Comments of
The Utility Solid Waste Activities Group on
Hazardous and Solid Waste Management System:
Disposal of Coal Combustion Residuals From Electric Utilities;
Legacy CCR Surface Impoundments

88 Fed. Reg. 77941 (Nov. 14, 2023)

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INTRODUCTION

The Utility Solid Waste Activities Group ("USWAG") submits these comments to the U.S. Environmental Protection Agency ("EPA" or "Agency") on its Notice of Data Availability ("NODA"), 88 Fed. Reg. 77941 (Nov. 14, 2023), related to the proposed rulemaking for legacy CCR surface impoundments and CCR management units ("CCRMUs")[1] (the "Proposal"). The NODA represents EPA's belated acknowledgement of the need to evaluate the risks from historical CCR management practices before it can move forward with this rulemaking. However, as discussed below, the new evaluation of potential risks presented by EPA does not cure the fundamental flaws in the Proposal and only serves to demonstrate why the Agency must go back and craft a revised proposed rulemaking that is within the scope of its authority under RCRA Subtitle D.

EPA has engaged in a backwards rulemaking process that has resulted in an underdeveloped Proposal and precluded meaningful comment from the public on that Proposal. A risk assessment relevant to the units that EPA now proposes to regulate should have been conducted *prior* to the development of a proposal, as that assessment informs not only *what* disposal practices warrant regulation under Subtitle D but also *how* those disposal practices should be regulated. And because a risk assessment forms the fundamental basis for a proposal, it is critical that the public have access to that risk assessment when reviewing and commenting on the proposal itself. Instead, EPA—ignoring repeated urgings from USWAG and other commenters to update its 2014 Risk Assessment—issued a hastily developed Proposal that was divorced from the statutory threshold for regulation under Subtitle D and only now is attempting to backfill its record in an apparent recognition of this fundamental flaw.

This backfill attempt is unsuccessful, as the new "risk assessment" is invalid and cannot be used to support a final proposal. This new risk assessment fails to use the best data available, relies on inappropriate methodologies, and makes overly conservative and unreasonable assumptions. This result is a document that significantly overestimates the risks of legacy surface impoundments and CCRMUs. Moreover, even if the conclusions in the risk assessment were valid, they do not support the scope of regulation proposed by EPA for legacy surface impoundments and CCRMUs.

Compounding this error is EPA's continuing decision to preclude meaningful public comment on this important rulemaking. In addition to providing only 60 days on the sprawling Proposal, the Agency now doubles-down on its abbreviated comment period strategy by providing a mere 25 days to comment on this NODA, which contains a new, complex risk analysis supported by a large amount of technical data (included in eight lengthy appendices and seventy-six referenced technical documents and reports). EPA also is seeking an enormous amount of information from the regulated community on the updated list of nearly 1,500 potential legacy impoundments and CCRMUs (a list, which explained below, is riddled with errors and nearly

[1] Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments, 88 Fed. Reg. 31982 (May 18, 2023).

incomprehensible).[2] As previously explained by USWAG and others whose comment period extension requests were uniformly denied by the Agency, 25 days is simply an inadequate amount of time to review and provide meaningful comment on this information.[3]

Ultimately, the flawed risk assessment serves only to highlight the problems with the Agency's approach in this rulemaking. In accordance with USWAG's previous comments, before proceeding, EPA must (1) first undertake a legitimate and scientifically sound risk assessment identifying the historical CCR disposal practices that in fact warrant regulation under Subtitle D because they pose a *reasonable probability* of adverse effects to health or the environment; and (2) craft a proposed rulemaking that is narrower in scope and directly tied to the valid risks identified in that risk assessment.

These and other issues are addressed in more detail below and in the attached technical report prepared by Gradient (Attachment A), which was retained by USWAG to review and provide comment on EPA's October 2023 Draft Risk Assessment of Coal Combustion Residuals: Legacy Impoundments and CCR Management Units ("Draft Risk Assessment").

DISCUSSION

I. EPA committed a critical error when it failed to conduct a risk assessment prior to developing its Proposal.

EPA casts the NODA as containing "new information" not previously available. But while EPA's analyses and conclusions in the Draft Risk Assessment may be new, the data underlying the Draft Risk Assessment are not new; all this information was available to EPA long before development of the Proposal.[4] In fact, much of the information contained in the Draft Risk

[2] In denying several comment period extension requests, EPA subsequently stated that the Agency is only seeking information to the extent it is available. *See* NODA Comment Period Extension Response (Dec. 4, 2023), Docket ID No. EPA-HQ-OLEM-2020-0107-0915 ("NODA Comment Period Extension Response"). But the NODA did not make this clarification. By requesting this information, EPA has conveyed that it believes the information to be important to how it proceeds in this rulemaking (though the Agency never specifically states how it plans to use the information). Indeed, the type of information sought by EPA directly ties to the level of risk posed by the universe of units it proposes to regulate. Further, EPA's expectation that facility owner/operators "will be able to comment on the accuracy of the information that others provided without doing further research, based on their knowledge of their own facility" is simply wrong; as USWAG has previously explained, many USWAG members recently have experienced high employee turnover, which means that new employees do not have the same historical knowledge base and would have to conduct research in verify the accuracy of the information presented by EPA.

[3] *See* USWAG, Comment Letter on Proposed Rule on Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments (Nov. 15, 2023), Docket ID No. EPA-HQ-OLEM-2020-0107-0896. In that letter, USWAG identified specific issues that it would not be able to address given the limited comment period. EPA's denial of that request failed to provide any reason as to why comments on these issues are not necessary or important to development of a final rulemaking.

[4] EPA has conceded as much. *See* NODA Comment Period Extension Response at 2 ("the EPA is soliciting comment on a supplement to the 2014 Risk Assessment that relies on the same methodology, and, in many instances, the same data as the 2014 Risk Assessment"). While the CCRMU fill analysis may be "new," it

Assessment was developed ***prior to promulgation of the original 2015 CCR Rule***. EPA therefore could have, and should have, conducted this analysis prior to developing the Proposal and made it available to the public at the time of the Proposal. Failure to do so is a critical error that has resulted in a fundamentally flawed Proposal and precluded meaningful comment on that Proposal.

a. EPA's attempt to backfill its record does not rectify the flaws in the Proposal.

As EPA itself has recognized, Subtitle D does not regulate all disposal practices.[5] Rather, Congress has granted EPA authority to issue Subtitle D criteria only for disposal practices that pose a reasonable probability of adverse effects to health or the environment.[6] Plainly, not all solid waste disposal practices—including CCR disposal practices—meet this statutory threshold for regulation. And it is EPA's statutory responsibility in the first instance to demonstrate that this statutory threshold has been met before regulating any disposal practices under Subtitle D. The determination of a "reasonable probability of adverse impact" is therefore a critical threshold question for the Agency that can only be answered through a thorough and scientifically sound risk assessment process.

The importance of a risk assessment in the rule development process under RCRA cannot be overstated. A risk assessment, when properly done, identifies the specific risks potentially posed by a disposal practice and estimates the magnitude of those risks. Thus, in addition to addressing whether a disposal practice warrants regulation under Subtitle D, a risk assessment also provides parameters on *how* that practice should be regulated to address those specific risks. For example, if an inhalation risk is identified above the applicable regulatory threshold, EPA would likely choose to promulgate regulations that provide controls on fugitive dust. Likewise, if no risk to groundwater is identified, controls to protect groundwater would not be necessary.

Because a proper risk assessment is a key piece of determining, in the first instance, whether regulation is necessary and, if so, the appropriate regulatory controls, it is critical that EPA conduct this assessment *prior* to developing proposed regulations. Without such assessment, a proposal would not be designed around real, identified risks and would lack an adequate basis. Failure to properly identify risks also results in an inability to accurately quantify the benefits of the proposed regulatory controls or to verify that those controls are in fact necessary and appropriate.

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is not based on new information received in response to the Proposal. Rather EPA could have performed this analysis prior to development and issuance of the Proposal.

[5] Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals from Electric Utilities, 80 Fed. Reg. 21302, 21348 (Apr. 17, 2015) ("not all disposal activities are regulated by EPA under subtitle D; rather, EPA only regulates those that present risks that exceed the Agency's acceptable risk levels").

[6] 42 U.S.C. § 6944(a).

This is precisely why USWAG repeatedly urged the Agency to conduct a risk assessment prior to development of the Proposal. In 2018, in its comments on the Advanced Notice of Proposed Rulemaking,[7] USWAG stated:

> USWAG would like to emphasize the need for EPA to develop an updated record to support any future rulemaking concerning legacy impoundments… [The 2014] risk assessment was limited to current disposal practices and did not consider [surface impoundments] that had "ceased receiving waste" or "historical disposal of CCRs by facilities that are no longer operating." Thus, the record for the 2015 rulemaking is not directly applicable to the universe of units at issue in this ANPRM. As the Agency moves towards issuing a proposal, USWAG urges EPA to update the record to reflect the actual risk posed by legacy impoundments.[8]

And again, in explaining why the Agency had not provided itself enough time in a consent decree to develop a proposal, USWAG noted that the consent decree deadlines would not allow EPA to "undertake a revised risk assessment" and "issue a reasoned proposal."[9]

Yet, as part of its continuing rush to complete this rulemaking, EPA ignored these comments and issued the Proposal without conducting the updated risk assessment necessary to evaluate whether legacy impoundments and CCRMUs in fact pose a reasonable probability of adverse effects on health or the environment. Not surprisingly, this resulted in a Proposal that casts a regulatory net that is far too broad and would result in regulating CCR management practices and uses that are beyond EPA's authority under Subtitle D. Only after commenters, including USWAG, highlighted this fundamental flaw did EPA commit to conducting a risk assessment utilizing data *it has had in its possession all along*. This attempt to backfill the rulemaking record—and support decisions the Agency previously made without a reasoned basis—does not fix the Proposal's primary problem: that it was too broad in scope and included regulatory requirements that are simply unnecessary and not supported by the record, even accepting (for purposes of argument) the alleged risks identified in the Draft Risk Assessment. Indeed, the Draft Risk Assessment only highlights that the Proposal still lacks an adequate rulemaking record.

As an example, EPA's conclusions regarding the presence of risk from "CCRMU fills"—and thus the basis for regulation—come solely from potential residential uses, at some undefined period in the future, at the facilities in question.[10] Even accepting that this is a valid risk consideration (which, as explained below, it is not), the controls proposed by EPA for all CCRMUs are not designed to address this potential future risk. In fact, in the Proposal, EPA purports to find

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[7] 85 Fed. Reg. 65015 (Oct. 14, 2020).

[8] USWAG, Comment Letter submitted by Jim Roewer on ANPRM at 3 (Feb. 12, 2021), Docket ID No. EPA-HQ-OLEM-2020-0107-0112.

[9] USWAG, Comment Letter on Proposed Consent Decree in the Matter of St*atewide Org. for Cmty. eMpowerment v. EPA* at 2 (Mar. 6, 2023), Docket ID No. EPA-HQ-OGC-2023-0055-0012.

[10] *See* Draft Risk Assessment of Coal Combustion Residuals: Legacy Impoundments and CCR Management Units, October 2023 at 4-18, 5-11–5-12 (Nov. 14, 2023) ("Draft Risk Assessment"), Docket ID No. EPA-HQ-OLEM-2020-0107-0887.

that the risks from *all* CCRMUs are similar to the risks from those units identified in the 2014 Risk Assessment and that these are the risks it is attempting to address.[11] Had EPA appropriately performed a risk assessment prior to developing its proposal, it could and should have proposed regulatory controls that were more narrowly focused to adequately address the identified risk to potential future residences, such as a deed restriction, at sites with "CCRMU fills." But, instead, the Agency proposed a wildly disproportionate set of proposed regulations for CCRMU fills that address a theoretical risk from these units that is not even identified in the Draft Risk Assessment itself. This is the result of EPA effectively putting the cart before the horse and proposing regulatory requirements for a risk that has not been identified for the entire broad universe of CCRMUs, as that term was defined in the Proposal, before first conducting a risk assessment, a fundamental and necessary step in the rulemaking process.

Ultimately, we are left with a Proposal that is overbroad and not adequately supported by the Draft Risk Assessment's conclusions. EPA is thus left with a Catch-22: either issue a final rule that is similar to the Proposal but with insufficient bases in the record, or issue a final rule that is substantially narrowed, but so changed that opponents of more targeted and rational controls may argue that it is no longer a logical outgrowth of the Proposal. As a result, and as USWAG stated in its comments on the Proposal,[12] EPA must go back to the drawing board and craft a proposal that is far narrower in regulatory scope and tied to the actual risks identified by a thorough and scientifically sound risk assessment (as further described below).

b. The Agency's flawed process has precluded meaningful comment on the Proposal.

EPA's flawed rulemaking process has also precluded the public from providing meaningful comment on the Proposal. It is well established that an agency must "identify and make available technical studies and data that it has employed in reaching the decisions to propose particular rules."[13] "If the notice of proposed rule-making fails to provide an accurate picture of the reasoning that has led the agency to the proposed rule, interested parties will not be able to comment meaningfully upon the agency's proposals."[14]

Here, the Agency is attempting to backfill its record and utilize the Draft Risk Assessment as the primary justification for its proposed regulations. But this information was not made available at the time the Proposal was issued and thus the public did not have the benefit of reviewing and providing comment on the Proposal in light of the Draft Risk Assessment (which, it bears repeating, is not based on *new* information). And while the Agency is now taking comment on the Draft Risk Assessment, EPA has specifically declined to reopen comment on the Proposal

[11] *See* 88 Fed. Reg. at 32010.

[12] USWAG, Comment Letter on Proposal at 2 (July 17, 2023), Docket ID No. EPA-HQ-OLEM-2020-0107-0242.

[13] *See, e.g.*, *Conn. Light & Power Co. v. Nuclear Regul. Comm'n*, 673 F.2d 525, 530 (D.C. Cir. 1982).

[14] *Id.*

itself.[15] In other words, EPA is not seeking comment on the Draft Risk Assessment for purposes of potentially narrowing the scope of the Proposal to address the risks identified in the document, but rather as an after-the-fact attempt to justify the Proposal.

By refusing to reopen comment on the Proposal, the Agency is effectively preventing the public from evaluating the Proposal with all critical data underpinning the proposed regulations and providing meaningful comment on those proposed requirements. As an example, if the Draft Risk Assessment would have been available at the time the Proposal was issued, USWAG would have provided comment on the appropriateness of the proposed regulatory definitions and requirements in light of the risks identified by EPA. One specific comment USWAG would have made is that the regulatory requirements for CCRMUs are far too stringent given the specific risk identified by EPA. The requirement to reclose units that have already been closed is simply not necessary to address risks to future residential uses of the property—a simple deed notification on the presence of CCR at the site would be sufficient.

Put simply, commenters were not provided with the opportunity to comment on proposed regulatory requirements in light of the risks that EPA is now asserting constitute the basis for its proposed regulatory requirements. Thus, commenters were denied a meaningful opportunity to comment on the proposed requirements for legacy impoundments and CCRMUs. This is not the manner in which notice and comment rulemaking is to be conducted. The only way for EPA to allow for full and meaningful comment on the complete rulemaking record is to revise and then reissue the Proposal.

II. The Draft Risk Assessment is scientifically invalid and fails to identify risks that are reasonably probable.

As noted above, USWAG has urged EPA to conduct an updated risk assessment for several years now and, therefore, supports the Agency's efforts to more fully consider the specific risks from the units it is now seeking to regulate. Unfortunately, the Draft Risk Assessment is riddled with flawed assumptions and overly conservative methodologies, such that the conclusions reached are not scientifically valid and cannot be relied on to support a final rule.

Of particular note is EPA's choice to utilize the most conservative assumptions reflecting worst-case scenarios at every turn. This approach not only is an inappropriate scientific methodology (as more fully described in the attached Gradient report) but also is contrary to EPA's statutory directive under Subtitle D. Subtitle D directs EPA to regulate only disposal practices that pose a "*reasonable probability* of adverse effects on health or the environment."[16] The statute thus precludes EPA from utilizing overly conservative assumptions and demands that the Agency determine "reasonably probable" outcomes based on sound scientific data and reasoned evidence.

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[15] *See* Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals from Electric Utilities; Legacy CCR Surface Impoundments Notice of Data Availability, 88 Fed. Reg. 77941, 77942 (Nov. 14, 2023).

[16] 42 U.S.C. § 6944(a).

Courts have frequently admonished agencies when they, in the face of uncertainty in predicting reasonably probable or likely environmental harms, use a worst-case analysis.[17]

But this is exactly what EPA has done here. The Agency has failed to adhere to RCRA's statutory standard for developing Subtitle D criteria, instead piling conservative assumption on top of conservative assumption. The result is a risk assessment that identifies risks that are unlikely to ever occur, let alone reasonably probable. For example, EPA assumes that it is "possible" these facilities could be redeveloped into residential properties at some undefined point in the future based solely on the fact that "many" properties "are located along water bodies."[18] The Agency identifies *one* closed site that is slated for mixed-use redevelopment, but it ignores that this property—which is located in the middle of Alexandria, VA, an extremely populated area—is not representative of the vast majority of regulated facilities. Simply being located "along water bodies" is an insufficient, and unfounded, basis for assuming residential use of these properties is a reasonable probability for *all*, or even most, CCRMU fills.

