is likely to be without an appreciable risk of deleterious effects during a lifetime" (US EPA, 2011). Illinois lists methods to derive an ADI from the primary literature (IEPA, 2019). In accordance with Illinois guidance, Gradient derived an ADI by multiplying the MCL by the default water ingestion rate of 2 L/day (IEPA, 2019). In the absence of an MCL, Gradient applied the RfD used by US EPA to derive its Regional Screening Levels (RSLs) (US EPA, 2024) as a conservative estimate of the ADI. The RfDs are given in mg/kg-day, while the ADIs are given in mg/day; thus, Gradient multiplied the RfD by a standard body weight of 70 kg to obtain the ADI in mg/day. The calculation of the HTC values is shown in Appendix B, Table B.1.

Gradient used bioconcentration factors (BCFs) from a hierarchy of sources. The primary BCFs were those that US EPA used to calculate the National Recommended Water Quality Criteria (NRWQC) for human health (US EPA, 2002). Other sources included BCFs used in the US EPA coal combustion ash risk assessment (US EPA, 2014) and BCFs reported by Oak Ridge National Laboratory's Risk Assessment

Information System (ORNL RAIS) (ORNL, 2020).[5] Lithium did not have a BCF value available from any authoritative source; therefore, the water quality criterion for lithium was calculated assuming a BCF of 1. This is a conservative assumption, as lithium does not readily bioaccumulate in the aquatic environment (ECHA, 2020a,b; ATSDR, 2010).

Illinois recommends a fish consumption rate of 0.020 kg/day (20 g/day) for an adult weighing 70 kg (IEPA, 2019). Illinois recommends a water consumption rate of 0.01 L/day for "incidental exposure through contact or ingestion of small volumes of water while swimming or during other recreational activities" (IEPA, 2019). Appendix B, Table B.1 presents the calculated HTC for fish and water and for fish consumption only.

The HTC for fish consumption for radium 226+228 was calculated as follows:

$$\mathrm{HTC} = \frac{\mathrm{TCR}}{(\mathrm{SF} \times \mathrm{BAF} \times \mathrm{F})}$$

where:

HTC	=	Human health protection criterion in picoCuries per liter (pCi/L)
TCR	=	Target cancer risk (1×10^5)
SF	=	Food ingestion slope factor (risk/pCi)
BAF	=	Bioaccumulation factor (L/kg tissue)
F	=	Fish consumption rate (kg/day)

The food ingestion slope factor (lifetime excess total cancer risk per unit exposure, in risk/pCi) used to calculate the HTC was the highest value of those for radium 226 (Ra226), radium 228 (Ra228), and "Ra228+D" (US EPA, 2001). According to US EPA (2001), "+D" indicates that "the risks from associated short-lived radioactive decay products (*i.e.*, those decay products with radioactive half-lives less than or equal to 6 months) are also included."

Screening Risk Evaluation, Lake of Egypt: The four COIs were not detected in the surface water data available from Lake of Egypt, therefore, Gradient used half of the maximum detection limit as the exposure concentration. The COI concentrations in surface water were compared to the calculated Illinois HTC values (Table 3.8). All surface water concentrations, all of which were non-detect, were below their respective benchmarks. The HTC values are protective of recreational exposure *via* water and/or fish ingestion and do not account for dermal exposures to COIs in surface water while boating. However, given that the measured COI surface water concentrations are well below HTC protective of water and/or fish ingestion, dermal exposures to COIs are not expected to be a risk concern. Moreover, the dermal uptake of metals is considered to be minimal and only a small proportion of ingestion exposures. Thus, none of the COIs evaluated pose an unacceptable risk to recreators exposed to surface water while boating and anglers consuming fish caught in the Lake of Egypt.

[5] Although recommended by US EPA (2015b), US EPA EpiSuite 4.1 (US EPA, 2019) was not used as a source of BCFs because inorganic compounds are outside the estimation domain of the program.

Table 3.9 Risk Evaluation for Recreators Exposed to Surface Water in Lake of Egypt

COI	Maximum Surface Water Concentration (Measured)[a]	HTC for Water and Fish	HTC for Water Only	HTC for Fish Only	COPC
Total Metals (mg/L)					
Boron	*0.01*	467	1400	700	No
Cadmium	*0.0015*	0.0019	1.0	0.0019	No
Cobalt	*0.0025*	0.0035	2.1	0.0035	No
Thallium	*0.001*	0.0017	0.40	0.0017	No

Notes:
COI = Constituent of Interest; COPC = Constituent of Potential Concern; HTC = Human Threshold Criteria; mg/L = Milligrams per Liter.
Concentrations are listed only for the constituents identified as COIs in the C-wells.
(a) Concentrations in italics were not detected; half the detection limit was used for non-detects.

Screening Risk Evaluation, Little Saline Creek: The modeled COI concentrations in surface water were compared to the calculated Illinois HTC values (Table 3.10). All surface water concentrations were below their respective benchmarks. Thus, none of the COIs evaluated pose an unacceptable risk for anglers consuming fish caught in Little Saline Creek.

Table 3.10 Risk Evaluation for Recreators Exposed to Surface Water in Little Saline Creek

COI	Maximum Surface Water Concentration (Modeled)	HTC for Water and Fish	HTC for Water Only	HTC for Fish Only	COPC
Total Metals (mg/L)					
Arsenic	1.37E-09	2.25E-02	2.00E+00	2.27E-02	No
Beryllium	9.27E-11	2.05E-02	8.00E-01	2.11E-02	No
Boron	3.55E-08	4.67E+02	1.40E+03	7.00E+02	No
Cadmium	6.30E-10	1.85E-03	1.00E+00	1.85E-03	No
Cobalt	6.18E-10	3.49E-03	2.10E+00	3.50E-03	No
Lead	9.16E-10	1.00E-02	1.00E-02	1.00E-02	No
Thallium	5.27E-10	1.72E-03	4.00E-01	1.72E-03	No

Notes:
COI = Constituent of Interest; COPC = Constituent of Potential Concern; HTC = Human Threshold Criteria; mg/L = Milligrams per Liter.
Concentrations are listed only for the constituents identified as COIs in the S-wells.
Modeled concentrations represent the potential effect on surface water quality resulting from the measured groundwater concentrations.

3.4.2 Use of Surface Water as Drinking Water

The Lake of Egypt is used as a public water supply (IEPA, 2024a). Gradient compared the maximum detected concentrations (or the maximum detection limit) from the available public water supply data (2018-2023) to the Illinois Class I GWPS (Table 3.11). There were no exceedances of the IL GWPS, therefore the use of surface water from the Lake of Egypt for residential drinking water does not pose an unacceptable risk to residents.

Table 3.11 Lake Public Water Supply Data Compared to GWPS (2018-2023)

Constituent[a]	Number of Detects	Number of Samples	Detected Minimum	Detected Maximum[b]	Maximum Laboratory Detection Limit	GWPS[c]	Exceedance
Total Metals							
Antimony	0	6			0.003	0.006	No
Arsenic	0	6			0.001	0.01	No
Barium	6	6	0.021	0.0263	NA	2	No
Beryllium	0	6			0.001	0.004	No
Cadmium	0	6			0.003	0.005	No
Chromium	0	6			0.005	0.1	No
Mercury	0	6			0.0002	0.002	No
Selenium	1	6	0.0024	0.0024	0.002	0.05	No
Thallium	0	6			0.002	0.002	No
Other							
Chloride	6	6	10.4	23	NA	200	No
Fluoride	6	6	0.553	0.73	NA	4	No
Sulfate	6	6	34.6	51.7	NA	400	No
Total Dissolved Solids	6	6	87	158	NA	1200	No
Radionuclides							
Radium 226 + Radium 228	1	1	1.03	1.03	NA	5	No

Notes:
GWPS = Groundwater Protection Standard; NA = Not Available.

3.5 Ecological Risk Evaluation

Based on the ecological CEM (Figure 3.4), ecological receptors could be exposed to surface water and dietary items (*i.e.*, prey and plants) potentially impacted by identified COIs.

3.5.1 Ecological Receptors Exposed to Surface Water in Little Saline Creek

Screening Exposures: The ecological evaluation considered aquatic communities in Little Saline Creek potentially impacted by identified ecological COIs. Modeled surface water concentrations were compared to risk-based ecological screening benchmarks.

Screening Benchmarks: Surface water screening benchmarks protective of aquatic life were obtained from the following hierarchy of sources:

- IEPA SWQS (IEPA, 2019), regulatory standards that are intended to protect aquatic life exposed to surface water on a long-term basis (*i.e.*, chronic exposure). For cadmium, the surface water benchmark is hardness dependent and calculated using a default hardness of 100 mg/L (US EPA, 2022);[6]
- US EPA Region IV (2018) surface water ESVs for hazardous waste sites.

[6] Conservatisms associated with using a default hardness value are discussed in Section 3.6.

Risk Evaluation: The maximum modeled COI concentrations in surface water were compared to the benchmarks protective of aquatic life (Table 3.12). The modeled surface water concentrations for the COIs were below their respective benchmarks. Thus, none of the COIs evaluated are expected to pose an unacceptable risk to aquatic life in Little Saline Creek.

Table 3.12 Risk Evaluation for Ecological Receptors Exposed to Surface Water in Little Saline Creek

COI	Maximum Surface Water Concentration (modeled)	Ecological Freshwater Benchmark	Basis	COPC
Cadmium	6.30E-10	1.13E-03	IEPA SWQC	No
Cobalt	6.18E-10	1.90E-02	EPA R4 ESV	No
Lead	9.16E-10	2.01E-02	IEPA SWQC	No
Thallium	5.27E-10	6.00E-03	EPA R4 ESV	No

Notes:
COI = Constituent of Interest; COPC = Constituent of Potential Concern; ESV = Ecological Screening Value; IEPA = Illinois Environmental Protection Agency; SWQC = Surface Water Quality Criteria; US EPA = United States Environmental Protection Agency.
Criteria sources: IEPA SWQC: IEPA (2019a); EPA R4 ESV: US EPA Region IV (2018)

3.5.2 Ecological Receptors Exposed to Sediment in Little Saline Creek

Screening Exposures: COIs in impacted groundwater flowing into Little Saline Creek can sorb to sediments *via* chemical partitioning. In the absence of sediment data, sediment concentrations were modeled using maximum detected groundwater concentrations. Therefore, the modeled COI sediment concentrations reflect the potential maximum Site-related sediment concentration originating from groundwater.

Screening Benchmarks: Sediment screening benchmarks were obtained from US EPA Region IV (2018). The majority of the sediment ESVs are based on threshold effect concentrations (TECs) from MacDonald *et al.* (2000), which provide consensus values that identify concentrations below which harmful effects on sediment-dwelling organisms are unlikely to be observed. The benchmarks used in this evaluation are listed in Table 3.13.

Screening Risk Results: The maximum modeled COI sediment concentrations were below their respective sediment screening benchmarks (Table 3.13). The modeled sediment concentrations attributed to potential contributions from Site groundwater for all COIs were less than 1% of the sediment screening benchmark. Although thallium does not have an ESV, the modeled concentration is well below the soil ESV of 0.05 mg/kg (US EPA Region IV, 2018); therefore, thallium does not present an unacceptable risk to ecological receptors. Thus, the modeled sediment concentrations attributed to potential contributions from Site groundwater are not expected to significantly contribute to ecological exposures in Little Saline Creek adjacent to the Site.

Table 3.13 Risk Evaluation for Ecological Receptors Exposed to Sediment in Little Saline Creek

COI	Modeled Sediment Concentration (mg/kg)	ESV[a] (mg/kg)	COPC	% of Benchmark
Cadmium	2.6E-07	1.0E+00	No	0.00003
Cobalt	1.9E-07	5.0E+01	No	0.0000004
Lead	1.4E-06	3.6E+01	No	0.000004
Thallium	6.5E-09	NA	No	NA

Notes:
COI = Constituent of Interest; COPC = Constituent of Potential Concern; ESV = Ecological Screening Value; NA = Not Available; US EPA = United States Environmental Protection Agency.
(a) ESV from US EPA Region IV (2018).

3.5.3 Ecological Receptors Exposed to Bioaccumulative Constituents of Interest

Screening Exposures: COIs with bioaccumulative properties can impact higher trophic level wildlife exposed to these COIs *via* direct exposures (surface water and sediment exposure) and secondary exposures through the consumption of dietary items (*e.g.*, plants, invertebrates, small mammals, and fish).

Screening Benchmark: US EPA Region IV (2018) and IEPA SWQS (IEPA, 2019) guidance were used to identify constituents with potential bioaccumulative effects.

Risk Evaluation: The ecological COIs (cadmium, cobalt, lead, and thallium) were not identified as having potential bioaccumulative effects. Therefore, these COIs are not considered to pose an ecological risk *via* bioaccumulation. IEPA (2019) identifies mercury as the only metal with bioaccumulative properties, however, mercury was not considered an ecological COI. US EPA Region IV (2018) identifies selenium as having potential bioaccumulative effects; although selenium was detected in groundwater, it was not considered an ecological COI.

3.6 Uncertainties and Conservatisms

A number of uncertainties and their potential impact on the risk evaluation are discussed below. Wherever possible, conservative assumptions were used in an effort to minimize uncertainties and overestimate rather than underestimate risks.

Exposure Estimates:

- The risk evaluation included the IL Part 845.600 constituents detected in groundwater samples (above GWPS) collected from wells associated with the MGS facility. However, it is possible that not all of the detected constituents are related specifically to the MGS facility.
- The human health and ecological risk characterization was based on the maximum measured or modeled COI concentrations, rather than on averages. Thus, the variability in exposure concentrations was not considered. Assuming continuous exposure to the maximum concentration overestimates human and ecological exposures, given that receptors are mobile and concentrations change over time. For example, US EPA guidance states that risks should be estimated using average exposure concentrations as represented by the 95% upper confidence limit on the mean (US EPA, 1992). Given that exposure estimates based on the maximum concentrations did not exceed risk benchmarks, Gradient has greater confidence that there is no risk concern.

- Only constituents detected in groundwater were used to identify COIs and model COI concentrations in surface water. For the constituents that were not detected in facility groundwater, the detection limits were below the IL Part 845.600 GWPS for all constituents except antimony, and thus do not require further evaluation. (Antimony was not detected in 32 groundwater samples from 2018 to 2023; 30 of the detection limits ranged from 0.001 to 0.005 mg/L, thus were below the GWPS of 0.006 mg/L.)
- There are limited groundwater data available that have been analyzed for Appendix IV constituents to specifically characterize the ponds of interest. If additional data are collected, the new data could lead to different risk estimates (either increased or decreased risk).
- COI concentrations in Little Saline Creek were modeled using the maximum detected total COI concentrations in groundwater from the S-wells. Modeling surface water concentrations using total metal concentrations may overestimate surface water concentrations because dissolved concentrations, which are lower than total concentrations, represent the mobile fractions of constituents that could likely flow into and mix with surface water.
- The COIs identified in this evaluation also occur naturally in the environment. Contributions to exposure from natural or other non-MGS-related sources were not considered in the evaluation of modeled concentrations; only exposure contributions potentially attributable to Site groundwater mixing with surface water were evaluated. While not quantified, exposures from potential MGS-related groundwater contributions are likely to represent only a small fraction of the overall human and ecological exposure to COIs that also have natural or non-MGS-related sources.
- Screening benchmarks for human health were developed using exposure inputs based on US EPA's recommended values for reasonable maximum exposure (RME) assessments (Stalcup, 2014). RME is defined as "the highest exposure that is reasonably expected to occur at a site but that is still within the range of possible exposures" (US EPA, 2004). US EPA states the "intent of the RME is to estimate a conservative exposure case (*i.e.*, well above the average case) that is still within the range of possible exposures" (US EPA, 1989). US EPA also notes that this high-end exposure "is the highest dose estimated to be experienced by some individuals, commonly stated as approximately equal to the 90^{th} percentile exposure category for individuals" (US EPA, 2015c). Thus, most individuals will have lower exposures than those presented in this risk assessment.

Toxicity Benchmarks:

- Screening-level ecological benchmarks were compiled from IEPA and US EPA guidance and designed to be protective of the majority of Site conditions, leaving the option for Site-specific refinement. In some cases, these benchmarks may not be representative of the Site-specific conditions or receptors found at the Site, or may not accurately reflect concentration-response relationships encountered at the Site. For example, the ecological benchmark for cadmium is hardness dependent, and Gradient relied on US EPA's default hardness of 100 mg/L. Use of a higher hardness value would increase the cadmium SWQS because benchmarks become less stringent with higher levels of hardness. Regardless of the hardness, the maximum modeled cadmium concentration is orders of magnitude below the SWQS.
- In addition, for the ecological evaluation, Gradient conservatively assumed all constituents to be 100% bioavailable. Modeled COI concentrations in surface water are considered total COI concentrations. In addition, the measured surface water data used in this report represent total concentrations. US EPA recommends using dissolved metals as a measure of exposure to ecological receptors because it represents the bioavailable fraction of metal in water (US EPA, 1993). Therefore, the modeled surface water COI concentrations may be an overestimation of exposure concentrations to ecological receptors.

- In general, it is important to appreciate that the human health toxicity factors used in this risk evaluation are developed to account for uncertainties, such that safe exposure levels used as benchmarks are often many times lower (even orders of magnitude lower) than the levels that cause effects that have been observed in human or animal studies. For example, toxicity factors incorporate a 10-fold safety factor to protect sensitive subpopulations. This means that a risk exceedance does not necessarily equate to actual harm.

4 Summary and Conclusions

A screening-level risk evaluation was performed for Site-related constituents in groundwater at the MGS in Marion, Illinois. The CSM developed for the Site indicates that groundwater beneath the facility may flow into the Lake of Egypt to the east of the Site, or into Little Saline Creek to the north of the Site, and may potentially impact surface water.

CEMs were developed for human and ecological receptors. In the Lake of Egypt, the complete exposure pathways for humans include recreators (boaters) in the who are exposed to surface water, and anglers who consume locally caught fish. The use of surface water from the Lake of Egypt as a drinking water source was also evaluated as a complete pathway. The complete exposure pathway for humans in Little Saline Creek includes anglers who consume locally caught fish. Based on the local hydrogeology, residential exposure to groundwater used for drinking water or irrigation is not a complete pathway and was not evaluated. The complete exposure pathways for ecological receptors include aquatic life (including aquatic and marsh plants, amphibians, reptiles, and fish) exposed to surface water; benthic invertebrates exposed to sediment; and avian and mammalian wildlife exposed to bioaccumulative COIs in surface water, sediment, and dietary items.

Groundwater data collected from 2018 to 2023 were used to estimate exposures. The surface water data collected from the Lake of Egypt (in 2020) were also evaluated. Surface water concentrations were modeled in Little Saline Creek using the maximum detected groundwater concentration in the S-wells from the northern portion of the Site. Surface water exposure estimates were screened against benchmarks protective of human health and ecological receptors for this risk evaluation.

US EPA has established acceptable risk metrics. Risks above these US EPA-defined metrics are termed potentially "unacceptable risks." Based on the evaluation presented in this report, no unacceptable risks to human or ecological receptors resulting from CCR exposures associated with the Site were identified. This means that the risks from the Site are likely indistinguishable from normal background risks. Specific risk assessment results include the following:

- For recreators exposed to surface water, all COIs were below the conservative risk-based screening benchmarks. Therefore, none of the COIs evaluated in surface water are expected to pose an unacceptable risk to recreators in the Lake of Egypt.
- For anglers consuming locally caught fish, the modeled concentrations of all COIs in surface water (as well as the measured data) were below conservative benchmarks protective of fish consumption. Therefore, none of the COIs evaluated are expected to pose an unacceptable risk to anglers consuming fish caught from the Lake of Egypt or Little Saline Creek.
- For Lake of Egypt surface water used as a public drinking water supply, all COIs were below the Illinois Class I GWPS, thus no unacceptable risks were identified for the use of Lake of Egypt surface water as drinking water.
- Groundwater downgradient of the Site is not being used as a drinking water, thus the use of groundwater is not a complete exposure pathway.
- Ecological receptors exposed to surface water in Little Saline Creek include aquatic and marsh plants, amphibians, reptiles, and fish. The risk evaluation showed that none of the modeled COIs in Little Saline Creek exceeded protective screening benchmarks. Ecological receptors exposed to

sediment include benthic invertebrates. The modeled sediment COIs did not exceed the conservative screening benchmarks; therefore, none of the COIs evaluated in sediment are expected to pose an unacceptable risk to ecological receptors in Little Saline Creek.

- Ecological receptors were also evaluated for exposure to bioaccumulative COIs. This evaluation considered higher trophic level wildlife with direct exposure to surface water and sediment and secondary exposure through the consumption of dietary items (*e.g.*, plants, invertebrates, small mammals, fish). None of the ecological COIs were identified as having potential bioaccumulative effects. Overall, this evaluation demonstrated that none of the COIs evaluated are expected to pose an unacceptable risk to ecological receptors.

It should be noted that this evaluation incorporates a number of conservative assumptions that tend to overestimate exposure and risk. The risk evaluation was based on the maximum detected COI concentration; however, US EPA guidance states that risks should be based on a representative average concentration such as the 95% upper confidence limit on the mean; thus, using the maximum concentration tends to overestimate exposure. Although the COIs identified in this evaluation also occur naturally in the environment, the contributions to exposure from natural background sources and nearby industry were not considered; thus, CCR-related exposures were likely overestimated. Exposure estimates assumed 100% metal bioavailability, which likely results in overestimates of exposure and risks. Exposure estimates were based on inputs to evaluate the "reasonable maximum exposure"; thus, most individuals will have lower exposures than those estimated in this risk assessment.

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Appendix A

Surface Water Modeling

List of Tables

Gradient modeled concentrations of constituents of interest (COIs) in the Little Saline Creek surface water based on available groundwater data. First, we estimated the flow rate of COIs flowing into the Little Saline Creek *via* groundwater. Then, we adapted United States Environmental Protection Agency (US EPA) indirect exposure assessment methodology (US EPA, 1998) in order to model surface water concentrations in the Little Saline Creek.

Model Overview

The groundwater flow to the creek is represented by a one-dimensional, steady-state model. In this model, the groundwater plume from the northern portion of the Site migrates horizontally in the uppermost water-bearing unit prior to flowing to Little Saline Creek. The groundwater flow entering the creek is the flow going through a cross-sectional area that has a length equal to the length of the creek adjacent to the Site with potential impacts from the ponds system and a height equal to the thickness of the uppermost water-bearing unit. It was assumed that all the groundwater flowing through this layer would ultimately discharge to Little Saline Creek. The length of the groundwater discharge zone was estimated using Google Earth Pro (Google, LLC, 2022).

The groundwater flow to Little Saline Creek mixes with the surface water in the creek. The COIs entering the creek *via* groundwater dissolve into the water column, sorb to suspended sediments, or sorb to benthic sediments. Using US EPA's indirect exposure assessment methodology (US EPA, 1998), the model evaluates the surface water COI concentrations at a location downstream of the groundwater discharge point, assuming a well-mixed water column.

Groundwater Discharge Rate

The groundwater flow rate was evaluated using conservative assumptions. Gradient conservatively assumed that the groundwater concentrations were uniformly equal to the maximum detected concentration of each individual COI. Further, Gradient ignored adsorption by subsurface soil and assumed that all the groundwater flowing through the aquifer and intersecting the creek was flowing into the creek.

For each groundwater unit, the groundwater flow rate into the creek was derived using Darcy's Law:

$$Q = K \times i \times A$$

where:

Q	=	Groundwater flow rate (m^3/s)
K	=	Hydraulic conductivity (m/s)
i	=	Hydraulic gradient (m/m)
A	=	Cross-sectional area (m^2)

For each COI, the mass discharge rate into the creek was then calculated by:

$$m_c = C_c \times Q \times CF$$

where:

m_c	=	Mass discharge rate of the COI (mg/year)
C_c	=	Maximum groundwater concentration of the COI (mg/L)
Q	=	Groundwater flow rate (m^3/s)
CF	=	Conversion factors: 1,000 L/m^3 and 31,557,600 s/year

The values of the aquifer parameters used for these calculations are provided in Table A.1. The calculated mass discharge rates were then used as inputs for the surface water model.

The length of the discharge zone was estimated to be approximately 840 m and the height of the discharge zone was estimated to be 3 m; thus, the cross-sectional area was estimated to be 2,560 m^2 (SIPC, 2021). The average horizontal hydraulic gradient was 0.019 m/m (estimated using groundwater elevation in wells S3 and S6; SIPC, 2007). The average horizontal hydraulic conductivity was 1.5×10^{-4} cm/s (Golder Associates Inc., 2021).

Surface Water Concentration

Groundwater that flows into the creek will be diluted with the surface water flow. Constituents transported by groundwater into the surface water migrate into the water column and the bed sediments. The surface water model Gradient used to estimate the surface water concentrations is a steady-state model described in US EPA's indirect exposure assessment methodology (US EPA, 1998) and also used in US EPA's "Human and Ecological Risk Assessment of Coal Combustion Residuals," referred to herein as the CCR risk assessment (US EPA, 2014). This model describes the partitioning of constituents between surface water, suspended sediments, and benthic sediments based on equilibrium partition coefficients (K_d values). It estimates the concentrations of constituents in surface water, suspended sediments, and benthic sediments at steady-state equilibrium at a theoretical location downstream of the discharge point after complete mixing of the water column. In our analysis, we used the K_d values provided in the US EPA CCR risk assessment for all of the COIs (US EPA, 2014, Table J1). These coefficients are presented in Table A.2.

To be conservative, Gradient assumed that the constituents were not affected by dissipation or degradation once they entered the water body. The total water body concentration of the COI was calculated as follows (US EPA, 1998):

$$C_{wtot} = \frac{m_c}{V_f \times f_{water}}$$

where:

C_{wtot}	=	Total water body concentration of the COI (mg/L)
m_c	=	Mass discharge rate of the COI (mg/year)
V_f	=	Water body annual flow (L/year)
f_{water}	=	Fraction of the COI in the water column (unitless)

For the Little Saline Creek annual flow rate, Gradient used the average peak-flow discharge rate of about 279 cubic feet per second (cfs), or 2.5×10^{11} L/year, based on the discharge rates measured at the United States Geological Survey (USGS) gauging station near Goreville, Illinois (USGS Station 03382025) between 1959 and 1980[7] (USGS, 2024a). The surface water parameters are presented in Table A.3.

The fraction of COIs in the water column was calculated for each COI using the sediment/water and suspended solids/water partition coefficients (US EPA, 2014). The fraction of COIs in the water column is defined as follows (US EPA, 2014):

$$f_{water} = \frac{(1 + [K_{dsw} \times TSS \times 0.000001]) \times \frac{d_w}{d_z}}{\left([1 + (K_{dsw} \times TSS \times 0.000001)] \times \frac{d_w}{d_z}\right) + ([bsp + K_{dbs} \times bsc] \times \frac{d_b}{d_z})}$$

[7] The available data were for the years 1959 to 1980.

where:

K_{dsw}	=	Suspended sediment-water partition coefficient (mL/g)
K_{dbs}	=	Sediment-water partition coefficient (mL/g)
TSS	=	Total suspended solids in the surface water body (mg/L). Assumed equal to 49 mg/L based on the average suspended sediment concentration measured in South Fork Saline River at the USGS gauging station at Carrier Mills, Illinois (USGS Station 03382100) between 1976 and 1997 (USGS, 2024b).
0.000001	=	Units conversion factor
d_w	=	Depth of the water column (m). The depth of the water column was estimated as 1.52 m from Google Earth photos.
d_b	=	Depth of the upper benthic layer (m). Set equal to 0.03 m (US EPA, 2014).
d_z	=	Depth of the water body (m). Calculated as $d_w + d_b$. Set equal to 1.55 m.
bsp	=	Bed sediment porosity (unitless). Set equal to 0.6 (US EPA, 2014).
bsc	=	Bed sediment particle concentration (g/cm^3). Set equal to 1.0 g/cm^3 (US EPA, 2014).

The fraction of COIs dissolved in the water column (f_d) is calculated as follows (US EPA, 2014):

$$f_d = \frac{1}{1 + K_{dsw} \times TSS \times 0.000001}$$

The values for the fraction of COI in the water column and other calculated parameters are presented in Table A.4.

The total water column concentration (C_{wcTot}) of the COIs, comprising both the dissolved and suspended sediment phases, is then calculated as follows (US EPA, 2014):

$$C_{wcTot} = C_{wtot} \times f_{water} \times \frac{d_z}{d_w}$$

Finally, the dissolved water column concentration (C_{dw}) for the COIs is calculated as follows (US EPA, 2014):

$$C_{dw} = f_d \times C_{wcTot}$$

The dissolved water column concentration (C_{dw}) was then used to calculate the concentration of COIs sorbed to suspended solids in the water column (US EPA, 1998):

$$C_{sw} = C_{dw} \times K_{dsw}$$

where:

C_{sw}	=	Concentration sorbed to suspended solids (mg/kg)
C_{dw}	=	Concentration dissolved in the water column (mg/L)
K_{dsw}	=	Suspended solids/water partition coefficient (mL/g)

In the same way, using the total water body concentration and the fraction of COI in the benthic sediments, the model derives the total concentration in benthic sediments (US EPA, 2014):

$$C_{bstot} = f_{benth} \times C_{wtot} \times \frac{d_z}{d_b}$$

where:

C_{bstot} = Total COI concentration in bed sediment (mg/L or g/m^3)
C_{wtot} = Total water body COI concentration (mg/L)
f_{benth} = Fraction of COI in benthic sediments (unitless)
d_b = Depth of the upper benthic layer (m)
d_z = Depth of the water body (m). Calculated as $d_w + d_b$.