In fact, the potential for future residential uses of these sites is not a reasonable probability. As the Agency well knows based on information already available on the publicly available CCR websites of regulated facilities, many of these sites are located in remote areas and/or in heavy industrial areas. Further, coal-fired generating plants and associated buffer property have an inherent value since they have a pre-existing trained workforce, help offset the electric production tax, and possess critical infrastructure to support the clean energy transition, such as existing substations, access to transmission, zoned industrial property, existing permits and access to water. The existing zoning restrictions or state/local institutional controls simply make redevelopment of these sites into residential areas unlikely, and in some cases explicitly prohibits such redevelopment.[19] Examples of these types of zoning restrictions and institutional controls are provided as Attachment B.

The specific technical flaws with the risk assessment are summarized below and discussed in more detail in Attachment A, *Technical Evaluation of US EPA's October 2023 Draft Risk*

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[17] *See, e.g.*, *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332 (1989) (rejecting a worse case analysis where the agency is looking at "reasonably foreseeable impacts"; *Me. Lobsterman Ass'n v. Nat'l Marine Fisheries Serv.*, 70 F.4th 582, 558-59 (D.C. Cir. 2023) (finding worst case assumptions to be inconsistent with agency's mandate to estimate impacts that are "likely" or "probable").

[18] Draft Risk Assessment at 2-7.

[19] For example, one USWAG member explained that one of its facilities is located in an area zoned "heavy industrial." This zoning classification is the most intense industrial classification under the Zoning Ordinance of the county and expressly prohibits residential development. Any rezoning of the site to allow residential use in the future is very unlikely. Properties adjacent to the facility are also zoned industrial, and a comprehensive redevelopment plan developed by the city and the board of metropolitan redevelopment recommends "heavy industrial" for the future use of this site and adjacent properties. In addition, new development of areas near the site has been limited to industrial purposes (including a new $150M industrial development within one mile of the facility).

Assessment for Legacy Impoundments and Coal Combustion Residual Management Units (CCRMUs), prepared by Gradient ("Gradient Report"):

1. EPA has not used the best available data to conduct its risk assessment. Instead, the Agency relies on outdated information that introduces significant uncertainties into the risk assessment.

2. The conceptual site model for legacy and historical impoundments is incorrect. Legacy and historical surface impoundments no longer contain standing or drainable water (*i.e.*, hydraulic head) and are therefore more similar to closed landfills than active CCR surface impoundments.

3. Although EPA is proposing to regulate the post-operational stage of legacy surface impoundments, the risk assessment looks solely at the potential risk associated with the prior operational stage of these units; it never actually evaluates the risks resulting from the post-operational stage, once the hydraulic head has been removed. In other words, EPA incorrectly assumes that any historical risk continues today without even attempting to evaluate the truth of this assumption. In fact, the Gradient Report demonstrates this is an unreasonable assumption that is not consistent with real world examples showing rapid declines in groundwater concentrations during the post-operational stage of surface impoundments.

   As discussed in USWAG's comments on the legacy proposal, EPA must demonstrate that disposal practices *currently* pose a risk exceeding the Subtitle D regulatory threshold before they can be regulated. It is inappropriate to rely on the 2014 Risk Assessment to make the necessary demonstration of current risk from these units.

4. Historical and inactive landfills do not pose a risk that exceeds the EPA cancer risk target. Even if one considers only the 90th percentile cancer risk for unlined landfills previously excluded from the 2014 Risk Assessment, the calculated risk does not exceed EPA's risk target of 1 x 10^{-5}. Moreover, the calculated risk is consistent with typical background exposures to arsenic in food or water.[20]

[20] Importantly, EPA effectively conceded that this risk did not warrant regulation in 2015, when it excluded closed and inactive landfills from regulation based on the same assessment of risk. The new Draft Risk Assessment modeling does not identify an increased risk for these units and EPA has not provided a reasoned basis for now changing its conclusions regarding the need for regulation. Rather, EPA relies solely on (1) its unsupported assumption that there are more unlined landfills than it previously thought, and (2) its assertion that new weather data would support an increased risk of infiltration. But the 2014 Risk Assessment already took into account unlined landfills and, as noted in the Gradient Report, showed that such units do not pose a risk exceeding the regulatory threshold. With regard to new weather data, EPA should have updated its modeling to include this data to verify its assumptions about increased risk. As with all "uncertainties" identified by the Agency, there is a potential for both increased and decreased risk. EPA cannot rely on an "uncertainty" to conclude that there is a risk warranting regulation.

5. Historical and legacy surface impoundments are much smaller than landfills and should have lower risks as a result. The average size of a legacy surface impoundment is 33 acres, which is 2-4 times smaller than the average size of a landfill. The risk assessment demonstrates that size has a meaningful impact on the calculated risk, with a linear decline in risk for landfills less than 40 acres in size. Since average historical and legacy surface impoundments are smaller than 40 acres, the risks from historical and legacy surface impoundments are likely below the acceptable risk threshold.

6. CCRMU fills are much smaller than landfills and should have significantly lower risks as a result. Instead, EPA's modeling predicts risks for CCRMU fills that are more than two orders of magnitude greater than what would be expected based on EPA's modeled risks for landfills. These risk results are inconsistent, highlighting the unrealistic nature of the CCRMU fill groundwater risk analysis.

7. EPA's risk assessment for CCRMUs is unrealistic, and the approach is fundamentally different from the approach used in its 2014 Risk Assessment. As a result, the calculated risks from CCRMU fills, which do not impound water, are substantially and implausibly higher than the risks calculated for *active surface impoundments* in 2014. These results are based on numerous unreasonable and overly conservative assumptions, including:

   - using a residential exposure scenario to evaluate unrestricted future use;
   - using the 90th percentile of the Agency's probabilistic modeling, which is sensitive to extreme values and emphasize the upper tail in non-normally distributed datasets;
   - changing many of the parameters of the 2014 Risk Assessment to accommodate EPA's new, unrealistic land use scenarios;
   - using only one site conceptual model to account for the wide variety of CCRMU fills that exist; and
   - overestimating infiltration rates.

8. EPA's modeling predicts higher groundwater concentrations for the smaller CCRMU fills with no impounded water when compared to active surface impoundments and landfills. This implausible result underscores that the modeling used for CCRMU fills is overly conservative and unrealistic.

9. EPA's risk conclusions for CCRMU fills have significant limitations for offsite beneficial use of CCR. Since the release of the 2015 rule, numerous beneficial uses, including structural fills, have undergone rigorous environmental risk evaluations and have received approvals from state agencies attesting to their safety and suitability for such applications. The overly conservative nature of the risk assessment for CCRMU

fills could negatively impact established practices and investments in beneficial use projects that have appropriately been deemed safe and environmentally sound.

10. The 5-mile radius used as the relevant area of interest around a CCRMU fill varies from the 2014 Risk Assessment and is not consistent with other environmental justice evaluations. EPA offers no rational basis for increasing the radius of interest from one to five miles and doing so only inflates the number of people living in the vicinity of CCRMUs.

11. EPA's radiological modeling predicts radon risks consistent with background and much lower risks from gamma radiation. But the Agency then appends an unrelated, oversimplified analysis to conclude risk exceedances.

III. The Draft Risk Assessment does not support the scope of regulations proposed by EPA.

Even assuming the Draft Risk Assessment conclusions are valid (which as discussed above, they are not), the Draft Risk Assessment does not support the scope of regulatory definitions and requirements included in the Proposal. Thus, even if EPA inappropriately moves forward with a final rule based on this flawed risk assessment, the Draft Risk Assessment does not support the proposed regulation of the below categories of units:

1. Historic CCR Landfills and Surface Impoundments Closed with More Than Two Feet of Soil

EPA concludes that the risks from historical CCR landfills and surface impoundments align with the risks found for closed landfills in the 2014 Risk Assessment. But the model for closed landfills assumed that landfills are closed with two feet of soil. A review of the updated list of potential legacy surface impoundments and CCRMUs shows that many of these units were closed with more than two feet of soil.[21] For example:

Great River Energy: As identified in previous comments submitted by USWAG, GRE owns a unit named the 'Closed Special Waste Landfill,' which was closed in 1996 under a state permit condition. As discussed below, it is not clear whether this unit is one of the referenced units in EPA's current list of potentially covered units. The final cover system for the Closed Special Waste Landfill consists of a two-foot-thick fat clay layer and a three-foot-thick soil cover layer.

Minnesota Power: The unit identified on the Earthjustice list as Cell A at Minnesota Power's Syl Laskin facility was partially closed by removal; the remaining portion of the unit was closed in place with a two-foot thick engineered composite final cover system that includes a 40-mil LLDPE geomembrane overlain by one foot of granular drainage sand,

[21] Inclusion of the specific units discussed in these comments is not an admission that any of these units in particular qualify as a legacy CCR surface impoundment or a CCRMU, as those terms were defined in the Proposal.

six inches of rooting zone soil, and six inches of vegetated topsoil. The cover system was approved by the Minnesota Pollution Control Agency under the NPDES Industrial Wastewater Permit Program.

Talen Energy: Talen Energy identified multiple units that have been closed with greater than two feet of soil. We identify just a few of those here.

At Talen's Martins Creek facility, Basin 4 was closed with a synthetic cap and two feet of soil. At Talen's Colstrip facility, the unit referred to as the "Stage 1 Evaporation Pond," was closed with a Montana DEQ-approved specific soil capping system consisting of six inches of topsoil and two feet of sub-soil over 12 inches of capillary barrier (scoria), which allowed vegetation to grow on the capped area that would be used for grazing cattle. The Colstrip unit, referred to as the "1&2 A Pond," was closed with a CCR Rule-compliant cap – a 40mil HDPE synthetic cap covered by 18 inches of soil and then vegetated. Further, at Talen's J.E. Corette facility, the CCR landfill was synthetically capped and covered with two feet of soil**.**

LGE-KU: Similar to other USWAG members, there are multiple LGE-KU units on the updated list of legacy impoundments and CCRMUs that have been closed with more than two feet of soil. The following LGE-KU units were closed with a synthetic liner (40-mil LLDPE) under a two-foot CCR Rule soil cap (six inches of top soil and 18 inches of cover soil):

(1) legacy impoundments ATB1 and ATB2 at the former Green River Generating Station;
(2) legacy impoundment ATB at the former Tyrone Station;
(3) legacy impoundment ATB at the former Pineville Generating Station; and
(4) legacy impoundment Main Ash Pond and Auxiliary Pond at EW Brown Generating Station.

Otter Tail Power Company: Several of the Otter Tail Power Company units included on the list of updated legacy impoundments and CCRMUs have closed with cover systems comprised of more than two feet of soil. These include the following:

Coyote Station: The units identified a Black Pit (row 111), Green Pit (row 112), and Purple Pit (row 113) have all been closed under state regulatory oversight, with the following cap/cover systems: Green Pit CCRMU: 15 inches of topsoil, underlain by 39 inches of general fill soils, underlain by 18 inches of drainage soils, underlain by two feet of clay soils; Black Pit CCRMU: nine inches of topsoil, underlain by six inches of rooting soil, underlain by 21 inches of clay-rich soils, underlain by 24 inches of compacted clay soils; and Purple Pit CCRMU: six inches of topsoil, underlain by four feet of uncompacted clay-rich soils.

OVEC/IKEC: The North Fly Ash Pond at OVEC's Kyger Creek facility, which is identified as a potential CCRMU, was closed in 2000, with two feet of compacted clay with a permeability that does not exceed 1.0 x 10-7, with a minimum of one foot of topsoil over the clay.

Salt River Project Agricultural Improvement and Power District (SRP): The unit identified as the solid waste landfill at SRP's Navajo Generation Station was closed with a final cover system consisting of the following: 6- inch vegetative soil layer, 12- inch protective cover soil layer, geocomposite drainage layer, 40-mil textured HDPE geomembrane liner, and 6- inch subgrade backfill.

Hoosier Energy: Areas 1 and 2 at the Merom facility were closed with at least 2.5 feet of soil, in accordance with the Indiana Type II RWS regulations. In addition to the 2.5 feet of soil cover, a synthetic cover was placed on the top of Area 1.

The risk assessment thus does not support regulation of these units and other similarly closed historic landfills and surface impoundments.

2. Historical/Closed Units Less Than 15 Acres in Size

The Agency concedes in the Draft Risk Assessment that the size of a unit can significantly impact the modeled risk. The risk assessment shows that units smaller than 15 acres consistently fall below $1x10^{-5}$.[22] Many units found on EPA's updated list of potential legacy impoundments and CCRMUs are below this size, including:

Talen Energy: At Talen's Colstrip station, the units identified as 1&2 A Pond and Former 1&2 Bottom Ash Ponds are smaller than 15 acres.

LGE-KU: The following LGE-KU units are less than 15 acres:

(1) the former legacy impoundment Scrubber/SO2 Pond (closed by removal) at the former Green River Generating Station is 12 acres;
(2) the former legacy impoundment ATB (closed in place) at the former Tyrone Station is 13 acres;
(3) the former legacy impoundment ATB (closed in place) at the former Pineville Generating Station is 7 acres; and
(4) the former E(mergency) Pond (closed by removal) at the Mill Creek Generating Station is 4 acres.

Cleco: The updated list of legacy impoundments and CCRMUs identifies a number of CCRMUs at Cleco's former Dolet Hills Generating Station that are less than 15 acres. Specifically, all five potential CCRMUs identified at the former facility are below 15 acres, including (1) the Auxiliary Surge Pond, which is 0.4 acres; (2) the Primary Surge Pond, which is 1.79 acres; (3) the Secondary Ash Basin, which is 5.0 acres; (4) the Secondary Surge Pond, which is 3.35 acres; and (5) the Metal Cleaning Waste Pond, which is 3.76 acres. Further, the leachate collection pond identified as a potential CCRMU at the Brame Energy Center is 10 acres.

Xcel Energy: Of the 37 Xcel Energy units included in the updated list of legacy impoundments and CCRMUs, 30 units are less than 15 acres in size. For example:

[22] Draft Risk Assessment at 3-7. As noted in the attached Gradient report, the risk for landfills significantly declines below 40 acres. Gradient Report at 13.

Bay Front Facility: The Polish Pond is 0.67 acres and the Surge Basin is 0.37 acres. They are both water treatment ponds that have been closed by removal. The Woodfield unit is 6 acres.

Harrington Facility: Unit 1 is a 1.637-acre construction debris landfill; Unit 117 is a 6.162 acre closed landfill with CCR present; Pond 1A is 0.9 acres and Pond 4A is 0.5 acres (both are water treatment ponds with no known ash present).

Pawnee Facility: Evaporative Pond B is 14.7 acres; Evaporative Pond C is 11 acres; and Intermediate Quality (IQ) Water Pond is 2.7 acres. In addition, these units have no known CCR management purposes and are instead used for water evaporation or recycling at the plant.

Tolk Facility: Unit 116 is a 3.221 acre construction debris landfill, with no known CCR disposal.

Golden Valley Electric Association: The extent of residual subsurface CCR remaining in the historical ash handling area at the Healy Power Plant is estimated to be less than 4 acres.

3. CCRMU Fills

The Draft Risk Assessment splits the proposed universe of CCRMUs, as defined in the Proposal, into two categories: (1) historical landfills and surface impoundments; and (2) CCRMU fills (a term not used in the Proposal). The risks identified for each of these categories is different. For CCRMU fills, the risks identified are for future residential uses of the property. Even if one accepts this as a valid risk (which it is not), the proposed controls applicable to CCRMUs as a whole are far more onerous than any controls needed to address this future risk. EPA explains that the risk to residential properties from CCRMU fills would arise when CCRMU fills are not adequately documented and thus future developers are not aware of the CCRMU fill. Such risk can easily and adequately be addressed by a simple deed notification, so that all future landowners are notified of the presence of CCR on site.

IV. EPA's updated list of potential legacy impoundments and CCRMUs is riddled with errors and many indecipherable entries.

While the inadequate time for comment prevented USWAG from evaluating all of the 1,480 units on the updated list of CCRMUs and legacy impoundments, even a cursory review of the list by USWAG members makes clear that it is riddled with factual inaccuracies, including, among other things: units that have been fully excavated, units that simply do not exist, units already regulated under the CCR Rule, and descriptions that are simply indecipherable.[23] In

[23] USWAG notes that EPA has double counted many of the identified potential legacy impoundments and CCRMUs in the list. It appears this mistake was made by including those units identified in the Earthjustice Appendix III Plant-Level Summary sheet in addition to those identified in the Appendix III Legacy Impoundment and CCRMU sheets. Our understanding is that those units on the Plant-Level Summary Sheet are the *same* units identified in the Legacy Impoundment and CCRMU sheets. *See* Summary of Potential

addition, the list identifies many process water ponds, stormwater ponds, clarifying ponds, and other similar units that generally were not used to manage accumulations of CCR and therefore should not be considered CCRMUs. These units do not fit the characteristics of the units evaluated in EPA's Draft Risk Assessment and therefore do not have the same risk profile.

We provide just a few examples below of the gross errors contained in the list. EPA's lack of basic due diligence to verify the data it may rely on to support its rulemaking indicates that the Agency is prioritizing is rushed rulemaking schedule over ensuring the accuracy of the information on which it is relying. Further, EPA's reliance on unverified third-party data, including from environmental groups, conflicts with the Agency's own information quality guidelines to "ensure and maximize the quality, including objectivity, utility and integrity, of disseminated information."[24]

The bottom line is that the Agency cannot blindly utilize information submitted from third parties. It is incumbent on EPA to ensure the data it is using is correct, and the Agency cannot push this obligation onto industry by requiring it to identify errors in the data (particularly where it has not provided enough time to thoroughly review and provide comment on the data). Moreover, EPA has failed to adequately explain *how* it is using the data in this list for the rulemaking in question.

> **Great River Energy:** The updated list has several errors regarding units located at GRE's Stanton facility. Specifically, it lists three units as Ponds A, B, and C, which were managed and closed under the state permit program. Pond A was closed by removal and therefore no longer exists. For Ponds B and C, the western portions were also closed by removal in 1996 (and therefore no longer exist, as described), with the remaining CCR in the eastern portion consolidated and closed as the "Closed Special Waste Landfill" (see above). It is not clear that this unit is included in EPA's list of CCRMU, as EPA's list does not match the names currently used in the solid waste permits for the units at Stanton Station. As another inaccuracy, the Pond C coordinates on EPA's list place it far from the plant site, in an area never owned nor even used by GRE.
>
> The unit listed as the "Retention Cell" also was regulated by the 2015 CCR Rule and was closed by removal in 2020. It therefore no longer exits and would not be subject to the Proposed Rule.

Universe Comments for Legacy CCRMU NODA, October 2023 (Nov. 14, 2023). Docket ID No. EPA-HQ-OLEM-2020-0107-0892.

[24] EPA, Guidelines for Ensuring and Maximizing the Quality, Objectivity, Utility, and Integrity, of Information Disseminated by the Environmental Protection Agency, EPA/260R-02-008 at 15 (Oct. 2002), https://www.epa.gov/sites/default/files/2020-02/documents/epa-info-quality-guidelines_pdf_version.pdf; *Id*. (EPA goes on to explain, "'Objectivity' focuses on whether the disseminated information is being presented in an accurate, clear, complete, and unbiased manner, and as a matter of substance, is accurate, reliable, and unbiased.").

As another inaccuracy, EPA's list identifies the Fly Ash Landfill and the Old Ash Landfill with coordinates that would place them in the location of GRE's permitted Glen Harold Mine landfill. Importantly, this facility is located at an offsite abandoned surface coal mine and is exempt from federal CCR regulations (an exemption that EPA has not proposed to change).

Minnesota Power: There are numerous factual errors with respect to the number of Minnesota Power units identified on the updated list of potential CCRMUs and Legacy Impoundments. We highlight some of these errors below:

Taconite Harbor Energy Center: The list identifies Dry Ash Landfills Cells 1-3 as individual CCRMUs. However, these cells are part of a single CCR landfill unit that is regulated under the CCR Rule. Cells 1-3 have closed in accordance with the rule and a Minnesota State Solid Waste Permit. Dry Ash Landfills Cells 4 and 5 were permitted for future development but were never constructed and do not exist.

Syl Laskin Facility: The data used to identify units at the Syl Laskin Facility is outdated, fails to clearly identify specific CCRMUs and lists more units than exist at the facility. For example, the unit identified as cell B was closed by removal and no longer exists. The units identified as cells C and D were settling ponds that never directly received CCR and both units have been dewatered and no longer exist. Cell E is regulated under the CCR Rule and has already closed in accordance with the rule and the Minnesota Pollution Control Agency National Pollution Discharge Elimination System ("NPDES") Industrial Wastewater Permit Program.

Clay Boswell Facility: The Clay Boswell site is listed twice, however the information sources for both lines reference the same potential CCRMU (Old Fly Ash Pond).

Talen Energy: As is the case with other USWAG members, there are numerous factual inaccuracies with respect to the listing of Talen units as potential legacy impoundments or CCRMUs on EPA's updated list. We identify some of these errors below:

Montour Facility: The updated list identifies Ash Area 3 Leachate Runoff Pond, Silo Runoff Pond, and Detention Basin. These units are active wastewater treatment units under Montour's NPDES permit and are not subject to the CCR Rule or the Proposal. The facility's Ash Area 2 landfill is currently undergoing closure by removal for beneficial use under state permit approval.

Corette Facility: The two former ash ponds were closed by removal and no longer exist.

Brandon Shores Facility: The updated list does not identify any potential CCRMU or legacy surface impoundments, but instead only references Brandon Shores CCR website, which is for Lot 15, an already regulated active CCR landfill.

LGE-KU: There are inaccuracies on updated list regarding the listing of LGE-KU units, including the following:

- the former E(mergency) Pond at the Mill Creek Generating Station was a regulated CCR unit that has been closed by removal; and
- there are two ash ponds identified at the Former KU Tyrone Generating Station; however, there was only one at the site and that former legacy pond ATB has been closed in place.

Cleco: There are a multitude of factual inaccuracies on the updated list with respect to the identification of potential legacy impoundments and CCRMUs at Cleco's facilities. Some of these are listed below:

Former Dolet Hills Generating Station: In Rows 135-139 of Earthjustice Appendix III, Sheet CCRMU, three of the identified potential CCRMUs have been closed by removal (the Auxiliary Surge Pond, the Metal Cleaning Waste Pond and the Secondary Ash Pond) and two of the identified potential CCRMUs are in the process of being closed by removal.

Brame Energy Center: The landfill identified as a potential CCRMU in Earthjustice Appendix III, Sheet CCRMU, Row 52, does not contain CCR. The material disposed in the unit is from a solid fuel generating unit fired with a mix of petroleum coke and coal where the coal fraction combusted is below 50%. The resulting combustion residue does not constitute CCR. Further, the impoundment referenced in Row 53 is a leachate collection pond and contains only de minimis amounts of CCR. Therefore, this unit does not qualify as a potential CCRMU.

Big Cajun Facility: A landfill and a series of water treatment units were incorrectly identified as CCRMUs. Specifically, the identified landfill in Row 47 simply does not exist; nor is there a closed landfill at the site. Similarly, the series of three water treatment impoundments identified in Row 48 contain only de minimis amounts of CCR and therefore do not qualify as potential CCRMUs.

Xcel Energy: The updated list contains dozens of factual errors with the identified Xcel Energy units. Many of these units identified have either been closed by removal and no longer exist, have no known CCR disposal in the first instance, or are already regulated under the CCR Rule. Below are a handful of these factual inaccuracies:

Allen S. King Facility: The identified unit, AS King Ash Disposal Facility, is not on plant property and was closed in 2011 in accordance with state requirements.

Arapahoe Facility: The South Ash Pond, the South Storm Water/Process Pond and North Storm Water/Process Ponds were cleaned closed in 2017 and no longer exist.

Bay Front Facility: The Polish Pond and Surge Basin were closed by removal in 2017 and no longer exist. Neither of these units were constructed as ash storage units.

Black Dog Facility: It is unclear what impoundment is identified at this facility, as there were three small (< 3 acres) on-site Ash Basins that were closed by removal under the CCR Rule and no longer exist, and a forth pond at the site (< 3 acres), which was a water treatment pond used to ensure compliance with NPDES discharge requirements, but also has been closed by removal.

Cherokee Facility: None of the identified units at this facility have known CCR and therefore are not within the scope of the CCR Rule or the Proposal, including the East Polishing Pond, the Emergency Spill Pond, and the West Polishing Pond.

Comanche Facility – Ash Ponds 1, 2, & 4 are wastewater treatment ponds that have no known CCR and therefore are not within the scope of the CCR Rule or the proposal.

Pawnee Facility: It is unclear what unit is being identified here as the "Ash Disposal Facility," as the facility has two CCR landfills currently regulated under the CCR Rule.

Tolk Facility: Unit 116 is a construction/debris landfill that has no known CCR; therefore, it is not subject to the CCR Rule or the Proposal.

Otter Tail Power: Several of the units at Otter Tail Power's Hoot Lake facility included on the updated list of legacy impoundments and CCRMUs are already regulated under the CCR Rule and/or have closed by removal. These include the following:

- The units identified a IL002-Phase 1 and IL002-Phase 1A at the Hoot Lake Facility are regulated under the existing CCR Rule as a CCR Landfill. Further, the CCR Landfill has closed in accordance with the closure requirements in the CCR Rule.

- Areas 1-4 at the Hoot Lake facility (Rows 175 – 178) have been closed by removal and no longer exist.

Lower Colorado River Authority: The updated list of legacy impoundments and CCRMUs identifies LCRA's Fayette Power Project (FPP) (Row 342) as a legacy surface impoundment and CCRMU. The apparent basis for this listing is Earthjustice's Appendix III, Sheet Plant-Level Summary (Row 124). However, the Earthjustice data states no evidence of legacy ponds and no potential CCRMU landfills or ponds at FPP. The Earthjustice spreadsheet also says "No CCRMU identified" for FPP. Therefore, there is no factual basis for the identification of the FPP on the list.

Hoosier Energy: The updated list of legacy impoundments and CCRMUs inaccurately lists and/or identifies a number of units at Hoosier Energy's Ratts and Merom facilities:

Ratts Facility: The Earthjustice Appendix double counts the ponds at Hoosier Energy's Ratts facility. Ponds 1, 2, 3, and 4 are listed (with years "online", and latitude and longitude info), while there is a separate listing for the same four units as Fly Ash Pond 1, Fly Ash Pond 2, Fly Ash Pond 3, and Bottom Ash Pond (there are no dates or locations for those four). To correct this double counting, the first four ponds (Ponds 1, 2, 3, and 4) should be included on the list, and the other four ponds that are listed should be deleted.

Merom Facility: Areas 1 and 2 are units listed as CCRMUs. However, these units are not located on property that is part of a power generation station and therefore are incorrectly included on the list. In 2022, Hoosier Energy completed the sale of the Merom Generating Station, including the power generation assets and an active CCR landfill (Area 3). Hoosier Energy retained ownership of Areas 1 and 2; however, these units are no longer located on the property of the generation station or active Area 3 landfill and therefore are not subject to potential regulation as CCRMUs.

OVEC/IKEC: The rationale for identifying the Type III landfill at OVEC's Clifty Creek facility as a CCRMU is factually flawed. The listing appears to be based EPA's misunderstanding that the Type III landfill was identified as the source of contamination in an alternative source demonstration submitted by the facility. The alternative source demonstrations identified other potential sources and did not identify the Type III landfill. Therefore, the factual basis for the listing of this unit as a potential CCRMU is incorrect.

SRP: The updated list contains inaccuracies and lack of information with respect to the identification of CCRMUs at SRP's Coronado Generating Station and Navajo Generating Station.

Coronado Generating Station (CGS): EPA's "Summary of Legacy Impoundments and CCRMUs" at rows 244 and 245 identify CGS as having two CCRMUs and cites to Earthjustice Appendix III, Sheet Plant-Level Summary, Row 86, and Sheet CCRMU, Row 110 as its source of authority. First, it appears that Earthjustice is alleging only one CCRMU, not two as EPA's table seems to indicate. Second, the Earthjustice information is not verifiable. SRP, as the entity and operator of CGS since it was constructed, does not believe CGS has any CCRMUs. The claims regarding CCRMUs at CGS are incorrect.

Navajo Generating Station (NGS): EPA's "Summary of Legacy Impoundments and CCRMUs" identifies NGS as having legacy surface impoundments and CCRMUs, and again cites only to Earthjustice Appendix III, Sheet Plant-Level Summary, Row 274, despite the fact that Row 274 indicates that no legacy ponds or CCRMUs are present at NGS. Moreover, NGS, an "active facility" as defined by 40 C.F.R. 257.51, cannot have a legacy surface impoundment. As indicated in SRP's comments on the Proposed Rule, NGS has several potential CCRMUs as defined by the Proposed Rule.

Platte River Power Authority: The updated list identifies two potential CCRMUs at the Rawhide Energy Station. This appears to be based on the belief that certain cells of a CCR landfill are inactive landfills. This is inaccurate. Platte River Power Authority considers the entirety of the CCR landfill at this facility to be a "CCR landfill" regulated under the existing federal CCR regulations.

Cooperative Energy: The updated list identifies three potential CCRMUs at Plant RD Morrow based on the 2010 Information Collection Request (ICR). These three units are identified as "Cells 1-6," "East Inactive Landfill," and "West 26 Acres." Although these units were listed separately in the 2010 ICR, "Cells 1-6" and "East Inactive Landfill" are

expansions of a single landfill. The entirety of that landfill was treated as a regulated CCR unit under the federal CCR regulations and was closed, in accordance with the CCR Rule, in 2021. Note that the "West 26 Acres" was permitted for potential future expansion; however, no expansion of the landfill was constructed in the "West 26 Acre" area. Therefore, none of the three potential CCRMUs identified for this plant are accurate listings because they are either part of the regulated CCR Unit under the 2015 CCR Rule or were never constructed.

Sunflower Electric Power Corporation: EPA has listed Holcomb Plant as having both a legacy surface impoundment and CCRMU and cross-references to the Earthjustice Appendix III, Sheet Plant-Level Summary, Row 179. However, that spreadsheet indicates 'No' to both legacy surface impoundment and CCRMU for Holcomb. Holcomb has never had a CCR surface impoundment and only has one landfill unit at the facility, which is regulated under the 2015 CCR Rule.

American Electric Power (AEP): AEP identified several errors in the updated list, including:

- The units identified for the Mountaineer facility are regulated under the existing federal CCR regulations;
- Basin C at the Northeastern facility is a non-CCR stormwater pond;
- The Secondary Ash Pond at the Welsh facility is a non-CCR clarifier pond;
- Rows 3 and 4 are not AEP facilities;
- Earthjustice Appendix III, Sheet CCRMU, Row 295, identifies a fly ash impoundment, and the listed latitude and longitude coordinates are about 700-800 feet southeast of the left end of Conner Run dam. This entry appears to be the Conner Run impoundment and misidentifies the "Potential Owner/Operator" as AEP.

NRG Energy, Inc. (NRG): NRG identified several errors in the updated list, including several units that were not used to manage or dispose of CCR and therefore should not be considered CRRMUs. These include, for example, the units identified in Earthjustice, Appendix III, Sheet CCRMU, Rows 222 and 223, both of which were the subject of an Illinois Pollution Control Board order finding that these units are process water ponds not used to accumulate CCR.[25]

DTE: The updated list identifies the Monroe Power Plant (Row 715), River Rouge Power Plant (Row 893), and Trenton Channel Power Plant (Row 1024) as having legacy surface impoundments and/or CCRMUs. However, the source data (Earthjustice EPA-HQ-OLEM-2020-0107-0368) does not identify any legacy surface impoundments or CCRMUs.

[25] *See* Illinois Pollution Control Board, AS 21-2, In the Matter Of: Petition of Midwest Generation, LLC for an Adjusted Standard from 35 Ill. Adm. Code 845.740(a) and Finding of Inapplicability of 25 Ill. Adm. Code 845 at 6 (Feb. 17, 2022), https://pcb.illinois.gov/documents/dsweb/Get/Document-105336.

Further, these three power plants are all active facilities and thus it would be impossible to have a legacy surface impoundment at these sites.

AES: The updated list identifies one CCRMU and one legacy surface impoundment at the AES Warrior Run Cogeneration Facility. However, since the beginning of commercial operations, all CCR material generated at AES Warrior Run has been managed dry in aboveground storage silos prior to being beneficially used offsite (for mine reclamation), in accordance with Maryland Department of Environment regulations.

Entergy: The updated list contains inaccuracies with respect to the identification of potential legacy surface impoundments and CCRMU at Entergy facilities. While some of the information cited by EPA is unclear and thus difficult to verify, some is clearly in error, including information cited for Entergy's White Bluff Generating Station and Entergy's R S Nelson Generating Station.

White Bluff Generating Station: In row 1104 of the update list, EPA indicates that potential legacy impoundments and CCRMU were identified at the White Bluff generating station in Earthjustice Appendix III, Sheet Plant-Level Summary, Row 408. A review of row 408 of the referenced worksheet indicates that the opposite is in fact true: the Earthjustice comments specifically indicate (in row 408) that no evidence of legacy ponds (Column M) or potential CCRMU (Column O) was found.

R S Nelson Generating Station: In row 883 of the updated list, EPA indicates that a potential CCRMU was identified at the R S Nelson generating station in Earthjustice Appendix III, Sheet CCRMU, Row 371l. A review of Row 371 of the referenced worksheet indicates that this entry is for a "CFB Ash Landfill," purported to be located at the R S Nelson site. This appears to be a reference to the landfill located at the adjacent Nelson Industrial Steam Company (NISCO) facility, where petroleum coke is burned in two Circulating Fluidized Bed boilers—not the Nelson facility. The ash placed in this landfill at the NISCO facility is from the combustion of petroleum coke and is not a coal combustion residual. Therefore, this CFB ash landfill is not a potential CCRMU.

* * *

USWAG appreciates the opportunity to submit comments on the NODA. If you have questions regarding any of the issues raised in the comments, please contact USWAG Executive Director Dan Chartier (dan.chartier@USWAG.org), USWAG Ash Committee Chair JR Register (harold.registerjr@cmsenergy.com), or USWAG counsel Maggie Fawal (mkfawal@venable.com) or Doug Green (dhgreen@venable.com) at Venable, LLP.

Attachment A

Technical Evaluation of US EPA's October 2023 Draft Risk Assessment for Legacy Impoundments and Coal Combustion Residual Management Units (CCRMUs)

Prepared for

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Abbreviations

ACH	Air Changes Per Hour
CCP	Coal Combustion Product
CCR	Coal Combustion Residual
CCRMU	Coal Combustion Residual Management Unit
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CSM	Conceptual Site Model
EIP	Environmental Integrity Project
EPACMTP	US EPA's Composite Model for Leachate Migration with Transformation Products
EPRI	Electric Power Research Institute
FGD	Flue Gas Desulfurization
GWPS	Groundwater Protection Standard
HEI	Highly Exposed Individual
MCL	Maximum Contaminant Level
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NODA	Notice of Data Availability
PRGs	Preliminary Remediation Goals
RIA	Regulatory Impact Analysis
SI	Surface Impoundment
TVA	Tennessee Valley Authority
US EPA	United States Environmental Protection Agency

Executive Summary

In April 2015, the United States Environmental Protection Agency (US EPA) published a final rule entitled "Hazardous and Solid Waste Management System; Disposal of Coal Combustion Residuals From Electric Utilities" to regulate the disposal of coal combustion residuals (CCR) in surface impoundments (SIs) and landfills (US EPA, 2015). As part of this rule, US EPA undertook a comprehensive process to evaluate risks associated with active surface impoundments and landfills. It developed a conceptual site model (CSM) representing the characteristics of SIs and landfills, used a probabilistic modeling approach to evaluate the potential releases that may occur from SIs and landfills and the downgradient fate and transport of CCR-related constituents, and then assessed potential risks to downgradient receptors. Moreover, US EPA then presented a validation of modeled risks using available damage case information.