This value can be used to calculate dry weight sediment concentration as follows:

$$C_{seddw} = \frac{C_{bstot}}{bsc}$$

where:

C_{seddw} = Dry weight sediment concentration (mg/kg)
C_{bstot} = Total sediment concentration (mg/L)
bsc = Bed sediment bulk density. Used the default value of 1 g/cm^3 from US EPA (2014).

The total sediment concentration is composed of the sum of the COI concentration dissolved in the bed sediment pore water (equal to the concentration dissolved in the water column) and the COI concentration sorbed to benthic sediments (US EPA, 1998).

The COI concentration sorbed to benthic sediments was calculated as follows (US EPA, 1998):

$$C_{sb} = C_{dbs} \times K_{dbs}$$

where:

C_{sb} = Concentration sorbed to bottom sediments (mg/kg)
C_{dbs} = Concentration dissolved in the sediment pore water (mg/L)
K_{dbs} = Sediments/water partition coefficient (mL/kg)

For each COI, the modeled total water column concentration, dry weight sediment concentration, and concentration sorbed to sediment are presented in Table A.5.

Table A.1 Parameters Used to Estimate Groundwater Discharge to Surface Water

Parameter	Name	Value	Unit
A	Cross-Sectional Area	2,560	m^2
i	Hydraulic Gradient	0.019	m/m
K	Hydraulic Conductivity	1.50E-04	cm/s

Sources: SIPC, 2021; SIPC, 2007; Golder Associates Inc., 2021.

Table A.2 Partition Coefficients

Constituent	Mean Sediment-Water Partition Coefficient (K_{dbs})		Mean Suspended Sediment-Water Partition Coefficient (K_{dsw})	
	Value (log_{10}) (mL/g)	Value (mL/g)	Value (log_{10}) (mL/g)	Value (mL/g)
Metals				
Arsenic	2.4	2.51E+02	3.9	7.94E+03
Beryllium	2.8	6.31E+02	4.2	1.58E+04
Boron	0.8	6.31E+00	3.9	7.94E+03
Cadmium	3.3	2.00E+03	4.9	7.94E+04
Cobalt	3.1	1.26E+03	4.8	6.31E+04
Lead	4.6	3.98E+04	5.7	5.01E+05
Thallium	1.3	2.00E+01	4.1	1.26E+04

Notes:
mL/g = Milliliters per Gram.
Source: US EPA, 2014.

Table A.3 Surface Water Parameters

Parameter	Name	Value	Unit
TSS	Total Suspended Solids	49	mg/L
V_{fx}	Surface Water Flow Rate	2.5×10^{11}	L/year
d_b	Depth of Upper Benthic Layer (default)	0.03	m
d_w	Depth of Water Column	1.52	m
d_z	Depth of Water Body	1.55	m
bsc	Bed Sediment Bulk Density (default)	1	g/cm^3
bsp	Bed Sediment Porosity (default)	0.6	–
M_{TSS}	TSS Mass per Unit Area[a]	0.075	kg/m^2
M_S	Sediment Mass per Unit Area[b]	30	kg/m^2

Notes:
CF = Conversion Factor.
Source of default values: US EPA, 2014.
(a) $M_{TSS} = TSS \times d_w \times CF1 \times CF2$.
(b) $M_S = d_b \times bsc \times CF3 \times CF4$.
CF1 = 1,000 L/m^3; CF2 = 1E06 mg/kg; CF3 = 1E+06 cm^3/m^3; CF4 = 0.001 kg/g.

Table A.4 Calculated Parameters

COI	Fraction of COI in the Water Column (f_{water})	Fraction of COI in the Benthic Sediments ($f_{benthic}$)	Fraction of COI Dissolved in the Water Column ($f_{dissolved}$)
Metals			
Arsenic	0.219	0.781	0.720
Beryllium	0.1250	0.8750	0.5629
Boron	0.9108	0.0892	0.7198
Cadmium	0.1107	0.8893	0.2044
Cobalt	0.142	0.858	0.244
Lead	0.032	0.968	0.039
Thallium	0.800	0.200	0.618

Note:
COI = Constituent of Interest.

Table A.5 Surface Water Modeling Results for Little Saline Creek

COI	Maximum Measured Groundwater Concentration (mg/L)	Modeled Surface Water Concentration (mg/L)
Arsenic	1.20E-01	1.37E-09
Beryllium	8.10E-03	9.27E-11
Boron	3.10E+00	3.55E-08
Cadmium	5.50E-02	6.30E-10
Cobalt	5.40E-02	6.18E-10
Lead	8.00E-02	9.16E-10
Thallium	4.60E-02	5.27E-10

Notes:
COI = Constituent of Interest; mg/L = Milligrams per Liter.

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Appendix B

Screening Benchmarks

Table B.1 Calculated Water Quality Standards Protective of Incidental Ingestion and Fish Consumption

Human Health COI	Bioconcentration Factor (BCF)		Average Daily Intake (ADI)			Human Threshold Criteria (HTC)		
	BCF[a] (L/kg-tissue)	Basis	MCL (mg/L)	RfD (mg/kg-d)	ADI[b] (mg/day)	Water & Fish (mg/L)	Water Only (mg/L)	Fish Only (mg/L)
Arsenic	44	NRWQC (2002)	0.01	0.0003	0.02	0.022	2.0	0.023
Beryllium	19	NRWQC (2002)	0.004	0.002	0.008	0.021	0.80	0.021
Boron	1	(d)	NC	0.2	14	467	1400	700
Cadmium	270	US EPA (2014)	0.005	0.0001	0.01	0.0018	1.0	0.0019
Cobalt	300	ORNL (2023)	NC	0.0003	0.021	0.0035	2.1	0.0035
Lead	46	US EPA (2014)	0.01	NC	0.02	0.01	0.01	0.01
Thallium	116	NRWQC (2002)	0.002	0.00001	0.004	0.0017	0.40	0.0017

Notes:

ADI = Average Daily Intake; BCF = Bioconcentration Factor; COI = Constituent of Interest; F = Fish Consumption Rate; HTC = Human Threshold Criteria; MCL = Maximum Contaminant Level; NA = BCF Not Available and Therefore, WQC for Fish Only Not Calculated; NC = No Criterion Available; NRWQC = National Recommended Water Quality Criteria; ORNL = Oak Ridge National Laboratory; RfD = Reference Dose; W = Water Consumption Rate; WQC = Water Quality Criteria; SWQC = Surface Water Quality Criteria; US EPA = United States Environmental Protection Agency.

(a) BCFs from the following hierarchy of sources:

NRWQC (2002). National Recommended Water Quality Criteria: 2002. Human Health Criteria Calculation Matrix.

US EPA (2014). Human and Ecological Risk Assessment of Coal Combustion Residuals.

ORNL (2023). Risk Assessment Information System (RAIS) Chemical Toxicity Values.

(b) ADI based on the MCL is calculated as the MCL (mg/L) multiplied by a water ingestion rate of 2 L/day. In the absence of an MCL, the ADI was calculated as the RfD (mg/kg-d) multiplied by the body weight (70 kg).

(c) SWQC based on US EPA's action level.

(d) BCF of 1 was used as a conservative assumption, due to lack of published BCF.

Consumption of Water and Fish

$$HTC = \frac{ADI}{W + (F \times BCF)}$$

Consumption of Water Only

$$HTC = \frac{ADI}{W}$$

Consumption of Fish Only

$$HTC = \frac{ADI}{F \times BCF}$$

Where:

Human Threshold Criteria (HTC)	Chemical-specific	mg/L
Acceptable Daily Intake (ADI)	Chemical-specific	mg/day
Fish Consumption Rate (F)	0.02	kg/day
Bioconcentration Factor (BCF)/ Bioaccumulation Factor (BAF)	Chemical-specific	L/kg-tissue
Water Consumption Rate (W)	0.01	L/day
Body Weight	70	kg
Target Cancer Risk (TCR)	1.0E-05	unitless

EXHIBIT 38

Closure Impact Assessment
Pond 4
Marion Generating Station,
Marion, Illinois

Prepared by

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Abbreviations

BMP	Best Management Practice
CBR	Closure-by-Removal
CCR	Coal Combustion Residual
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CY	Cubic Yards
EJ	Environmental Justice
FEMA	Federal Emergency Management Agency
GHG	Greenhouse Gas
GWPS	Groundwater Protection Standard
IDNR	Illinois Department of Natural Resources
IEPA	Illinois Environmental Protection Agency
N_2O	Nitrous Oxide
NO_x	Nitrogen Oxide
NPDES	National Pollutant Discharge Elimination System
PM	Particular Matter
SIPC	Southern Illinois Power Cooperative
TDS	Total Dissolved Solids
US	United States
US DOT	United States Department of Transportation
VOC	Volatile Organic Compound

Executive Summary

Southern Illinois Power Cooperative (SIPC) owns and operates the Marion Generating Station (Site), a gas and coal-fired power generating station. The station is located approximately eight miles south of Marion, Illinois, on the northwestern bank of the Lake of Egypt. The facility began operation in 1963. The area surrounding the facility is a rural agricultural community (Kleinfelder and Wendland, 2013).

The Site has several surface impoundments that have been used for storage of coal combustion residuals (CCR) and impoundments that were used to support other operational purposes (*e.g.*, wastewater storage, surface water run-off collection). The focus of my analysis in this report is Pond 4. Pond 4 was built in 1979 and is in the central portion of the Site. Historically, Pond 4 received decant water from other ponds that received bottom ash, and it has been used to receive runoff from the coal pile (Kleinfelder, 2013; SIPC, 2021a). No CCRs were ever directly sent to or disposed in Pond 4. Currently, Pond 4 receives overflow from Pond S-6. Water in Pond 4 discharges into the Little Saline Creek *via* Outfall 002 (Kleinfelder, 2013; SIPC, 2021a).

The goal of this Closure Impact Assessment was to holistically evaluate a closure scenario with respect to a wide range of factors, including risks to human health and the environment, risks of future releases, effects on groundwater, surface water, and air quality, impacts to the local community, and impacts on worker safety. Specifically, I evaluated the impacts and potential benefits associated with one specific closure scenario at Pond 4: closure-by-removal (CBR). CBR would include dewatering of the pond and excavation of sediment in the pond; it may also include either on-Site disposal or off-Site disposal of the excavated sediment. Post-excavation, this scenario could also include a retrofit of Pond 4 with an impermeable bottom liner to allow for continued operation and use of the pond. Results of the closure impact assessment were compared to the impacts associated with current operational conditions at Pond 4.

Based on the assessment, CBR does not lead to greater environmental benefit as compared to continued operation of Pond 4. Specifically, CBR will not result in any reduction in risks to human health or the environment and will not result in any improvement to groundwater or surface water quality. However, implementing CBR may have several adverse effects compared to the continued operation of Pond 4. Specifically, closure may cause short-term impacts to air quality, result in increased greenhouse gas (GHG) emissions and increased energy consumption, cause an increase in worker injuries, and result in increased accidents, traffic, and noise to nearby communities.

1 Introduction

Southern Illinois Power Cooperative (SIPC) owns and operates the Marion Generating Station (Site), a gas and coal-fired power generating station. The station is located approximately eight miles south of Marion, Illinois, on the northwestern bank of the Lake of Egypt (Figure 1.1). Power generation Units 1, 2, and 3 started operating in 1963; Unit 4 started operating in 1978. Unit 123 replaced the retired Units 1, 2, and 3 in the early 2000s, and Unit 4 ceased operation in 2020 (Kleinfelder, 2013; SIPC, 2021b).

The Site has several surface impoundments that have been used for storage of CCR and impoundments that were used to support other operational purposes (*e.g.*, wastewater storage, surface water run-off collection). Only "relatively small amounts of fly ash" were ever produced at the Site (SIPC, 2021b). Fly ash that was generated was transported and stored in the Initial Fly Ash Holding Area, Replacement Fly Ash Holding Area, Pond A-1, or the Former On-Site Landfill (SIPC, 2021b). The former Fly Ash Holding Areas are within the cover area for the Former On-Site Landfill (SIPC, 2021b). Other ponds located on Site (Figure 1.1) and a description of their historic and current operation are described below.

- Ponds 1 and 2 received sluiced bottom ash from power generation units 1, 2, 3, and 4 (Figure 1.1; SIPC, 2021b). During the entire pond operational life, bottom ash was removed from Ponds 1 and 2 and sold for beneficial reuse to shingle manufacturers, grit blasting companies, and local highway departments. Decanted water from Ponds 1 and 2 flowed into Pond 4. Ponds 1 and 2 are no longer in operation and are currently being closed (SIPC, 2021b).
- The Former Emery Pond was constructed in the late 1980s to hold stormwater drainage from the generating station (Figure 1.1; SIPC, 2021b). All CCRs in Emery Pond have been removed and the pond has been closed (SIPC, 2021b). Groundwater corrective action is currently on-going (Hanson Professional Services Inc., 2021).
- South Fly Ash Pond was constructed in 1989 and was originally intended to be a replacement for Pond A-1 (Figure 1.1; SIPC, 2021b). Ultimately, Pond A-1 did not need to be replaced. Thus, the South Fly Ash Pond was only used to receive decant water from the Former Emery Pond while it was operational. No CCRs were ever directly sent to or disposed of in the South Fly Ash Pond (SIPC, 2021b).
- Ponds 3 and 3-A were secondary ponds that received overflow from the fly ash holding areas (Figure 1.1; SIPC, 2021b). They also received storm water runoff, coal pile runoff, and water from the facility floor drains. In approximately 1982, Pond 3-A was separated from Pond 3 by construction of an internal berm. All sediment and debris were removed from Pond 3 in 2006 and 2011. All sediment and debris were removed from Pond 3-A in 2014. Subsequently, no CCRs were ever directly sent to or disposed in Ponds 3 or 3-A. Currently, water from the South Fly Ash Pond flows into Pond 3 (SIPC, 2021b).
- Pond S-6 was originally built to manage stormwater associated with the Former Landfill (Figure 1.1; SIPC, 2021a. Initially, water in Pond S-6 discharged to Little Saline Creek through Outfall 001; however, in approximately 1993, water from Pond S-6 was pumped to Pond 4. No CCRs were ever directly sent to or disposed in the Pond S-6 (SIPC, 2021b).
- Pond B-3 was built in 1985 and was primarily used as a secondary pond that received water from Pond A-1 (Figure 1.1; SIPC, 2021b). During periodic shutdowns of Pond A-1, Pond B-3 may have received some short-term discharges of fly ash from Unit 1, 2, and 3 prior to their shutdown (SIPC,

2021b). Pond A-1 was taken off-line approximately 3 to 4 times between 1985 and 2003, each lasting about 2 weeks. In 2017, Pond B-3 was dewatered and all sediment and CCR were excavated.

- Pond 4 was built in 1979 and historically received decant water from Ponds 1 and 2 for secondary treatment and received runoff from the coal pile (Figure 1.1; Kleinfelder, 2013; SIPC, 2021a,b). No CCRs were ever directly sent to or disposed of in Pond 4. All sediment and debris were removed from Pond 4 in 2012. Currently, Pond 4 receives overflow from Pond S-6; water in Pond 4 discharges into the Little Saline Creek *via* Outfall 002 (Kleinfelder, 2013; SIPC, 2021b).

This Closure Impact Assessment is focused solely on Pond 4 (Figure 1.1).

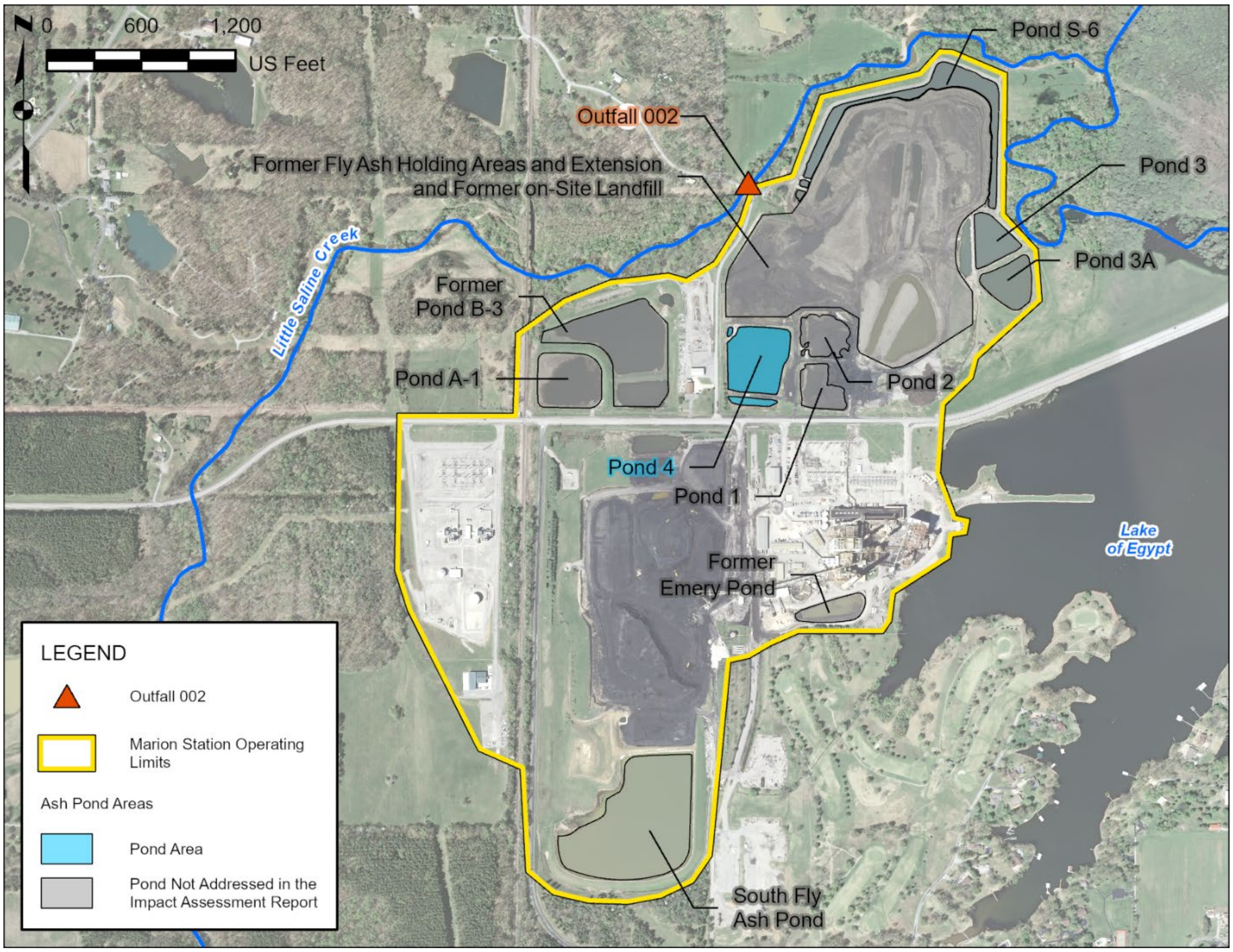

Figure 1.1 Site Location Map. Sources: Golder Associates, 2021; Andrews Engineering, 2021; USGS, 2011.

Based on the Human Health and Ecological Risk Assessment conducted for the Site (Gradient, 2024), there are no current risks to human health or the environment due to CCR-related constituents associated with Pond 4. As a result, closing Pond 4 would not result in any reduction of risk to human health or the environment. In this report, I evaluate the potential impacts that would be incurred if Pond 4 were to be closed. The Pond 4 closure scenario was assumed to be CBR. This closure scenario would include dewatering of the pond and excavation of sediment in the pond; CBR may include either on-Site disposal or off-Site disposal of the excavated sediment. Post-excavation, this scenario could also include a retrofit of Pond 4 with an impermeable bottom liner to allow for continued operation and use of the pond. This impact assessment holistically assesses the CBR closure scenario based on a series of metrics, including the efficiency, reliability, and ease of implementation of the closure scenario, as well as its potential positive and negative short- and long-term impacts on human health and the environment. These metrics are largely consistent with factors that are recommended for consideration in a closure alternatives evaluation specified in Section 845.710 of Title 35, Part 845 of the Illinois Administrative Code (IAC Part 845; IEPA, 2021).

2 Qualifications

I am a Principal at Gradient, an environmental consulting firm located in Boston, Massachusetts, and a licensed professional engineer. During my 26 years of professional experience, I have consulted and testified on a variety of projects related to the fate and transport of constituents in the environment, hydrogeology, groundwater and surface water modeling, site characterization, and remediation system design. I have a master's degree in environmental engineering from the Massachusetts Institute of Technology and bachelor's degrees in environmental engineering and physics from the University of Michigan. A copy of my *curriculum vitae* is provided in Appendix A.

I have applied my knowledge to address a range of complex challenges in the electric power, oil and gas, chemical manufacturing, pharmaceutical, mining, agrichemical, and waste disposal sectors. Related to CCRs, my experience includes projects involving regulatory comment, closure alternatives analysis, corrective action alternatives analysis, relative impact assessments, and fate and transport modeling. I have worked on projects at approximately 75 CCR coal ash landfills and surface impoundments. Additionally, I have published and presented on a variety of topics, including fate and transport of coal ash constituents in groundwater and surface water, closure evaluations at coal ash disposal facilities, groundwater and surface water modeling, remedial system optimization, and the impact of environmental regulations in the United States (US) and abroad.

3 Site Overview

3.1 Site Description

The Marion Generating Station is located in Marion, Illinois, on the west shores of the Lake of Egypt. The Site is bounded by Lake of Egypt to the east, Lake of Egypt Country Club to the southeast, Little Saline Creek to the north, and agricultural fields to the west and south (Figure 3.1). Little Saline Creek flows to the northeast (USGS, 2022). This Closure Impact Assessment addresses potential impacts associated with closure of Pond 4 by CBR.

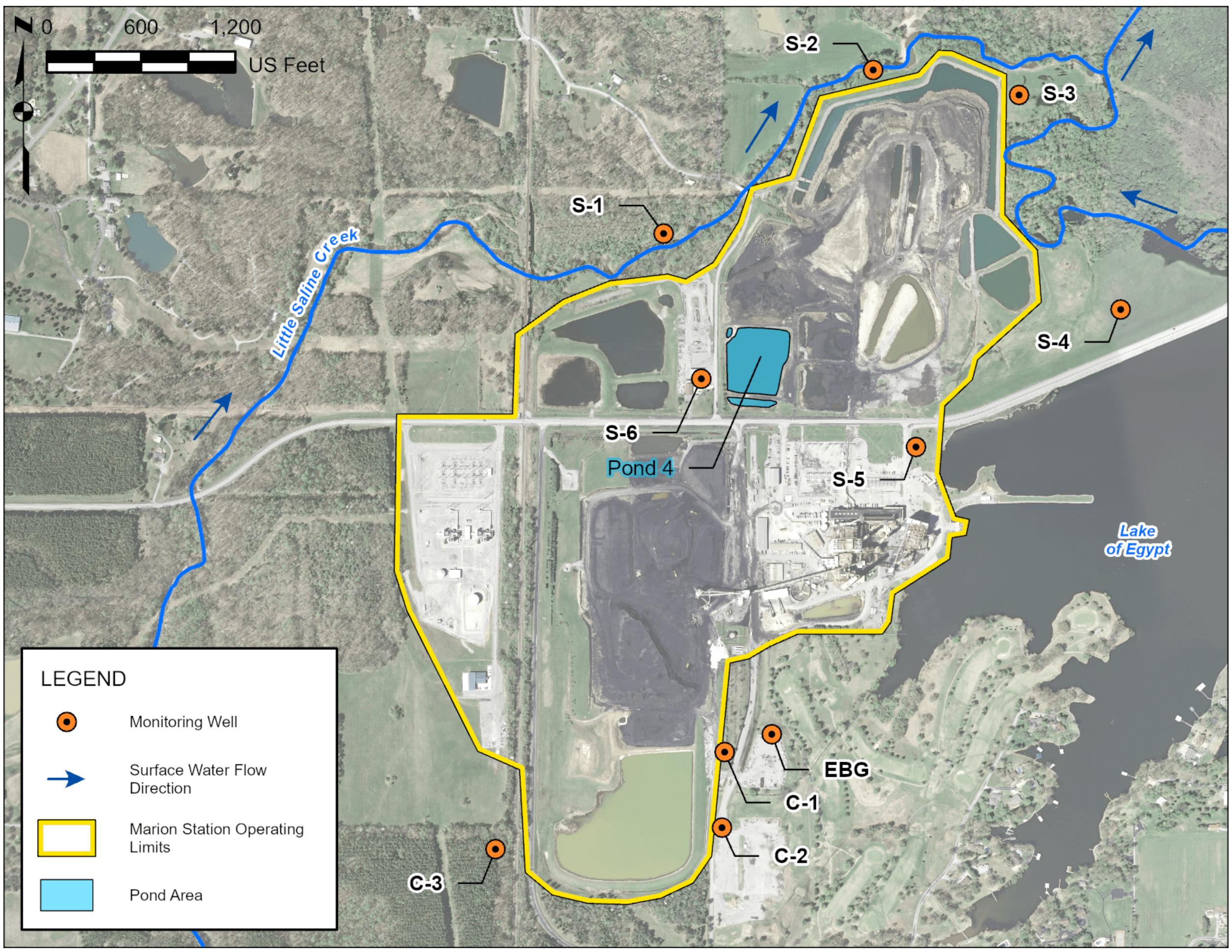

Figure 3.1 Site Location Map with Groundwater Monitoring Well Locations. Sources: USGS, 2022; Golder Associates, 2021; Andrews Engineering, 2021; USGS, 2011). Note: Monitoring Wells associated with the Former Emery Pond are not shown on this map.

Pond 4 was built in 1979 (Kleinfelder, 2013). It is approximately 3.7 acres in size with a total volume of approximately 1,370,059 ft^3 (50,743 cubic yards [CY]; Haley & Aldrich, 2021). Pond 4 is located in the central portion of the Site (Figure 3.1; SIPC, 2021a). During operation, bottom ash from power generating units 1, 2, 3 and 4 was sluiced to Ponds 1 and 2 (SIPC, 2021a). Pond 4 received decant water from Ponds 1 and 2 for secondary treatment prior to the shutdown of Unit 4. Pond 4 also received runoff from the coal pile area. Pond 4 never received direct discharge of CCRs. Around 1993, following the requirements of an Illinois Environmental Protection Agency (IEPA)-issued permit, SIPC installed pumps to transfer water from Pond S-6 to Pond 4 (SIPC, 2021a). In 2012, Pond 4 was excavated to the clay layer underlying the pond, removing all plant debris and any accumulated CCR or coal fines. Since 2012, Pond 4 has only received overflow from Pond S-6 and stormwater runoff. Water in Pond 4 is discharged into the Little Saline Creek *via* Outfall 002 (Kleinfelder, 2013; SIPC, 2021a). Figures 3.2-3.5 show the Site conditions of Pond 4 in 2011 prior to the excavation.

Figure 3.2 2011 Photographs of Pond 4 – General Conditions. Source: Kleinfelder, 2013.

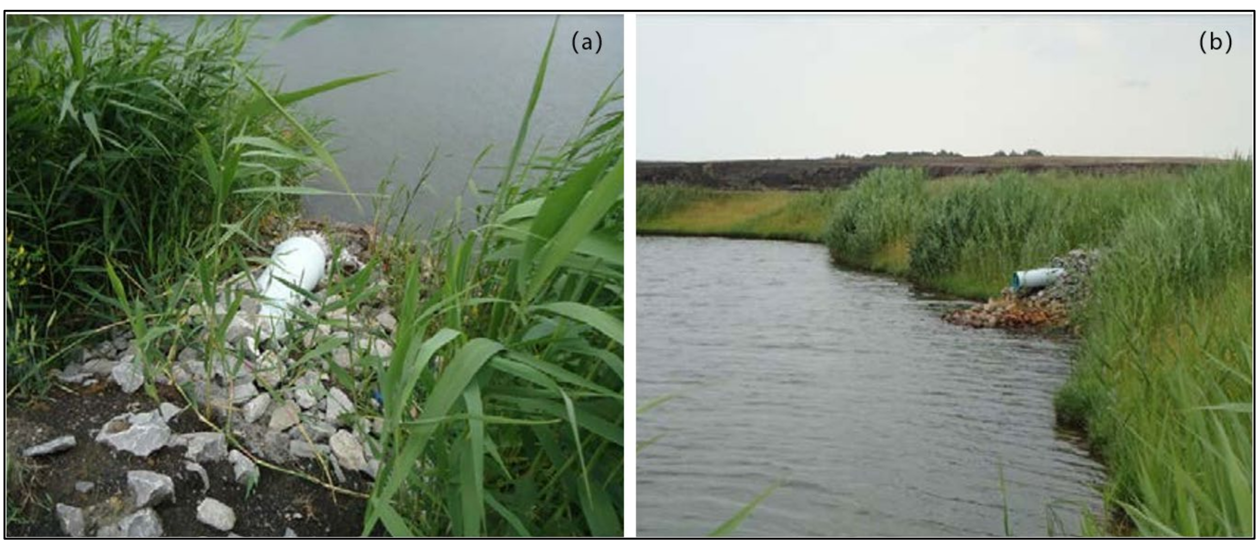

Figure 3.3 2011 Photographs of Pond 4 – (a) Discharge Pipe from Pond 1 into Pond 4; (b) Discharge Pipe from Pond 2 into Pond 4. Source: Kleinfelder, 2013.

Figure 3.4 2011 Photographs of Pond 4 – (a) Intake from Pond 4 to Outlet Structure (pipe submerged); (b) Outlet Structure from Pond 4. Source: Kleinfelder, 2013**.**

Based on a 2021 Pond Investigation Report by Haley & Aldrich, the average sediment thickness in Pond 4 is approximately 1.67 feet, which means that sediment is currently less than 10% of the total volume in Pond 4[1] (Haley & Aldrich, 2021). Sediment samples collected from Pond 4 had low concentrations of sulfate and calcium which suggests there is minimal CCR in the pond (Haley & Aldrich, 2021). Shake test concentrations of Pond 4 sediments were all below Class I groundwater standards. Based on these results, the limited amount of CCR materials that may be present in Pond 4 sediment "are not expected to result in groundwater impacts above the Part 620 Class I groundwater standards" (Haley & Aldrich, 2021).

3.2 Hydrogeology

The Site is located on the southern edge of the Illinois Basin in the Shawnee Hills Section of the Interior Low Plateaus physiographic province (Golder, 2021). The Illinois Basin is a depositional and structural basin composed of sedimentary rocks ranging in age from Cambrian to Permian. The southern portion of the basin is characterized by extensive faulting, and some of these faults host commercially significant fluorite vein deposits (Golder, 2021). The regional stratigraphic sequence includes the following, from the surface downward (Golder, 2021):

- The Caseyville/Tradewater Formation: consists of lenticular, vertically and horizontally interbedded layers of sandstone, siltstone, and shale beneath a relatively thin layer of unconsolidated materials. It ranges from 190 to 500 feet in thickness.
- The Kinkaid Formation: consists of limestone, shale, claystone, and sandstone. It ranges from 120 to 160 feet in thickness.
- The Degonia Formation: consists of thin, very-fine grained sandstone, siltstone, shale, and irregular chert beds. It ranges from 20 to 64 feet in thickness.
- The Clore Formation: consists of sandstone, shale and limestone, which sporadically outcrops at the surface. It ranges from 110 to 155 feet in thickness.

[1] Based on the sediment and pond volumes reported by Haley & Aldrich, Inc. (2021), the sediment volume in Pond 4 is approximately 6.6% of its total volume; however, Haley & Aldrich, Inc. (2021) reported a value of 10.9% instead.

On Site, soils overlying the Caseyville/Tradewater Formation consist of glacial and alluvial deposits including layers of silty clay, clayey silt, silty sand and clayey sand (Kleinfelder, 2013). Table 3.1 provides a detailed summary of the Site lithology for the upper 50 feet (Golder, 2021).

Table 3.1 Site Geology

Lithology	Description
Peoria/Roxana Silt	Light yellow-tan to gray, fine sandy silt
Glasford Formation	Silty/sandy diamictons with thin lenticular bodies of silt, sand, and gravel
Caseyville Formation/Bedrock	Sedimentary rocks including sandstone, limestone, and shales

Sources: Golder, 2021; Kleinfelder, 2013.

The Site is located within the South Fork Saline River/Lake Egypt watershed. Groundwater in the southern/eastern portion of the Site flows toward and discharges into the Lake of Egypt; groundwater throughout the rest of property flows in a northeasterly direction toward Little Saline Creek (Figure 3.5; SIPC, 2007). The uppermost water-bearing zone (*i.e.*, the Unlithified Unit) is a shallow, hydraulically perched layer consisting of fill and residuum (silts and clays), with a saturated thickness of approximately up to 10 feet (Hanson Professional Services Inc., 2021). The average horizontal hydraulic conductivity is estimated to be approximately 1.5×10^{-4} cm/s in the Unlithified Unit (Golder, 2021). The hydraulic gradient was estimated to be 0.019 based on measured groundwater elevations at monitoring wells S-3 and S-6 (SIPC, 2007).

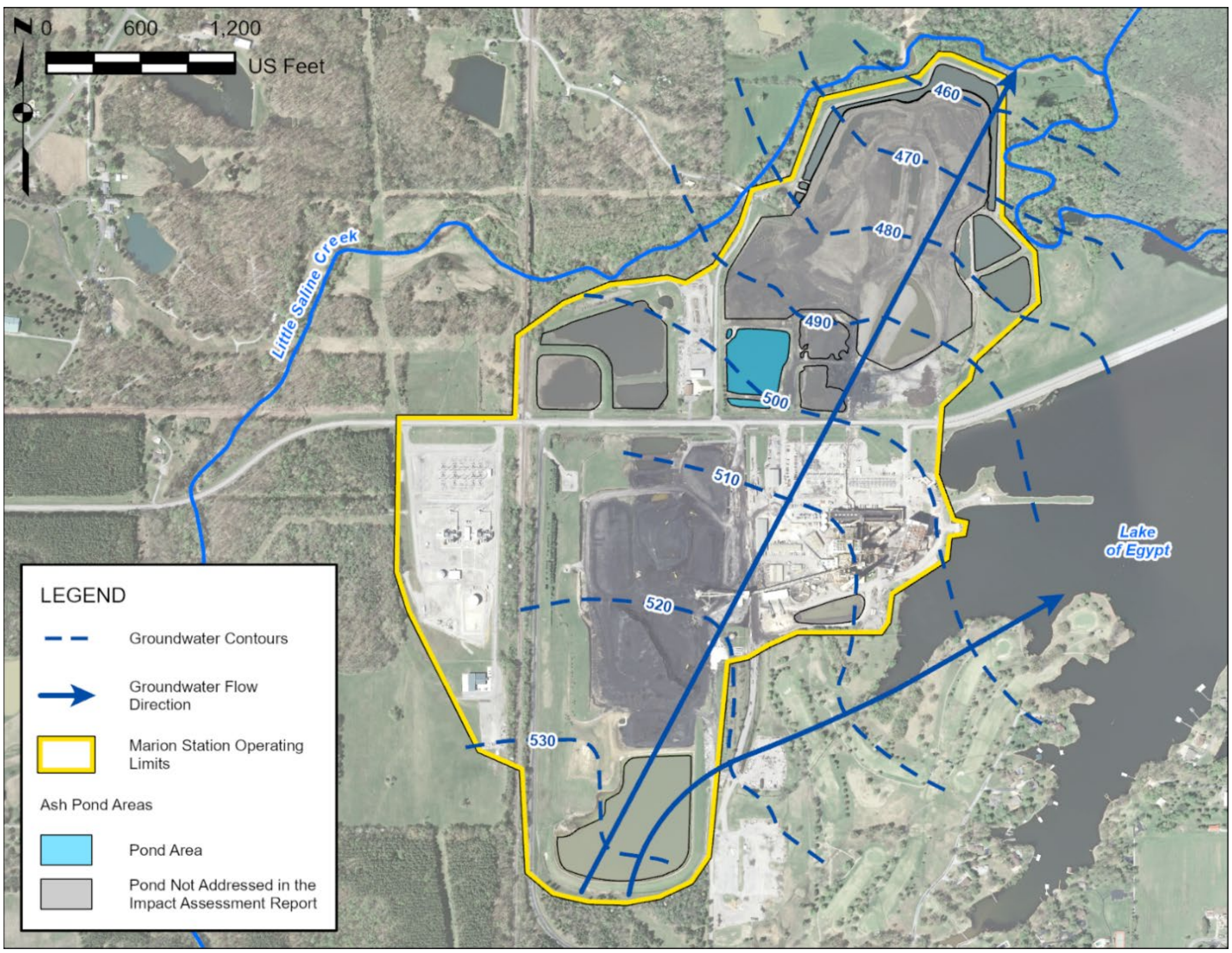

Figure 3.5 2007 Groundwater Elevations, Contours, and Flow Direction at the Site. Source: SIPC, 2007.

3.3 Groundwater Monitoring

Groundwater samples have been collected from a series of monitoring wells to monitor groundwater quality near Pond 4 ("S" series wells; Figure 3.1). Groundwater samples were analyzed for a suite of total metals, specified in IAC 845.600 (IEPA, 2021),[2] as well as general water quality parameters (pH, chloride, fluoride, sulfate, and total dissolved solids). Groundwater quality data from samples collected at "S" wells over the past five years are summarized in Table 3.2.

Table 3.2 Groundwater Data Summary (2018-2023) from Monitoring Wells ("S" Wells) Located Near Pond 4

Constituent	Samples with Constituent Detected	Samples Analyzed	Minimum Detected Value	Maximum Detected Value	Maximum Laboratory Detection Limit
Total Metals (mg/L)					
Antimony	0	12	ND	ND	0.0050
Arsenic	3	12	0.0089	0.12	0.050
Barium	12	12	0.020	1.5	NA
Beryllium	1	12	0.0081	0.0081	0.0050
Boron	35	126	0.0041	2.8	0.50
Cadmium	12	126	0.00068	0.055	0.002
Chromium	9	12	0.0014	0.069	0.0050
Cobalt	5	12	0.0012	0.054	0.010
Lead	7	12	0.0027	0.080	0.0050
Mercury	0	12	ND	ND	0.00020
Selenium	3	12	0.0021	0.017	0.025
Thallium	1	12	0.046	0.046	0.025
Dissolved Metals (mg/L)					
Boron	14	48	0.0051	3.1	0.50
Cadmium	0	48	ND	ND	0.001
Other (mg/L or SU)					
Chloride	88	90	6.1	480	20
Fluoride	6	12	0.062	0.18	0.50
pH	66	66	5.7	6.9	NA
Sulfate	122	126	2.6	310	20
Total Dissolved Solids	66	66	78	4500	NA

Notes:
mg/L = Milligrams per Liter; NA = Not Available; ND = Not Detected; SU = Standard Unit.
Source: Gradient (2024).

[2] Samples were analyzed for a longer list of inorganic constituents and general water quality parameters (chloride, fluoride, sulfate, and total dissolved solids), but these constituents were not evaluated in the risk evaluation.

4 Closure Impact Assessment

The goal of this Closure Impact Assessment was to holistically evaluate a closure scenario with respect to a wide range of factors, including risks to human health and the environment, risks of future releases, effects on groundwater, surface water, and air quality, impacts to the local community, and impacts on worker safety. Specifically, I evaluated the impacts and potential benefits associated with one specific closure scenario at Pond 4: CBR. Results of the closure impact assessment were compared to the impacts associated with current operational conditions at Pond 4.

4.1 Introduction

For this report, the Pond 4 closure scenario was assumed to be CBR. This scenario would include dewatering of the pond and excavation of sediment in the pond; CBR may include either on-Site disposal or off-Site disposal of the excavated sediment. Post-excavation, this scenario could also include a retrofit of Pond 4 with an impermeable bottom liner to allow for continued operation and use of the pond. This impact assessment holistically assesses the CBR closure scenario based on a series of metrics, described below.

- **Risks to Human Health and the Environment:** This metric evaluates the impact of closure by CBR on the reduction of risks to human health and the environment due to exposure to CCR-related constituents in groundwater and surface water.
- **Risks of Potential Future CCR Releases:** This metric evaluates the residual risk of potential CCR releases. Sub-categories include CCR releases due to a dike failure event and CCR releases under flood conditions.
- **Groundwater Quality:** This metric describes the likelihood of groundwater concentration exceedances of relevant regulatory standards.
- **Surface Water Quality:** This metric describes the likelihood of surface water concentration exceedances of relevant regulatory standards.
- **Air Quality:** This metric describes the air quality impacts of closure activities under CBR, including the generation of fugitive dust and emissions from diesel-powered construction equipment.
- **Climate Change and Sustainability:** This metric describes sustainability and climate change-related aspects of CBR, including GHG emissions and energy consumption during closure activities.
- **Worker Safety:** This metric describes potential for worker fatalities and injuries to occur during closure activities, either on-Site or off-Site (*i.e.*, due to haul truck accidents).
- **Community Impacts:** This metric describes potential for fatalities and injuries to occur in the community due to off-Site haul truck accidents. It also includes the nuisance impacts that may arise from closure activities, including traffic and noise.
- **Environmental Justice (EJ):** This metric evaluates the possible impacts of the closure activities on EJ communities.

- **Recreational Value:** This metric evaluates the potential impacts resulting from noise and visual disturbances to recreators during closure activities.

Section 4.2 summarizes the CBR scenario that I evaluated as part of this assessment. Section 4.3 presents my analysis of the various closure alternatives with respect to the metrics listed above, and Section 4.4 summarizes the conclusions of this Closure Impact Assessment.

4.2 Summary of Closure Approach

For this report, I assumed the closure scenario was CBR, which may include the following elements:

- Removal of liquids. Water would be managed in accordance with the National Pollutant Discharge Elimination System (NPDES) permit for the facility;
- Excavation of sediments;
- Site restoration such as placement of topsoil along the side slopes and bottom of Pond 4 and revegetation with native grasses;
- Disposal of the excavated sediments at either an on-Site area or an off-Site landfill; and
- Post-excavation, this scenario may also include a retrofit of Pond 4 with an impermeable bottom liner to allow for continued operation and use of the pond.

Based on a 2021 report, the total sediment volume in Pond 4 was estimated to be approximately 91,077 ft^3 (*i.e.*, 3,373 CY; Haley & Aldrich, 2021). On-Site disposal may be feasible if there is an existing on-Site landfill or construction of a new on-Site landfill is demonstrated to be viable. For this report, I assumed that that excavated sediments from Pond 4 would be transported to the West End Disposal Facility located in Thompsonville, Illinois (1710 McFarland Road), which is approximately 35 road miles from the Site. Excavated sediments could be hauled to the off-Site landfill using haul trucks with an assumed capacity of 16.5 CY.

Based on my previous experience for similarly sized units, I assumed that CBR-related closure activities would take approximately 2-4 months. Key parameters for the CBR scenario are shown in Table 4.1.

Table 4.1 Key Parameters for the CBR Scenario

Parameter	Value
Size of Pond 4 (acres)	3.7
Volume of sediments (yd^3)	3,373
Estimated duration of construction activities (months)	2 - 4
Truckloads required	205
Length of the haul route between Pond 4 and disposal area (mi)	35
Total vehicle miles traveled (mi)	14,350

Source: Haley & Aldrich, 2021.

4.3 Closure Impact Assessment

4.3.1 Risks to Human Health and the Environment

A Human Health and Ecological Risk Assessment (Gradient, 2024) concluded that, under current conditions at the Site, there are no unacceptable risks to human health or the environment associated with the use of groundwater or the discharge of groundwater to surface water. Because the current operational conditions in Pond 4 do not present a risk to human health or the environment, there are not likely to be any unacceptable risks after Pond 4 is closed. As a result, there is no risk reduction achieved by closing Pond 4.

4.3.2 Risks of Potential Future CCR Releases

Environmental impacts can occur at coal ash impoundments due to the sudden release of CCR during infrastructure failures and flooding events. This section evaluates the risk of CCR releases resulting from a dike failure or flood event.

Releases Due to Dike Failure

Sites in Illinois may be subject to seismic risks arising from the Wabash Valley Seismic Zone and the New Madrid Seismic Zone (IEMA, 2020). Specifically, the Wabash Valley Fault System is approximately 85 miles northeast of the Site, the New Madrid fault zone is located approximately 80 miles southwest of the Site, and the St. Genevieve fault zone is approximately 40 miles west of the Site (Hanson Professional Services Inc., 2019a). Although the Marion Generating Station property is located within a seismic impact zone (Hanson Professional Services Inc., 2019a), the Site does not lie within 200 feet of an active fault or fault damage zone at which displacement has occurred in Holocene time (Hanson Professional Services Inc., 2019b). As a result, there is minimal risk of dike failure under current conditions due to seismic impact. Furthermore, because there are currently only negligible amounts of CCR related materials in Pond 4, there is very little risk of a release of CCR due to a seismic event. Under the CBR scenario, all of the sediments in Pond 4 will be excavated and relocated, which would eliminate the risk of a future CCR release.

Flood-Related Releases

Based on the effective Federal Emergency Management Agency (FEMA) Flood Map for the Site, Pond 4 is not located within the 100-year flood zone (*i.e.*, Zone A) for the Lake of Egypt (FEMA, 2024). For this reason and because there are currently only negligible amounts of CCR related materials in Pond 4, there is very little risk of a flood-related CCR release at Pond 4. Under the CBR scenario, all sediments in Pond 4 would be excavated and disposed, eliminating the risk of any flood-related CCR releases.

4.3.3 Groundwater Quality

Concentrations of constituents detected in groundwater near Pond 4 were compared to the relevant groundwater protection standards (GWPSs) and to a Site-specific background concentration (Table 4.2; "S" Wells on Figure 3.1). GWPSs were defined based on IAC 845.600. The site-specific background concentration was estimated based on the maximum concentration detected at monitoring well C-3 which is located upgradient of the power generation station (Figure 3.1). Exceedances were identified when the constituent concentrations exceed either the corresponding GWPS or the background concentration, whichever is higher.

Table 4.2 Groundwater Exceedances Summary for (2018-2023) - Monitoring Wells ("S" Wells) Located Near Pond 4

Constituent[a]	Maximum Concentration Detected	Groundwater Protection Standard (GWPS; IAC 845.600)	Background Concentration (Well C-3)[b]	Exceedance of Benchmark Identified (Location of Exceedance)[c]
Total Metals (mg/L)				
Antimony	--	0.0060	--	No
Arsenic	0.12	0.010	0.0033	Yes (S-1)
Barium	1.5	2.0	0.23	No
Beryllium	0.0081	0.0040	--	Yes (S-1)
Boron	2.8	2.0	0.414	Yes (S-2)
Cadmium	0.055	0.005	0.013	Yes (S-1, S-2, S-3, S-4, S-5, and S-6)
Chromium	0.069	0.10	0.0029	No
Cobalt	0.054	0.0060	0.0072	Yes (S-1 and S-6)
Lead	0.080	0.0075	0.0062	Yes (S-1, S-2, and S-6)
Mercury	--	0.0020	--	No
Selenium	0.017	0.050	0.012	No
Thallium	0.046	0.0020	--	Yes (S-2)
Dissolved Metals (mg/L)				
Boron	3.1	2.0	0.031	Yes (S-2)
Cadmium	--	0.005	--	No
Other (mg/L or SU)				
Chloride	480	200	570	No
Fluoride	0.18	4.0	0.19	No
pH	6.9	9.0	7	No
Sulfate	310	400	414	No
Total Dissolved Solids	4,500	1,200	4,000	Yes (S-4)

Notes:
COI = Constituent of Interest; GWPS = Groundwater Protection Standard; IL = Illinois; mg/L = Milligrams per Liter; SU = Standard Units.
"--" indicate constituent was not detected
(a) The constituents are those listed in the IL Part 845.600 GWPS (IEPA, 2021).
(b) Well C-3 (Figure 3.1) is located upgradient of the Site and the maximum level of concentrations identified at C-3 were used to represent the Site background concentrations.
(c) Exceedances were identified when the constituent concentrations exceed either the GWPS or the background concentrations, whichever is higher.
Source: Gradient (2024).

The "S" series monitoring wells are located in close proximity to other historic ponds and disposal areas that received CCR during their operation, including Ponds 1 and 2, the Initial Fly Ash Holding Area, Replacement Fly Ash Holding Area, Pond A-1, and the Former On-Site Landfill. Moreover, Shake Tests performed on Pond 4 sediments did not identify concentrations of any constituents in excess of Class I groundwater standards (Haley & Aldrich, 2021). Because of this, and since CCRs were never directly sent to or disposed in Pond 4, GWPS and background concentration exceedances that have been observed at the "S" series monitoring wells are likely the result of other nearby historic ponds and disposal areas that received CCR during their operation. Thus, closure of Pond 4 by CBR is not likely to result in any improvement in groundwater quality.

4.3.4 Surface Water Quality

The impacts to surface water quality from groundwater adjacent to Pond 4 flowing into the Little Saline Creek was estimated by modeling the mixing of groundwater flowing into the stream (Gradient, 2024). Even using a conservative methodology,[3] modeling results concluded that surface water concentrations potentially attributable to groundwater discharges in the area near Pond 4 are below all relevant human health and ecological surface water screening benchmarks. The model predicted surface water concentrations in Little Saline Creek are presented in Table 4.3a and 4.3b. Consequently, closure of Pond 4 by CBR is not likely to affect surface water quality in Little Saline Creek resulting from groundwater discharges into the creek. However, construction activity associated with the closure and/or pond retrofit may result in exposed terrain which could increase the potential for surface runoff and increased sedimentation in the creek.

Table 4.3a Surface Water Modeling Results for the Little Saline Creek – Human Health Benchmarks

COI	Maximum Surface Water Concentration (Modeled)	HTC for Water and Fish	HTC for Water Only	HTC for Fish Only	Exceedance of Benchmarks
Total Metals (mg/L)					
Arsenic	1.37E-09	2.25E-02	2.00E+00	2.27E-02	No
Beryllium	9.27E-11	2.05E-02	8.00E-01	2.11E-02	No
Boron	3.55E-08	4.67E+02	1.40E+03	7.00E+02	No
Cadmium	6.30E-10	1.85E-03	1.00E+00	1.85E-03	No
Cobalt	6.18E-10	3.49E-03	2.10E+00	3.50E-03	No
Lead	9.16E-10	1.00E-02	1.00E-02	1.00E-02	No
Thallium	5.27E-10	1.72E-03	4.00E-01	1.72E-03	No

Notes:
COI = Constituent of Interest; HTC = Human Threshold Criteria; mg/L = Milligrams per Liter.
Concentrations are listed only for the constituents identified as COIs in the "S" Wells.
Modeled concentrations represent the potential effect on surface water quality resulting from the measured groundwater concentrations.
Source: Gradient (2024).

[3] The maximum detected concentrations in groundwater from the "S" Wells from 2018 to 2023 were conservatively used to model constituents of interest (COI) concentrations in surface water.

Table 4.3b Surface Water Modeling Results for the Little Saline Creek – Ecological Benchmarks

COI	Maximum Surface Water Concentration (modeled)	Ecological Freshwater Benchmark	Basis	Exceedance of Benchmark
Total Metals (mg/L)				
Cadmium	6.30E-10	1.13E-03	IEPA SWQC	No
Cobalt	6.18E-10	1.90E-02	EPA R4 ESV	No
Lead	9.16E-10	2.01E-02	IEPA SWQC	No
Thallium	5.27E-10	6.00E-03	EPA R4 ESV	No

Notes:
COI = Constituent of Interest; ESV = Ecological Screening Value; IEPA = Illinois Environmental Protection Agency; SWQC = Surface Water Quality Criteria; EPA = United States Environmental Protection Agency; R4 = Region 4; mg/L = Milligrams per Liter.
Concentrations are listed only for the constituents identified as COIs in the "S" Wells.
Modeled concentrations represent the potential effect on surface water quality resulting from the measured groundwater concentrations.
Sources: Gradient (2024); IEPA SWQC: IEPA (2019a); EPA R4 ESV: US EPA Region IV (2018).

4.3.5 Air Quality

Construction activities can adversely impact air quality. Air pollution due to construction and/or pond retrofit occurs both on-Site and off-Site (*i.e.*, along haul routes). For this analysis, two categories of air pollution are of primary concern: equipment emissions and fugitive dust. The equipment emissions of greatest concern are those found in diesel exhaust. Most construction equipment is diesel-powered, including the dump trucks used to haul material to and from the Site. Diesel exhaust contains air pollutants, including nitrogen oxides (NO_x), particular matter (PM), carbon monoxide (CO), and volatile organic compounds (VOCs) (Hesterberg *et al*., 2009; Mauderly and Garshick, 2009). Fugitive dust, another major air pollutant at construction sites, is generated by earthmoving operations and other soil- and sediment-handling activities. Along haul routes, an additional source of fugitive dust is road dust along unpaved dirt roads. Careful planning and the use of Best Management Practices (BMPs) such as wet suppression are used to minimize and control fugitive dust during construction activities; however, it is not possible to prevent dust generation entirely.

During closure, air quality impacts would be expected both near the Pond 4 construction and retrofit area and along haul roads for off-Site disposal.

4.3.6 Climate Change and Sustainability

In addition to the air pollutants listed above in Section 4.3.5, construction equipment emits GHGs, including carbon dioxide (CO_2) and possibly nitrous oxide (N_2O). Moreover, construction activities have high energy demands. The energy for construction comes from the burning of fossil fuels (*e.g.*, the diesel used to power construction equipment). This section describes the impact of closure on two metrics related to climate change and sustainable construction: GHG emissions and energy consumption.

GHG Emissions

The potential impact of the CBR scenario associated with GHG emissions from construction equipment is proportional to the vehicle miles required. The off-Site disposal of Pond 4 sediments would require a total of 14,350 vehicle miles, which would result in higher GHG emissions than the current Pond 4 operation.

Energy Consumption

Energy consumption at a construction site is synonymous with fossil fuel consumption, because the energy to power construction vehicles and equipment comes from the burning of fossil fuels. The potential energy consumption impact associated with the CBR scenario is proportional to the vehicle miles required. Off-Site disposal of Pond 4 sediments would require a total of 14,350 vehicle miles. This would result in higher energy consumption/fossil fuel consumption than the current Pond 4 operation.

4.3.7 Worker Safety

Best practices would be employed during construction and/or pond retrofit in order to ensure worker safety and comply with all relevant regulations, permit requirements, and safety plans. However, it is impossible to completely eliminate the risk of accidents occurring during construction activities.

Accidents may occur either on-Site or off-Site. On-Site accidents include injuries and deaths arising from the use of heavy equipment and/or earthmoving operations. Off-Site accidents include injuries and deaths due to haul truck accidents.

Table 4.4 shows the expected number of accidents and injuries to vehicle occupants (workers) and non-occupants (community members) due to the hauling of sediments from the Site under the CBR scenario assuming off-Site disposal. Values in Table 4.4 are based on the "per vehicle mile traveled" crash rates reported by United States Department of Transportation (US DOT) for large trucks in the US (US DOT, 2023) and total vehicle miles estimated in Table 4.1.

Table 4.4 Expected Injuries and Fatalities Under the CBR Scenario

Factor	Value
Worker Injuries	0.003
Worker Fatalities	2.3×10^{-4}
Community Injuries	0.0037
Community Fatalities	2.78×10^{-5}

4.3.8 Community Impacts

Closure activities can impact communities near the Site as well as communities located along trucking routes. Community impacts may include air pollution, haul truck accidents, and nuisance impacts from traffic and noise.

Accidents

Haul truck accidents have the potential to injure or kill community members as well as workers. Table 4.4 (above) shows the number of community injuries and fatalities that would be expected under the CBR scenario due to off-Site hauling of sediments from the Site.

Traffic

Haul routes are expected to use major arterial roads and highways, if possible, which will reduce the incidence of traffic. However, heavy use of local roads for construction operations may result in traffic near the Site. Potential sources of traffic include the mobilization of equipment and materials, the daily arrival and departure of the workforce, and transport of the excavated sediment (TVA, 2015).

For the CBR scenario (assuming off-Site disposal of sediment), approximately 205 truckloads would be required to transport excavated sediments to the off-Site landfill (Table 4.1). Therefore, some traffic would be expected adjacent to the Site during the 2-4 month construction period.

Noise

Construction generates a great deal of noise, both in the vicinity of the Site and along haul routes. However, in a similar closure impact analysis performed by TVA (2015), the authors found that "[T]ypical noise levels from construction equipment used for closure are expected to be 85 dBA or less when measured at 50 ft. These types of noise levels would diminish with distance…at a rate of approximately 6 dBA per each doubling of distance and therefore would be expected to attenuate to the recommended EPA noise guideline of 55 dBA at 1,500 ft." As identified in Google Street View (Google LLC, 2024), there are no residences located within 1,500 ft of Pond 4 of the Site and, thus, closure will not cause any adverse noise impacts.

Haul routes are expected to use major arterial roads and highways, if possible, which would reduce the noise impacts on nearby communities. However, local roads near the Site may experience noise pollution under the CBR scenario due to high volumes of truck traffic. Notably, dump trucks generate significant noise pollution, with noise levels of approximately 88 decibels or higher expected within a 50 ft radius of the truck (Exponent, 2018). This noise level is similar to the noise level of a gas-powered lawnmower or a leaf blower (CDC NCEH, 2019). Decibel levels above 80 can damage hearing after two hours of exposure (CDC NCEH, 2019).

4.3.9 Environmental Justice

The State of Illinois defines environmental justice (EJ) communities to be those communities with a minority population above twice the state average and/or a total population below twice the state poverty rate (IEPA, 2019b). Relative to other communities, EJ communities experience an increased risk of adverse health impacts due to environmental pollution (US EPA, 2016).

As shown in a map of EJ communities throughout the state (US EPA, 2024), the nearest EJ community (Marion) lies approximately 6 miles from the Site to the north (Figure 4.1). As described above, noise impacts due to CBR-related construction are expected to be limited to potential receptors located within 1,500 feet (or 0.28 miles) of the Site. Similarly, the air quality impacts of construction are expected to be limited to potential receptors located within 1,000 feet (or 0.19 miles) of the Site (CARB, 2005; BAAQMD, 2017). The EJ community near Marion is therefore unlikely to be affected by impacts to on-Site air emissions and noise pollution.

EJ communities located along the potential haul routes to the off-Site landfills may be negatively impacted throughout the excavation period by the air pollution, noise, traffic, and accidents generated by hauling activities. A review of the EJ communities in Illinois (Figure 4.1) reveals that the off-Site landfill (*i.e.*, the West End Disposal Facility in Thompsonville, Illinois) is not located within the 1-mile buffer zone of an EJ community. Moreover, none of the three major haul routes suggested by Google Maps (Figure 4.1; Google LLC, 2024) would require hauling sediment through any EJ communities or buffer zones. Therefore, no EJ impacts would be expected to occur under this disposal scenario.