On May 18, 2023, US EPA published the "Hazardous and Solid Waste Management System: Disposal of Coal Combustion Residuals From Electric Utilities; Legacy CCR Surface Impoundments" ("proposed rule") to amend and expand the regulation of CCR (US EPA, 2023b). This proposed rule was intended to address potential releases and risks from legacy surface impoundments and CCR management units (CCRMUs), which were not addressed in the 2015 CCR Rule. US EPA did not conduct a risk assessment for CCRMUs and legacy impoundments in support of the proposed rule. Instead, US EPA assumed the risks from active SIs and landfills are applicable to all "historical units" (*i.e.*, CCRMUs and legacy impoundments) without considering factors and characteristics of CCRMUs and legacy impoundments that make them different from active SIs and landfills. The problematic nature of this assumption was identified in comments received by US EPA following its May 2023 proposed rule.

Responding to comments received regarding its May 2023 proposed rule, US EPA published a "Notice of Data Availability" ("NODA") on November 14, 2023, and provided a new risk assessment for legacy surface impoundments and CCRMUs. This risk assessment presents risk results for 122 landfills and 163 surface impoundments ("previously excluded" units), which US EPA modeled during its 2014 risk assessment but decided to exclude because "they fell outside the scope of the 2015 CCR Rule"[1] (US EPA, 2023a, p. 3-1). US EPA (2023a) also presents a new risk assessment for "CCRMU fills".

This report prepared by Gradient provides comments on technical issues in US EPA's new risk assessment for legacy impoundments and CCRMUs, and addresses issues related to the potential risks associated with these units and the subsequent requirements that would be imposed upon these facilities as a result of the proposed rule. The following comments are discussed[2] in this report:

1. US EPA has not used the best available data to conduct its risk assessment. Extensive measured groundwater data are available since the 2014 risk assessment that provide comprehensive information on the nature and extent of CCR constituent concentrations near and around CCR units and should have been used to inform risk conclusions.
2. US EPA's CSM for legacy and historical impoundments is incorrect. US EPA fails to recognize that historical and legacy impoundments have not been active for long periods of time and have a

[1] These units were excluded from the final results presented in US EPA's 2014 risk assessment because either "[t]he facility was no longer a coal-fired electric utility according to the 2012 EIA [Energy Information Association] database" or "[t]he landfill or surface impoundment was found to be inactive or retired" (US EPA, 2023a, p. 3-1).
[2] The 25-day comment period provided by US EPA significantly limited the scope of the technical review.

different risk profile than active SIs. Because legacy and historical impoundments are smaller and lack a hydraulic head, their CSM is more similar to landfills than to active SIs.

3. US EPA is proposing to regulate the post-operational stage of legacy SIs and historical SIs based on the potential risk associated with their prior operational stage, but never actually evaluates the risks resulting from the post-operational stage, when the hydraulic head has been removed.
4. Based on US EPA's own assessment of "previously excluded" units, historical and inactive landfills, even unlined units, do not pose a risk that exceeds US EPA's risk target.
5. US EPA's own data evaluation demonstrates that smaller landfills (*i.e.*, those with area less than approximately 40 acres), even unlined units, do not exceed risk targets. Because historical and legacy SIs have a CSM similar to a landfill and are much smaller than landfills, US EPA's conclusion that historical and legacy SIs pose a risk is not supported.
6. Consistent with the observation that US EPA's own assessment shows that landfills less than approximately 40 acres do not pose a risk, CCRMU fills, which are much smaller than landfills (less than 5 acres) should have significantly lower risks.
7. US EPA's risk assessment for CCRMUs is unrealistic, and the approach is fundamentally different from the approach used in its 2014 risk assessment. As a result, the calculated risks from CCRMU fills, which do not impound water, are substantially and implausibly higher than the risks calculated for active surface impoundments in 2014. These results reflect numerous unreasonable and overly conservative assumptions, including: using a residential exposure scenario to evaluate unrestricted future use; using the 90^{th} percentile, which is sensitive to extreme values and emphasizes the upper tail in a non-normally distributed dataset; changing many of the parameters of the 2014 risk assessment to accommodate US EPA's new, unrestricted land use scenarios; using one site conceptual model to account for the wide variety of CCRMU fills that exist; and overestimating infiltration rates.
8. US EPA's modeled concentrations for CCRMU fills are inconsistent, and much higher, than concentrations measured at larger active units.
9. US EPA's risk conclusion for CCRMU fills has significant implications for offsite beneficial use of coal combustion products (CCPs). Specifically, the unrealistic and overly conservative CSM is inconsistent with the process for evaluating beneficial uses.
10. The 5-mile radius used by US EPA as the relevant area of interest around a CCRMU fill is not sufficiently justified, varies from the 2014 risk assessment, and is not consistent with other environmental justice evaluations.
11. US EPA's radiological modeling predicts radon risks consistent with background and much lower risks from gamma radiation. US EPA then appends an unrelated, oversimplified analysis to conclude risk exceedances.

1 US EPA has not used the best available data to conduct its risk assessment.

When conducting a risk assessment, particularly one with significant regulatory implications, it is critical to support the assessment using the best available data. US EPA's current risk assessment for legacy impoundments and coal combustion residual management unit (CCRMU) fills was not based on the best available data and, instead, relied on outdated information that introduced significant uncertainties into the risk assessment. Specifically, in its assessment of previously excluded landfills and surface impoundments, US EPA relied on the same data and approach that was used to conduct the 2014 risk assessment of active impoundments and landfills. At the time of the 2014 assessment, limited information was available on the concentrations of coal combustion residual (CCR) constituents in groundwater in the vicinity of landfills and SIs. In the absence of a robust groundwater dataset, US EPA modeled the potential downgradient CCR constituent groundwater concentrations using available porewater and leachate data. The two-step modeling approach, using EPACMTP, simulated the vertical transport of CCR constituents into the underlying groundwater and then the subsequent lateral migration of constituents in groundwater. This approach required many assumptions in order to predict potential groundwater impacts at the disposal unit, including, but not limited to, porewater and leachate characteristics, the operational conditions of the disposal units, and infiltration rates. Each assumption introduces some uncertainty into the risk estimate.

Since the 2014 risk assessment, and as a direct result of the 2015 CCR Rule requirements, tens of thousands, if not hundreds of thousands of groundwater samples have been collected and analyzed for CCR constituents in the vicinity of surface impoundments and landfills. These data, which are publicly available, provide comprehensive information on the nature and extent of CCR constituent concentrations near and around CCR units and should have been used as the starting point to simulate the subsequent downgradient migration of CCR constituents in groundwater. The use of these measured groundwater data would have eliminated the first step in US EPA's modeling process, which simulated the downward migration of porewater and leachate into groundwater from the overlying CCR unit. Eliminating this modeling step would reduce the number of required modeling assumptions, which would in turn reduce uncertainty in the model results and increase confidence in the subsequent risk estimates. At the very least, the large available measured groundwater dataset should have been used to validate US EPA's model results. Model validation is an important step to verify model results and to increase confidence in model predictions.

As detailed throughout subsequent comments, the active surface impoundment (SI) risks, calculated in the 2014 risk assessment, are not representative of risks that would be expected from legacy and historical impoundments and CCRMU fills (see Sections 2, 3, and 5). Thus, the groundwater data collected at active SIs are not relevant for evaluating risks for legacy and historical impoundments and CCRMU fills. However, the risk results for landfills, calculated in the 2014 risk assessment, are relevant to legacy and historical impoundments. Using the available groundwater monitoring data from landfills to evaluate risks for legacy and historical impoundments would be appropriate and, in fact, conservative, because, landfills are much larger than legacy and historical impoundments. In contrast, because CCRMU fills are so much smaller than landfills, it would be inappropriate to use groundwater data from landfills to evaluate risk for CCRMU fills. Instead, measured groundwater data from landfills could be used to "ground truth" the modeled results of the CCRMU fills risk assessment.

To this point, as detailed in Section 8, measured groundwater data compiled by the Environmental Integrity Project (EIP) indicate that measured concentrations near active units (SIs and landfills) are substantially

lower than the modeled groundwater concentrations downgradient of CCRMU fills. This suggests that the data and approach US EPA used to model CCRMU fills are inappropriate to characterize risk and, consequently, are not a sound basis for regulatory decision-making.

2 US EPA's CSM for legacy and historical impoundments is incorrect.

As part of US EPA's new risk assessment for legacy impoundments and CCRMUs (US EPA, 2023a), the agency developed new terminology and new definitions for units that were proposed for regulation in its May 2023 proposed rule (US EPA, 2023b). Legacy impoundments were previously defined as "inactive surface impoundments at inactive facilities" (US EPA, 2023b, p. 31988); more specifically, a legacy impoundment was defined as a "surface impoundment that is located at a power plant that ceased generating power prior to October 19, 2015, and the surface impoundment contained both CCR and liquids on or after the effective date of the 2015 CCR Rule" (US EPA, 2023b, p. 31989). US EPA's prior definition did not prescribe any conditions on the closure status of a legacy impoundment. In US EPA's new risk assessment, the definition of a legacy impoundment has changed. US EPA now states that legacy impoundments are defined as "impoundments located at inactive electric utilities, that ceased receipt of CCR prior to the effective date of the 2015 Rule, have the potential to accept CCR in the future, and still contain free water" (US EPA, 2023a, p. 2-4). The additional phrase "potential to accept CCR in the future" seems to imply that legacy impoundments have not undergone any form of closure.

US EPA's definition of legacy impoundments in the risk assessment is in contrast to its definition of historical surface impoundments, a new term that US EPA created as part of its risk assessment for legacy impoundments and CCRMUs (US EPA, 2023a). Historical impoundments are defined as "impoundments that ceased receipt of CCR prior to the effective date of the 2015 Rule, have no intention of accepting CCR in the future, and have moved to dewater the unit and install some form of cover system" (US EPA, 2023a, pp. 2-4).

US EPA determined that the current conditions of legacy impoundments "most closely resemble an active surface impoundment" and historical impoundments range in similarity between "an active surface impoundment and a closed landfill" (US EPA, 2023a, p. 2-4). In the 2014 risk assessment (US EPA, 2014), US EPA only modeled the operational phase of surface impoundments (*i.e.*, an active surface impoundment) because this was the phase from which they expected risks to be the highest (US EPA, 2023a, p. 2-4).

> EPA modeled only one stage of the impoundment lifecycle at the time because the groundwater model required a static unit configuration. The primary difference among impoundment lifecycle stages is the presence of free water in the unit before closure. The hydraulic head from this water forces leachate into subsurface soils at a higher rate than can occur from gravity alone. EPA chose to model all surface impoundments during the active stage of their lifecycle under the assumption the constant presence of a hydraulic head would result in the highest releases.

"Historical surface impoundments" or impoundments that have been closed were not included in the 2014 risk assessment. In its current risk assessment, US EPA determined that, legacy and historical impoundments both held "free water during the active stage of their lifecycle" (US EPA, 2023a, p. 2-4) and that legacy impoundments still contained free water (US EPA, 2023a, p. 2-4). Because of this, risks from both historical and legacy impoundments were characterized by US EPA using the same conceptual models developed for active surface impoundments in the 2014 risk assessment, which assumed active operation (Figure 2.1). US EPA's conclusion that both historical and legacy impoundments are represented by a

conceptual site model (CSM) developed for active surface impoundments is incorrect. Specifically, US EPA fails to recognize that historical and legacy impoundments have not been active for long periods of time, and as a result makes incorrect assumptions about the presence and effect of free water in legacy impoundments. Consequently, US EPA fails to recognize that both legacy and historical impoundments are more similar to landfills than to active surface impoundments.

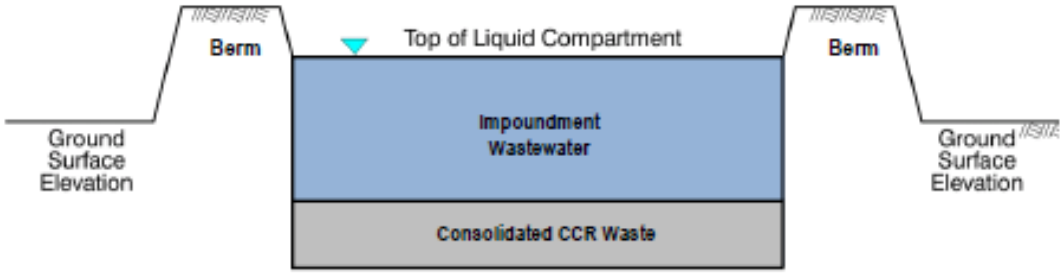


Figure 2.1 Surface Impoundment Conceptual Site Model Used by US EPA in 2014 Risk Assessment. CCR = Coal Combustion Residual; US EPA = United States Environmental Protection Agency. Source: Figure 2.2 from US EPA (2014a).

2.1 US EPA's conclusions about free water in legacy impoundments are incorrect.

US EPA defines free water to include standing water above the ash surface and porewater in the CCR (US EPA 2023b, pp. 31992-31993). These two types of free water are important to distinguish. US EPA has acknowledged on multiple occasions that impounded, drainable water provides the hydraulic head that forces leachate into subsurface soils and is the mechanism that drives risks (US EPA, 2015, p. 21342).

> 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.

While legacy and historical impoundments both likely contained standing water above the ash surface during their operational life, once operation at these units stopped, standing water above the ash surface would have been either actively removed or drained naturally over time. The result is that legacy and historical impoundments do not currently contain standing water above the ash surface. As detailed in Gradient (2023), a preliminary evaluation of the more than 150 legacy impoundments identified by US EPA indicated that none of the legacy units identified have standing water above the ash surface. Additionally, a visual inspection of the 127 units identified in the regulatory impact analysis as part of the "Potential Legacy Impoundment Universe" as well as additional units identified in a sensitivity analysis, showed no evidence of standing water above the ash surface at any of the legacy impoundments (Gradient, 2023).

Porewater within ash may or may not cause a hydraulic head. For example, porewater in the ash at or below its residual saturation level will not readily separate from the ash and, thus, does not cause a hydraulic head. In reality, during the post-operational phase of an impoundment's lifecycle, when there is no standing water overlying the ash surface, porewaters in the ash will drain over time until they reach residual saturation, the point at which they no longer cause a hydraulic head and or induce leachate migration into the subsurface in the manner described by US EPA's CSM for active impoundments.

2.2 Legacy and historical impoundments are more similar to landfills than to active surface impoundments.

Because legacy and historical SIs do not contain standing water above the ash surface, they are more similar to the CSM developed for landfills by US EPA in the 2014 risk assessment (US EPA, 2014; Figure 2.2), as opposed to the CSM for active SIs (Figure 2.1). US EPA's landfill CSM consisted of a covered CCR waste disposal compartment with no overlying ponded water (Figure 2.2), similar to a legacy and historical impoundment with no standing water above the ash surface.

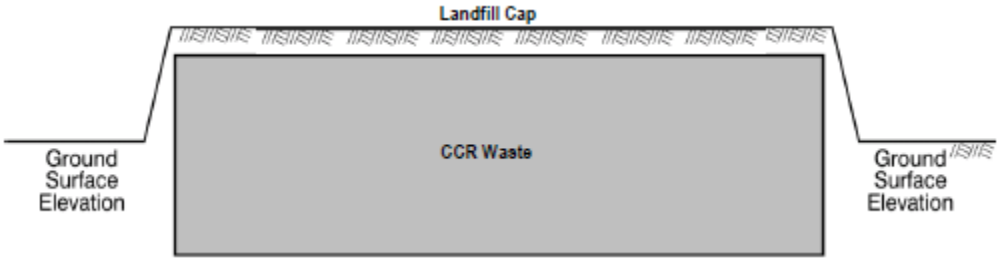


Figure 2.2 Landfill Conceptual Site Model Used by US EPA in 2014 Risk Assessment.
CCR = Coal Combustion Residual; US EPA = United States Environmental Protection Agency. Source: Figure 2.4 from US EPA (2014a).

It is a key point that legacy and historical impoundments closely resemble landfills because the risks calculated by US EPA for active landfills in the 2014 risk assessment were significantly lower than the risks that were calculated for SIs (US EPA, 2014). Specifically, even at the 90th percentile risk for landfills, there were no cancer risk exceedances *via* consumption of groundwater. Only when the assessment was limited to just unlined landfills (at the 90th percentile risk) was a benchmark risk exceedance identified (2×10^{-5}) and, even then, it was only slightly above the acceptable risk benchmark (US EPA, 2014).

3 US EPA is proposing to regulate the post-operational stage of legacy SIs and historical SIs based on the potential risk associated with their prior operational stage without actually evaluating the risks resulting from the post-operational stage.