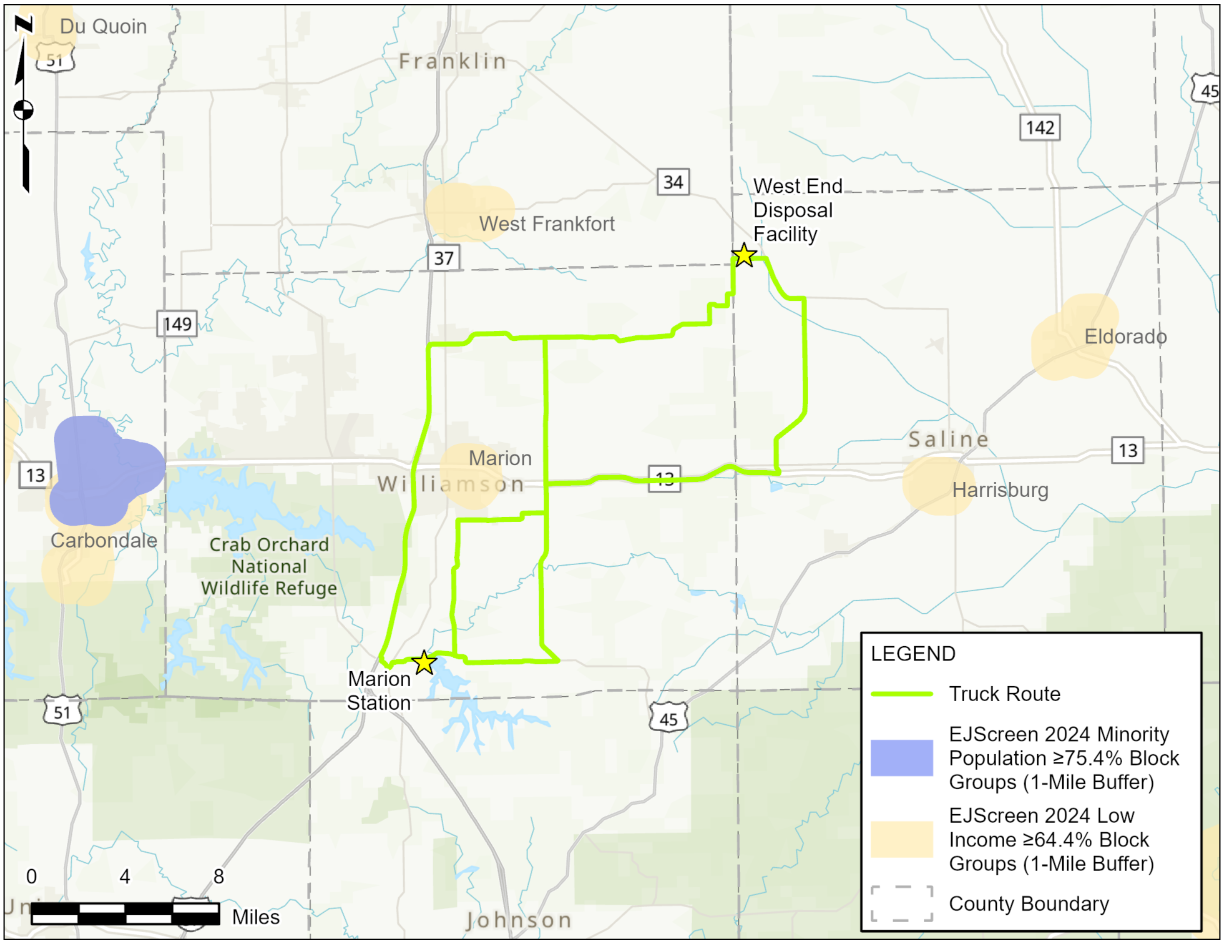

Figure 4.1 EJ Communities in the Vicinity of the Site and the Off-Site Landfill. Sources: US EPA (2024); IEPA (2019b); Google LLC (2024).

4.3.10 Scenic, Recreational, and Historical Value

During construction activities, negative impacts on scenic and recreational value may occur along the Lake of Egypt. Construction activities at the Pond 4 may not be visible to recreators given the separation between Pond 4 and the lake. Based on a review of the Illinois Department of Natural Resources (IDNR) Historic Preservation Division database and the Illinois State Archaeological Survey database, there are no historic sites located within 1,000 meters of Pond 4 (IDNR, 2023; ISAS, 2023). Thus, no impacts on historical sites would be expected under the CBR scenario.

4.4 Summary

The impacts associated the potential closure scenario, (*i.e.*, CBR) at Pond 4 were analyzed. CBR does not lead to greater environmental or human health benefit as compared to continued operation of Pond 4. Specifically, CBR will not result in any reduction in risks to human health or the environment and will not result in any improvement to groundwater quality or surface water quality. However, implementing CBR will have several adverse effects compared to the continued operation of Pond 4. Specifically, closure may cause short-term impacts to air quality, result in increased GHG emissions and increased energy consumption, cause an increase in worker injuries, and result in increased accidents, traffic, noise to nearby communities.

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Appendix A

Curriculum Vitae of Andrew Bittner, M.Eng., P.E.

GRADIENT

Andrew B. Bittner, M.Eng., P.E.
Principal
(he/him)

Andy.Bittner@gradientcorp.com

Areas of Expertise

Contaminant fate and transport in porous and fractured media, migration of coal ash combustion products in groundwater and surface water, non-aqueous phase liquid (NAPL) transport, surface water and groundwater hydrology, groundwater and surface water modeling, remedial investigation design, remedy evaluation and optimization, cost allocation, international regulatory compliance and remediation.

Education & Certifications

M.Eng., Environmental Engineering and Water Resources, Massachusetts Institute of Technology, 2000

B.S.E., Environmental Engineering, University of Michigan, 1997

B.S., Physics, University of Michigan, 1997

Licensed Professional Engineer: Idaho, New Hampshire, Nevada

Professional Experience

2000 – Present GRADIENT, Boston, MA
Environmental Engineer. Specializes in the fate and transport of contaminants in groundwater and surface water, coal combustion products, groundwater hydrology, groundwater flow and contaminant transport modeling, NAPL transport, and remedial investigation and design. Has served as principal-in-charge, testifying expert, and consulting expert on large, multi-disciplinary projects at coal combustion product surface impoundments and landfills, pharmaceutical facilities, automotive facilities, manufacturing plants, dry cleaning facilities, and Superfund sites. Extensive experience in South America and at other international sites.

1997 – 1999 PARSONS ENGINEERING SCIENCE, Canton, MA
Environmental Engineer. Specialized in industrial wastewater treatability. On-site supervisor for bioremediation bench scale treatment and laboratory study for a major pharmaceutical company. Built hydraulic models for pharmaceutical wastewater treatment facilities. Designed hazardous waste treatment systems for a major pharmaceutical company. Performed site investigations to delineate NAPL plumes and design remedial recovery plans.

Professional Affiliations

National Ground Water Association; Chi Epsilon – Environmental Engineering Honor Society

Technical Session Chair:

- World of Coal Ash Conference. Lexington, KY. May 8-11, 2017. Session title: "Groundwater."
- Battelle Conference on Remediation of Chlorinated and Recalcitrant Compounds. Palm Springs, CA. May 23-26, 2016. Session title: "Coal Ash Facility Restoration."
- Battelle Conference on Remediation of Chlorinated and Recalcitrant Compounds. Monterey, CA. May 21-24, 2012. Session title: "Environmental Remediation in Emerging Markets."
- Defense Research Institute. Panelist for session titled "Groundwater-Surface Water Connectivity and the Clean Water Act." New Orleans, LA. May 13-14, 2019.
- World of Coal Ash Conference. St. Louis, MO. May 13-16, 2019. Session title: "Project-Specific Case Studies."
- World of Coal Ash Conference. Covington, KY. May 16-19, 2022. Session title: "Regulatory."

Projects – *Coal Combustion Products*

Industry Research Group: Reviewed and submitted comments related to US EPA's proposed legacy impoundment rule. The review focused both on US EPA's risk models, fate and transport models, and their conceptual site model for both legacy impoundments and coal combustion residual management units (CCRMUs).

Utility Client: Evaluated the amount of greenhouse gas emissions that would be generated during the potential hauling of coal ash from surface impoundments to off-site landfills. Used SiteWise, a tool developed by US ACE, to determine the amount PM10, SOx, NOx, and CO2 generated during the transportation process. Our analysis supported communications with the public and regulators regarding different surface impoundment closure alternatives.

Utility Client: Conducted a relative impact assessment of potential closure options at a former CCR disposal facility in Illinois. Ranked each closure option based on 10 different metrics including human health and environmental risks, water and air quality, safety, community and habitat impacts, risk of potential release, climate change and sustainability, and cost.

Electric Power Research Institute: Modeled groundwater impacts from coal combustion product (CCP) surface impoundments with intersecting groundwater conditions and evaluated hydrogeological factors and other characteristics that influence risks to human health and the environment (HHE).

Utility Client: Served as litigation consulting expert regarding the fate and transport of metal constituents in groundwater from 18 different coal combustion residual (CCR) disposal facilities at 7 sites in the Midwest.

Utility Client: Prepared expert report and provided testimony related to the fate and transport of metal constituents in groundwater from 11 different coal combustion residual (CCR) disposal facilities at 6 sites in West Virginia, Virginia, and Ohio.

Utility Client: Prepared expert report in support of "Petition for a Finding of Inapplicability or, in the Alternative, an Adjusted Standard from 35 ILL. Admin. Code Part 845." Report assessed current risks to human and environmental receptors and evaluated net environmental benefits (*i.e.*, NEBA) of potential closure options at a former CCR disposal facility.

Utility Client: Prepared Closure Alternatives Assessment (CAA), Corrective Measures Assessment (CMA), and Corrective Action Alternatives Analysis (CAAA) reports for multiple CCR surface impoundments located at a series of midwestern power plants. Reports were prepared consistent with requirements of 35 ILL. Admin. Code Part 845.

Utility Client: Evaluated risks to human health and the environment associated with CCR surface impoundments at six coal fired power plants in the southern US. Evaluations included assessing CCR constituent migration in groundwater and the flux of constituents into nearby surface waters.

Utility Client: Calculated alternative groundwater protection standards (GWPSs) at a coal fired power plant facility in the midwestern US. Alternative standards were calculated based on site-specific human and ecological receptors and attenuation factors.

Utility Client: Prepared expert report and testified before state pollution control board regarding proposed coal ash disposal regulations.

Electric Power Research Institute: Evaluated the performance of alternative liners, including engineered clay liners, natural clay liners, and geomembrane composite-lined systems at CCP impoundments. Used a probabilistic approach to model the flux of CCP constituents through each liner and the subsequent transport of constituents through the underlying vadose and saturated zone.

Industry Research Group: Developed methodology to evaluate performance equivalency of various surface impoundment liner systems. The methodology, which was submitted to US EPA in order to inform future rulemakings, presented a process to evaluate and compare hydraulic flux and travel times through different liner systems including geocomposite, compacted clay, and natural clay liners.

Confidential Client: Developed a screening-level risk assessment for a manufacturing facility beneficially using coal fly ash as a soil stabilizer. The risk assessment compared estimated coal ash constituent exposure concentrations in soil, groundwater, and surface water to relevant benchmarks protective of human health and the environment.

Manufacturing Client: Performed beneficial use risk assessments consistent with US EPA Federal Coal Combustion Residual (CCR) Rule and Secondary Use Guidance for multiple commercial and construction products containing coal ash – including carpet backing, interior and exterior trim, and backer board. Analysis evaluated risks to groundwater, surface water, indoor air, and soil. Evaluation also considered exposure pathways for residents, construction workers, and landfill workers associated with installation of products, active life of the installed products, and post-life disposal in a landfill.

Electric Power Research Institute: Developed framework for creating alternative groundwater standards at CCP storage sites. The framework considers the development of alternative standards for the protection of human health and the environment, current and future uses of groundwater near CCP management units, and potential attenuation that may occur between the current point of compliance and a relevant point of exposure.

Utility Client: Prepared expert report and provided testimony related to the fate and transport of metal constituents in groundwater, including sulfate, boron, and arsenic, from over 30 different coal combustion residual surface impoundments at 15 sites in North Carolina and South Carolina.

Industry Research Group: Prepared technical comments regarding proposal to add boron to list of Appendix IV constituents to the Federal CCR Rule. Evaluated technical practicability and cost implications associated with the potential boron addition.

Industry Research Group: Prepared technical comments regarding portion of Federal CCR Rule that requires the groundwater protection standard (GWPS) of Appendix IV constituents with no MCL to be the background concentration. Evaluated technical practicability, cost implications, and potential benefits associated with the requirement for the four current Appendix IV constituents with no established MCL – cobalt, lithium, molybdenum, and lead.

Confidential Client: Developed a screening-level risk assessment for a steel production and recycling facility that is beneficially using coal fly ash as a soil stabilizer. The risk assessment addressed a requirement in the Federal Coal Combustion Residuals (CCR) Disposal Rule for a characterization of risk from unencapsulated beneficial use of CCR. Used the Industrial Waste Evaluation Model (IWEM) to evaluate potential transport of coal ash constituents, including arsenic, in groundwater as a result of the beneficial reuse.

Utility Client: Prepared expert report interpreting data produced during a field investigation performed at a large midwestern coal ash landfill.

Utility Client: For litigation support, modeled the fate and transport of arsenic and other coal ash related constituents in groundwater and surface water downgradient of a large midwestern coal ash surface impoundment located in a karst environment. Model simulations compared potential impacts to groundwater and surface water resulting from potential surface impoundment closure scenarios.

Manufacturing Client: Performed beneficial use risk assessments consistent with US EPA Federal Coal Combustion Residual (CCR) Rule and Secondary Use Guidance for multiple commercial and construction products containing coal ash. Analysis evaluated risks to groundwater, surface water, indoor air, worker safety, and residential safety. Evaluation also considered exposure pathways associated with installation of products, active life of the installed products, and post-life disposal in a landfill. Used the Industrial Waste Evaluation Model (IWEM) to evaluate potential transport of coal ash constituents, including arsenic, in groundwater as a result of the beneficial reuse.

Industry Research Group: Developed a groundwater fate and transport model to evaluate the level of groundwater protection provided by various coal ash surface impoundment closure options, including closure in place and closure by removal. Model simulated transport of arsenic (III) and arsenic (V) in groundwater downgradient of coal ash disposal facilities. Model results are being used by utilities in support of closure planning which is required by Federal Coal Combustion Residual Rule.

Confidential Client: Prepared expert report on human health and ecological risks due to a potential spill of barged coal combustion byproducts (CCBs) on a large midwestern river. Modeled the fate and transport of key CCB constituents, including arsenic, in surface water for a range of spill scenarios and river flow conditions and estimated potential downstream concentrations at drinking water intake locations.

Industry Research Group: Evaluated technical approach used by United States Environmental Protection Agency (US EPA) to simulate the migration of arsenic, selenium, and other metals in groundwater from overlying coal combustion storage units. Model analyses were included in regulatory comments submitted in response to US EPA's 2010 Coal Combustion Product Risk Assessment.

Industry Research Group: Developed relative risk framework to assess impacts to groundwater associated coal combustion product (CCP) surface impoundment closure scenarios. Framework identified potential deterministic and probabilistic modeling approaches to simulate potential migration of CCP constituents, including arsenic, boron, selenium, and molybdenum through the vadose and saturated zones for each closure alternative.

Industry Research Group: Modeled the downward migration of leachate from unlined coal combustion product surface impoundments using a probabilistic framework for a wide range of climatic and site conditions. Model results provided estimated durations for interactions between the impoundment leachate and nearby surface and groundwater.

Industry Research Group: As part of a relative risk framework, performed detailed sensitivity analysis of all factors associated with a coal ash surface impoundment closure that may impact the fate and transport of constituents in groundwater. Factors analyzed included surface impoundment characteristics (*e.g.*, volume, depth, and leachate quality), hydrogeological conditions (*e.g.*, hydraulic conductivity, hydraulic gradient, soil type, depth to groundwater, and surface water proximity), climatic characteristics (*e.g.*, precipitation), and closure details (*e.g.*, closure type and duration).

Projects – *Fate & Transport and Modeling*

Confidential Client, New Hampshire: Prepared expert report regarding the source of MTBE detected in a private, residential well and evaluated the timing of potential MTBE releases at an upgradient retail fuel dispensing station.

Confidential Client: Provided environmental site management and risk communication support for a property developer at a former Superfund site. Presented at public meetings with local officials, led discussions with state environmental agencies, conducted a public site visit, prepared a site investigation work plan, analyzed environmental data, proposed a low-impact remediation approach in collaboration with the stormwater design team, and submitted an environmental impact report.

Mining Client: Prepared expert report regarding the fate and transport of metal constituents in soils and groundwater from various sources at 4 different mining sites located in Ontario and Manitoba, Canada.

Manufacturing Client: Provided oral testimony related to the fate and transport of dioxins and furans in the environment resulting from waste disposal and wastewater treatment lagoons at a paper mill in South Carolina.

PRP Group: Reviewed hydrogeological characteristics and evaluated potential off-site migration of contaminants at a former industrial site in Nevada. Presented the findings of our assessment to the Nevada Division of Environmental Protection (NDEP) and to representatives of the neighboring property to support discussions relating to a groundwater remedial alternatives study.

Manufacturing Client: Consulting expert for a class certification case. Evaluated PFAS transport from known and potential sources.

Natural Gas Processing Facility: Prepared an expert report evaluating the hydrogeological conditions at and downgradient of a natural gas processing plant and provided assessment of the fate and transport over time of light non-aqueous phase liquids (LNAPLs) released from the plant and associated pipelines.

Confidential Client, Rhode Island: Designed and calibrated a groundwater flow and solute transport model for multiple chlorinated organic constituents at a northeastern Superfund site. Used one-year long tracer test to calibrate model. Model was used to predict the future effectiveness of various remedial alternatives.

Confidential Client: Designed and calibrated a groundwater flow and solute transport model for a Superfund site that has groundwater impacted with volatile organic compounds including benzene, tetrachloroethylene, trichloroethylene, and vinyl chloride. The model was used successfully to present the case to US EPA for shutting down the source remedy.

Confidential Client, Brazil: Developed 3-D numerical groundwater and solute transport model using MODFLOW and MT3D for volatile organic compounds and pesticides. Used model to evaluate and design remediation alternatives. Managed multiple site investigation and characterization studies. Projects involved calculation of risks to human health from exposure to soils, groundwater, indoor air, and outdoor air.

Savage Well Superfund Site: For a potentially responsible party (PRP) group, managed the development of a 3-D numerical groundwater and solute transport model for tetrachloroethylene (PCE) at a Superfund site in New Hampshire. Calibrated the model using approximately 10 years of data with review and oversight by US EPA and United States Geological Survey (USGS). Designed an optimization algorithm to develop the optimal groundwater pump and treat system.

Confidential Client, Massachusetts: Developed a 2-D contaminant transport model for PCE to demonstrate that contaminant contribution from a dry-cleaning operation to the town water supply wells was insignificant compared to contribution from other potential sources. Managed the installation and operation of a pump and treat system at the site.

Confidential Client, Argentina: Developed a 2-D numerical groundwater and solute transport model using MODFLOW and MT3D. Used the calibrated model to design a hydraulic barrier system to control off-site migration.

Confidential Client: Performed site-specific vapor intrusion modeling using the Johnson-Ettinger model at a pharmaceutical facility. Performed a detailed sensitivity analysis for each model input parameter.

Confidential Client: Performed NAPL transport and travel time calculations through porous media vadose and saturated zones and clay confining layers.

Confidential Client: Wrote critique of US EPA geochemistry model.

Projects – *Remediation*

Confidential Client: Developed a remedial strategy at a former mining site contaminated with metals located in Brazil. Evaluated historical constituent concentrations in soil, surface water, and sediment, developed a conceptual site model, and designed a site-characterization sampling program to define whether remediation was warranted.

Confidential Client: Evaluated potential liabilities related to range of issues including waste surface impoundment closure, groundwater remediation, and regulatory compliance at sites around the world that were involved in a corporate transaction.

Manufacturing Client, New Hampshire: Served as consulting expert for a case related to a failed groundwater remedy. Evaluated remedy design and installation and performed probabilistic modeling to determine appropriate design factors.

PRP Group, Nevada: Provided hydrogeological support at an industrial site with groundwater impacts due to benzene, chlorobenzene, chloroform, perchlorate, and chromium. Evaluated and critiqued a remedial investigation (RI) report related to a neighboring property and developed a conceptual site model (CSM) describing the fate and transport mechanisms of constituents in groundwater. Prepared submittals and presented conclusions at meetings with the state environmental agency.

Confidential Client, Brazil: Designed and implemented nanoscale zero valent iron remedy to prevent off-site arsenic migration. Upon completion of remedy, negotiated site closure with state of Rio de Janeiro environmental agency.

Confidential Client, Brazil: Designed and implemented a pilot scale enhanced *in-situ* bioremediation remedy for groundwater impacted with chlorinated organic compounds at a former agricultural product manufacturing facility.

Confidential Client, New Hampshire: As an independent third party, performed a review of a proposed Electrical Resistive Heating remedy for a chlorinated solvent dense non-aqueous phase liquid (DNAPL) source zone.

Confidential Client, New York: Provided regulatory comments regarding a US EPA Proposed Remedial Action Plan at a Region II Superfund site on Long Island. Provided support during mediation and during negotiations with US EPA.

Confidential Client, New Jersey: Provided regulatory comments regarding a US EPA Proposed National Priorities List (NPL) listing at a Region II Superfund site.

Confidential Client, Brazil: Managed multiple conceptual and detailed engineering remedial design projects for a soil vapor extraction system, dual-phase extraction system, and a pump and treat system. Remediation efforts focused on soil and groundwater contamination by pesticides and chlorinated solvents.

Confidential Client, Brazil: Managed site remediation projects to operate and maintain a soil vapor extraction system, dual-phase extraction system, and a hydraulic barrier system.

Confidential Client, Argentina: Managed conceptual and detailed engineering remedial design project for dual-phase extraction system focused on the remediation of volatile organic compounds in soil and groundwater.

Confidential Client: On-site supervisor for bioreactor bench scale study at a pharmaceutical wastewater treatment plant. Performed an in-depth investigation on the bio-inhibitory effects due to the chronic exposure of biomass to manganese. Performed laboratory work required to support the bioreactors including tests for mixed liquor volatile suspended solids (MLVSS), total suspended solids (TSS), chemical oxygen demand (COD), dissolved oxygen (DO), ammonia (NH_3), and respirometry.

Confidential Client: Lead environmental engineer for a belt filter press replacement project for a pharmaceutical company wastewater treatment plant. Designed and sized polymer addition system.

Projects – *Site Characterization*

Confidential Client, Brazil: Provided strategic oversight for a series of environmental investigations, remedial actions, and agency negotiations for an automotive facility located in São Paolo.

Confidential Client: Managed large-scale cost allocation at a midwestern Superfund site. Forensically evaluated the sources of tar to river sediments considering site industrial operational history, contaminant fate and transport, chemistry, site modification and filling history, and observed contaminant patterns. Calculated the mass of tar present in the environment using both visual observations and analytical data.

Confidential Client, Brazil: Managed large-scale site investigations and human health risk assessment projects at a former pharmaceutical facility located in São Paulo. Key compounds were petroleum hydrocarbons and volatile organic compounds.

Confidential Client, New York: Served as consulting expert for large cost allocation involving over 16 responsible parties and chlorinated organic groundwater plumes extending for nearly 2 miles. Evaluated lateral and vertical groundwater flow direction, chemical usage history, and groundwater chemistry to support a *de minimis* contribution argument for our client.

Confidential Client, Ohio: Served as consulting expert for cost allocation project at a midwestern landfill. Evaluated differences in toxicity and risk associated with municipal solid waste and industrial hazardous waste. Used data to devise risk-weighted allocation approach for remedy costs.

Confidential Client, Brazil: Managed site investigation to evaluate groundwater responses due to seasonal precipitation events and their effect on potential contaminant fate and transport.

Confidential Client: Managed site investigation project identifying sources of PCE present at a former electrical resistor manufacturing facility. Soil, groundwater, and soil gas data were evaluated and used to identify individual sources of PCE to the subsurface. The impact of each source on remediation costs related to the site was evaluated and successfully used as a tool to mediate between responsible parties. Served as consulting expert during mediation between responsible parties.

Confidential Client, New Jersey: Delineated NAPL plumes and investigated spill history, sewer maps, and gas chromatography fingerprint results at an East Coast Superfund site. Designed French Drain to recover NAPL from subsurface.

City of Pittsfield, Massachusetts: Technical consultant to the city for mediation between General Electric (GE) and governmental agencies. Evaluated reports and clean-up standards and attended mediation sessions on behalf of the city.

Projects – *Clean Water Act*

Municipal Client, Ohio: Consulting expert for significant nexus evaluation to determine whether wetlands and surface water tributaries are jurisdictional waters of the United States.

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EXHIBIT 39

BEFORE THE
ILLINOIS POLLUTION CONTROL BOARD

IN THE MATTER OF: PETITION OF SOUTHERN ILLINOIS POWER COOPERATIVE FOR AN ADJUSTED STANDARD FROM 35 ILL. ADMIN. CODE PART 845 OR, IN THE ALTERNATIVE, A FINDING OF INAPPLICABILITY	AS 2021-006 (Adjusted Standard)

SECOND AMENDED PETITION FOR AN ADJUSTED STANDARD FROM 35 ILL. ADMIN. CODE PART 845 AND A FINDING OF INAPPLICABILITY

Submitted on behalf of
Southern Illinois Power Cooperative

TABLE OF CONTENTS

I. INTRODUCTION

This Second Amended Petition for an Adjusted Standard ("Petition") concerns eight existing and former ponds located at Southern Illinois Power Cooperative's ("SIPC's") Marion Generating Station ("Marion Station") in Williamson County, Illinois. These ponds are as follows: Pond 3 (including Pond 3A), Pond 4, former Pond B-3, South Fly Ash Pond, Pond 6 (together the "De Minimis Units"), the Initial Fly Ash Holding Area, the former Replacement Fly Ash Holding Area, and the former Fly Ash Holding Area Extension (together the "Former Fly Ash Holding Units").[4] This Second Amended Petition also addresses a unit known as the Former Landfill Unit, located on top portions of the Former Fly Ash Holding Units.

This Second Amended Petition amends the Amended Petition for Adjusted Standard filed by SIPC on September 2, 2021. The Amended Petition reflected the results of a Pond Investigation Report for Certain Ponds at SIPC's Marion Station ("Pond Investigation Rep.") (Ex. 29),[5] the Updated Opinion of Lisa Bradley ("Updated Bradley Op.") (Updated Ex. 28), and the Supplemental Declaration of Kenneth W. Liss ("Supp. Liss Dec.") (Ex. 30). A redline comparison showing changes made since the initial Petition was attached as Exhibit 31. This Second Amended Petition reflects an updated proposed adjusted standard, a Human Health and Ecological Risk Assessment from Gradient Corporation (Ex. 37), the Expert Opinion of Andrew Bittner setting

[4] The De Minimis Units and the Former Fly Ash Holding Units are depicted on the Site Map prepared by Andrews Engineering for SIPC (May 2021) ("Site Map"), Ex. 3.

[5] For Exhibit 29, the Pond Investigation Report, SIPC attached to the electronically filed version of the Amended Petition only the Report itself and not the appendices, as they are several hundred pages long. Those appendices were being transmitted separately to the Board and to IEPA. *See* Pond Investigation Rep., Ex. 29.

forth a closure impact assessment for Pond 4 (Ex. 38), and the Expert Opinion of Ari Lewis regarding the De Minimis Units (Ex. 36).[6]

As discussed herein, neither the De Minimis Units nor the Former Fly Ash Holding Units are regulated "CCR surface impoundments" for purposes of Illinois's Standards for the Disposal of Coal Combustion Residuals ("Part 845"). Nor are they CCR surface impoundments regulated by the federal CCR regulations upon which Part 845 was based. None of these former or current ponds pose the types of risks to the environment and human health that federal and state CCR regulations aim to address. In fact, they fall into categories of units that were intended to be excluded from the definition of CCR surface impoundment. Indeed, some of the ponds at issue closed decades ago and have not contained water since then, some are secondary and tertiary finishing ponds containing *de minimis* amounts of CCR, and one had any water and CCR removed years ago. Nevertheless, the Illinois Environmental Protection Agency ("IEPA") has so far taken the incorrect position that all eight current and former ponds, and the Former Landfill Area, are covered by Part 845.

Compliance with Part 845 is plainly not required for the units at issue, which do not fall under the definition of "CCR surface impoundment" and therefore are not covered by Part 845. However, to the extent the Illinois Pollution Control Board (the "Board") finds that any of the units at issue are regulated CCR surface impoundments (they are not), an adjusted standard is warranted because they differ from the surface impoundments the Board targeted for regulation under Part 845 and the units at issue pose minimal—if any—risk to human health and the environment. The

[6] SIPC has attached only new (beginning with Exhibit 32) or updated (labeled "Second Amended Pet. Updated Ex. ___") exhibits to this Petition. All other exhibits referred to within are attached to SIPC's initial or Amended Petition, as the case may be.

updated adjusted standard proposed in this Second Amended Petition will not result in any adverse impact to health or the environment while allowing for adjustments based on the units' unique characteristics.

Accordingly, for the reasons set forth herein, SIPC respectfully requests that the Board issue a finding of inapplicability with respect to the current and former ponds at issue or, in the alternative, an adjusted standard as set forth in Appendix A to this Second Amended Petition.

II. FACTUAL AND PROCEDURAL BACKGROUND.[7]

A. Nature of Petitioner's Activity and General Plant Description

Marion Station is a gas and coal-fired power plant located approximately seven miles south of the City of Marion in Williamson County, Illinois. *See* Site Map, Ex. 3. Marion Station currently consists of one operating coal-fired unit (Unit 123), with a nominal capacity of 1402 Metric Million British Thermal Units per hour ("mmBtu/hr"), and two additional gas-fired combined-cycle units (Units 5 and 6).

Unit 123 was constructed in the early 2000s, repowering the existing steam turbine that had been powered by retired Units 1, 2, and 3. Units 1, 2, and 3 were 33-megawatt ("MW") coal-fired cyclone generating units constructed in the 1960s. An additional 173 MW coal-fired unit (Unit 4) came online in 1978. Unit 4 shut down permanently in October 2020. A 109 MW circulating fluidized bed boiler provides steam to generating Unit 123. The two gas-fired simple-cycle units (Units 5 and 6) are nominally rated at 969 mmBtu/hr each (dependent upon ambient air temperature). Marion Station uses Illinois basin bituminous coal for Unit 123. Since 1978,

[7] The Declarations of Wendell Watson (Second Amended Pet. Updated Ex. 1) and Todd Gallenbach (Updated Ex. 2) are provided in support of facts stated herein regarding Marion Station and the current and former ponds at issue. SIPC's investigation into the facts set forth herein is ongoing, and SIPC reserves the right to further supplement or amend its Second Amended Petition to reflect receipt of new or additional information.

SIPC also has burned more than ten million tons of mine waste, helping to clean up many abandoned mines.

SIPC owns 4,674 acres around Marion Station and employs seventy-seven people. Nearby Lake of Egypt (the "Lake") was constructed in 1963 to provide cooling water for the Station's coal-fired generating units. The Lake provides some local public water supply and is also used for recreational purposes, such as boating and fishing. The local water authority periodically tests the Lake water for public use. *See, e.g.*, Lake Egypt Water District IL 1995200, Annual Drinking Water Quality Report (Jan. 1–Dec. 30, 2019), Ex. 4. SIPC owns several parcels bordering the plant property. Other nearby land uses include agricultural and recreational use, including a golf course and a country club. Shawnee National Forest is located approximately fifteen miles to the south of Marion Station. The closest identified potential groundwater well is at the Lake of Egypt Country Club, located more than 2,000 feet away from any pond at issue in this proceeding. That well is up gradient from the Station's pond system.

B. <u>CCR Management at Marion Station.</u>

Coal combustion residuals ("CCR") are a byproduct of the coal-fired power generation process. Currently, only Unit 123 generates CCR (in the form of ash) at the Station. The majority of CCR generated from Unit 123 is handled dry and used for mine reclamation beneficial use off-site and a portion is sold for beneficial uses allowed under 415 Ill. Comp. Stat. 5/3.135. Unit 123 controls SO^2 through its combustion process, and thus, no scrubber is needed.

There is no wet handling of CCR generated from current operations at Marion Station. While in operation, former Units 1, 2, and 3 generated CCR in the form of fly ash and bottom ash. Former Unit 4 generated CCR in the form of fly ash and bottom ash as well as scrubber sludge from an SO^2 scrubber installed around 1978. This was the first wet SO^2 scrubber installed in

Illinois—and one of the first in the nation—and reflects SIPC's early environmental commitment, which continues to this day. The historic handling, storage, and disposal of CCR at Marion Station is described below.

1. Fly Ash.

SIPC began collecting fly ash from former Units 1, 2, and 3 after installing electrostatic precipitators ("ESPs")[8] at each unit in 1975 in accordance with the Clean Air Act.[9] Because Units 1, 2, and 3 were cyclone units, they generated relatively small amounts of fly ash as compared to other types of coal-fired boilers. Cyclone boilers produce less than twenty-five percent of the fly ash pulverized coal units produce.

Between 1975 and 1978, on information and belief, fly ash from Units 1, 2, and 3 was collected wet using a hydroveyer system and conveyed to an area labeled on historic documents as a "fly ash holding area" (the "Initial Fly Ash Holding Area") located just to the west of Pond 3. *See* Site Map, Ex. 3. In 1977, SIPC received a permit from IEPA to abandon and cover the Initial Fly Ash Holding Area and to construct an additional holding area for fly ash (the "Replacement Fly Ash Holding Area"). *See* IEPA Water Pollution Control Permit, No. 1977-EN-5732 (Nov. 14, 1977) ("1977 Permit"), Ex. 5.

In 1978, Unit 4 was constructed. Around the same time, the hydroveyer system was modified to allow for dry collection of fly ash. From 1978 until 2003, most of the fly ash collected from Unit 4 was collected dry using the hydroveyer system. Most of that fly ash was disposed of

[8] ESPs are control devices that capture particulate matter in the exhaust gas, including fly ash.
[9] Prior to installation of the ESPs, most of the fly ash from Units 1, 2, and 3 would have been expected to exit the stack with exhaust gases, and only minimal amounts of fly ash may have been collected from the cyclone Units 1, 2, and 3. On information and belief, any minimal amounts of fly ash collected would likely have been conveyed to Pond 1, Pond 2, or the Initial Fly Ash Holding Area, which had an outlet to Pond 3.

at a former on-site, permit-exempt landfill ("Former Landfill"), often mixed with scrubber sludge as discussed further below.

Also around 1978, documents indicate that SIPC constructed the Replacement Fly Ash Holding Area to the North of Pond 2. *See* 1977 Permit, Ex. 5. The Replacement Fly Ash Holding Area likely received spent water from the hydroveyer system, which is believed to have contained only *de minimis* amounts of fly ash. *See* Letter from SIPC to IEPA (July 27, 1982), Ex. 6. On information and belief, the Replacement Fly Ash Holding Area also was designated to receive sluiced fly ash from Unit 4 during intermittent emergencies in which the fly ash was unable to be conveyed to the Former Landfill. *Id*.

In or around 1981, SIPC received a permit from IEPA to build a fly ash holding area extension (the "Fly Ash Holding Area Extension"), to the west of the Replacement Fly Ash Holding Area, and a berm around a portion of the Former Landfill that received fly ash and scrubber sludge from Unit 4. *See* IEPA Water Pollution Control Permit, No. 1981-EN-2776-1 (Oct. 13, 1981) ("1981 Permit"), Ex. 7. That bermed area collected stormwater runoff from the Former Landfill, and that collected water eventually became what is now denominated as Pond 6 (discussed *infra*).

On information and belief, between 1978 and 1985, limited fly ash from Units 1, 2, and 3[10] may have been sluiced to the Replacement Fly Ash Holding Area. In 1985, former Pond A-1 was constructed. After 1985, water from the hydroveyer system and, on information and belief, any fly ash from Units 1, 2, and 3 were conveyed to Pond A-1 or, in limited cases of Pond A-1 outrages

[10] Units 1, 2, and 3 were run infrequently after the installation of Unit 4.

between 1985 and 2003 (*see infra* at14–15), former Pond B-3. *See, e.g.*, Letter from SIPC to IEPA (Sept. 16, 1993) ("1993 Letter"), Ex. 8.

On information and belief, the Replacement Fly Ash Holding Area and the Fly Ash Holding Area Extension stopped receiving wastes after former Pond A-1 was built. Subsequently, those two units were drained of water—other than occasional stormwater runoff—and, by the early 1990s, were covered at least in part by the Former Landfill. Currently, the area that previously contained those units is within the Former Landfill cover area and part of the Proposed Closure Plan SIPC submitted to IEPA for the Former Landfill, as described further below. Declaration of Kenn Liss ("Liss Dec."), Ex. 9; *see also* Andrews Engineering, SIPC's Proposed Closure Plan for IEPA Site No. 199055505 (Dec. 16, 2020) ("Former Landfill Closure Plan"), Ex. 10.

In 2003, SIPC repowered the old Units 1, 2, and 3 with a Circulating Fluidized Bed ("CFB"), now referred to as Unit 123. The CFB allowed SIPC to convert its fly ash system to one hundred percent dry ash handling and disposal and ended even the minimal wet fly ash discharge that had previously occurred at Marion Station.

2. Scrubber Sludge.

Unit 4 came online in 1978 and produced scrubber sludge, which was predominately calcium sulfite. The scrubber sludge was mixed with fly ash and moved via a conveyer to the Former Landfill, which ceased accepting waste prior to October 2015 and for which SIPC has submitted a landfill Closure Plan to IEPA at IEPA's request (*see infra* at 15–16). Former Landfill Closure Plan, Ex. 10. In 2009, the scrubber was modified to a forced oxidation system, which produced calcium sulfate, better known as gypsum. One hundred percent of the gypsum generated at Marion Station was sold as an agricultural modifier or an ingredient for cement. With the closure of Unit 4, Marion Station no longer generates scrubber sludge or gypsum.

3. Bottom Ash.

Historically, bottom ash from now-retired Units 1, 2, 3, and 4 was sluiced to Ponds 1 and 2. On information and belief, SIPC sold one hundred percent of its bottom ash to shingle manufactures, grit blasting companies, and local highway departments for more than forty years. For almost the entire lives of the ponds, the water in Ponds 1 and 2, from which bottom ash was removed, discharged to Pond 4 and, from there, through permitted Wastewater Discharge Outfall 002. Beneficial use Ponds 1 and 2 are no longer in use with the closure of Unit 4 and have been cleaned to the clay. Ash from Unit 123's fluidized bed boiler is handled dry and beneficially used offsite.

4. Other Non-CCR Waste Streams.

Minor other non-CCR waste streams from the Marion Station, including air heater wash water and flue gas desulfurization decant excess water, were historically discharged to the former Emery Pond. The former Emery Pond was built in the late 1980s as a stormwater storage structure for drainage from the adjacent plant area, including the more recent Gypsum Loadout Area. *See* Hanson, Emery Pond Corrective Action and Selected Remedy Plan, Including GMZ Petition (Mar. 29, 2019), Ex. 11. Process wastewater discharges to the former Emery Pond have ceased and any water or CCR in the former Emery Pond has been removed pursuant to closure and related plans overseen by IEPA. The former Emery Pond's closure has been conducted consistent with Part 257 and, although the field work was completed before adoption of Part 845, the closure was generally consistent with Part 845 as well. A new storm basin is located in the area of the former Emery Pond.

C. <u>The Ponds Subject to This Petition.</u>

This Petition concerns the De Minimis Units—five current or former ponds at SIPC's Marion Generating Station: the South Fly Ash Pond, Pond 3 (including Pond 3A), Pond 6, Pond 4, and former Pond B-3, which have contained only *de minimis*, if any, amounts of CCR. These current and former ponds are described in Section C.1. This Petition also addresses the Former Fly Ash Holding Units: three former fly ash ponds that closed and were dewatered decades ago, at least one of which under IEPA oversight and permitting, and are now part of the Former Landfill, which are described below Section C.2.

1. <u>The De Minimis Units</u>.

A map showing the location of the De Minimis Units is attached to SIPC's May 11, 2021, Petition. Site Map, Ex. 3. As discussed below, none of the De Minimis Units receive or received meaningful direct discharges of CCR and, to the extent they contain CCR as a result of limited historic or incidental discharges, such CCR should be *de minimis* in light of historic practices. In addition, as discussed *infra* at 31–33, Haley & Aldrich, Inc., on behalf of SIPC, has completed an investigation of the De Minimis Units pursuant to an investigation protocol negotiated with IEPA, which confirmed that the De Minimis Units contain only *de minimis* amounts of CCR. *See infra* at 31–33; *see also* Pond Investigation Rep., Ex. 29.

<u>South Fly Ash Pond</u> – The South Fly Ash Pond was built around 1989 as a potential replacement for Pond A-1, in case one was needed. *See* IEPA Water Pollution Control Permit, No. 1989-EN-3064 (May 17, 1989), Ex. 12. Ultimately, Pond A-1 did not need replacement and operated until 2003, as described above; thus, despite being permitted as a fly ash settling pond, the South Fly Ash Pond was never used for that purpose. Rather, the South Fly Ash Pond served as a secondary finishing pond, receiving decant water from the former Emery Pond until Emery

Pond stopped receiving process wastewater discharges in the fall of 2020. No fly ash, bottom ash, or scrubber sludge was ever directly sent to or placed into the South Fly Ash Pond. If the pond received any CCR throughout its life, it was *de minimis*, consisting only of any residual CCR in decanted pond overflow from the former Emery Pond or stormwater.

The Pond Investigation Report confirms that the South Fly Ash Pond contains minimal sediments, with a mean sediment thickness of approximately 1.57 feet, representing approximately 11 percent of historic pond volume[11]. *See* Pond Investigation Rep., Ex. 29 at 7. That is far less than the amount of sediment present in a typical CCR surface impoundment that is used for the storage, treatment, or disposal of CCR. *Id*. at 7–8 ("In Haley & Aldrich's experience, for typical CCR impoundments, the volume of CCR materials is often a major portion (>50%) of the overall impoundment volume."). Further, of that small amount of sediment, only a fraction (ranging from ten percent to sixty-four percent in the sediment samples that were taken from the South Fly Ash Pond) is estimated to include CCR material.[12] *Id*. at 14. Further, the South Fly Ash Pond has a berm, but boring logs associated with the berm do not indicate the presence of fly ash in that berm. *Id.* at Attachment C (boring logs for B-B3a and B-B3b).

<u>Pond 3 (including 3A)</u> – Water from the South Fly Ash Pond is permitted to flow to Pond 3, then Ponds 6 and 4, before discharging through Outfall 002.[13] *See* IEPA Reissued National

[11] As explained in the Pond Investigation Report, the South Fly Ash Pond's water level was lowered for operational reasons during the time the bathymetric survey. *See* Pond Investigation Rep., Ex. 29 at 7. As a point of comparison, Haley & Aldridge also estimated sediment volume as a percentage of pond volume using the 2007 pond elevation for the South Fly Ash Pond and Pond 4, which was determined to be more representative of historical conditions. *See id.*

[12] The CCR percentages included here and below, as reflected in Exhibit 29, include the estimated percentage of materials, through polarized light microscopy ("PLM"), determined to be fly ash, bottom ash and/or slag. Pond Investigation Rep., Ex. 29 at 14.

[13] SIPC timely applied for a National Pollution Discharge Elimination System ("NPDES") permit renewal and is currently working with IEPA on permit reissuance.

Pollutant Discharge Elimination System Permit, No. IL0004316 (February 1, 2007) ("2007 NPDES Permit"), Ex. 13. On information and belief, Pond 3 may have received some overflow from the Initial Fly Ash Holding Area and later the Fly Ash Holding Area Extension, serving as a secondary finishing pond. *See* IEPA Water Pollution Control Permit, No. 1973-ED-1343-OP (June 1973), Ex. 14. Pond 3 also received stormwater runoff, coal pile runoff, and water from the Station's floor drains. Later, by 1982, a berm was built within Pond 3 to separate Pond 3 into two areas, with one area now known and referred to as Pond 3A.

Pond 3 has been cleaned to remove pond sediment and debris, including vegetation, twice—once in 2006 and again in 2011. Pond 3A was drained of water and cleaned of debris and sediment in 2014. Those cleanings would also have removed any CCR that may have collected in the pond from historic operations. Starting around 2007, SIPC built a berm around Pond 3 to prevent landfill runoff from reaching that pond. Since the pond's last cleanings, any CCR that has entered Pond 3 or Pond 3A is *de minimis*, such as through stormwater, potential overflow from South Fly Ash Pond, or air deposition; no ash has been placed in the pond for treatment, storage, or disposal.

The Pond Investigation Report, which included a survey of the ponded areas of Pond 3, confirms that Pond 3 (including 3A) contains minimal sediments, with a mean sediment thickness of approximately 1.38 feet in Pond 3 and 1.45 feet in Pond 3A, representing approximately 9 percent and 13.3 percent of pond volume, respectively. *See* Pond Investigation Rep., Ex. 29 at 7. That is far less than the amount of sediment present in a typical CCR surface impoundment which is used for the storage, treatment or disposal of CCR. *Id*. at 7–8 ("In Haley & Aldrich's experience, for typical CCR impoundments, the volume of CCR materials is often a major portion (>50%) of the overall impoundment volume."). Further, of that small amount of sediment, only a fraction (ranging from twenty-three percent to thirty-four percent in the samples that were taken from Pond 3/3A) is estimated to include CCR material. *Id*. at 14 (explaining slag, fly ash and bottom ash (i.e. CCR) makes up 23% and 34%, respectively, of the sediment samples from Pond 3). Additionally, samples from Pond 3A contain carbon contents much higher than would be expected from CCR materials. *Id.* at 8–10. A carbon to nitrogen/hydrogen correlation analysis demonstrates that coal is the likely common contributor to the organic content in pond sediment samples with a high carbon content. *Id.*

Pond 6 – Pond 6 was developed to manage stormwater runoff associated with the Former Landfill and grew within a berm built to capture runoff from the Former Landfill that was addressed in a 1982 construction permit issued by IEPA. Originally, Pond 6 discharged through Outfall 001. In or around 1993, in accordance with another IEPA-issued permit, SIPC extended Pond 6 and installed pumps to pump water from Pond 6 to Pond 4, where it then discharged through Outfall 002 to Little Saline Creek. *See* 1993 Letter, Ex. 8. Outfall 001 was subsequently eliminated. Any CCR discharges Pond 6 received throughout its life were *de minimis*, consisting of incidental amounts of CCR inflow from other ponds and stormwater runoff from the Former Landfill. Thus, Pond 6 was designed and served as a stormwater management unit to contain runoff from the Former Landfill and was not designed to accumulate CCR and liquids or to treat, store, or dispose of CCR in more than *de minimis* amounts.

The Pond Investigation Report confirms that Pond 6 contains minimal sediments, with a mean sediment thickness of approximately 0.84 feet, representing approximately 8.2 percent of pond volume. *See* Pond Investigation Rep., Ex. 29 at 7. That is far less than the amount of sediment present in a typical CCR surface impoundment which is used for the storage, treatment or disposal of CCR. *Id*. at 7–8 ("In Haley & Aldrich's experience, for typical CCR impoundments, the volume of CCR materials is often a major portion (>50%) of the overall impoundment volume."). Further, of that small amount of sediment, only a fraction (ranging from thirty percent to fifty-three percent in the samples that were taken from Pond 6) is estimated to include CCR material. *Id*. at 14.

Pond 4 – Pond 4 is a stormwater runoff and secondary finishing pond that received no more than *de minimis* amounts of CCR. Pond 4 has primarily served two purposes at the Station: to receive decant water from Ponds 1 and 2, when they were in operation before Unit 4's shutdown, and to receive coal pile runoff. Pond 4 has also received decanted overflow water from Pond 6 for approximately thirty years and discharges through Outfall 002 into the Little Saline Creek.

During an outage in 2010, Pond 4 was dewatered and cleaned down to the clay, removing plant debris and any ash, coal fines, and other sediment that may have collected in the pond. There were two types of materials in the pond after it was dewatered: (1) dry and dark materials (consisting of sixty to seventy percent of the pond materials) and (2) muddy materials high in organic matter. Declaration of Jason McLaurin, Ex. 32. The dry and dark materials were taken to the coal yard to further dry and then were burned at the Station for fuel. *Id*. Again, this demonstrates the materials consisted of primarily coal fines deposited into the pond as a result of stormwater runoff from the coal pile and that the amount of CCR present in Pond 4 has been consistently *de minimis*. Since its cleaning in 2010, any CCR that has entered Pond 4 is *de minimis*, such as through stormwater, overflow from Pond 6, or air deposition. Pond 4's primary use continues to be to catch stormwater runoff from the coal pile.

The Pond Investigation Report confirms that Pond 4 contains minimal sediments, with a mean sediment thickness of approximately 1.67 feet, representing approximately 10.9 percent of pond volume. *See* Pond Investigation Rep., Ex. 29 at 7. That is far less than the amount of sediment present in a typical CCR surface impoundment which is used for the storage, treatment or disposal of CCR. *Id*. at 7–8 ("In Haley & Aldrich's experience, for typical CCR impoundments, the volume of CCR materials is often a major portion (>50%) of the overall impoundment volume."). Further, of that small amount of sediment, only a fraction (ranging from twenty-five percent to sixty-eight percent in the samples that were taken from Pond 4) is estimated to include CCR material. *Id*. at 14. Additionally, samples from Pond 4 contained carbon contents much higher than would be expected from CCR materials. *Id.* at 8–10. A carbon to nitrogen/hydrogen correlation analysis demonstrated that coal is the likely common contributor to the organic content in pond sediment samples with a high carbon content. *Id.*

Pond B-3 – Former Pond B-3 was built by 1985 and was used primarily as a secondary pond to Pond A-1. Pond A-1 received some fly ash (as described above) and coal pile runoff until 2003, at which time all fly ash was handled dry and the runoff was directed to Pond 4. During periodic, intermittent outages of Pond A-1, former Pond B-3 may have received some discharges of fly ash from Units 1, 2, and 3 prior to their shut down in 2003. On information and belief, Pond A-1 was taken offline at most three to four times between 1985 and 2003, and each of those outages lasted approximately two weeks. Most (or all) of those outages would have occurred during boiler shutdowns, when Marion Station was operating at less than full capacity and generating less ash. Accordingly, any fly ash sluiced to former Pond B-3 during these intermittent outages would have been minimal.

In 2017, former Pond B-3 was cleaned out down to the clay and has not held water since that time. A BTU analysis showed the material removed had a heat content comparable to coal—not CCR—and at least a portion of the material was consumed for energy production.

Because former Pond B-3 no longer holds water, except in a small area of the former pond where stormwater may collect after storms before drainage and evaporation, it was not able to be included as part of the bathymetric survey conducted in conjunction with the Pond Investigation Report. However, Haley & Aldridge performed an analysis of two samples taken of a berm associated with former Pond B-3 in conjunction with the Pond Investigation Report, as well as nine samples taken in 2017, and concluded that those samples contained little, if any, CCR material.[14] *See* Pond Investigation Rep., Ex. 29 at 12 (including shake test results for samples B-B3a and B-B3b).

2. The Former Fly Ash Holding Units.

As discussed below, the Former Fly Ash Holding Units no longer contain water and are covered by the Former Landfill (or, in the case of the Fly Ash Holding Area Extension, a combination of dry CCR disposed in the landfill area, as well as sediments and other materials cleaned out from the pond system). The Former Fly Ash Holding Units were located within the green area on the site map attached to SIPC's May 11, 2021, initial Petition. Site Map, Ex. 3.

The Initial Fly Ash Holding Area – On information and belief, the Initial Fly Ash Holding Area received wet fly ash that was collected from Units 1, 2, and 3 until approximately 1977. In October 1977, IEPA issued a permit to SIPC for the Replacement Fly Ash Holding Area with a condition that required the Initial Fly Ash Holding Area to be abandoned and covered. *See* 1977 Permit, Ex. 5. In the early 1990s, plant personnel observed that while stormwater might on occasion collect for short periods after precipitation, the Initial Fly Ash Holding Area contained

[14] Hanson Engineering, which performed the bathymetric survey and collected the data analyzed in the Pond Investigation Report, attempted to take a soil boring from the area of former Pond B-3 but was unable to access the agreed-upon IEPA sampling location. *See* Pond Investigation Rep., Ex. 29 at 6.

no pond or other area that continuously held water. Further, as of that time, the area was covered by a combination of the Former Landfill and a soil/vegetation cover. Based upon these area observations and in light of the "abandon and cover" permit condition, SIPC believes that the area was covered before the 1990s pursuant to the permit condition issued and approved by IEPA.

The Replacement Fly Ash Holding Area – In October 1977, IEPA issued a permit to SIPC to construct the Replacement Fly Ash Holding Area to the north of Pond 2. *See* 1977 Permit, Ex. 5. On information and belief, the Replacement Fly Ash Holding Area likely received spent water from the hydroveyer system, which likely contained *de minimis* amounts of fly ash. The Replacement Fly Ash Holding Area also may have received discharges of fly ash from Units 1, 2, and 3 prior to the construction of Pond A-1 in 1985. On information and belief, the Replacement Fly Ash Holding Area may have also been designated to receive sluiced fly ash from Unit 4 during intermittent emergencies in which the fly ash was unable to be conveyed to the Former Landfill. It is unknown whether the Replacement Fly Ash Holding Area ever received sluiced fly ash from Unit 4 during emergencies. By the early 1990s, the Replacement Fly Ash Holding Area had been drained of water and was covered by the Former Landfill.

The Fly Ash Holding Area Extension – In or around 1982, SIPC received a permit from IEPA to construct the Fly Ash Holding Area Extension to the west of the Replacement Fly Ash Holding Area and build a berm around a portion of the Former Landfill area that received fly ash and scrubber sludge from Pond 4. *See* 1981 Permit, Ex. 7. The extent to which the Fly Ash Holding Area Extension actually received any fly ash is unknown. As with the Initial Fly Ash Holding Area, by the early 1990s the Fly Ash Holding Area Extension did not hold water and was covered in part by the Former Landfill. The remaining area was covered by soil and other material from the Station, including debris cleaned from the pond system.

All three Former Fly Ash Holding Units are in the area of the Former Landfill. *See* Site Map, Ex. 3. These units were included in the Former Landfill area and, thus, were of part of the Former Landfill operation for decades before the landfill ceased operating in 2015. At least most of the area that at one time encompassed these units when operating was covered by 1991, and the entire area was covered before October 2015 by Former Landfill material, which included dry CCR, soil, and sediments. As discussed above, use of the Former Landfill is believed to have started around 1978 for scrubber sludge and fly ash disposal. SIPC estimates that the maximum volume of scrubber sludge and ash deposited in the Former Landfill was approximately 1.5 million cubic yards.

In September of 1992, SIPC submitted to IEPA an Initial Facility Report ("IFR") for the Former Landfill. *See* IEPA Initial Facility Report – for On-Site Facilities (Sept. 18, 1992), Ex. 15. In 1993, SIPC installed groundwater monitoring wells around the Former Landfill in accordance with Illinois landfill regulations. After that time, SIPC submitted annual groundwater monitoring reports to IEPA pursuant to the landfill regulations. Because the Former Landfill did not receive CCR after the effective date of 40 C.F.R. Part 257, Subpart D, the landfill is not subject to those requirements. *See* 40 C.F.R. § 257.50(d).

As discussed below, in March 2020, IEPA issued a Violation Notice ("VN") for the Former Landfill, alleging violations of Section 21 of the Illinois Environmental Protection Act ("the Act"), the Illinois landfill regulations, and Illinois's groundwater quality standards, and listing several remedial actions SIPC could take to resolve the alleged violations. *See* IEPA Violation Notice L-2020-00035 (Mar. 20, 2020) ("2020 Landfill VN"), Ex. 16. In December 2020, and in response to IEPA's request, SIPC submitted a Former Landfill Closure Plan to IEPA consistent with the Illinois landfill regulations for closure cited by IEPA in the landfill VN (2020 Landfill VN, Ex.

16), and since that time, SIPC has negotiated some elements of that plan with IEPA. SIPC was ready to proceed with that Closure Plan, in accordance with the requirements of 35 Ill. Admin. Code § 811.314, upon receiving IEPA's approval for the plan. *See* Former Landfill Closure Plan, Ex. 10, Figure B-05. In March 2021, nearly three months after receiving SIPC's proposed Closure Plan, an IEPA representative for the first time informed SIPC of a new position that the Former Landfill was regulated by and required to close pursuant to Part 845, rather than pursuant to the Illinois landfill regulations under which the Former Landfill had been operating for decades (and under which IEPA had issued the VN). Subsequently, IEPA withdrew the Landfill VN via a letter dated May 6, 2021.

Despite issuing a VN to SIPC for alleged violations of landfill regulations, IEPA now appears to argue—apparently based on its proximity to the Former Fly Ash Holding Units—that the Former Landfill (which has been treated by SIPC and regulators as a landfill for more than thirty years) meets the definition of a CCR surface impoundment, "a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the surface impoundment treats, stores, or disposes of CCR," under Part 845 that became effective as of April 21, 2021 (and which explicitly exempts CCR landfills from coverage). As discussed *infra* at Part III.B, IEPA's position is incorrect. In addition, this development has delayed finalization and execution of SIPC's proposed Former Landfill Closure Plan. The Former Landfill area, including the Former Fly Ash Holding Units, is not a CCR surface impoundment and this area qualifies for a finding of inapplicability. However, to the extent the Board finds this area is a CCR surface impoundment, SIPC has proposed an adjusted standard that would close the entirety of this area consistent with Part 845 performance standards and with a Part 845 compliant groundwater monitoring and corrective action program.

D. The Federal CCR Rule and the WIIN Act.

CCR disposal is regulated at the federal level pursuant to Part 257, Subpart D, which was promulgated on April 17, 2015. *See* Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, 80 Fed. Reg. 21,302 (April 17, 2015) ("Final Rule"), attached in relevant part as Second Amended Pet. Updated Ex. 17. Part 257 was promulgated pursuant to the federal Resource Conservation and Recovery Act, Subtitle D, and includes comprehensive technical requirements for regulated CCR landfills and CCR surface impoundments. Part 257 defines a "CCR surface impoundment" as "a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR." 40 C.F.R. § 257.53.