In its new risk assessment for legacy impoundments and CCRMUs, US EPA (2023a) concludes that legacy and historical surface impoundments, which are in the post-operational stage, pose a risk warranting regulation, based on the potential risk associated with their operational stage:

> Although the current configuration of the legacy and historical impoundments may vary, both types of units held free water during the active stage of their lifecycle. In the case of legacy impoundments, that free water is still present. Thus, EPA believes the risks from both historical and legacy impoundments are best characterized using the same conceptual model developed for active impoundments. (US EPA, 2023a, pp. 2-4 to 2-5)

In proposing this approach, US EPA argues that "[t]he fact that some historical and inactive units" are "in a different stage of their lifecycle … does not necessarily differentiate the long-term risks from those of previously modeled active units" and that these units should be regulated based on the potential for risk "over [their] full lifecycle" (US EPA, 2023a, p. 3-1). However, US EPA has not calculated the current risk from these units that exist today. As discussed below, the potential risk associated with the current post-operational stage of historical and legacy SIs is very different from the risk associated with the operational stage of these units because of the vastly different CSMs for these units in comparison to active SIs (Section 3.1). US EPA's modeling of legacy and historical impoundments, which is used for risk calculations and regulatory decisions, inappropriately simulates operational conditions rather than reflecting the post-operational conditions at legacy and historical impoundments (Section 3.2). Groundwater data collected during different stages of surface impoundments also demonstrate reduction in risk from the operational stage to post-operational stage (Section 3.3).

3.1 Risks from historical and legacy SIs are different from active SIs because historical SIs and legacy SIs do not impound drainable water.

US EPA has acknowledged that impounded, drainable water is the primary driver of risk for active impoundments, noting that "the highest risks are associated with [active] CCR surface impoundments due to the hydraulic head imposed by impounded water" (US EPA, 2015, p. 21342). US EPA states that "[t]he hydraulic head from this water forces leachate into subsurface soils at a higher rate than can occur from gravity alone" (US EPA, 2023a, p. 2-4). However, as discussed in Section 2.1, historical SIs and most legacy SIs do not contain impounded water because it has either been actively removed or drained naturally over time. US EPA also notes that "[t]he primary difference among impoundment lifecycle stages is the presence of free water in the unit before closure" (US EPA, 2023a, p. 2-4). The conceptual model for a historical and legacy SI consists of partially-saturated CCR (Figure 3.1) with porewater likely close to residual saturation (see discussion in Section 2.1) and does not include the "impoundment wastewater"

compartment that is present in the CSM for active impoundments (Figure 2.1). Legacy and historical impoundments may also have a cover system installed over the dewatered ash. In the absence of impounded, drainable water, which is the primary driver of risk, the risk during the current post-operational stage of historical and legacy SIs is much smaller than the risk during their operational stage. US EPA's proposed regulations do not reflect the current conditions at historical and legacy SIs.

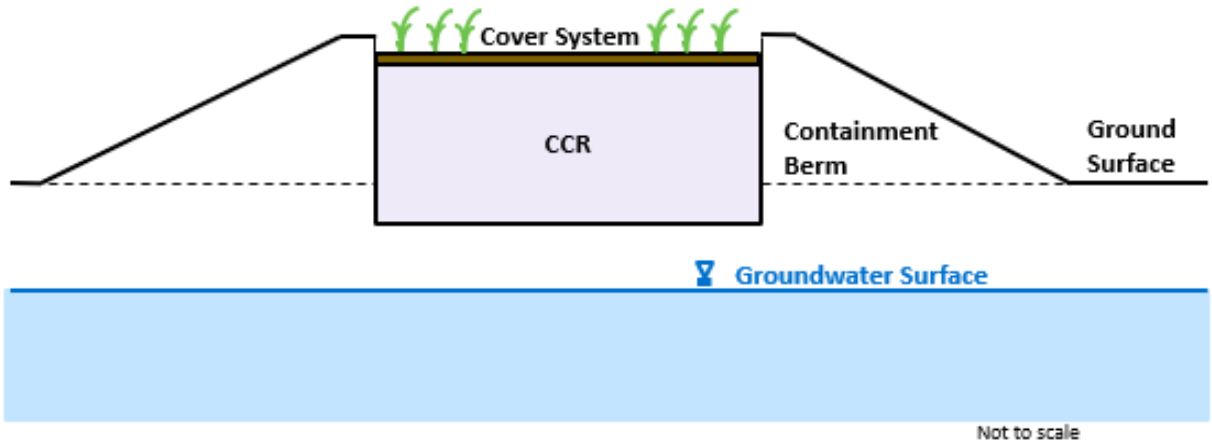


Figure 3.1 Conceptual Model Schematic for Historical and Legacy Surface Impoundments. CCR = Coal Combustion Residual.

3.2 US EPA's modeling does not simulate the current conditions at historical and legacy SIs.

US EPA modeled the risks from historical and legacy SIs using the same conceptual model that it used in its 2014 Risk Assessment (US EPA, 2014) for active SIs. In 2014, US EPA modeled SIs during their operational stage "under the assumption [that] the constant presence of a hydraulic head would result in the highest releases" (US EPA, 2023a, p. 2-4). However, as discussed above, historical and legacy SIs do not have this hydraulic head and their current conditions are very different from operational stage. Thus, by using the same model as active SIs, US EPA is overestimating the current risk from historical and legacy impoundments.

US EPA's model for "previously excluded" SIs (*i.e.*, historical and legacy SIs) uses a ponding depth (hydraulic head) ranging between 0.1 and 58 meters and a source duration of 75 years, which was based on the operating life of SIs (US EPA, 2014, p. 4-7). Using this model, US EPA predicts a 90th percentile cancer risk of 8×10^{-5} from these units (US EPA, 2023a, p. 2-4). However, the input values used in the model are not representative of current conditions at historical and legacy SIs because these units do not impound drainable water (*i.e.*, a ponding depth of zero) and are not operational. Moreover, some of these units have some form of cover system[3] limiting infiltration. Thus, US EPA's modeling overestimates key input parameters that result in higher risks for historical and legacy SIs, and these risks do not represent the current risks from historical and legacy impoundments.

[3] Historical impoundments by definition "have moved to dewater the unit and install some form of cover system" (US EPA, 2023a, p. 2-4; emphasis added).

3.3 Groundwater monitoring data show rapid decline in concentrations in the post-operational stage of SIs.

Groundwater monitoring data collected during the operational and post-operational stages of surface impoundments provide additional support that risks during the post-operational stage of surface impoundments are much smaller than risks during their operational stage, as discussed in examples below.

Ash Ponds 2 and 4, Hennepin Power Plant, Hennepin, Illinois

During operation, boron was routinely detected in downgradient groundwater at concentrations above the Illinois Groundwater Protection Standard (GWPS) (Hagen, 2020). However, boron concentrations declined significantly after operation of Ash Ponds 2 and 4 were discontinued in 1996 and 1984, respectively, and even before the final cover system was installed in 2020 (Figure 3.2).

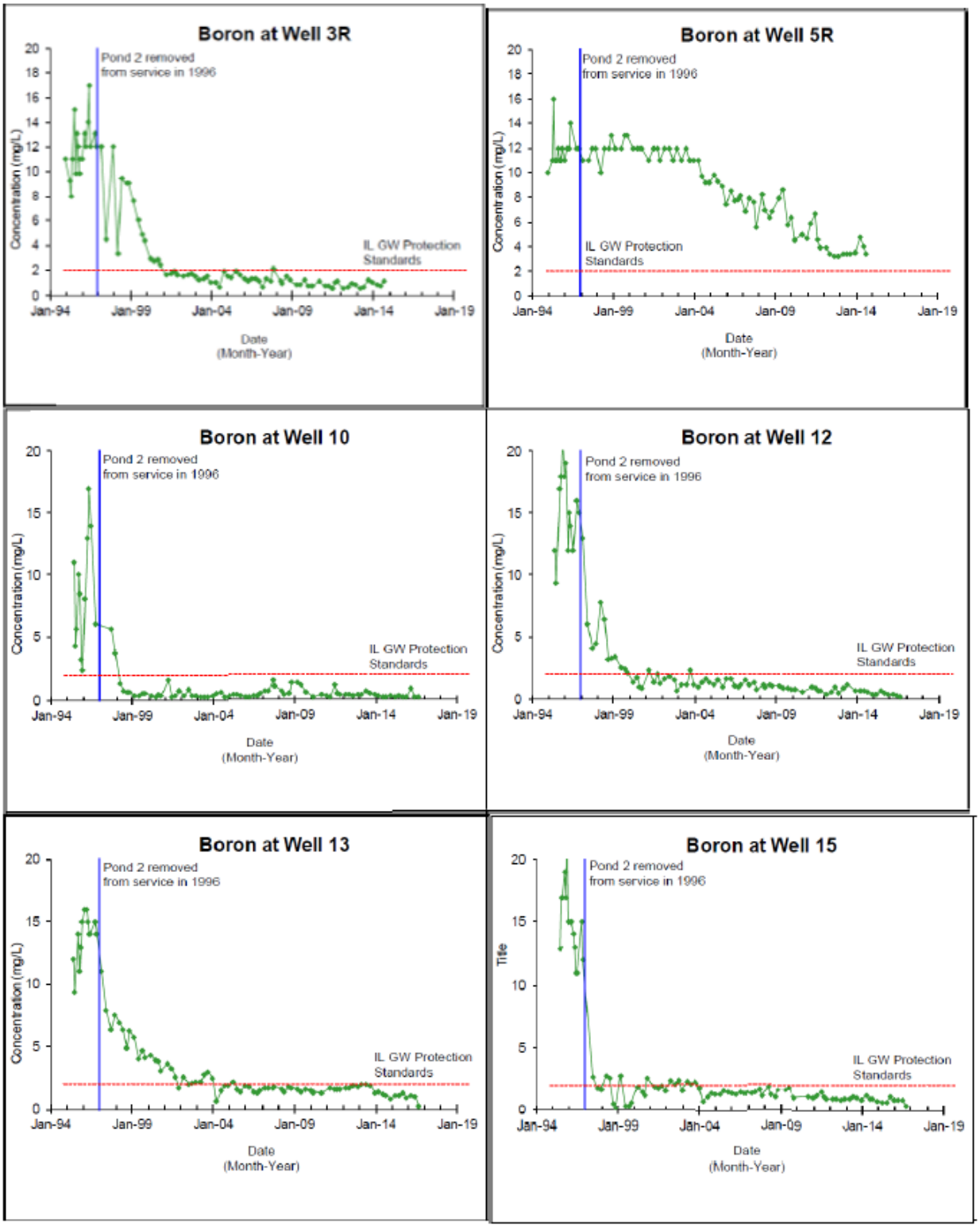


Figure 3.2 Boron Concentration *Versus* Time Plots at Wells Downgradient of Ash Pond 4 and Ash Pond 2 at the Hennepin Power Plant. IL = Illinois; GW = Groundwater. Source: Hagen (2020).

South Ash Pond at the Havana Power Station, Havana, Illinois

The South Ash Pond at the Havana Power Station operated until 1993 and was closed in 1994 with a final cover consisting of 3 feet of locally sourced soils (Hagen, 2020). The soil cover likely does not meet the permeability requirement contained in 40 CFR 257.102[d][3]. Nevertheless, while during operation of the pond boron was detected above the Illinois GWPS at downgradient monitoring wells (Figure 3.3, Hagen, 2020), soon after the pond was removed from operation and the soil cap was installed the concentrations of boron in groundwater declined significantly and are currently below relevant GWPSs (Figure 2.3, Hagen, 2020).

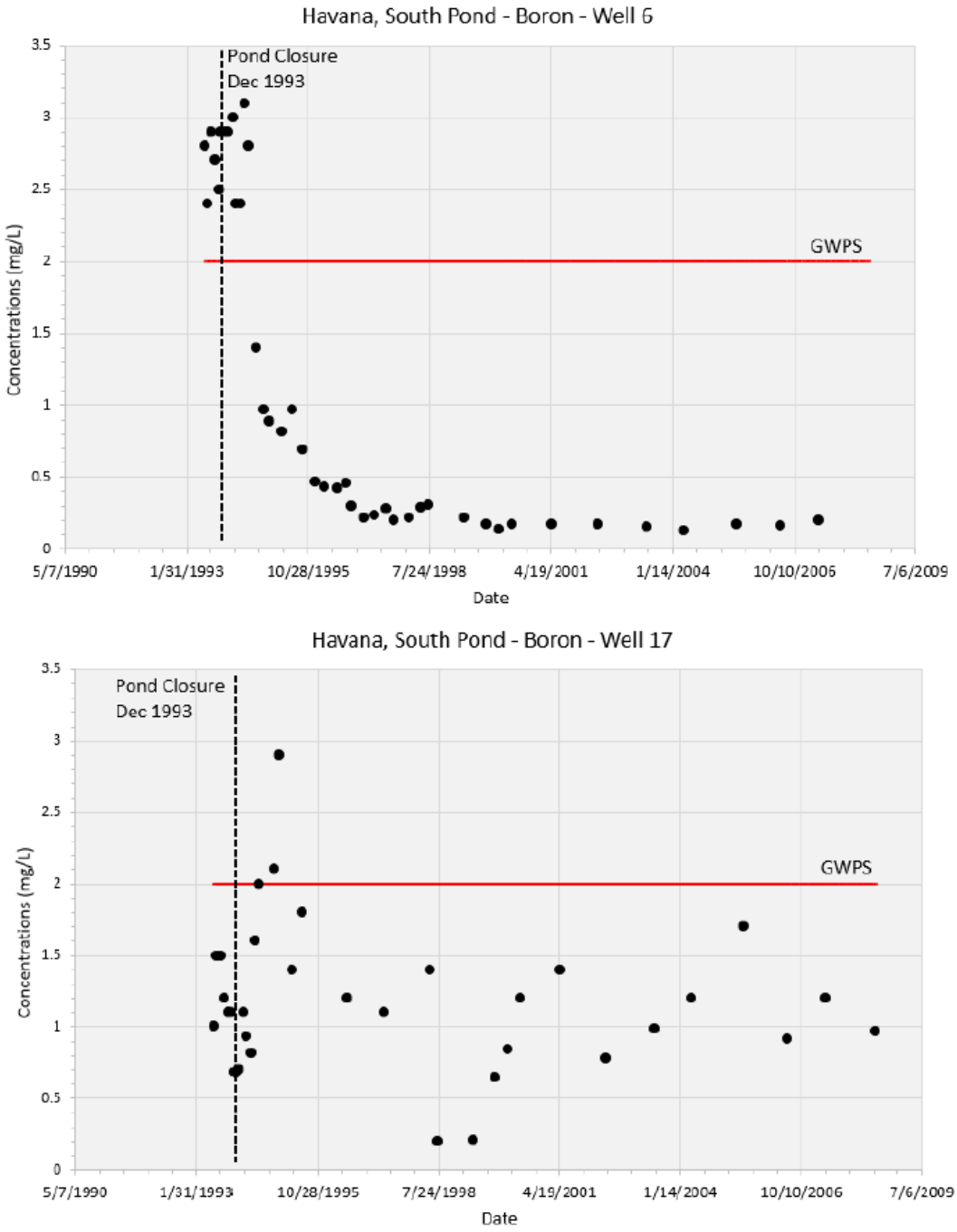


Figure 3.3 Boron Concentration *Versus* Time Plots at Wells Downgradient of the South Ash Pond at the Havana Power Station. Source: Hagen (2020).

In conclusion, historical and legacy SIs pose much smaller risks in their post-operational conditions than during prior operational conditions due to the absence of a hydraulic head. This is also supported by groundwater data collected during different operational stages of real surface impoundments' lifecycles. US EPA's proposal that risks that may have resulted from prior operating conditions warrant regulation of the current non-operating units with very different risk profiles is not justified.

4 Historical and inactive landfills do not pose a risk that exceeds the US EPA risk target.

US EPA's current risk assessment for previously excluded landfills relied on results from the 2014 risk assessment. As shown in Table 4.1, all 90th percentile non-cancer risks (from arsenic III, arsenic V, molybdenum, lithium and thallium) and cancer risks (from arsenic III and arsenic V) were below the target risk levels for these previously excluded landfills, of which about 70% were unlined (US EPA, 2023a, p. 3-2). Although all risks were below the risk targets, US EPA described the results for the subset of unlined landfills as having risks that "fall above the criteria for arsenic III" (US EPA, 2023a, p. 3-2). The risk for previously excluded unlined landfills is not clearly stated in US EPA's risk assessment (US EPA, 2023a), but based on the modeling inputs provided by US EPA (US EPA, 2023a, Attachment C-1), the calculated 90th percentile risk for unlined previously excluded landfills is 1×10^{-5}. This result does not support US EPA's conclusion that previously excluded landfills pose a risk. First, a risk of 1×10^{-5} for all unlined landfills is equal to US EPA's risk target, but does not exceed it. Second, a risk of 1×10^{-5} for arsenic is below the risk from typical background exposure to arsenic in food or water. For example, USGS (2014) reports that nearly half of drinking water wells have arsenic concentrations greater than 1 µg/L. Consuming water at 1 µg/L arsenic results in a lifetime cancer risk of 2×10^{-5}, a risk higher than is estimated for previously excluded unlined landfills. As another example, US FDA (2016) estimated a mean concentration of 92.3 µg/kg in white rice and a per capita daily intake for adults of 0.303 g/kg-day, resulting in a mean exposure to inorganic arsenic from rice of 0.028 µg/kg-day. Lifetime daily consumption of white rice at this level is associated with an arsenic cancer risk of 4×10^{-5}, which is higher than the risk posed by unlined historical and inactive landfills.