In December 2016, the President signed the Water Infrastructure Improvements for the Nation Act (the "WIIN Act"), Pub. L. No 114-322 (2016). The WIIN Act authorized states to adopt permit programs that, upon approval by the U.S. Environmental Protection Agency ("U.S. EPA"), may operate in lieu of Part 257. 42 U.S.C. § 6945(d)(1)(B). State programs must be as protective as Part 257. *Id.* § 6945(d)(1)(B)(ii). The WIIN Act further allows U.S. EPA to enforce violations of the Part 257 and requires U.S. EPA to develop a federal permitting program for CCR surface impoundments that would apply in states that elect not to seek approval of a state CCR permitting program. 42 U.S.C. § 6945(d)(2)(B).

In 2024, U.S. EPA amended Part 257 (the "2024 Legacy Rule"). *See* Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments, 89 Fed. Reg. 38,950 (May 8, 2024) (the "2024 Legacy Pond Final Rule"), attached in relevant part as Ex. 33. The 2024 Legacy Rule amends Part 257 to include CCR regulations for inactive surface impoundments at inactive electric utilities, referred to as "legacy CCR surface impoundments," requiring owners and operators of legacy CCR surface impoundments to comply with all existing requirements applicable to inactive CCR surface impoundments at active facilities, except for the location restrictions and liner design criteria. In addition, the 2024 Legacy Rule establishes groundwater monitoring, corrective action, closure, and post closure care requirements for other areas where CCR was disposed of or managed on land outside of regulated units at regulated CCR facilities, referred to in the 2024 Legacy Rule as "CCR management units" (regardless of how or when that CCR was placed).

E. <u>The Illinois CCR Act and Part 845.</u>

On July 30, 2019, the Illinois Legislature adopted the Illinois Coal Ash Pollution Prevention Act ("Illinois CCR Act"). 415 Ill. Comp. Stat. 5/22.59. In the findings section of the Illinois CCR Act, the Legislature stated that "CCR generated by the electric generating industry has caused groundwater contamination and other forms of pollution at active and inactive plants throughout this State," and "environmental laws should be supplemented to ensure consistent, responsible regulation of all existing CCR surface impoundments[.]"[15] 415 Ill. Comp. Stat 5/22.59(a)(3), (4).

The Illinois CCR Act copied Part 257's definition of a CCR surface impoundment: "a natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the unit treats, stores, or disposes of CCR." 415 Ill. Comp. Stat. 5/3.143. A pond that does not satisfy this definition is not subject to Part 257 or the Illinois CCR Act.

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[15] Prior to passage of the Illinois CCR Act, most CCR surface impoundments in Illinois were regulated as wastewater treatment units. *See* R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, IEPA's Statement of Reasons (Mar. 30, 2020) ("IEPA Statement of Reasons"), Ex. 18 at 4.

The Illinois CCR Act prohibits any person from allowing the discharge of contaminants from a CCR surface impoundment to the environment so as to cause a violation of the Illinois CCR Act; requires owner and operators of CCR surface impoundments to obtain construction permits from IEPA; requires IEPA approval prior to closing any CCR surface impoundment; and requires post-closure financial assurance for closed CCR surface impoundments.[16] 415 Ill. Comp. Stat. 5/22.59(b), (d), (f).

The Illinois CCR Act also set forth a fee regime, pursuant to which covered CCR surface impoundment owners and operators must pay initial and annual fees to IEPA for certain closed CCR surface impoundments, as well as those that have not completed closure. 415 Ill. Comp. Stat. 5/22.59(j). The Illinois CCR Act also required the Board to adopt rules governing CCR surface impoundments that must be at least as protective and comprehensive as Part 257. *See* 415 Ill. Comp. Stat. 5/22.59(g).

F. <u>The Part 845 Rulemaking.</u>

On March 30, 2020, IEPA proposed regulations titled "Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments" to be included as Part 845 of Illinois Administrative Code's Title 35. According to the Statement of Reasons issued with the proposed regulations,

> [t]he foremost purpose and effect of this regulatory proposal is to fulfill Illinois EPA's statutory obligation to propose CCR rules consistent with the requirements in Section 22.59(g). The second purpose and effect of this regulatory proposal is to protect the groundwater within the state of Illinois. . . . Groundwater has an essential and pervasive role in the social and economic well-being of Illinois, and is important to the vitality, health, safety, and welfare of its citizens. This rule has been developed based on the goals above and the principle that groundwater resources should be utilized for beneficial and legitimate purposes. *See* 415 ILCS

[16] The Illinois CCR Act's financial assurance requirements do not apply to SIPC because it is a not-for-profit electric cooperative. 415 Ill. Comp. Stat. 5/22.59(f).

> 55/1 *et seq*. ***Its purpose is to prevent waste and degradation of Illinois' groundwater***. The proposed rule establishes a framework to manage the underground water resource to allow for maximum benefit of the State.

IEPA Statement of Reasons, Ex. 18 at 10 (emphasis added).[17] IEPA's Statement of Reasons attached a list of "power generating facilities with CCR surface impoundments [that] may be affected by Illinois EPA's proposed rule." *Id*. at 36–37. IEPA indicated, incorrectly, on that list that Marion Station includes nine CCR surface impoundments. *Id*. at 37.

The Board held two sets of hearings and received 138 written public comments on the proposed rules. SIPC submitted public comments to the Board on September 25, 2020. In those comments, SIPC stated that only one of the units at Marion Station of the nine ponds then identified by IEPA—former Emery Pond (which is not at issue in this Petition)—is a regulated CCR surface impoundment as defined in the then-proposed regulations, the Illinois CCR Act, and Part 257. *See* R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, SIPC Comments to Illinois Pollution Control Board (Sept. 25, 2020), Ex. 19.

G. <u>The Board's Opinion and the Final Rule.</u>

The Board issued its Second Notice Opinion and Order ("Second Notice Opinion") on February 4, 2021. The Second Notice Opinion largely adopted IEPA's proposed rules, including its definition of "CCR surface impoundment" as a "natural topographic depression, man-made excavation, or diked area, which is designed to hold an accumulation of CCR and liquids, and the surface impoundment treats, stores, or disposes of CCR." R2020-019, *In the Matter of Standards*

[17] For all citations to R2020-019 rulemaking materials—except Board orders and the final Part 845—we provided excerpted documents including only the relevant and cited page numbers, which were attached to SIPC's May 11, 2021, initial Petition. The page number cited here, and for all R2020-019 materials, is the page number of the original document, not the page number of the Exhibit.

for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845, Illinois Pollution Control Board's Second Notice Opinion and Order at 11 (Feb. 4, 2021) ("Second Notice Opinion and Order"); *see also* 35 Ill. Admin. Code § 845.120. Thus, the Board, like the legislature in the Illinois CCR Act, adopted Part 257's definition of "CCR surface impoundment."

The final Part 845 also adopted the following definitions that are relevant to the instant Petition:

> "Existing CCR surface impoundment" means a CCR surface impoundment in which CCR is placed both before and after October 19, 2015, or for which construction started before commenced prior to October 19, 2015 and in which CCR is placed on or after October 19, 2015. A CCR surface impoundment has started commenced construction if the owner or operator has obtained the federal, State, and local approvals or permits necessary to begin physical construction and a continuous on-site, physical construction program had begun before prior to October 19, 2015.
>
> . . .
>
> "Inactive CCR surface impoundment" means a CCR surface impoundment in which CCR was placed before but not after October 19, 2015 and still contains CCR on or after October 19, 2015. Inactive CCR surface impoundments may be located at an active facility or inactive facility.

35 Ill. Admin. Code § 845.120. The Board declined industry's request to adopt a new definition of *de minimis* units in Part 845, at least in part because it did not want to "create" new language that was not in Part 257, which could create inconsistency. Second Notice Opinion and Order at 14–15. In so doing, the Board appeared to recognize that such units may not be subject to Part 845, just as such units are not subject to Part 257, because they are not "CCR surface impoundments." The Second Notice Opinion suggested that there is authority to determine such units are not covered CCR surface impoundments subject to Part 845, and that operators of *de*

minimis units could—if necessary—petition for a variance or an adjusted standard from Part 845 if it disagrees with how the IEPA characterized a unit:

> Regulatory relief mechanisms are available to owners and operators when they disagree with an IEPA determination concerning whether a unit is a CCR surface impoundment. In those instances, an owner or operator may seek an adjusted standard or a variance from the Board

Id. at 14.

Following approval by the Joint Committee on Administrative Rules ("JCAR"), the Board adopted Part 845 as final on April 15, 2021, with an effective date of April 21, 2021. *See* R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, Illinois Pollution Control Board's Final Order Adopted Rule (Apr. 15, 2021) ("Final Order").

H. The Pond Investigation

SIPC has received VNs from IEPA that are related to the units that are the subject of this Petition.[18] *See* 2020 Landfill VN, Ex. 16; IEPA Violation Notice W-2020-00046 (July 28, 2020), Ex. 20; IEPA Violation Notice W-2020-00087 (Dec. 16, 2020), Ex. 21. In connection with discussions related to these VNs, IEPA requested, and SIPC agreed, that SIPC complete a pond investigation pursuant to an agreed protocol designed to yield information related to whether the five De Minimis Units at issue in this Petition qualify as excluded *de minimis* units. The investigation was intended to gather information related to the extent and composition of the sediments in the De Minimis Units.

[18] By a letter dated July 3, 2018, IEPA also issued a VN to SIPC pursuant to Section 31(a)(1) of the Act (Violation Notice No. W-2018-00041), alleging violations of groundwater quality standards for various constituents based on groundwater sampling at monitoring wells surrounding or near the former Emery Pond. As discussed *supra*, SIPC closed the former Emery Pond by removal pursuant to an IEPA-approved closure compliant with Part 257, and it is not included in this Petition.

The pond investigation involved (1) completion of a bathymetric survey to determine the amount of sediments below water in the De Minimis Units (with the exception of former Pond B-3, which no long holds water); and (2) analysis of pond sediments to determine whether and to what extent they contain CCR. At the request of IEPA, soil borings were also taken from the berms associated with Ponds 3 (including 3A), B-3, and 4.[20] Field work and data collection was completed by Hanson Engineering, Inc. Haley & Aldridge analyzed the results and authored the Pond Investigation Report. SIPC provided an initial version of that Report to IEPA on August 6, 2021. Haley & Aldridge subsequently updated the Report following a call with IEPA, including to address questions raised by IEPA, and that updated version is the version attached as Ex. 29.

I. <u>Requested Relief</u>

Through this Petition, SIPC requests a finding of inapplicability from the Part 845 requirements for the De Minimis Units and the Former Fly Ash Holding Units (including the Former Landfill) or, in the alternative, an adjusted standard for the De Minimis Units and the Former Fly Ash Holding Units as set forth in Appendix A.

III. <u>REQUEST FOR FINDING OF INAPPLICABILITY</u>.

The Board has recognized that a Petition for an adjusted standard can, in the alternative, seek a finding of inapplicability from the regulation at issue. *See* AS 2009-003, *In the Matter of Petition of Westwood Lands, Inc. for an Adjusted Standard from Portions of 35 Ill. Adm. Code 807.14 and 35 Ill. Adm. Code 807.104 and 35 Ill. Adm. Code 810.103 or, in the Alternative, a Finding of Inapplicability*, Opinion and Order of the Board (Oct. 7, 2010) (granting request for a

[20] IEPA also requested that borings be taken from former Pond A-1 (which is not part of this Petition) and former Pond B-3. As discussed, SIPC was unable to collect either of those borings because bedrock was encountered at the surface of former Pond A-1 (confirming no CCR present) and the designated boring area of former Pond B-3 was inaccessible. *See* Pond Investigation Rep., Ex. 29 at 6.

finding of inapplicability from solid waste regulations); AS 2004-002, *In the Matter of Petition of Jo'Lyn Corporation and Falcon Waste and Recycling Inc. for an Adjusted Standard from 35 Ill. Adm. Code 807.103 and 35 Ill. Adm. Code 810.103, or in the Alterative, a Finding of Inapplicability*, Opinion and Order of the Board (Apr. 7, 2004) (granting a request for a finding of inapplicability from solid waste regulations). Such relief is appropriate here on the basis that none of the units at issue are CCR surface impoundments subject to Part 845, as set forth further below.

A. The De Minimis Units Are Not Subject to Part 845.

Part 845 is clear that it only regulates "CCR surface impoundments." The regulation's "Scope and Purpose" section specifies that Part 845 applies to "owners and operators of new and existing CCR surface impoundments," 35 Ill. Admin. Code § 845.100(a), and "inactive CCR surface impoundments at active and inactive electric utilities or independent power producers." *Id.* § 845.100(b). As discussed below, none of the units at issue are CCR surface impoundments, new or existing CCR surface impoundments, or inactive CCR surface impoundments, and therefore, none of the current and former ponds at issue are covered by Part 845.

1. The De Minimis Units Are Not "CCR Surface Impoundments."

As discussed below, the De Minimis Units are not "CCR surface impoundments" as defined in Part 257 or Part 845. Both Part 257 and Part 845 define a CCR surface impoundment as "a natural topographic depression, man-made excavation, or diked area, which ***is*** designed to hold an accumulation of CCR and liquids, ***and*** the unit[21] treat***s***, store***s***, or dispose***s*** of CCR." 40

[21] Part 845 substitutes "surface impoundment" for "unit," but this works no substantive change. 35 Ill. Admin. Code § 845.120

C.F.R. § 257.53 (emphasis added); *see also* 35 Ill. Admin. Code § 845.120. None of the De Minimis Ponds meet this two-part definition.[22]

As discussed above, the De Minimis Units are not designed to—and do not—hold a necessary accumulation of CCR and liquids. Accordingly, the De Minimis Units do not fall within the first part of the definition of CCR surface impoundment. Further, none of the De Minimis Units treat, store, or dispose of CCR, and (to the extent they ever did) have not done so since October 19, 2015, as required by the second part of the definition of CCR surface impoundment.

The De Minimis Units primarily received CCR only through their service as secondary finishing ponds (through decanted overflow water), stormwater runoff, or air deposition. The only unit to ever receive direct disposal of CCR was former Pond B-3. However, that disposal occurred only three to four times during then entire course of its operation (when Pond A-1 was not in operation). *See supra* at Part II.C.1. When materials from B-3 were removed in 2017, it had a high BTU content, and at least a portion of those materials were burned, suggesting any CCR in the pond was *de minimis*.

The fact that certain of the De Minimis Units *may* have received historic, largely indirect, discharges of CCR does not bring them within the definition of a "CCR surface impoundment."

[22] Part 257, upon promulgation, did not impose any requirements on any CCR surface impoundments that no longer existed or had closed before the rule's effective date—i.e., those that no longer contained water and could no longer impound liquid. Final Rule, Second Amended Pet. Updated Ex. 17 at 21,343. Whether a unit met the definition of CCR surface impoundment depended on what waste was managed in the unit ***as of October 19, 2015***. The court's decision in *Util. Solid Waste Activities Grp. v. Envtl. Prot. Agency*, 901 F.3d 414 (D.C. Cir. 2018) ("*USWAG*") reversed and remanded the Final Rule to the U.S. EPA to regulate any ash pond that was a "legacy pond," which is an inactive CCR surface impoundment at a closed or no longer operating facility. The *USWAG* decision described the risks posed by legacy ponds as risks associated with open, wet ponds that were not closed. See *USWAG*, 901 F.2d at 432–33. The *USWAG* decision's remand did **not** speak to ponds at active facilities that contained *de minimis* CCR or could no longer contain water and impound liquid as of the effective date of the Final Rule. Accordingly, the *USWAG* decision did not order U.S. EPA to regulate units like the De Minimis Units or the Former Fly Ash Holding Units.

To the contrary, both the history and the current condition of the De Minimis Units make clear that they are precisely the type of *de minimis* units excluded from the definition of CCR surface impoundment in Part 257 and Part 845.

In its preamble to the Final Rule, U.S. EPA stated that

> The Agency received many comments on the proposed definition of CCR surface impoundment. The majority of commenters argued that the definition was overly broad and would inappropriately capture surface impoundments that are not designed to hold an accumulation of CCR. Commenters were concerned that the proposed definition could be interpreted to include downstream secondary and tertiary surface impoundments, such as polishing, cooling, wastewater and holding ponds that receive only *de minimis* amounts of CCR.

Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357.

In response to those concerns, U.S. EPA reviewed the risk assessment on which Part 257 was based "to determine the characteristics of the surface impoundments that are the source of the risks the rule seeks to address." *Id*.

> Specifically, these are units that contain a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants. . . . EPA agrees with commenters that ***units containing only truly ''de minimis'' levels of CCR are unlikely to present the significant risks this rule is intended to address***.

Id. (emphasis added).

Accordingly, U.S. EPA amended the definition of CCR surface impoundment in the Final Rule "to clarify the types of units that are covered by the rule": "a natural topographic depression, man-made excavation, or diked area, which ***is*** designed to hold an accumulation of CCR and liquids, ***and the unit treats, stores, or disposes of CCR***." *Id.* (emphasis added). The intent of the amendment was to implement U.S. EPA's determination, as described in Part 257's preamble, that *de minimis* units would be **excluded** from Part 257 requirements. U.S. EPA's amended definition is, as noted above, the same definition used in Part 845. *See* 35 Ill. Admin. Code § 845.120. In making the change, U.S. EPA noted that it

> agrees with commenters that relying solely on the criterion from the proposed rule that the unit be designed to accumulate CCR could inadvertently capture units that present significantly lower risks, such as process water or cooling water ponds, because, although they will accumulate any trace amounts of CCR that are present, they *will not contain the significant quantities* that give rise to the risks modeled in EPA's assessment. By contrast, units that are designed to hold an accumulation of CCR and in which treatment, storage, or disposal occurs will contain substantial amounts of CCR and consequently are a potentially significant source of contaminants.

Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357. U.S. EPA further stated that "CCR surface impoundments do not include units generally referred to as cooling water ponds, process water ponds, wastewater treatment ponds, storm water holding ponds, or aeration ponds. These units are not designed to hold an accumulation of CCR, and *in fact, do not generally contain significant amounts of CCR*." *Id.* (emphasis added). Further, U.S. EPA stated that secondary or tertiary ponds that do not receive "significant amounts of CCR from a preceding impoundment" would not fall within the definition of a regulated CCR surface impoundment. *See Id.* at 21,357; *see also*, U.S. EPA, *Frequent Questions about Definitions and Implementing the Final Rule Regulating the Disposal of Coal Combustion Residuals*,[23] Ex. 34 ("Surface runoff, coal pile runoff, CCR landfill leachate, stormwater and evaporation ponds would not generally be expected to meet the definition of a CCR surface impoundment, because based on their typical design and function, such units are not usually designed primarily to hold an accumulation of CCR and liquid and would not be expected to treat, store, or dispose of CCR.")

[23] Available at https://www.epa.gov/coalash/frequent-questions-about-definitions-and-implementing-final-rule-regulating-disposal-coal#q7.

U.S. EPA reiterated the *de minimis* exception in the 2024 Legacy Rule, explaining that "evaporation ponds, or secondary or tertiary finishing ponds that have not been properly cleaned up" are expected to "contain no more than a *de minimis* amount of CCR" and, therefore, would not be regulated under Part 257. 2024 Legacy Pond Final Rule, Ex. 33 at 39,050. Further, U.S. EPA stated in its proposal for the 2024 Legacy Rule that "the following would not be considered CCR [management units]: . . . closed or inactive process water ponds, cooling water ponds, wastewater treatment ponds, and storm water holding ponds or aeration ponds. These units are not designed to hold an accumulation of CCR, and *in fact, do not generally contain a significant amount of CCR*. . . ." Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments, 88 Fed. Reg. 31,982, 32,018 (May 18, 2023) (emphasis added), attached in relevant part as Ex. 35. SIPC's request that the Board find Part 845 inapplicable to the De Minimis Ponds is consistent with federal law as the units contain little to no CCR and, therefore, are not federally regulated.

The Illinois CCR Act and Part 845 both incorporate Part 257's definition of "CCR surface impoundment," including the amended language that implemented U.S. EPA's determination that *de minimis* units would not be considered regulated surface impoundments. Thus, Part 845 and the Illinois CCR Act do not apply to *de minimis* units.

The Board declined to "create" a new definition of "*de minimis,*" as it is not expressly defined in Part 257, but that decision did not mean that *de minimis* units would be covered under Part 845. Second Notice Opinion and Order at 14–15. Indeed, that decision was based at least in part on concerns about assuring conformity with Part 257, *id.* at 15, and Part 257 does not apply to *de minimis* units as such units are described by U.S. EPA, including in the Preamble to its Final Rule. *See* Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357. Consistently, the Board also implicitly recognized in its discussion of defining *de minimis* units that IEPA might make decisions about whether a unit qualifies as an excluded *de minimis* unit, and, if a company disagreed, it could choose to seek relief from the Board, including, for example, through an adjusted standard. Second Notice Opinion and Order at 14. IEPA, and the Board, may determine that a unit is *de minimis* and thus not regulated because the regulations do not apply to such units under the identical "CCR surface impoundment" definitions in Part 257 and Part 845. Here, for the reasons set forth below, SIPC asks the Board in the first instance[24] to determine that the De Minimis Units are not regulated CCR surface impoundments.

Both the Pond Investigation Report and the history of the De Minimis Units outlined above show that the units do not "contain a large amount of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants." Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357; *see also* Pond Investigation Rep., Ex. 29. To the extent any of the De Minimis Units ever received discharges of CCR, the discharges were mostly indirect, either from pond overflow or process wastewater. The only De Minimis Unit that is known to have received direct discharges of CCR—former Pond B-3[25]—likely only did so for short periods of time, has not received any CCR for decades, and is no longer able to contain water. *See supra* at Part II.C.1. Accordingly, none of the De Minimis Ponds at issue ever contained "significant quantities" or "substantial amounts" of CCR. Further, all the De Minimis Units have been cleaned of debris since Marion Station switched to fully dry handling fly ash, and those cleanings would have removed any CCR that would have accumulated in them as a result of historic operations. As a

[24] As set forth below, if the Board denies this request, SIPC asks the Board for an adjusted standard with respect to the De Minimis Units.

[25] While the South Fly Ash Pond was *designed* to receive direct discharges of CCR, it never did receive direct discharges of CCR. *See supra* at 9–10.

result, the De Minimis Units simply do not present the "significant risks" Part 257 and Part 845 are intended to address.

This conclusion is bolstered by the results and analysis set forth in the Pond Investigation Report. As summarized in that report, Haley & Aldridge reviewed extensive information relating to the De Minimis Units, including bathymetric survey results, results of analyses of pond sediments, and results of a PLM analyses, which characterize the fraction of CCR in sediment samples. Based on that information, Haley & Aldridge determined that the De Minimis Units contain on average less than 2 feet of total sediments. Of that less than two feet, Haley & Aldridge determined that the average fraction of CCR materials in the De Minimis Units was approximately forty percent. Pond Investigation Rep., Ex. 29 at 13. In other words, the De Minimis Units contain only a small amount of sediment, and only a fraction of those sediments appears to contain CCR materials. Haley & Aldridge accordingly concluded that "these results are consistent with what we understand to be the function of [the De Minimis Units], which generally did not receive direct discharges of CCR materials, were not designed to hold an accumulation of CCR and water, and have not been used for the treatment, storage and disposal of CCR." Pond Investigation Rep., Ex. 29 at 7.

Haley & Aldridge also contrasted the volume and type of pond sediments in the De Minimis Units with the characteristics of a "typical" CCR surface impoundment that is used to treat, store, or dispose of CCR. As discussed in the Pond Investigation Report, the volume of sediments in such CCR surface impoundments generally is greater than fifty percent of pond volume. In contrast, the volume of sediments in the De Minimis Units ranged from 8.2 percent (Pond 6) to 13.3 percent (Pond 3A). Similarly, the total volume of sediments in the De Minimis Units is far smaller than one would expect to see in a CCR surface impoundment used for the treatment storage or disposal of CCR. *See* Pond Investigation Rep., Ex. 29 at 7. These results further bolster the conclusion that the De Minimis Units are not CCR surface impoundments as defined in or Part 845 or Part 257.

Further, Haley & Aldridge reviewed multiple years of groundwater monitoring data collected by SIPC and determined that any CCR that is in the De Minimis Units has not had any appreciable impact on groundwater at SIPC. *See* Pond Investigation Rep., Ex. 29 at 26. Ms. Lewis concurs with this conclusion and determines that the De Minimis Units do not pose appreciable risk to human health or the environment—and are therefore not the type of units intended by regulated by Part 845 or Part 257—based on her review of the Pond Investigation Report and her own review of Station groundwater monitoring data and pond histories. Ari Lewis, M.S. *Support for the Petition of an Adjusted Standard for Pond 4, Ponds 3 and 3A, Pond S-6, Former Pond B-3, and South Fly Ash Pond* (Dec. 20, 2024) ("Lewis Op."), Ex. 36. As discussed by Ms. Lewis in her report, the De Minimis Units are precisely the types of *de minimis* units that U.S. EPA sought to exclude from regulation under Part 257 because they do not "***present the significant risks [Part 257] is intended to address***." Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357; *see also* Lewis Op., Ex. 36. They should likewise be excluded under Part 845, as discussed below.

Given that the De Minimis Units are not CCR surface impoundments under Part 257, the Board should find that they also are not covered by Part 845. As noted above, the definition of "CCR surface impoundment" is identical in both Part 257 and Part 845 and plainly excludes the De Minimis Units. As a practical matter, it would be anomalous, to say the least, that the same words mean something different in Part 845 and that a unit is subject to Part 845 but excluded from Part 257 under the same rule language. Part 257 clearly excludes units such as the De

Minimis Units. Further, the administrative record is clear that the legislature, IEPA, and the Board in adopting the same definition of "CCR surface impoundments" as Part 257, all intended for Part 845 to regulate the same universe of "CCR surface impoundments" as Part 257. *See, e.g.*, R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, IEPA Responses to Pre-Filed Questions (Aug. 3, 2020) ("IEPA Responses"), attached in relevant part as Updated Ex. 22 at 7–8 ("It is the Agency's position that the same universe of CCR surface impoundments [that is regulated by Part 257] is intended to be regulated by Part 845."); *id*. at 17 ("CCR surface impoundments not subject to Part 257, are not subject to the requirements of Part 845. (Agency Response)"); R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, Hearing Transcript (Aug. 11, 2020), Ex. 23 at 43–44 (Q: "[M]y question was is Part 845 intended to apply to the same ponds that are subject to requirements under Part 257 given that they both define CCR surface impoundments in an identical fashion?" A: "In the Agency's opinion, they will be the same ones."); Final Order at 8 (noting that "many of the technical elements required of owners and operators of CCR surface impoundments are already required under federal law.").

Indeed, to the extent IEPA *had* desired to deviate from Part 257 for the scope of units of covered by Part 845, it admitted that it did not conduct its own risk assessment or otherwise gather evidence that would support doing so. *See, e.g.*, IEPA Responses, Updated Ex. 22 at 55 (Q: "Are you familiar with the Risk Assessment performed by U.S. EPA when it finalized the 2015 Federal CCR Rule?" A: "No."); R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, First Supplement to IEPA Pre-Filed Responses (Aug. 5, 2020), Ex. 24 at 37–38 (admitting that IEPA did not perform its own risk assessment and IEPA relied upon U.S. EPA's risk assessment "to the extent that USEPA's risk assessment was used by USEPA to develop the requirements of Part 257"). There is no question, then, that the De Minimis Units are excluded from regulation under both Part 257 **and** Part 845.

2. The De Minimis Units Are Not Existing or Inactive CCR Surface Impoundments.

The De Minimis Units also do not fall within the definition of "existing CCR surface impoundment" or "inactive CCR surface impoundment" under either Part 845 or Part 257. As an initial matter, under either regulatory scheme, a unit cannot be an "existing CCR surface impoundment" or an "inactive CCR surface impoundment" unless it is first a "CCR surface impoundment" which, as discussed above, the De Minimis Units are not. *See, e.g.*, Second Notice Opinion and Order at 15 ("The Board notes that for an impoundment to be an inactive surface impoundment, first it must be a *CCR surface impoundment*, which is defined in Section 845.120 as being designed to 'hold CCR and liquid.'" (emphasis in original)). Furthermore, it is undisputed that none of the De Minimis Units "received" CCR or had CCR "placed" in them—other than any small amounts that may have been incidentally deposited through indirect overflow discharges, runoff, or air—on or after October 2015. Other than B-3, they also did not "receive" CCR or have CCR "placed" in them—again, other than any small amounts that may have been incidentally deposited through indirect overflow discharges, runoff, or air—prior to October 2015. These ponds, used for secondary overflow, stormwater runoff, and landfill runoff, are exactly types of units U.S. EPA expected would be *de minimis.* The De Minimis Units thus are clearly not "existing CCR surface impoundments" under Part 257 or Part 845.

The De Minimis Units are likewise not "inactive CCR surface impoundments." Part 257 defines an "inactive surface impoundment" as a "CCR surface impoundment that no longer receives CCR on or after October 19, 2015 and still contains both CCR and liquids on or after October 19, 2015" 40 C.F.R. § 257.53. Part 845 similarly defines "inactive CCR surface impoundment" as a "CCR surface impoundment in which CCR was placed before but not after October 19, 2015 and still contains CCR on or after October 19, 2015." 35 Ill. Admin. Code § 845.120. There is no dispute that CCR was never "placed" in the South Fly Ash Pond or Pond 6, either before or after October 19, 2015. Those ponds plainly are not inactive CCR surface impoundments. To the extent any CCR was ever "placed" in the Ponds 3, 4, or B-3 decades ago, the historical record is clear that any historic receipt of CCR by those ponds was temporary and intermittent in nature and of a *de minimis* amount not intended to be covered under Part 257 or Part 845. Accordingly, the De Minimis Units do not contain more than *de minimis* amounts of CCR, which is not sufficient to meet the requirements for regulation as an inactive CCR surface impoundment under either Part 257 or Part 845. Accordingly, the De Minimis Units should not be regulated as inactive CCR surface impoundments under Part 257 or Part 845.

B. The Former Fly Ash Holding Units Are Not Subject to Part 845.

1. The Former Fly Ash Holding Units Are Not CCR Surface Impoundments, Existing CCR Surface Impoundments, or Inactive CCR Surface Impoundments.

The Former Fly Ash Holding Units are likewise not "CCR surface impoundments" subject to Part 257 or Part 845. The Former Fly Ash Holding Units are—and have been since at least the early 1990s—dry and operated in conjunction with the Former Landfill, which, in turn, has been operated and regulated as an on-site, permit-exempt landfill pursuant to 35 Ill. Admin. Code Part 815 for decades. *See e.g.* 2020 Landfill VN, Ex. 16. The Former Fly Ash Holding Units are not currently, and were not as of October 19, 2015, "designed to hold an accumulation of CCR and liquids" and accordingly, fall outside of the plain definition of "CCR surface impoundment." *See supra* at Part III.A.1; *see also* U.S. EPA, Comment Summary and Response Document: Hazardous and Solid Waste Management System; Identification and Listing of Special Wastes; Disposal of Coal Combustion Residuals from Electric Utilities; Proposed Rule, Vol. 3 (Dec. 2014), Ex. 25 at 73 ("CCR surface impoundments that have been dewatered and are no longer able to hold free liquids" prior to October 19, 2015 "are not subject to [Part 257].").

Because the Former Fly Ash Holding Units are not CCR surface impoundments, they do not fall within the definition of "existing" or "inactive CCR surface impoundments." *See supra* at Part III.A.2 (relating to the De Minimis Units and emphasizing that to be regulated as an existing or inactive CCR surface impoundment, the unit at issue must first be a "CCR surface impoundment" within the meaning of Parts 845 and 257).

2. The Former Fly Ash Holding Units Have Been Managed for Decades as a Landfill, which Is Excluded from Regulation under Part 845.

The Former Fly Ash Holding Units are not subject to Part 845 for the separate reason that they function (and have functioned for decades) as part of the Former Landfill, and both Part 257 and Part 845 make clear that CCR landfills are not surface impoundments. Part 257 specifically defines a CCR landfill as **not** being a CCR surface impoundment: "CCR landfill or landfill means an area of land or an excavation that receives CCR ***and which is not a surface impoundment***, an underground injection well, a salt dome formation, a salt bed formation, an underground or surface coal mine, or a cave." 40 C.F.R. § 257.53 (emphasis added). Part 257 likewise contains separate and distinct requirements for CCR landfills and CCR surface impoundments. *Compare e.g.*, 40 C.F.R. § 257.70 *with* 40 C.F.R. § 257.71 and 40 C.F.R. § 257.84 *with* 40 C.F.R § 257.83.

The 2024 Legacy Rule continues to make this distinction by promulgating federal requirements for CCR landfills that ceased receiving CCR prior to October 19, 2015. 2024 Legacy Pond Final Rule, Ex. 33 at 38,951. There is simply no question that the U.S. EPA intended to regulate CCR landfills separately from CCR surface impoundments in Part 257.[26]

Part 845 is likewise clear that it does not regulate CCR landfills; the "Scope and Purpose" section states "this Part ***does not apply*** to landfills that receive CCR." 35 Ill. Admin. Code § 845.100(h) (emphasis added); *see also* IEPA Responses, Updated Ex. 22 at 6 ("A man-made excavation where CCR is disposed could be a CCR surface impoundment or a landfill***, but a landfill that receives CCR is not a CCR surface impoundment***." (emphasis added)). The Board explicitly declined to extend Part 845's reach to landfills and other unconsolidated piles of CCR during the rulemaking, stating "that regulation of these unconsolidated coal ash fills and piles is beyond the scope of [the Illinois CCR Act]." Second Notice Opinion and Order at 12. Instead, the Board opted to open a separate sub-docket to explore regulating CCR in landfills and unconsolidated coal ash fills and piles. *Id*. IEPA agreed with the Board, taking the position that "limiting Part 845 to CCR surface impoundments is necessary and appropriate." R2020-019, *In the Matter of Standards for the Disposal of Coal Combustion Residuals in Surface Impoundments: Proposed new 35 Ill. Adm. Code 845*, IEPA Post-Hearing Comments (Oct. 30, 2020), Ex. 26 at 10. There is no question that the Former Landfill, which includes the Former Fly Ash Holding Area Units, has been regulated as a landfill for decades. *See supra* at Part II.C.2. Indeed, as recently as March 2020, IEPA issued a VN to SIPC for alleged violations of the Illinois landfill regulations at the Former Landfill. As part of the Former Landfill, the Former Fly Ash Holding Units cannot be subject to

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[26] As noted *supra*, the Former Landfill at Marion Station is not regulated pursuant to Part 257 because it stopped receiving waste prior to October 2015. 40 C.F.R. § 257.53.

Part 845. Illinois landfill regulations, consistent with Part 257 and Part 845, clearly state that a landfill is not a surface impoundment.[27]

3. The Board Should Reject IEPA's Apparent Position that the Historic Presence of a CCR Surface Impoundment Converts a Landfill into a CCR Surface Impoundment.

Finally, the Board should reject IEPA's apparent new and convoluted argument that, notwithstanding its regulation of the Former Landfill as a landfill for decades—including its issuance of a VN asserting alleged violations of Illinois landfill regulation—, the landfill regulations do not apply, and the entire Former Landfill area, including the Former Fly Ash Holding Units, is actually a CCR surface impoundment subject to Part 845.

IEPA's argument appears to be this: the Former Fly Ash Holding Units were once, decades ago, used to store CCR and water. They no longer contain water and no longer receive CCR, but the fact that they once did and appear on a map in the vicinity of the Former Landfill somehow converts the (now closed) Former Landfill, which both SIPC and IEPA have recognized for decades as a landfill, into a CCR surface impoundment. This is an illogical and absurd result, and one that runs directly contrary to the definition of "CCR surface impoundment" in Part 257, Part 845, and Illinois landfill regulations.

Treating the Former Fly Ash Holding Units, and indeed the entire Former Landfill, as CCR surface impoundments after years of regulating the area as a landfill upends years of settled expectations about the requirements for operation and closure, raising significant retroactivity and fairness concerns for this not-for-profit cooperative and its owners. The Board should reject

[27] 35 Ill. Admin. Code § 810.103 ("'Landfill' means a unit or part of a facility in or on which waste is placed and accumulated over time for disposal, and that is not a land application unit, a surface impoundment or an underground injection well."); *see also* 35 Ill. Admin. Code § 810.104 ("For the purposes of this Part and 35 Ill. Adm. Code 811 through 815, a surface impoundment is not a landfill.").

IEPA's last-minute overreach and find that Part 845 does not apply to the Former Landfill, including the Former Fly Ash Holding Units.[28]

IV. PETITION FOR AN ADJUSTED STANDARD.

If the Board declines to issue a finding of inapplicability and determines that the current and former ponds at issue in this Petition are "CCR surface impoundments," SIPC requests in the that the Board grant an adjusted standard from 35 Ill. Admin. Code Part 845 for the De Minimis Units and the Former Landfill (including the Former Fly Ash Holding Units). When petitioned, the Board may grant an adjusted standard from a rule of general applicability for persons who can justify such an adjustment under the applicable statutory factors. 415 Ill. Comp. Stat. 5/28.1(a).

In this Petition, SIPC is requesting an adjusted standard as described below and with the language presented in the attached Appendix A. The adjusted standard would result in the closure of all the units subject to this Petition consistent with Part 845 performance standards. It will also require groundwater monitoring and corrective action for each of the units consistent with Part 845 requirements. SIPC's proposed adjusted standard accounts for the unique characteristics of these units while ensuring no adverse impact to health or the environment.

As set forth below, the requested adjusted standard is warranted based on the factors set forth in Section 28.1 of the Act, including consistency with Section 27(a). Accordingly, SIPC's request for an adjusted standard for the De Minimis Units and the Former Landfill (including the

[28] The Indiana Office of Environmental Adjudication recently rejected similar attempts by environmental groups to argue that a portion of a former Duke Energy ash pond—which had been closed for decades—was subject to Part 257, stating that "an impoundment's regulatory status over three decades ago is not relevant to determining whether it is currently subject to the Federal CCR Rule." *In the Matter of Objection to the Issuance of Partial Approval of Closure/Post Closure Plan Duke Gallagher Generating Station Ash Pond System*, No. 20-S-J-5096 (OEA May 4, 2021), Ex. 27 at 14.

Former Fly Ash Holding Units) should be granted in the event the Board does not grant its request for a finding of inapplicability.

A. <u>Regulatory Standard.</u>

Section 28.1 of the Act describes the factors the Board must consider in granting an adjusted standard:

> (c) If a regulation of general applicability does not specify a level of justification required of a petitioner to qualify for an adjusted standard[[29]], the Board may grant individual adjusted standards whenever the Board determines, upon adequate proof by petitioner, that:
>
> (1) factors relating to that petitioner are substantially and significantly different from the factors relied upon by the Board in adopting the general regulation applicable to that petitioner;
>
> (2) the existence of those factors justifies an adjusted standard;
>
> (3) the requested standard will not result in environmental or health effects substantially and significantly more adverse than the effects considered by the Board in adopting the rule of general applicability; and
>
> (4) the adjusted standard is consistent with any applicable federal law.

415 Ill. Comp. Stat. 5/28.1(c)(1)–(4).

Part 845, which is a regulation of general applicability, does not specify a level of justification or other requirements for an adjusted standard outside of those set forth in Section 28.1 of the Act. Any adjusted standard must also be "consistent" with subsection (a) of Section 27 of the Act, which provides that

> the Board shall take into account the existing physical conditions, the character of the area involved, including the character of surrounding land uses, zoning classifications, the nature of the existing air quality, or receiving body of water, as the case may be[[30]], and the technical feasibility and economic reasonableness of

[29] Part 845 does not specify a level of justification required to qualify for an adjusted standard.
[30] The physical conditions at Marion Station and character of the area involved, including the character of surrounding land uses, zoning classifications, and the nature of the receiving body of water are discussed *supra* at Part II.A.

measuring or reducing the particular type of pollution.

415 Ill. Comp. Stat. 5/27(a).[31] Extremely high costs of controlling a particular pollutant have been determined to be economically unreasonable.[32] A treatment or control technology is not economically reasonable if it would not significantly improve environmental conditions or increase the aesthetic or recreational value of the receiving water body, especially given high associated implementation costs.[33]

As discussed below, granting the requested adjusted standard for the De Minimis Units and the Former Landfill (including the Former Fly Ash Holding Units) is justified by the factors set forth in Section 28.1 and consistent with the factors set forth in Section 27.

B. De Minimis Units Pond 3/3a and South Fly Ash Pond.

1. SIPC Requests an Adjusted Standard for De Minimis Units Pond 3/3a and the South Fly Ash Pond.

In the event the Board denies SIPC request for a finding of inapplicability, the Board should grant the very limited adjusted standard from Part 845 for De Minimis Units Pond 3/3A and the South Fly Ash Pond set forth in Appendix A. The primary adjustments requested from Part 845 for Pond 3/3A and the South Fly Ash Pond are related to the timeframe for submitting operating

[31] The Illinois Court of Appeals has held that the Board's review is limited to the factors set forth in Sections 27(a) and 28.1: "The Act sets forth the factors the Board is to consider when determining whether to grant an adjusted standard. The Board lacks the authority to add to or rewrite the statutory factors." *Emerald Performance Materials, LLC v. Ill. Pollution Control Bd*., 2016 IL App (3d) 150526, ¶ 27.

[32] *EPA v. Pollution Control Bd*., 308 Ill. App. 3d 741, 752 (2d Dist. 1999) (upholding Board's finding that compliance would be economically unreasonable where "[a]ccording to the uncontested figures Swenson presented, the cost of installing a powder coating system would be more than 15 times the average control cost the Board historically has used to measure reasonableness"); *see also Granite City Div. of Nat. Steel Co. v. Ill. Pollution Control Bd*., 155 Ill. 2d 149, 183 (1993) ("The Act specifically provides for variance and adjusted standard procedures by which the Board may relieve a discharger from compliance with its environmental control standards upon a showing of unreasonable economic or individual hardship.").

[33] *See, e.g*., R 1981-024, *In the Matter of Proposed Water Quality Standard for Wood River (Olin, East Alton)*, Proposed Rule First Notice Order and Opinion of the Board, at 6 (Nov. 12, 1982); PCB 2009-038, *Ameren Energy Generating Co. v. IEPA*, Order and Opinion of the Board, at 42 (Mar. 18, 2010).

and closure construction permit application materials. These adjustments are a necessary step to the application of the remaining Part 845 requirements to these units. As of the filing of this Petition, the applicability of Part 845 has been stayed for Pond 3/3A and the South Fly Ash Pond and deadlines for submitting these permit application materials have passed. *See* 35 Ill. Adm. Code §§ 845.230, 845.700. As explained further below, these units are also not subject to Part 257's CCR requirements. Thus, these adjustments simply provide a reasonable timeframe for SIPC to take the steps necessary to comply with the remainder of Part 845's requirements.

Under the adjusted standard, SIPC also proposes to commit itself to closing these units via removal in accordance with Section 845.740. Thus, the closure alternatives assessment for the units would consider only closure by removal with off-site disposal or on-site disposal (to the extent practicable). These units will otherwise be subject to the remainder of applicable Part 845 requirements, including those related to permitting, location restrictions, design criteria, operating criteria, groundwater monitoring and corrective action, closure and post-closure care, and recordkeeping.[35]

2. The Factors Relating to Pond 3/3A and the South Fly Ash Pond Are Substantially and Significantly Different from the Factors and Circumstances on which the Board Relied in Adopting Part 845.

In determining whether to grant an adjusted standard, the Board first considers whether the factors relating to the Petition are significantly different from the factors considered in adopting the regulation at issue (Part 845). *See* 415 Ill. Comp. Stat. 5/28.1(c)(1). As discussed below, they are here.

[35] As a "not-for-profit electric cooperative as defined in Section 3.4 of the Electric Supplier Act," SIPC is exempt from the financial assurance requirements in Part 845. 415 Ill. Comp. Stat. 5/22.59(f).

Like the Part 257 rules relating to surface impoundments, Part 845 was intended to address the risks posed by CCR surface impoundments that have resulted or are likely to result in groundwater contamination:

> The second purpose and effect of this regulatory proposal is to protect the groundwater within the state of Illinois. The proposed rule contains a program for groundwater monitoring and the remediation of contaminated groundwater resulting from leaking CCR surface impoundments. Groundwater has an essential and pervasive role in the social and economic well-being of Illinois, and is important to the vitality, health, safety, and welfare of its citizens. This rule has been developed based on the goals above and the principle that groundwater resources should be utilized for beneficial and legitimate purposes . . . Its purpose is to prevent waste and degradation of Illinois' groundwater. The proposed rule establishes a framework to manage the underground water resource to allow for maximum benefit of the State.

IEPA Statement of Reasons, Ex. 18 at 10; *see also id*. at 3–4 ("The presence of [certain contaminants that can be found in CCR] threatens groundwater as these contaminants are soluble and mobile. When the CCR surface impoundments are not lined with impermeable material, these contaminants may leach into the ***groundwater***, affecting the potential use of the ***groundwater***." (emphasis added)).

In its Second Notice Opinion, the Board likewise emphasized that "[a]mong the program's primary goals is protecting groundwater from contamination by CCR pollutants leaking from surface impoundments." Second Notice Opinion and Order at 1; *see also id*. at 3 ("In Illinois, CCR has caused groundwater contamination and other forms of pollution that are harmful to human health and the environment."); *id*. at 41 ("[T]he installation and operation of a leachate collection system in a new CCR surface impoundments serves the same purpose as in a landfill to reduce the head on the liner to reduce the threat of groundwater contamination."); *id*. at 48 ("The Board finds that the proposed leachate collection system provides additional groundwater protection against the potential threats of contamination from new CCR surface impoundments, while allowing the operation of the impoundments in compliance with Part 845.").[36]

In determining which types of CCR surface impoundments pose the risks that Part 845 seeks to address, Part 257 is instructive; both because of its identical definition of "CCR surface impoundment" and the fact that IEPA did not perform any risk assessment of its own to support its Part 845 proposal and, instead, modeled its proposal on Part 257, which was based upon U.S. EPA's risk assessment. In other words, because the IEPA-proposed and Board-adopted Part 845 rules were based upon Part 257, and IEPA never conducted a risk assessment, Part 845 too must be based upon U.S. EPA's risk assessment. U.S. EPA was clear that it was targeting for regulation those "units that contain *a large amount* of CCR managed with water, under a hydraulic head that promotes the rapid leaching of contaminants." Final Rule, Second Amended Pet. Updated Ex. 17 at 21,357 (emphasis added); Lewis Op., Ex. 36 at 4–10.

The factors relating to Pond 3/3A and the South Fly Ash Pond are substantially and significantly different than those that motivated U.S. EPA in Part 257, and also the state legislature, IEPA, and the Board in regulating CCR surface impoundments in Illinois with the aim of protecting Illinois groundwater. As discussed above, these and the other De Minimis Units do not contain large amounts of CCR under a hydraulic head that promotes rapid leaching of contaminants to groundwater. Lewis Op., Ex. 36 at 8–10, 14. These units are not known to have ever received direct wastewater discharges of CCR. To the extent they received historic, indirect discharges of CCR, the amounts of CCR were *de minimis* in nature. *Id.* The South Fly Ash Pond

[36] The Illinois legislature also made clear that the Illinois CCR Act is intended to address and prevent groundwater contamination caused by CCR surface impoundments. *See* 415 Ill. Comp. Stat. 5/22.59(a)(3) ("The General Assembly finds that . . . CCR generated by the electric generating industry has caused ***groundwater*** contamination . . . ." (emphasis added)).

served as a secondary pond, receiving only decanted water from the former Emery Pond. Pond 3/3A received overflow from the Initial Fly Ash Holding Area and later the Fly Ash Holding Area Extension, stormwater runoff, coal pile runoff, and water from the plant's floor drains. Further, since the closure of Unit 4 and the former Emery Pond, all CCR generated at the Station is handled dry, meaning no unit on site is continuing to receive any direct discharges of CCR.

As Ms. Lewis explains in her report, the U.S. EPA determined *de minimis* units—like Ponds 3/3A and the South Fly Ash Pond—do not pose the risk to groundwater, human health, or the environment that Part 257 (or Part 845) seeks to prevent. *See* Lewis Op., Ex. 36 at E-1–E-2, 11–20 (explaining the De Minimis Units "do not present the same level of risk as the surface impoundments evaluated in the US EPA CCR risk assessment.").

These forgoing facts, alone, are sufficient to establish that Pond 3/3A and the South Fly Ash Pond do not pose a similar threat to groundwater as the CCR surface impoundments that motivated Part 257 and Part 845. This conclusion is bolstered by the Pond Investigation Report. As described in the report, Haley & Aldridge reviewed the results of shake tests taken of pond sediment samples, as well as the results of Site groundwater monitoring wells, and determined that any potential presence of CCR in Pond 3/3A and the South Fly Ash Pond should not be expected to cause and has not had a material adverse impact on groundwater at the Site. *See* Pond Investigation Rep., Ex. 29 at 26; *see also* Lewis Op., Ex. 36 at 11–16. Further, a site-specific assessment of the De Minimis Units, including Pond 3/3A and the South Fly Ash Pond, confirms there is no unacceptable risk to human health or the environment from CCR constituents that may have migrated to groundwater. Lewis Op., Ex. 36 at 17–20 (demonstrating no unacceptable risk to human health or ecological receptors). Thus, the requested adjusted standard may be granted based upon this Petition.

Another important difference between these units and the CCR surface impoundments that drove Part 845 is the burden of compliance. During the rulemaking, IEPA argued, and the Board agreed, that certain Part 845 requirements, including expedited timeframes for compliance, were feasible and reasonable because units subject to Part 845 were also subject to Part 257, and therefore, owners had years to develop and implement compliance plans. *See* Final Order at 8–9. However, as discussed above, the De Minimis Units, including Pond 3/3A and South Fly Ash Pond, are not subject to Part 257, and thus, there has been no need to undertake compliance actions under Part 257, such as groundwater and location restriction assessments. Accordingly, the timing and cost of Part 845 compliance for Pond 3/3A and the South Fly Ash Pond differs substantially from the units the Board anticipated would be covered by Part 845, which were units subject to Part 257 and that already had years of Part 257 compliance activity that could be used to comply with Part 845.

3. <u>The Factors Relating to the Pond 3/3A and the South Fly Ash Pond—which Differ from those Relied upon by the Board in Passing Part 845—Justify an Adjusted Standard.</u>

The factors unique to the Pond 3/3A and the South Fly Ash Pond —namely that they are not subject to Part 257 and do not contain a large quantity of CCR managed under a hydraulic head—justify the requested adjusted standard. As discussed above, the De Minimis Units like Pond 3/3A and the South Fly Ash Pond simply do not present the risks that Part 845 was intended to address. Additionally, the adjusted standard is only requesting adjustments to provide a timeline for coming into compliance with the full scope of Part 845 in the event a finding of inapplicability is not granted for Pond 3/3A or the South Fly Ash Pond. Further, as discussed below, the adjusted standard will have no adverse impact to human health or the environment. Accordingly, SIPC's adjusted standard is justified.

4. The Requested Adjusted Standard Will Not Result in Adverse Environmental or Health Effects.

The adjusted standard requested for Pond 3/3A and the South Fly Ash Pond "will not result in environmental or health effects substantially or significantly more adverse than the effects considered by the Board in adopting" Part 845. 415 Ill. Comp. Stat. 5/28.1(c)(3).

As discussed above, the history of receipt of minimal amounts of CCR indicate these units do not present the types of risk to human health and the environment that Part 845 (and Part 257) seek to address. Neither of these units present a risk to human health or the environment. *See Gradient,* Human Health Risk Assessment, Marion Power Station (Dec. 20, 2024) ("Risk Assessment"), Ex. 37. Further, the units are not anticipated to pose a reasonable probability of adverse effects on health or the environment. Lewis Op., Ex. 36 at 4–20.

Significantly, the adjusted standard proposed for Pond 3/3A and the South Fly Ash Pond will require full compliance with the requirements of Part 845. The only adjustment being sought is for deadlines to submit operating and construction permit application materials. SIPC is further committing to close these units via a closure by removal, thereby removing any potential for sediments from these units to impact groundwater in the future. There is no adjustment being sought from the portions of Part 845 aimed at protecting human health and the environment, including its closure standards, groundwater monitoring requirements and corrective action requirements. Thus, the proposed adjusted standard will not result in any adverse environmental or health effects.

5. The Requested Adjusted Standard Is Consistent with Federal Law.

As discussed above, Pond 3/3A and the South Fly Ash Pond are not regulated as existing CCR surface impoundments or inactive CCR surface impoundments under Part 257. Accordingly, any adjustment from Part 845 for these units is consistent with federal law. *See* 35 Ill. Admin. § Code 104.406(i).

Further, Part 845 is not currently a federally designated program, thus Part 845 and Part 257 operate independently and concurrently. Owners and operators of CCR surface impoundments must comply with both sets of regulations and an adjustment from Part 845 has no impact on a requirement to comply with Part 257. Thus, the Board is free to grant an adjustment from Part 845 requirements without consideration of Part 257.

C. De Minimis Unit Former Pond B-3

1. SIPC Requests an Adjusted Standard for De Minimis Unit Former Pond B-3.

As explained above, former Pond B-3 was dewatered and cleaned to the clay in 2017, well before the promulgation of Part 845. Nothing remains within the unit other than an internal berm. Thus, it makes little sense to require Part 845 requirements related to continued operation or an extended closure construction application process apply to former Pond B-3, which poses no ongoing risk, does not currently have the characteristics of a CCR surface impoundment (lacking both water—other than the occasional stormwater—and sediment), and is nearly closed consistent with Part 845 closure by removal standards.

SIPC's adjusted standard for former Pond B-3 seeks to have those Part 845 provisions apply that are necessary to ensure the unit is closed consistent with Part 845 and in a way that is protective of human health and the environment. Under the adjusted standard, the unit will be subject to the same operating permit, and other operating requirements, applicable to units that completed closure prior to June 30, 2021. *See* 35 Ill. Admin. Code § 845.230(d)(3). SIPC will be required to submit a final closure plan for the unit to IEPA for review and approval and complete closure of former Pond B-3 in a manner consistent with Section 845.740's closure by removal requirements. Former Pond B-3 will also be subject to Part 845, Subpart F's groundwater monitoring and corrective action requirements and any recordkeeping requirements relevant to the Part 845 provisions that apply under the adjusted standard.

Given the unique nature of this unit, Part 845's location restrictions, design criteria, and other operating criteria, as explained below, do not make practical sense for former Pond B-3. Also, given that closure by removal consistent with Part 845 requirements is nearly complete under the unit's current state, the adjusted standard seeks to have the closure process completed as quickly as possible, by requiring a closure plan and approval from IEPA but not requiring a closure construction permit. As explained further below, application of these requirements makes little sense given the unique nature of this unit and the adjusted standard will have no detrimental impact on human health or the environment.

2. The Factors Relating to former Pond B-3 Are Substantially and Significantly Different from the Factors and Circumstances on which the Board Relied in Adopting Part 845.

The factors relating to former Pond B-3 are substantially and significantly different from the factors considered by the Board in adopting Part 845 for the same reasons described in Section IV.B.2 above. *See* 415 Ill. Comp. Stat. 5/28.1(c)(1). Former Pond B-3 only ever accumulated small amounts of CCR compared to those CCR surface impoundments that were the subject of the risk assessment completed to justify promulgation of Part 257 and, correspondingly, Part 845. *See supra*, IV.B.2. Former Pond B-3 primarily served as a secondary pond, receiving decant water from Pond A-1. During three to four outages at Pond A-1, former Pond B-3 may have received discharges of fly ash from Units 1, 2, and 3 prior to their shut down in 2003. When former Pond B-3 was closed in 2017, tests confirmed its sediment was high in BTU content and at least a portion of the removed sediment was burned as fuel. This supports the conclusion that former Pond B-3 differs from the types of units intended to be regulated under Part 845 because it did not ever hold significant amounts of CCR. *See* Lewis Op. Ex. 36.

Additionally, since 2017, unlike all (or nearly all) of the units regulated under Part 845, this unit has been cleaned of sediments and no longer holds water, except in a small area of the former pond where stormwater may collect after storms before drainage and evaporation. Samples taken of the berm at former Pond B-3 indicate it contains little, if any, CCR material. Pond Investigation Rep, Ex. 29 at 12. This further distinguishes former Pond B-3. There is no ongoing management of sediment with water, let alone CCR with water, that would justify the unit being subject to many of the Part 845 requirements related to ongoing operation, such as location restrictions, design criteria, and operating criteria. Many of these portions of Part 845 address physical circumstances that do not exist at former Pond B-3. *See generally* Second Notice Opinion and Order at 32–61. Instead, former Pond B-3 is most similar to a unit that underwent closure prior to the promulgation of Part 845. Thus, it makes sense for former Pond B-3 to be subject to the same operating permit, design criteria, and operating criteria applicable to such units under Part 845. This is what SIPC has proposed in its adjusted standard.

Further, given that former Pond B-3 has been cleaned to the clay, the only material that remains is a small internal berm with little, if any, CCR. Pond Investigation Rep., Ex. 29 at Appendix C. It makes little sense for closure of the unit under 845 to be completed via any method other than closure by removal (consistent with Section 845.740). Additionally, due to the limited steps that remain to complete closure of the unit by removal and the fact that the berm contains little, if any, CCR, it makes little practical sense for the unit to be subject to the full closure construction permitting requirements of Part 845.

The proposed adjusted standard for former Pond B-3 takes into account the unit's unique characteristics, while ensuring it closes with IEPA oversight, consistent with Part 845 closure performance standards, and subject to groundwater monitoring and corrective action requirements to protect against any risk to human health and the environment.

3. The Factors Relating to the Former Pond B-3—which Differ from those Relied upon by the Board in Passing Part 845—Justify an Adjusted Standard.

The factors unique to former Pond B-3 —namely that it is not subject to Part 257, does not contain, and has never contained, a large quantity of CCR managed under a hydraulic head, and has been dewatered and cleaned to the clay—justify the requested adjusted standard. As discussed above, former Pond B-3 simply does not present the risks that Part 845 was intended to address. Additionally, as discussed below, the adjusted standard for former Pond B-3 will have no adverse impact to human health or the environment. Accordingly, SIPC's adjusted standard is justified.

4. The Requested Adjusted Standard Will Not Result in Adverse Environmental or Health Effects.

The adjusted standard requested for former Pond B-3 "will not result in environmental or health effects substantially or significantly more adverse than the effects considered by the Board in adopting" Part 845. 415 Ill. Comp. Stat. 5/28.1(c)(3).