Table 4.1 90th Percentile Noncancer and Cancer Risk for Previously Excluded Landfills

Constituent	Risk
Cancer	
Arsenic III	7×10^{-6}
Arsenic V	3×10^{-7}
Noncancer	
Arsenic III	0.2
Arsenic V	<0.01
Molybdenum	<0.01
Lithium	Not assessed
Thallium	0.2

Note:
Adapted from Table 3-1 (US EPA, 2023a)

5 Historical and legacy SIs are much smaller than landfills and should have lower risks as a result.

Historical and legacy SIs closely resemble landfills modeled by US EPA in its 2014 risk assessment, as discussed in Section 2.2 (US EPA, 2014), because they do not impound drainable water. However, the size of historical and legacy SIs is very different from that of landfills. The average size of a landfill regulated under the 2015 CCR rule is 120 acres (US EPA, 2015, p. 21303), whereas the average size of "previously excluded" landfills modeled by US EPA is 77 acres. In comparison, the average size of "legacy impoundments" is 33 acres[4] (US EPA, 2023c, p. ES-6) with the average size of "previously excluded" SIs modeled by US EPA being 28 acres. Thus, historical and legacy SIs are on average 2-4 times smaller than landfills.

This difference in the sizes of the two units is relevant because US EPA's risk *vs*. size graph for unlined landfills (Figure 3-2, US EPA, 2023a, p. 3-5; reproduced below as Figure 5.1) shows an approximately linear decline in risk for unit size below approximately 40 acres. Figure 5.1 shows a running 90^{th} percentile of peak risk values for groups of 2,000 units ordered by risk. The 90^{th} percentiles of peak risk results for units grouped by size are plotted in Figure 5.2. Figure 5.2 is consistent in showing a decline in risk with decreasing unit size, and additionally shows that the 90^{th} percentile risk is generally below the acceptable risk threshold of 1×10^{-5} for unit sizes below approximately 40 acres. Since average historical and legacy SIs are smaller than 40 acres, these graphs suggest that the risks from historical and legacy SIs are likely below the acceptable risk threshold of 1×10^{-5}.

In contrast, US EPA's modeled risks from previously excluded SIs (90^{th} percentile cancer risk from arsenic III of 8×10^{-5}) are much higher than the modeled risks from landfills, even though the landfills are much larger. As discussed in Section 3, US EPA's modeling overestimates the risk from historical and legacy SIs by simulating conditions during their operational stage instead of their current conditions (post-operational stage). The difference in the risks from historical and legacy SIs and landfill units provides additional evidence that US EPA's modeling for historical and legacy SIs is unrealistic and significantly overestimates the risk from these units.

[4] US EPA's Regulatory Impact Assessment released with the May 2023 proposed rule reported the average size of legacy impoundments as 33 acres (US EPA, 2023c, p. ES-6), but the new risk assessment erroneously reports an average size of 31 acres (US EPA, 2023a, p. 3-5).

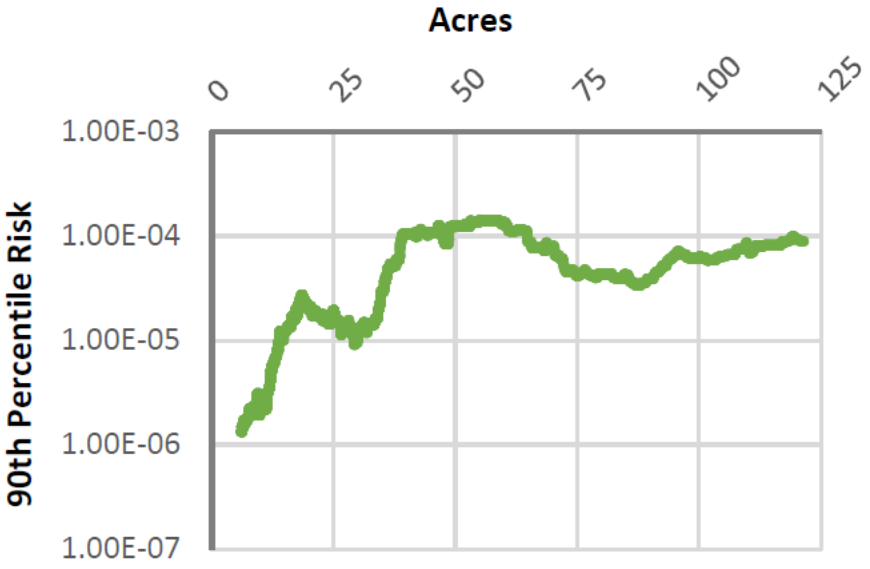


Figure 5.1 Modeled Risk as a Function of Size for Unlined Landfills. Source: Figure 3-2 from US EPA (2023a).

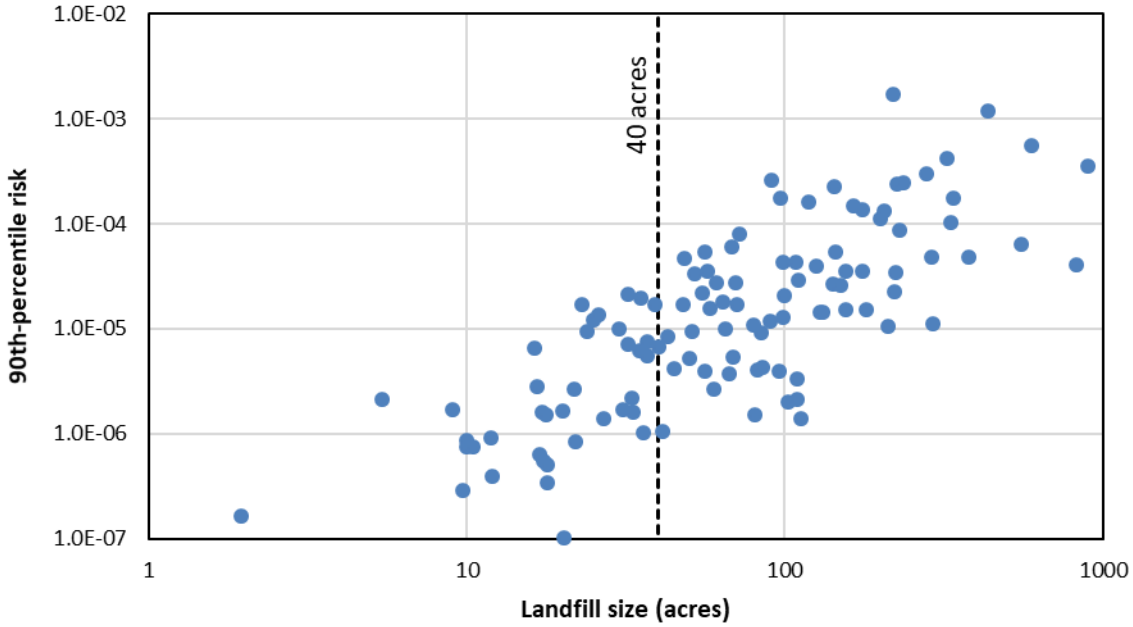


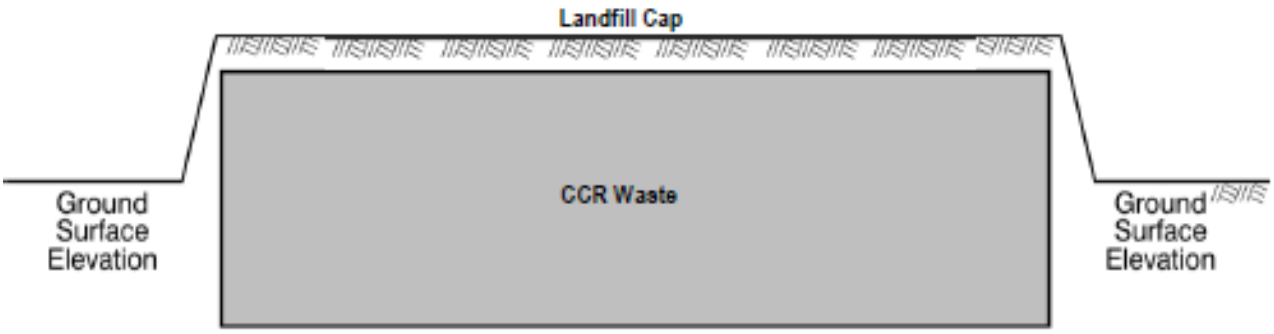
Figure 5.2 Modeled Risk as a Function of Size for Unlined Previously Excluded Landfills. For this figure, unlined previously excluded landfills were aggregated according to their size (since the dataset of unlined previously excluded landfills includes units with 119 discrete sizes). The 90th percentile risk was then calculated for each group with the same landfill size.

6 CCRMU fills are much smaller than landfills and should have significantly lower risks as a result.

The conceptual model for CCRMU fills used by US EPA closely resembles the conceptual model for landfills modeled by US EPA (Figure 6.1) in its 2014 Risk Assessment (US EPA, 2014). Both conceptual models involve CCR placed on or within the soil with a cover on top of the CCR,[5] and both units are modeled to have a square footprint. US EPA also acknowledges the similarity in its conceptual models for these two units:

> CCRMU fill involves placement of dry CCR on or within the soil. In this way, the conceptual model for fills mirrors that of a landfill. (US EPA, 2023a, p. 2-6)

(a)



(b)

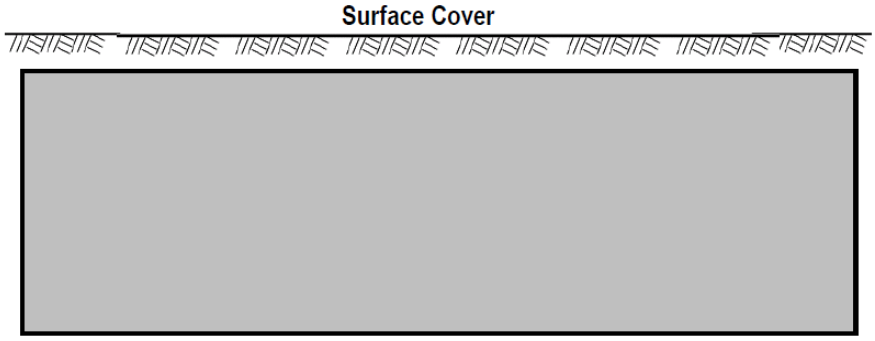


Figure 6.1 (a) Conceptual Model of a Landfill Used by US EPA (b) Conceptual Model of a CCRMU Fill Used by US EPA. CCRMU = Coal Combustion Residual Management Unit; US EPA = United States Environmental Protection Agency. Sources: Figure 2.4 from US EPA (2014a); Figure 2-4 from US EPA (2023a).

However, the sizes of CCRMU fills are typically much smaller than the sizes of landfills. The average size of a landfill regulated under the 2015 CCR rule is 120 acres (US EPA, 2015, p. 21303), whereas the average size of the CCRMU fills modeled by US EPA is 0.9 acres (ranging from 0.0006 to 4.7 acres) based on a

[5] For CCRMU fills, US EPA assumes "at least 2 ft of soil cover" (US EPA, 2023a, p. 4-3).

review of the modeling inputs provided by US EPA (US EPA, 2023a, Attachment C-2). Thus, the CCRMU fills modeled by US EPA are significantly (*i.e.*, approximately 100 times) smaller than landfills. In addition, US EPA conducted a focused analysis[6] intended to evaluate the "full magnitude and extent of" (US EPA, 2023a, p. 4-9) individual groundwater plumes from CCRMU fills occurring at the high-end of the risk range, for which the unit sizes ranged "between 0.2 and 2 acres" (US EPA, 2023a, p. 4-18). The CCRMU fills selected by US EPA as representative of the 90th percentile CCRMU fill risks are also significantly smaller than landfills.

The difference in the sizes of CCRMU fills and landfills is relevant because US EPA described its Figure 3-2 (US EPA, 2023a, p. 3-5) as presenting "the relationship between modeled high-end risks and both total area and mass disposed per area" (US EPA, 2023a, p. 3-4) and showing that "risks start to consistently decline only beyond a certain size, falling below the 10^{-5} around 15 acres" (US EPA, 2023a, p. 3-5).[7] US EPA created its Figure 3-2 (US EPA, 2023a, p. 3-5) by filtering model runs from its 2014 risk assessment (US EPA, 2014) to "focus on model runs that best reflect CCRMU fills" (US EPA, 2023a, p. 3-4), and expects that CCRMU disposal units will "pose a similar magnitude of risk as currently regulated units" (US EPA, 2023a, p. 3-5) because US EPA estimates their average size as 31 acres (US EPA, 2023a, p. 3-5).[8] Since the CCRMU fills modeled by US EPA are less than 5 acres in size, however, US EPA's Figure 3-2 suggests that the risks from CCRMU fills should be significantly below the acceptable risk threshold of 1×10^{-5}.

Instead, US EPA's modeled risks from CCRMU fills are much higher than the modeled risks from landfills, even though the landfills are significantly larger. Figure 6.2 in this report shows US EPA's Figure 3-2 (US EPA, 2023a, p. 3-5), along with the risks modeled for CCRMU fills in the groundwater risk analysis. The 90th percentile risks for CCRMU fills were reported as 2×10^{-4} (Table 4-6 in US EPA, 2023a, p. 4-16), and the CCRMU fills characterizing the 90th percentile risk ranged in size from 0.2 to 2 acres (US EPA, 2023a, p. 4-18). US EPA's modeling predicts risks for CCRMU fills that are more than two orders of magnitude greater than what would be expected from the trend in US EPA's Figure 3-2. These risk results are inconsistent, highlighting the unrealistic nature of the CCRMU fill groundwater risk analysis as discussed in Section 7.

[6] US EPA did not provide the modeling files used for their focused analysis as part of the docket, limiting the ability to review or comment on its work.
[7] US EPA did not provide the data supporting its Figure 3-2 (US EPA, 2023a, p. 3-5) as part of the docket, limiting the ability to review or comment on its work.
[8] US EPA's Regulatory Impact Assessment released with the May 2023 proposed rule reported the average size of CCRMUs as 31 acres (US EPA, 2023c, p. ES-6), but the new risk assessment erroneously reports an average size of 33 acres (US EPA, 2023a, p. 3-5).

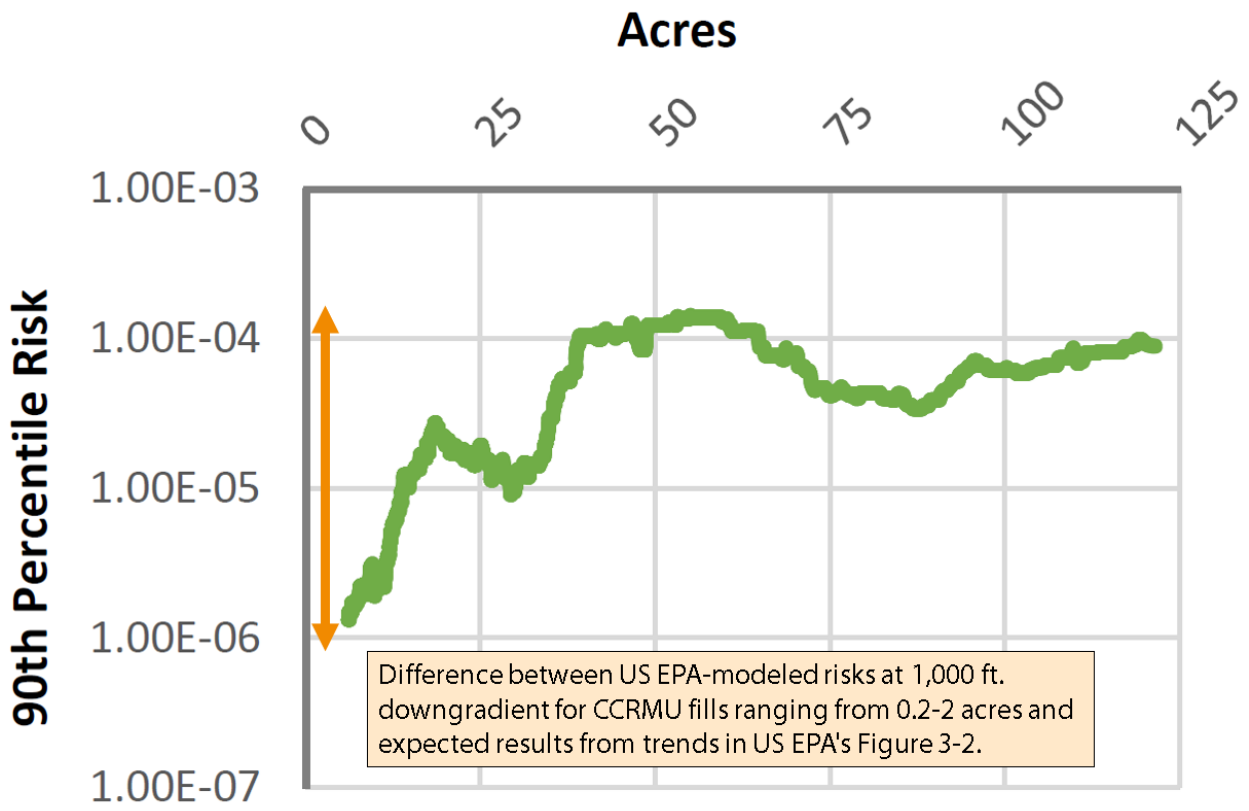


Figure 6.2 Contradictory Risk Results Presented by US EPA (2023a). CCRMU = Coal Combustion Residual Management Unit; US EPA = United States Environmental Protection Agency. Adapted from Figure 3-2 in US EPA (2023a).