As discussed above, the history of receipt of minimal amounts of CCR indicate this unit does not present the types of risk to human health and the environment that Part 845 and Part 257 seek to address. *See* Lewis Op., Ex 36. B-3 has been cleaned of sediment and no longer contains water (other than the occasional stormwater). It does not currently present a human health or environmental risk. *See* Risk Assessment, Ex. 37 (identifying no unacceptable risks to human or ecological receptors resulting from CCR exposures associated the De Minimis Units). Further, the former Pond B-3 is not anticipated to pose a reasonable probability of adverse effects on health or the environment. Lewis Op., Ex. 36 at 4–20.

More importantly, while evidence demonstrates that this unit does not and would not be expected to pose any risk to human health or the environment (*id.*) the adjusted standard also requires compliance with all Part 845 requirements necessary to ensure that is and remains the case. For example, the adjusted standard requires that closure of former Pond B-3 is completed consistent with Part 845 closure standards. It also requires that former Pond B-3 be subject to the groundwater monitoring and corrective action requirements in Part 845, meaning, if former Pond B-3 is causing or contributing to exceedances of the groundwater protection standards in Section 845.600, SIPC will be required to undertake corrective action to remediate that contamination. Thus, to the extent former Pond B-3 poses any risk to human health or the environment (and there is no indication that it does), those risks will be addressed under the adjusted standard.

5. <u>The Requested Adjusted Standard Is Consistent with Federal Law</u>.

As discussed above, the De Minimis Units, including former Pond B-3, are not regulated as existing CCR surface impoundments or inactive CCR surface impoundments under Part 257. Accordingly, any adjustment from Part 845 for former Pond B-3 is consistent with federal law. *See* 35 Ill. Admin. Code § 104.406(i).

Further, Part 845 is not currently a federally designated program, thus Part 845 and Part 257 operate independently and concurrently. Owners and operators of CCR surface impoundments must comply with both sets of regulations and an adjustment from Part 845 has no impact on a requirement to comply with Part 257. Thus, the Board is free to grant an adjustment from Part 845 requirements without consideration of Part 257.

6. Consideration of Section 27(a) Factors.

Existing physical conditions, the character of the area involved, and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution all support granting the adjusted standard for former Pond B-3. 415 Ill. Comp. Stat. 5/27(a). There are costs associated with the Part 845 requirements from which SIPC seeks an adjustment at former Pond B-3. Additionally, given the physical condition of the unit and surrounding area, these requirements make no practical sense as applied because, as explained above, former Pond B-3 was cleaned and closed years ago. A unit such as this simply does not cause a hazard, risk of structural instability, or contain material that could contribute fugitive dust, for example. The unit also poses no active threat to human health or the environment, including groundwater or a neighboring water body. Risk Assessment, Ex. 37; Lewis Op., Ex. 36.

D. De Minimis Unit Pond 4

1. SIPC Requests an Adjusted Standard for De Minimis Unit Pond 4

SIPC requests two adjustments from Part 845 requirements for De Minimis Unit Pond 4. First, like Pond 3/3A, the South Fly Ash Pond, and former Pond B-3, the adjusted standard provides 12 months from its entry for SIPC to submit an operating permit application for Pond 4. Again, this adjustment is necessary because the deadline for submitting an initial operating permit application under Part 845 has passed (*see* 35 Ill. Admin. Code §§ 845.230; § 845.700) and Pond 4 is not subject to Part 257, so SIPC will not have already undertaken the activities necessary to compile the operating permit application. This adjustment will allow a reasonable period of time for SIPC to prepare its operating permit application for Pond 4.

Second, the adjusted standard provides an adjustment to the Part 845 closure construction permit application deadline. Under the adjusted standard, SIPC will be required to either initiate closure or begin retrofitting Pond 4, by way of submitting a construction permit application, upon the earlier of the following occurrences: (1) within 12 months of a finding that CCR within Pond 4 are the source of an exceedance of the Section 845.600 groundwater protection standards, or (2) the end of the life of the Marion Station. Thus, the adjusted standard will allow SIPC to continue the operation of Pond 4 through the end of Marion Station's life, so long as it is not contributing to groundwater contamination, as measured through a Part 845 compliant groundwater monitoring program. If Pond 4 is found to contribute to a groundwater protection standard exceedance, this extension no longer applies and SIPC must submit a closure or retrofit construction permit for Pond 4 within twelve months of that finding. As explained below, these adjustments account for Pond 4's unique condition and will be protective of health and the environment.

Under the adjusted standard, Pond 4 will be subject to the remainder of Part 845's requirements, including any other applicable permitting requirements, location restrictions, design criteria, operating criteria, groundwater monitoring and corrective action requirements, closure and post-closure care requirements, and recordkeeping requirements. Through its adjusted standard, SIPC is also committing to closing this unit via closure by removal requirements (35 Ill. Admin. Code § 845.740). Thus, the closure alternatives assessment for the unit would consider only closure by removal with off-site disposal or on-site disposal (to the extent practicable).

2. The Factors Relating to Pond 4 Are Substantially and Significantly Different from the Factors and Circumstances on which the Board Relied in Adopting Part 845.

The factors relating to the Pond 4 are substantially and significantly different from the factors considered in adopting Part 845 for the same reasons described in Section IV.B.2, above. See 415 Ill. Comp. Stat. 5/28.1(c)(1). Pond 4 only ever accumulated small amounts of CCR compared to those CCR surface impoundments that were the subject of the risk assessment completed to justify promulgation of Part 257 and, correspondingly, Part 845. *See supra*, IV.B.2. Pond 4 never directly received CCR. It received decant water from Ponds 1 and 2, stormwater runoff from the coal pile, and overflow water from Pond 6. As part of regular maintenance activities at the Marion Station in 2010, Pond 4 was dewatered, and its contents removed. The majority of removed materials were dark in color, taken to the coal yard, and burned as fuel at the Station. This would not have been possible if the materials were CCR or high in CCR content. The Pond Investigation Report found that the materials sampled in Pond 4 contained high carbon content, which is also inconsistent with a finding that the materials are CCR or high in CCR content. Pond Investigation Rep., Ex. 29 at 8-10. This supports the conclusion that Pond 4 differs from the types of units intended to be regulated under Part 845 because it did not ever hold significant amounts of CCR. *See* Lewis Op., Ex. 36.

Additionally, unlike the CCR surface impoundments regulated under Part 845, Pond 4's primary purpose is not CCR management. Rather, its primary purpose has historically been and continues to be stormwater management of the coal pile: an operating need for as long as the Marion Station is in operation.

3. <u>The Factors Relating to Pond 4—which Differ from those Relied upon by the Board in Passing Part 845—Justify an Adjusted Standard.</u>

The factors unique to Pond 4 —namely that it is not subject to Part 257, does not contain and has never contained a large quantity of CCR managed under a hydraulic head, and is primarily used for coal pile stormwater management—justify the requested adjusted standard. As discussed above, Pond 4 simply does not present the risks that Part 845 was intended to address. Additionally, as discussed below, the adjusted standard for Pond 4 will have no adverse impact to human health or the environment. Accordingly, SIPC's adjusted standard is justified.

4. The Requested Adjusted Standard Will Not Result in Adverse Environmental or Health Effects.

The adjusted standard requested for Pond 4 "will not result in environmental or health effects substantially or significantly more adverse than the effects considered by the Board in adopting" Part 845. 415 Ill. Comp. Stat. 5/28.1(c)(3).

Extending the closure construction permit deadline for Pond 4 will not have an adverse impact on human health or the environment. Pond 4 will still be subject to the groundwater monitoring and corrective action requirements in Part 845. Accordingly, if the Pond contributes to a groundwater protection standard exceedance, it will result in corrective action, similar to any other unit regulated under Part 845. Additionally, as explained above, to the extent Pond 4 is found to have contributed to an exceedance of the groundwater protection standards, the extension of its closure construction permit deadline to the end of the life of Marion Station will no longer apply. Instead, SIPC will be required to submit a closure or retrofit construction permit within 12 months of such a finding. Thus, the adjusted standard ensures that Pond 4 is monitored for groundwater impacts and that any groundwater impacts will be remediated, resulting in no adverse impact on health or the environment.

Additionally, Pond 4 does not present a current risk to human health or the environment. Risk Assessment, Ex. 37 (identifying no unacceptable risks to human health or ecological receptors resulting from CCR exposures associated the De Minimis Units); Andrew Bittner, M.Eng., P.E. *Closure Impact Assessment, Pond 4* at 2 (Dec. 20, 2024) ("Bittner Op."), Ex. 38. Further, the units are not anticipated to pose a reasonable probability of adverse effects on health or the environment. Lewis Op., Ex. 36 at 4–20.

The closure impact assessment for Pond 4 further concludes that there is no reduction in risk to health or the environment that would be achieved through the closure of Pond 4, thus the extension of the closure construction permit deadline will not have an adverse impact on health or the environment. Bittner Op., Ex. 38 at 12. Specifically, this report demonstrates there is little risk of flood related CCR release from Pond 4; based on current groundwater monitoring data, Pond 4 is not the likely source of any potential groundwater protection standard exceedances; closure of Pond 4 is unlikely to affect the surface water quality in Little Saline Creek (however, construction activity associated with a closure or retrofit could increase the potential for surface runoff and sedimentation to the creek); and construction activities associated with closure or retrofit could result in air quality impacts (e.g., related to fugitive dust, green-house gas emissions) in greater amounts than the current status quo. Bittner Op., Ex. 38 at 12–16. Thus, extending the time period for closing Pond 4 will not have an adverse human health or environmental impact.

5. The Requested Adjusted Standard Is Consistent with Federal Law.

As discussed above, Pond 4 is not regulated as an existing CCR surface impoundment or inactive CCR surface impoundment under Part 257. Accordingly, any adjustment from Part 845 for Pond 4 is consistent with federal law. *See* 35 Ill. Admin. Code § 104.406(i).

Further, Part 845 is not currently a federally designated program, thus Part 845 and Part 257 operate independently and concurrently. Owners and operators of CCR surface impoundments must comply with both sets of regulations and an adjustment from Part 845 has no impact on a requirement to comply with Part 257. Thus, the Board is free to grant an adjustment from Part 845 requirements without consideration of Part 257.

6. Consideration of Section 27(a) Factors.

Existing physical conditions, the character of the area involved, and the technical feasibility and economic reasonableness of measuring or reducing the particular type of pollution all support granting the adjusted standard for Pond 4. 415 Ill. Comp. Stat. 5/27(a).

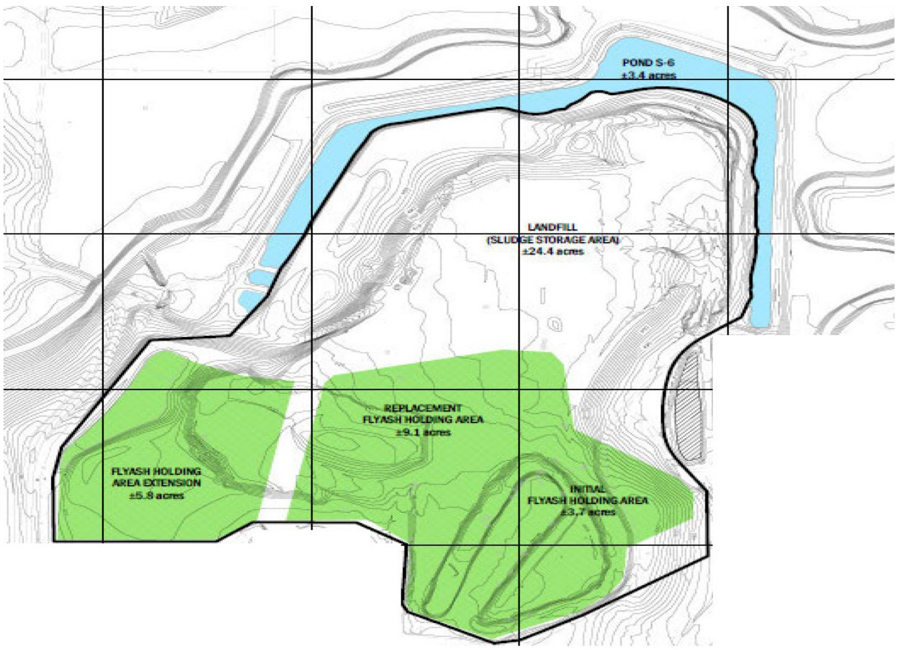
If Pond 4 does not receive the requested adjusted standard, SIPC will be required to either retrofit or close the unit. *See* 35 Ill. Admin Code. §§ 845.700–.770. However, SIPC requires the continued use of Pond 4 into the foreseeable future for stormwater management at Marion Station, particularly due to the location of the coal pile. Accordingly, SIPC must either close the pond by removal ***and then rebuild it*** as a stormwater basin or retrofit it by cleaning it (i.e., removing materials within the Pond) and installing a liner. Due to the additional exorbitant costs of dredging and installing liners, closure by removal is the least costly, technically feasible alternative. That "least costly" alternative would still cost SIPC a significant amount in capital costs (with no human health or environmental benefit). *See* Supp. Liss Dec., Ex. 30 at ¶ 6; Bittner Op., Ex. 38. This cost does not include the cost of constructing a new stormwater basin, which would be needed to replace Pond 4. Supp. Liss Dec., Ex. 30 at ¶ 6.

Significantly, this adjusted standard does not propose to put economic reasonableness considerations above protection of human health and the environment. While there are significant costs with closing or retrofitting Pond 4 (and in the event of closure building a new stormwater basin to replace Pond 4), SIPC is committing to closing or retrofitting Pond 4 earlier than at the end of Marion Station's life if Pond 4 is found to potentially impact human health or the environment (i.e. if it is contributing to Section 845.600 groundwater protection standard exceedances).

E. The Former Fly Ash Holding Units and Pond 6

1. SIPC Requests an Adjusted Standard For the Former Landfill Area (including the Former Fly Ash Holding Units) and Pond 6.

SIPC proposes an adjusted standard that would apply to the Former Landfill Area (including the Former Fly Ash Holding Units) and Pond 6. Given the multiple units involved, below is a diagram (pulled from Ex. 3 of the initial Petition) depicting the area discussed in this Section for ease of reference.[44]



The Former Fly Ash Holding Units (which as explained above, consists of the Initial Fly Ash Holding Area, the Replacement Fly Ash Holding Area, and the Fly Ash Holding Area Extension) are within the footprint of the Former Landfill at Marion Station. The Former Landfill has been historically regulated as a permit-exempt landfill under Illinois landfill regulations and, thus, is required to be covered pursuant to the Part 811 Closure Plan SIPC has already submitted

[44] As explained above, the Initial Fly Ash Holding Area, Replacement Fly Ash Holding Area, and Fly Ash Holding Extension make up the "Former Fly Ash Holding Units." The Former Landfill consists of the entire "Landfill" area outlined in bold. Pond 6, labeled as Pond S-6 on this diagram, is located to the north of the Former Landfill.

to IEPA. Former Landfill Closure Plan, Ex. 10. As discussed above, that Closure Plan was submitted to IEPA at IEPA's request in connection with IEPA's claims that the Former Landfill failed to have the permanent cover required by Part 811. That closure plan involves closing the Former Landfill in place with a cover system (which would include the areas consisting of the Former Fly Ash Holding Units) while allowing De Minimis Unit Pond 6, located to the north of the Former Landfill, to serve as a stormwater pond to manage runoff.

The adjusted standard proposes to go beyond the Part 811 Closure Plan and close the entirety of the Former Landfill (including the Former Fly Ash Holding Units) and Pond 6 in accordance with Part 845 performance standards and subject to additional Part 845 requirements. Given the unique nature of this area (as further explained below), however, SIPC requests three categories of adjustment from Part 845 requirements for the Former Landfill (including the Former Fly Ash Holding Units) and Pond 6.

First, the adjusted standard provides deadlines for submittal of operating and closure construction permit applications. This adjustment is a necessity resulting from the fact that this area is not regulated under Part 257 and that Part 845 deadlines for permit applications have passed during the pendency of this adjusted standard proceeding. This adjustment also allows time to pursue the unique opportunity to close this area via removal while sending the CCR for beneficial use, as described below. The adjusted standard requests an 18-month period to submit a final operating permit application and closure construction permit application for this area.

Second, the adjusted standard provides an adjustment from the closure alternatives assessment requirements in Section 845.710. Rather than conduct a closure alternatives assessment, the adjusted standard would require this area to close via closure by removal with beneficial use of the CCR remaining in the area, if SIPC determines, with IEPA oversight, that this is a feasible closure option. If not, the Former Landfill (including the Former Fly Ash Holding Units) will be closed in accordance with 35 Ill. Admin. Code § 845.750's closure with final cover system requirements while Pond 6 will be closed in accordance with 35 Ill. Admin. Code § 845.740's closure by removal requirements.

Third, in the event closure by removal with beneficial use of CCR is a viable closure option for the Former Landfill area, the adjusted standard would allow Petitioner to request additional time, in two-year increments, from IEPA to complete closure, so long as CCR in the area continues to be removed for beneficial use. The adjusted standard includes requirements for Petitioner to provide a narrative demonstration to IEPA explaining why the extension is needed, how it will allow for the continued "beneficial use of CCR," and the estimated date upon which "beneficial use of CCR" will be complete. No more than five two-year extensions will be allowed.

With the exception of these adjustments, the Former Landfill Area will be subject to any remaining applicable Part 845 requirements, including those related to permitting, location restrictions, design criteria, operating criteria, groundwater monitoring and corrective action, closure and post-closure care, and recordkeeping.

2. The Factors Relating to the Former Landfill, including the Former Fly Ash Holding Units, and Pond 6 Are Substantially and Significantly Different from the Factors and Circumstances the Board Relied on in Adopting Part 845.

The factors relating to the Former Landfill Area, including the Former Fly Ash Holding Units, and Pond 6 differ significantly from the factors that were considered and motivated the Board in adopting Part 845. As noted *supra* at Part IV.B.2, the legislature, IEPA, and the Board were all motivated to address the same risk that U.S. EPA sought to address in Part 257 for surface impoundments[46]—the risk posed by CCR surface impoundments that contain large amounts of CCR managed with water under a hydraulic head. The Former Fly Ash Holding Units and the Former Landfill's stormwater pond, Pond 6, are different, in several important respects.

First, the Former Fly Ash Holding Units do not contain water and have not contained water for at least thirty years. Accordingly, any CCR remaining in the Fly Ash Holding Units is not under a hydraulic head and presents far less risk to groundwater than the units the Board sought to regulate in Part 845 (which the Board acknowledged when it declined to extend the Part 845 rulemaking to CCR landfills). *See* Lewis Op., Ex. 36, at 11–14.

Second, the Former Fly Ash Holding Units are now covered by and a part of the Former Landfill, which operated and was regulated as a permit-exempt, on-site landfill for decades under Part 815. The Board clearly did not intend to regulate CCR landfills under the adopted Part 845 surface impoundment rules, and in fact, it opened a subdocket to address possible, future CCR landfill regulations. Second Notice Opinion and Order at 12; *see also* Illinois Pollution Control Board Docket No. R2020-19(A). Additionally, the Former Landfill, including the Former Fly Ash Holding Units, make up one contiguous area, and Pond 6 is used to manage runoff from the Former Landfill. Thus, from a practical perspective, it makes sense to close the entire area together.

Third, IEPA seems to be claiming that Part 845 surface impoundment requirements apply to the entirety of the Former Landfill (not just the Former Fly Ash Holding Units) after having treated the Former Landfill as a landfill for years, including by issuing the Landfill VN to SIPC in 2020. 2020 Landfill VN, Ex. 16. SIPC operated the Former Landfill as a landfill, submitted

[46] As mentioned above, the Former Landfill ceased receiving CCR prior to October 2015, and thus, it is not subject to Part 257's landfill requirements. Consistent with that assertion, in its Landfill VN, IEPA asserted that Illinois's landfill regulations, Part 811 *et seq.*, were applicable, not Part 257.

landfill reports to IEPA, and ceased using the Former Landfill at a time that made Part 257 landfill requirements inapplicable. Unlike the other "CCR surface impoundments" regulated under Part 845, both SIPC and IEPA treated this area as a landfill under the Illinois regulations. IEPA continued to treat this area as a landfill after the promulgation of Part 257.

Having expected Part 257 to be inapplicable given the plain applicability language, reinforced by IEPA's prior view that the Former Landfill was subject to Illinois landfill requirements under Part 811, SIPC has not planned for Part 257 applicability, and it has not taken any Part 257 compliance actions. Indeed, if anyone had thought at the time it was adopted that Part 257 applied at all, it would have been anomalous, to say the least, for SIPC to have taken compliance action for its Former Landfill consistent with Part 257 surface impoundment requirements, but IEPA appears now to claim that Part 845's requirements, which are based on Part 257's surface impoundment requirements, apply to the Former Landfill.

In adopting Part 845, the Board included some very aggressive deadlines because, in its view, companies were already complying with Part 257 and could use those actions to comply with Part 845. *See supra* Section IV.B.2. That is simply not true for the Former Landfill, including the Former Fly Ash Holding Units within the landfill footprint and related stormwater runoff Pond 6. No one could reasonably have expected that Part 257's (and later Part 845's) surface impoundment requirements would apply to the Former Landfill, especially when IEPA asserted as late as 2020 that the Former Landfill was a landfill and regulated under Illinois landfill regulations. The Board did not consider or assess in its Part 845 rulemaking the application of Part 845's surface impoundment requirements to landfills, including the costs, feasibility, and necessity of compliance or the risks to be addressed. Applying Part 845 surface impoundment requirements to the Former Landfill area also would cause unfair surprise and retroactive change of regulatory status concerns.

Fourth, the Former Landfill, including the Former Fly Ash Holding Units, are unique because they contain CCR that is suitable for "beneficial use of CCR" as defined in 35 Ill. Admin. Code § 845.120. SIPC has been working with a third-party to evaluate additional uses of the CCR and to send samples to potential customers to gather additional data on demand and uses. SIPC will need some time to develop the market viability for third-party beneficial use of the landfill CCR, which this adjusted standard will allow. Potential end uses for the material include use as "green material" such as cement binder, sand, aggregate, and construction insulation.

Fifth, as discussed above, Pond 6 contains *de minimis* amounts of CCR and thus does not present the risk targeted by Part 845. *See* Section IV.B.2, *supra*. Pond 6 only ever accumulated small amounts of CCR compared to those CCR surface impoundments that were the subject of the risk assessment completed to justify promulgation of CCR surface impoundments in Part 257 and, correspondingly, Part 845. Pond 6 has only received incidental amounts of CCR through decanted overflow from other ponds or stormwater runoff from the Former Landfill. Additionally, Pond 6 serves the necessary operational function of capturing runoff from the Former Landfill. Thus, it makes sense for its closure to be tied to, and conducted with, the closure of the Former Landfill.

3. The Factors Relating to the Former Fly Ash Holding Units—which Differ from those Relied upon by the Board in Passing Part 845—Justify an Adjusted Standard.

The factors discussed above all justify granting the adjusted standard here, particularly where the units will be closed in accordance with Part 845 closure performance standards and in a manner that is protective of human health and the environment, as discussed below.

4. The Requested Adjusted Standard Will Not Result in Adverse Environmental or Health Effects.

As an initial matter, the adjusted standard will require compliance with Part 845 closure performance standards and groundwater monitoring and corrective action requirements, so to the extent the units in this area are having an impact on groundwater, those impacts will be addressed in accordance with the Part 845 requirements.

Additionally, the Former Fly Ash Holding Units do not contain water and, therefore, do not pose the same risks to the environment as CCR surface impoundments that contain large quantities of CCR under a hydraulic head. *See* Lewis Op., Ex. 36 at 14. Instead, they function as a landfill, which U.S. EPA, IEPA, and the Board have all recognized pose less of a threat to the environment than the units that the Board sought to regulate under Part 845. Final Rule, Second Amended Pet. Updated Ex. 17 at 21,342 ("As noted, EPA's risk assessment shows that the highest risks are associated with CCR surface impoundments due to the hydraulic head imposed by impounded water."); Lewis Op., Ex. 36 at 11–13. Further, Pond 6 is a landfill runoff, *de minimis* pond, and as discussed above, it too does not present a human health or environmental risk warranting regulation under Part 845. Risk Assessment, Ex. 37; Lewis Op., Ex. 36.

Finally, there are significant environmental benefits to allowing the CCR to be removed for beneficial use. As U.S. EPA has explained

> The beneficial use of CCR is a primary alternative to current disposal methods. And as EPA has repeatedly concluded, it is a method that, when performed correctly, can offer significant environmental benefits, including greenhouse gas (GHG) reduction, energy conservation, reduction in land disposal (along with the corresponding avoidance of potential CCR disposal impacts), and reduction in the need to mine and process virgin materials and the associated environmental impacts. . . . Three of the most widely recognized beneficial applications of CCR are the use of coal fly ash as a substitute for Portland cement in the manufacture of concrete, the use of FGD gypsum as a substitute for mined gypsum in the manufacture of wallboard, and the use of CCR as a substitute for sand, gravel, and

> other materials in structural fill. Reducing the amount of cement, mined gypsum, and virgin fill produced by substituting CCR leads to large supply chain-wide reductions in energy use and GHG emissions. . . . CCR can be substituted for many virgin materials that would otherwise have to be mined and processed for use. These virgin materials include limestone to make cement, and Portland cement to make concrete; mined gypsum to make wallboard, and aggregate, such as stone and gravel for uses in concrete and road bed. Using virgin materials for these applications requires mining and processing, which can impair wildlife habitats and disturb otherwise undeveloped land. It is beneficial to use secondary materials—provided it is done in an environmentally sound manner—that would otherwise be disposed of, rather than to mine and process virgin materials, while simultaneously reducing waste and environmental footprints. . . . Beneficially using CCR instead of disposing of it in landfills and surface impoundments also reduces the need for additional landfill space and any risks associated with their disposal. . . . As discussed in the final rule RIA, the current beneficial use of CCR as a replacement for industrial raw materials (e.g., Portland cement, virgin stone aggregate, lime, gypsum) provides substantial annual life cycle environmental benefits for these industrial applications.

Final Rule, Second Amended Pet. Updated Ex. 17 at 21,329.

Thus, the proposed adjusted standard will not have an adverse impact on human health or the environment, and in fact may result in environmental benefits.

5. The Requested Adjusted Standard is Consistent with Federal Law.

As discussed *supra*, the Former Fly Ash Holding Units and Pond 6 are not existing or inactive CCR surface impoundments under Part 257. Accordingly, excluding them from Part 845 is not inconsistent with federal law. *See* 35 Ill. Admin. Code § 104.406(i).

Further, Part 845 is not currently a federally designated program, thus Part 845 and Part 257 operate independently and concurrently. Owners and operators of CCR surface impoundments must comply with both sets of regulations and an adjustment from Part 845 has no impact on a requirement to comply with Part 257. Thus, the Board is free to grant an adjustment from Part 845 requirements without consideration of Part 257.

F. Proposed Language of Adjusted Standard.

See Appendix A.

G. Part 845 Was Promulgated to Implement Section 22.59 of the Act and the Automatic Stay Applies.

Because SIPC filed its initial petition for an individual adjusted standard within 20 days after the effective date of Part 845 (April 21, 2021), the operation and application of Part 845 is automatically stayed as to the De Minimis Units and Former Fly Ash Holding Units pending the disposition of this petition. 415 Ill. Comp. Stat. 5/28.1(e).

The only exception to this automatic stay is for regulations "adopted by the Board to implement, in whole or in part, the requirements of the federal Clean Air Act, Safe Drinking Water Act or Comprehensive Environmental Response, Compensation and Liability Act, or the State RCRA, UIC or NPDES programs." 415 Ill. Comp. Stat. 5/28.1(e). Part 845 was promulgated to implement Section 22.59 of the Act and the federal Resources Conservation and Recovery Act, Section 4005. It was not promulgated to implement, in whole or in part, the requirements of the federal Clean Air Act, Clean Water Act Safe Drinking Water Act or Comprehensive Environmental Response, Compensation and Liability Act, or the State RCRA, UIC or NPDES programs. *See* 35 Ill. Adm. Code 104.406(b).

H. Hearing Request.

SIPC requests a hearing for this adjusted standard pursuant to 35 Ill. Admin. Code § 104.406(j).

I. Supporting Documentation.

Documents and legal authorities supporting the Petition are cited herein (and, where applicable, on the attached Index of Exhibits) when they are used as a basis for the Petitioner's proof. Relevant portions of updated or new documents and legal authorities, other than Board's final Order State regulations, statutes, and reported cases, are attached to this Petition. *See* 35 Ill. Admin. Code § 104.406(k).

V. CONCLUSION.

SIPC respectfully requests that the Board grant its request for inapplicability or, in the alternative, an adjusted standard as set forth herein.

Respectfully Submitted,

SOUTHERN ILLINOIS POWER COORPERATION

/s/ *Bina Joshi*
One of its attorneys

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Exhibit 4	Lake Egypt Water District IL 1995200, Annual Drinking Water Quality Report (Jan. 1–Dec. 30, 2019)
Exhibit 5	IEPA Water Pollution Control Permit, No. 1977-EN-5732 (Nov. 14, 1977)
Exhibit 6	Letter from SIPC to IEPA (July 27, 1982)
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Exhibit 8	Letter from SIPC to IEPA (Sept. 16, 1993)
Exhibit 9	Declaration of Kenn Liss
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Exhibit 11	Hanson, Emery Pond Corrective Action and Selected Remedy Plan, Including GMZ Petition (Mar. 29, 2019)
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Exhibit 15	Initial Facility Report – for On-Site Facilities (Sept. 18, 1992)
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