7 US EPA's risk assessment for CCRMUs is unrealistic. The approach is fundamentally different from the approach used in its 2014 risk assessment.

US EPA's risk assessment for CCRMUs is unrealistic, and the approach is fundamentally different from the approach used in its 2014 risk assessment (US EPA, 2014). As a result, the calculated risks from CCRMU fills, which do not impound water, are substantially and implausibly higher than the risks calculated for active surface impoundments in 2014 (Table 7.1). In the 2014 risk assessment, the 90th percentile cancer risks for the ingestion of groundwater with arsenic III were 2×10^{-4} for SIs, and 5×10^{-6} for landfills (Table 7.1; US EPA, 2014). The landfill risks were considered below human health criteria, based on a target risk of 1×10^{-5}.

Table 7.1 90th Percentile Risks From Ingestion of Groundwater

Constituent	US EPA (2014)		US EPA (2023a)		
	Surface Impoundments	Landfills	CCRMU Fills 10 ft.	CCRMU Fills 100 ft.	CCRMU Fills 1000 ft.
Cancer risk					
Arsenic III	2×10^{-4}	5×10^{-6}	2×10^{-3}	1×10^{-3}	2×10^{-4}
Arsenic V	1×10^{-5}	7×10^{-8}	1×10^{-3}	6×10^{-4}	8×10^{-5}
Non-cancer risk					
Arsenic III	5	0.1	3	2	0.3
Arsenic V	0.4	< 0.01	1	0.7	0.1
Lithium	2		317	160	27
Molybdenum	2	< 0.01	143	77	14
Thallium	0.9	0.08	164	88	16

Notes:
CCRMU = Coal Combustion Residual Management Unit; ft = Feet; US EPA = United States Environmental Protection Agency.
Sources: US EPA (2014, p. 4-17); US EPA (2023a, p. 4-16).
1) US EPA did not evaluate risk from lithium for landfills in 2014 because of lack of leachate data.

The risks that US EPA calculated for CCRMU fills are unrealistically high in part because:

1. US EPA arbitrarily assumed that, in the future, all institutional and engineering controls would be removed and future residents would drill wells directly into the centerline of a groundwater plume;
2. US EPA focused on the 90th percentile while ignoring results and trends for the majority of units; and
3. US EPA inexplicably modified inputs from its peer-reviewed 2014 risk assessment (US EPA, 2014).

7.1 US EPA assumed future unrestricted residential use with no institutional controls.

US EPA assessed risks posed by CCRMU fills using a residential exposure scenario to evaluate unrestricted future use. The assumption that a former coal-fired power plant industrial site would in the future be used for residential purposes, however, is unrealistic. US EPA's risk assessment guidance is clear that risks should be evaluated based on "reasonably foreseeable future uses" of the site, using realistic assumptions. US EPA guidance does not imply that "reasonably foreseeable" future use includes highly uncertain potential uses thousands of years in the future. In the CCRMU fill assessment, US EPA states that:

> Reliance on a distribution of current receptors was necessary because peak risks sometimes occur after hundreds or thousands of years and there is no reliable way to predict population dynamics that far in the future. It was these risks to future receptors that formed the basis for regulation. (US EPA, 2023a, p. 3-6, emphasis added).

This approach contrasts US EPA's own guidance ("Memorandum to EPA Regional Directors re: Land use in the CERCLA remedy selection process"), which notes that US EPA should ensure the use of "realistic assumptions regarding future land use" (US EPA, 1995, p. 4):

> For example, future industrial land use is likely to be a reasonable assumption where a site is currently used for industrial purposes, is located in an area where the surroundings are zoned for industrial use, and the comprehensive plan predicts the site will continue to be used for industrial purposes. (US EPA, 1995, p. 6, emphasis added).

In particular, US EPA notes that:

> A landfill site is an example where it is highly likely that the future land use will remain unchanged (*i.e.*, long-term waste management area), given the NCP's [National Oil and Hazardous Substances Pollution Contingency Plan's] expectation that treatment of high volumes of waste generally will be impracticable and the fact that EPA's presumptive remedy for landfills is containment. In such a case, a remedial action objective could be established with a very high degree of certainty to reflect the reasonably anticipated future land use. (US EPA, 1995, p. 8, emphasis added).

US EPA ignores its own guidance that long-term waste management areas are "highly likely" (US EPA, 1995, p. 8) to remain industrial in favor of a receptor scenario that there is "no reliable way" (US EPA, 2023a, p. 3-6) to predict, proposing a hypothetical scenario where power plant sites may be used for residential purposes with no institutional controls starting at unspecified times as long as 10,000 years into the future. Given the presence of long-term waste management areas – such as landfills and SIs – at utility sites, it would be more realistic for US EPA to evaluate these sites as industrial sites rather than future residential sites.

Moreover, the approach used in US EPA (2023a) conflicts with multiple other US EPA programs (*e.g.*, Brownfields redevelopment, Superfund) because US EPA (2023a) assumed that all institutional controls (*e.g.*, property use restrictions) and engineering controls would be removed and "the site will be redeveloped in the future for residential use" (US EPA, 2023a, p. 4-1). While US EPA may evaluate risk for an unrestricted use (or residential) scenario, such evaluations would be done for the purpose of establishing the need for institutional controls:

> Especially where there is some uncertainty regarding the anticipated future land use, it may be useful to compare the potential risks associated with several land use scenarios to estimate the impact on human health and the environment should the land use unexpectedly change. The magnitude of such potential impacts may be an important consideration in determining whether and how institutional controls should be used to restrict future uses. (US EPA, 1995, p. 7)

Institutional controls "play a key role in ensuring long-term protectiveness and should be evaluated and implemented with the same degree of care as is given to other elements of the remedy" (US EPA, 1995, p. 10). Institutional controls are not assumed to become obsolete at arbitrary timescales and, in contrast, "institutional controls should be used to ensure that industrial use of the land is maintained and to prevent risks from residential exposures" (US EPA, 1995, p. 9).

7.2 90th percentile modeled values are inappropriately influenced by statistical outliers.

US EPA used the 90th percentile of its probabilistic modeling to evaluate risks and draw conclusions about CCR unit behavior. The 90th percentile model values evaluated by US EPA offer limited insights into the central tendency of the dataset because they are sensitive to extreme values and emphasize the upper tail in non-normally distributed datasets with significant outliers. Therefore, relying solely on the 90th percentile will not represent the majority of sites. In fact, a majority of US EPA's model-predicted arsenic III concentrations fall below the federal Maximum Contaminant Level (MCL) for arsenic III of 10 µg/L. Specifically, for locations that are near the CCRMU fill boundary (*i.e.*, 3 and 10 ft downgradient), approximately 70% of the model-predicted concentrations are below the MCL of 10 µg/L (Figure 7.1). Moreover, as US EPA stated in its risk assessment, the modeled concentrations and risks "decline further away from the fill as the plume has greater opportunity to mix within the aquifer and disperse" (US EPA, 2023a, p. 4-16).

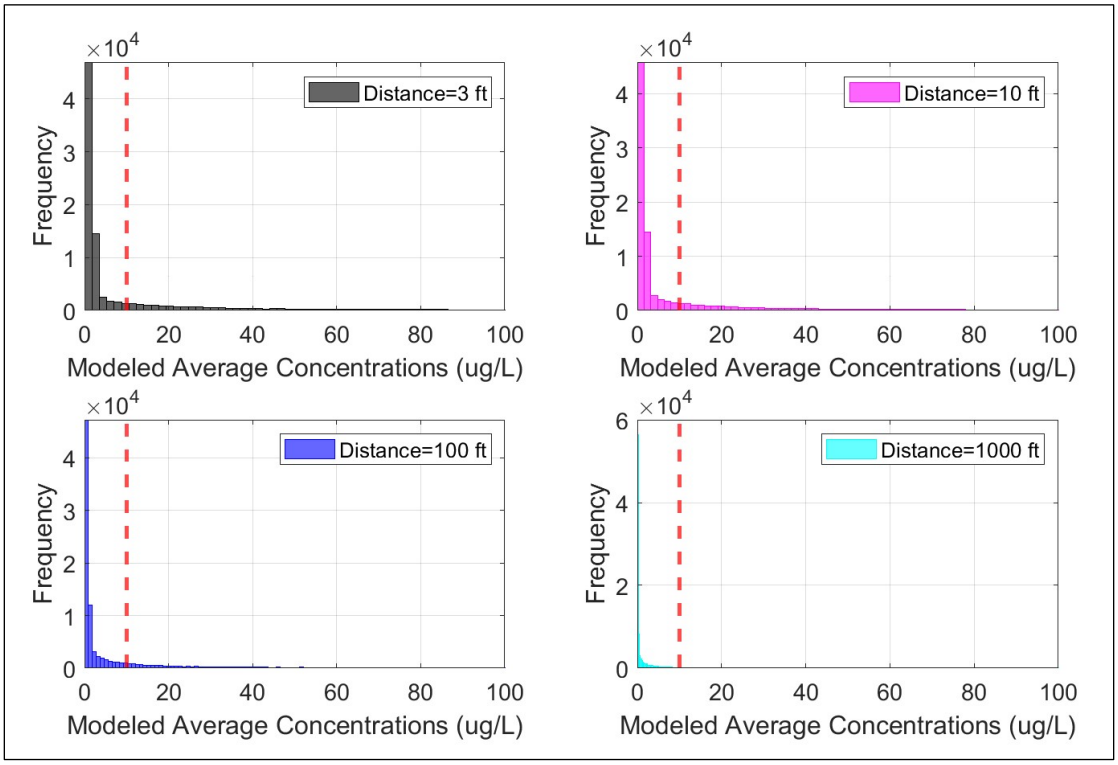


Figure 7.1 Histogram of 26-year Averaged Arsenic III Concentrations at Various Downgradient Distances Along the Centerline of the Plume. The vertical red dashed line shows the US EPA MCL of 10 µg/L. US EPA = United States Environmental Protection Agency; MCL = Maximum Contaminant Level.

7.3 US EPA's modeling assumptions significantly inflate risks for CCRMU fills.

US EPA's unrealistic and flawed future land use assumptions have significant numerical implications for the predicted risks from CCRMU fills. US EPA's 2014 risk assessment (US EPA, 2014) was developed by addressing "comments received from both independent external peer reviewers and public commenters on the methodology, data sources and assumptions used by the Agency" (US EPA, 2014, p. 1-1) where comments were provided on three Notices of Data Availability and a full draft risk assessment (US EPA, 2010) published prior to the final risk assessment. The new risk analysis (US EPA, 2023a) that US EPA drafted in response to comments submitted in July of this year (*e.g.*, Gradient, 2023, on behalf of USWAG) changes many of the parameters of the 2014 risk assessment to accommodate US EPA's new, unrealistic land use scenarios.[9]

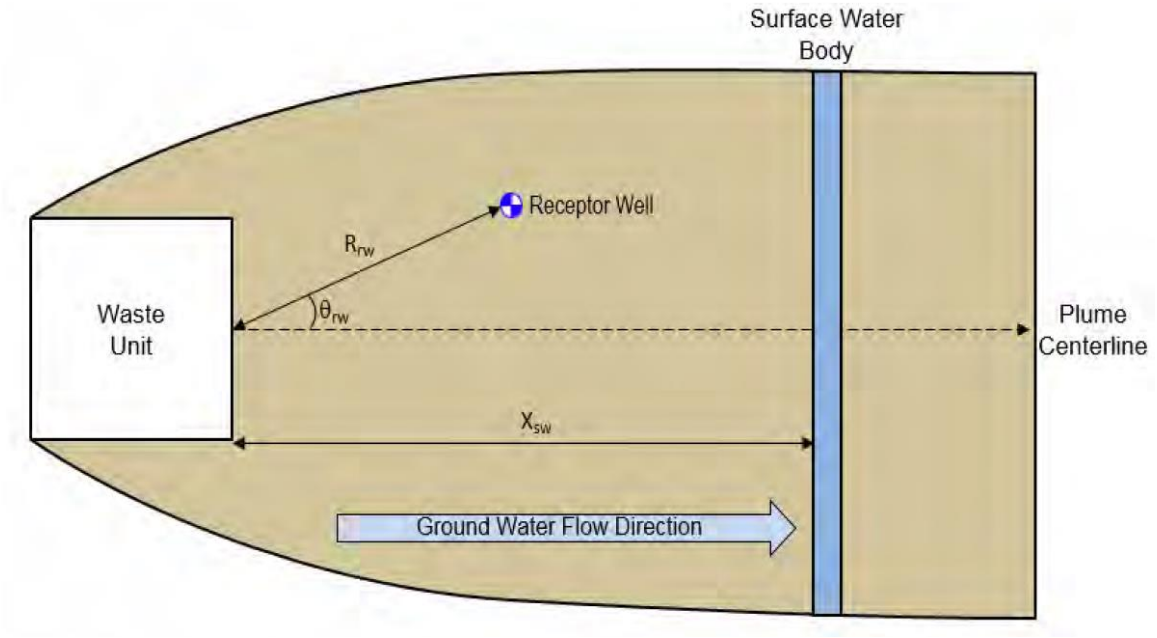
- In US EPA (2014), "[t]o capture the highly exposed individual (HEI), receptor wells and surface water bodies were placed probabilistically within the areal extent of the ground water plume" (US EPA, 2014, p. 4-11). In US EPA (2023a), receptor wells were limited to locations along the plume centerline within 1,000 ft. of a CCRMU fill. Figures 7.2a and 7.2b show the changes in receptor well location implemented by US EPA. US EPA (2014) restricted potential receptors to

[9] US EPA denied requests to extend the comment period on their Notice of Data Availability in part because it posits that its modeling approach was similar to the approach used in US EPA (2014) (see discussion in US EPA, 2023d). As described in these comments, there are significant methodology and input differences implemented by US EPA that (1) unrealistically inflate risks for CCRMU fills and (2) warrant additional time for review.

within the plume to be conservative, and then evaluated the 90th percentile risks from the highly exposed individuals. US EPA (2023a) unrealistically restricts receptors to being located only on the plume centerline, and then additionally evaluates the 90th percentile risks from the restricted subset of results. Actual groundwater pumping wells that could be installed under future land use scenarios create capture zones that draw water from areas that could include, but would not be restricted to, the plume centerline. US EPA has not quantified the impact of changing the modeling approach from US EPA (2014) nor provided commenters with sufficient time to evaluate the impact.[10] As discussed in Section 6 and shown in Figure 6.2, based on the sizes of CCRMU fills, risks for CCRMU fills would be expected to fall below 10^{-6} using the modeling approach presented in US EPA (2014); whereas the modified assumptions used by US EPA (2023a) result in modeled risks above 10^{-4}. Thus, US EPA's modified assumptions and inputs may result in changes to risk results that exceed multiple orders of magnitude.

[10] US EPA (2023d) is factually inaccurate in claiming that appendices C-1 and C-2 to the draft risk assessment were posted "[o]n the same day" US EPA (2023d, p. 3) as the other materials on the docket and that "the public was unable to access these files for only a few hours on the first day" US EPA (2023d, p. 4). The NODA was published in the Federal Register, and materials were posted to the docket, on November 14. On November 15, Gradient contacted US EPA to obtain the missing files. US EPA notified Gradient that the files were posted to US EPA's website on November 16.

(a)



(b)

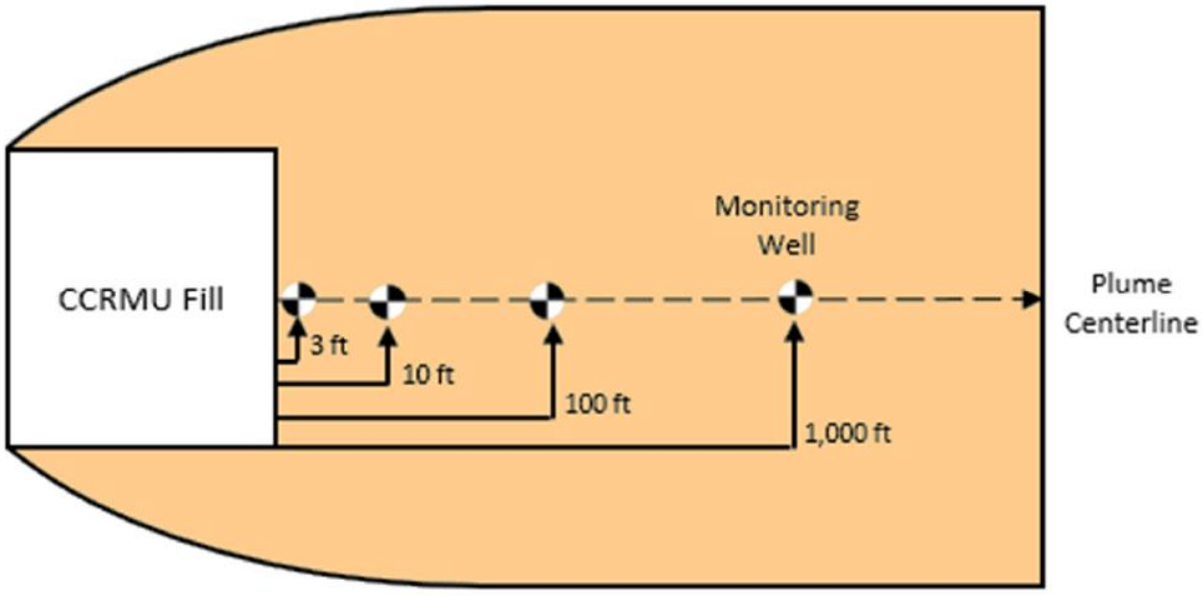


Figure 7.2 (a) Modeled Receptor Well Location From Figure 4-5 in US EPA (2014) (b) Modeled Receptor Well Location From Figure 4-2 in US EPA (2023a). CCRMU = Coal Combustion Residual Management Unit; US EPA = United States Environmental Protection Agency.

- US EPA (2014) recognized that "[i]t is common for coal-fired utilities to be located near water bodies" and modeled "the interception of ground water by surface water bodies, which is accounted for in the revised risk assessment to provide a more accurate mass balance of constituent mass during transport" (US EPA, 2014, p. ES-5). US EPA (2023a) did not include the interception of surface water in the risk assessment to provide a more accurate mass balance. US EPA (2023a)

argued that CCRMU fills "are not subject to the same siting considerations as landfills and impoundments" (US EPA, 2023a, p. 4-7) and removed surface water considerations from the risk assessment. This contrasts US EPA's description of the relevant land areas being highly valuable for residential purposes because "[m]any of these utilities are located along surface water bodies" (US EPA, 2023a, p. 2-7). US EPA both describes the land as highly valuable for residential developments because of its surface water presence, yet also removes surface water considerations from its risk assessment modeling. US EPA has not quantified the impact of changing the modeling approach from US EPA (2014) nor provided commenters with sufficient time to evaluate the impact. As discussed in Section 6 and shown in Figure 6.2, based on the sizes of CCRMU fills, risks for CCRMU fills would be expected to fall below 10^{-6} using the modeling approach presented in US EPA (2014); whereas the modified assumptions used by US EPA (2023a) result in modeled risks above 10^{-4}. Thus, US EPA's modified assumptions and inputs may result in changes to risk results that exceed multiple orders of magnitude.

- US EPA assumed that all engineering controls, including caps, would be removed in the 2023 risk analysis (US EPA, 2023a, p. 4-1). This assumption is inconsistent with the concept of a final cover system being an acceptable closure plan as described in the Federal CCR Rule (US EPA, 2015), or with the concept of engineering controls as a site remedy option in general.
    - The assumption that caps would be removed increases the infiltration rate relative to reasonably anticipated future land use conditions. Without any cap or cover, US EPA set infiltration rates through CCRMU fills equal to the regional recharge rate (*i.e.*, assuming that no overlying caps or any other structures would be present). Moreover, CCRMU fills may be present for a variety of purposes, including as CCR berms designed to promote runoff, rather than infiltration. US EPA inappropriately uses one conceptual site model to account for the wide variety of CCRMU fills that may exist, and many CCRMU fills may be designed such that infiltration is decreased relative to surrounding soil conditions. Overestimated infiltration rates result in overestimates of mass entering the aquifer, and overestimated groundwater concentrations and risks.

US EPA's modifications to the 2014 risk assessment (US EPA, 2014) result in unrealistically inflated risk calculations for CCRMU fills.

8 US EPA's modeled concentrations for CCRMU fills are inconsistent with concentrations measured at larger active units.

US EPA used EPACMTP to evaluate risks from CCRMU fills and reported model-predicted concentrations of arsenic III, arsenic V, lithium, molybdenum, and thallium at the fill boundary. US EPA's results show that the model-predicted 90th percentile concentrations were many times higher than the GWPS for all five constituents with exceedance ratios ranging from 9 (for arsenic V) to 349 (for lithium), as shown in Table 4-5 of the Risk Assessment (US EPA, 2023a) and in Table 8.1 (below). However, these results are inconsistent with monitoring well data for active SIs and landfills that are much larger in size than the CCRMU fills evaluated by US EPA.

In its new risk assessment, US EPA has not relied on any of the measured groundwater data that has been collected around CCR landfills and SIs over the past eight years. However, the Environmental Integrity Project (EIP) compiled groundwater monitoring data (reported between 2018 and 2022) from 302 sites with active units (SIs and landfills) regulated under the 2015 CCR Rule (EIP, 2022; Earthjustice, 2022). EIP calculated ratios by which average concentrations at each well downgradient of these units exceeded the GWPS (*i.e.*, the fold increase over the GWPS for each Appendix IV chemical) and reported the highest exceedance ratio for each constituent. Gradient compared the exceedance ratios (and resulting concentrations) reported by EIP, without independently verifying or evaluating the data, to US EPA's model-predicted exceedance ratios (and resulting concentrations) for CCRMU fills.

Based on data reported by EIP, which was not independently verified or evaluated, the 90th percentile GWPS exceedance ratios for arsenic, lithium, molybdenum, and thallium are 16, 21, 10, and 1, respectively; ratios much lower than those calculated by US EPA in the CCRMU fill risk assessment (Table 8.1). These ratios based on the EIP data were calculated by conservatively assuming an exceedance of 1 (*i.e.*, concentrations equal to the GWPS[11]) at sites for which an exceedance was not reported (*i.e.*, an assumption that will over-inflate the calculated EIP concentrations).

To provide further perspective on this issue, US EPA's modeled concentrations for CCRMU fills were compared to the measured data reported by EIP (as opposed to the exceedance ratio). Because EIP's exceedance ratios are based on the average concentration in the well with the highest concentration, and US EPA model results reflect the peak concentration, we compared the concentration data in two different ways to ensure that we did not overstate differences in the two datasets. These comparisons are shown in Tables 8.2 and 8.3.

- Table 8.2 presents comparisons of the 90th percentile model-predicted <u>peak</u> concentrations for CCRMU fills to the 90th percentile measured average concentrations for active SIs and landfills considered by EIP.

[11] For molybdenum, EIP calculated exceedances by comparing measured concentrations to a "safe level" of 40 µg/L instead of the GWPS of 100 µg/L used by US EPA (EIP, 2022; Earthjustice, 2022). Thus, assuming an exceedance of 1 at sites for which an exceedance was not reported by EIP resulted in molybdenum concentration of 40 µg/L. All molybdenum exceedances reported in this section (*e.g.*, Table 8.1) were adjusted to show fold increase over the GWPS of 100 µg/L by multiplying EIP's exceedance ratios by 0.4.

- Table 8.3 presents comparisons of the 90th percentile model-predicted 1-year average concentrations for CCRMU fills to the 90th percentile measured average concentrations for active SIs and landfills considered by EIP.

As shown in Tables 8.2 and 8.3, US EPA's 90th percentile modeled concentrations are much higher than the measured concentrations of lithium, molybdenum, and thallium at active regulated units. This comparison highlights the implausibility of US EPA's modeled concentrations, especially because the measured data compiled by EIP were for units much larger than CCRMU fills – a feature that is expected to cause higher constituent concentrations in groundwater. Specifically, the average size of an SI regulated under the 2015 CCR rule is 50 acres (US EPA, 2015, p. 21303) and the average size of a landfill regulated under the 2015 CCR rule is 120 acres (US EPA, 2015, p. 21303). In comparison, the size of CCRMU fill units modeled by US EPA ranges from 2.3 m^2 (0.0006 acres) to 4.7 acres with an average size of 0.9 acres based on the modeling inputs provided by US EPA (US EPA, 2023a, Attachment C-2). In addition, many of the active SIs considered by EIP are likely to have impounded water – another feature that would cause higher constituent concentrations in groundwater because of the hydraulic head associated with the impounded water. Yet US EPA's modeling predicts higher concentrations for the smaller CCRMU fills with no impounded water as compared to active SIs and landfills. This comparison indicates that US EPA's modeling for CCRMU fills is overly conservative and unrealistic.

While these comparisons provide useful perspective on modeled *vs* measured concentrations, it is important to note that we have not verified the accuracy of EIP's evaluation by comparing EIP's results with the reported data from each site.

Table 8.1 GWPS Exceedance Ratios for CCRMU Fills and Active Regulated Units

Constituent	90th Percentile – Model-Predicted Exceedance Ratios for CCRMU Fills (US EPA)	90th Percentile – Measured Exceedance Ratios for Active SIs and Landfills (EIP)
Arsenic	24	16
Lithium	349	21
Molybdenum	184	10
Thallium	19	1

Notes:
CCRMU = Coal Combustion Residual Management Unit; EIP = Environmental Integrity Project; SI = Surface Impoundment; US EPA = United States Environmental Protection Agency.
1) EIP did not differentiate between trivalent and pentavalent arsenic and reported values for total arsenic. US EPA reported values are for arsenic III.
2) EIP's exceedance ratios for molybdenum were multiplied by a factor of 0.4 because the "safe level" of 40 µg/L used by EIP is different from the GWPS of 100 µg/L used by US EPA.
3) For the calculation of 90th percentile exceedance ratios, an exceedance ratio of 1 was conservatively assumed for sites that did not have an exceedance ratio reported for a particular constituent. These include sites for which EIP reported that there were no exceedances and sites for which EIP did not evaluate exceedances.

Table 8.2 Concentrations (µg/L) at the Edge of CCRMU Fills and Active Regulated Units

Constituent	90th percentile – Model-Predicted Groundwater Concentrations at CCRMU Fills (US EPA)	90th percentile – Measured Groundwater Concentrations at active SIs and landfills (EIP)
Arsenic	235	160
Lithium	13,960	840
Molybdenum	18,380	1,000

Constituent	90th percentile – Model-Predicted Groundwater Concentrations at CCRMU Fills (US EPA)	90th percentile – Measured Groundwater Concentrations at active SIs and landfills (EIP)
Thallium	39	2

Notes:
CCRMU = Coal Combustion Residual Management Unit; EIP = Environmental Integrity Project; SI = Surface Impoundment; US EPA = United States Environmental Protection Agency.
1) EIP did not differentiate between trivalent and pentavalent arsenic and reported values for total arsenic. US EPA reported values are for arsenic III.
2) The 90th percentile concentrations for CCRMU fills are calculated using the modeling results provided by US EPA (US EPA, 2023a, Attachment C-2).

Table 8.3 Comparison of 1-Year Average Concentrations (µg/L) at the Edge of CCRMU Fills With Average Concentrations (µg/L) Measured at Active Regulated Units

Constituent	90th Percentile of Modeled 1-Year Average Concentration for CCRMU Fills (US EPA)	90th Percentile of Measured Average Concentration for Active Regulated Units (EIP)
Arsenic	199	160
Lithium	13,740	840
Molybdenum	15,270	1,000
Thallium	34	2

Notes:
CCRMU = Coal Combustion Residual Management Unit; EIP = Environmental Integrity Project; US EPA = United States Environmental Protection Agency.
1) EIP did not differentiate between trivalent and pentavalent arsenic and reported values for total arsenic. US EPA reported values are for arsenic III.
2) The 90th percentile concentrations for CCRMU fills are calculated using the modeling results provided by US EPA (US EPA, 2023a, Attachment C-2).

9 US EPA's risk conclusion for CCRMU fills has significant implications for offsite beneficial use of CCPs.

The 2015 CCR rule (US EPA, 2015) supports the beneficial use of CCRs with the statement that "Beneficial use of coal ash can produce positive environmental, economic and performance benefits such as reduced use of virgin resources, lower greenhouse gas emissions, reduced cost of coal ash disposal, and improved strength and durability of materials" (US EPA, 2023e). The 2015 CCR rule specifically states that CCRs can be used as a substitute for natural materials in construction and as a structural fill. The 2015 CCR rule, as well as subsequent guidance, defines the beneficial use of CCR by a series of criteria and sets out a process for evaluating beneficial uses (US EPA, 2016**)**, including structural fills, which are similar to the CCRMU fills scenario evaluated in the current risk assessment. Since the release of the 2015 CCR rule, numerous beneficial uses, including structural fills, have undergone rigorous environmental risk evaluations and have received approvals from state agencies attesting to their safety and suitability for such applications. For example, CCRs have been frequently used as fills in highway embankments, surface impoundment closures, mine fills, soil additives, *etc*. However, the current risk assessment overestimates the risks associated with CCRMU fills, and may cause public concerns about the potential negative impact of beneficial use applications. This overly conservative nature of the risk assessment for CCRMU fills could undermine the credibility and approvals granted to other CCR beneficial uses by state agencies. This has the potential to disrupt established practices and investments in beneficial use projects that have been deemed safe and environmentally sound.

10 The 5-mile radius used by US EPA as the relevant area of interest around a CCRMU fill varies from the 2014 risk assessment and is not consistent with other environmental justice evaluations.

In its risk assessment for CCRMU fills, US EPA uses a 5-mile radius around a facility as the area of interest. Although the 5-mile radius assumption does not impact risk estimates, it does appear that it is being used to justify risk conclusions. Using a 5-mile radius, however, is arbitrary and inconsistent with prior US EPA CCR evaluations.

US EPA notes that the 5-mile radius is used "to identify relevant hydrogeologic and meteorologic conditions" within and around a facility (US EPA, 2023a, p. 4-7). A 5-mile radius, however, is not relevant to a groundwater assessment. In fact, this assumption contradicts the assumption made in US EPA's draft Regulatory Impact Assessment (RIA), released in support of its May 2023 proposed rule (US EPA, 2023b), which states that "one and three-mile radii represent the populations likely to be affected by groundwater releases from both landfills and impoundments" (US EPA, 2023c, p. 5-18). The 5-mile radius assumption is also inconsistent with the 2014 CCR risk assessment, which also used a one-mile radius of interest.

US EPA also states that this 5-mile "radius was set to match the scale commonly considered for evaluation of impacts to environmental justice communities" (US EPA, 2023a, p. 4-7), but it does not provide any references to support this statement. We are unaware of a 5-mile radius being used in an environmental justice assessment and, similar to the comment above, just a few months earlier, US EPA characterized potential environmental justice-related issues using a one mile radius in the RIA.

It is unclear why the radius of interest changed from one to five miles other than to inflate the number of people living in the vicinity of CCRMUs. US EPA states, "the facilities considered in this risk assessment already have 38,000 individuals living in a five-mile radius on average, and over 100,000 in extreme cases" (US EPA, 2023a, p. 2-7). Based on statistics provided in the draft RIA, however, the average population located within 1 and 3 miles of sites with CCRMUs is 760 and 12,500, respectively (US EPA, 2023c, p. 5-20) – a population significantly smaller than estimated by US EPA in the risk assessment for CCRMU fills.

11 US EPA's radiological modeling predicts radon risks consistent with background and much lower risks from gamma radiation. US EPA then appends an unrelated, oversimplified analysis to conclude risk exceedances.

11.1 US EPA models low risks for a future resident scenario exposed to CCRMU fill, despite several issues that overestimate exposure.

US EPA presents a radiological risk assessment for a future resident living in a house built directly atop a CCRMU fill (US EPA, 2023a, p. 5-1). The main assessment evaluates inhalation exposures to radon, as well as exposures to gamma radiation. In the analysis, "moderate" inputs are used, resulting in a total risk estimate of 1.6×10^{-5} (US EPA, 2023a, Attachment C-4). US EPA concludes that "radon is the primary driver of risk in this scenario," with a risk of 1.55×10^{-5} (US EPA, 2023a, p. 5-10, Attachment C-4). A sensitivity analysis varying several inputs (*e.g.*, exposure duration, time spent outdoors, and cover depth) was also conducted, and showed risks in the range of 1.0×10^{-6} to 7.8×10^{-5} (US EPA, 2023a, Attachment C-4).

Although these risk results are within US EPA's acceptable risk range of 1×10^{-6} to 1×10^{-4}, the high end is slightly above the risk target that US EPA set for this risk assessment (*i.e.*, 1×10^{-5}). Despite this, US EPA does not retain consideration of the primary driver – radon – because "the potential for radon emanation and associated risk from CCR is not distinguishable from that of background soils" (US EPA, 2023a, p. 5-11). This parity is largely due to the fact that "despite higher radium activities, radon emanation from CCR is generally expected to be lower than from background soil" (US EPA, 2023a, p. 5-11). In other words, even at similar concentrations, radon is less likely to escape particles of CCR than particles of soil.

The risk from gamma radiation that US EPA models for the moderate, future resident scenario is much lower than radon: 5.4×10^{-7} (US EPA, 2023a, pp. 5-11, 5-12). Cover depth (*i.e.*, the total distance modeled between the CCRMU fill and receptor) is the primary influence on risk in the sensitivity tests (US EPA, 2023a, p. 5-8). US EPA tests total cover depths of 0.3 meters to 1.2 meters (US EPA, 2023a, p. 5-2). The highest gamma risk US EPA models in any sensitivity test (equal to 1.11×10^{-5}) is for the scenario with 0.3 meters of cover (US EPA, 2023a, Attachment C-4). Nonetheless, US EPA does not assert that its model findings merit regulation of this scenario, in which a future resident lives atop a CCRMU fill. US EPA does separately consider a scenario in which a future resident lives atop CCR that has been previously disturbed and mixed into soil at the ground surface. This second scenario is discussed in Section 11.2, below.

Although risks were considered consistent with background under this scenario, it is worth noting that several of US EPA's input selections overestimate values that would be appropriate for modeling a future resident scenario, for example:

- US EPA's future resident scenario models a new house being built directly atop a CCRMU fill area. However, US EPA uses a high-end foundation diffusion coefficient that assumes the presence of cracked concrete (US EPA, 2023a, p. 5-7). Use of this coefficient increases the modeled radon risk by approximately three-fold in the sensitivity analysis (US EPA, 2023a, Attachment C-4). There is insufficient support in the draft risk assessment to reasonably consider a scenario in which a new house would be built, weather, and age to develop a cracked brick and concrete foundation that then permits radon transport.
- The air changes per hour (ACH) US EPA models range from 0.18 to 1.26 ACH, and are based on national data for the existing housing stock presented in the 2011 Exposure Factors Handbook (US EPA, 2023a, pp. 5-2, 5-8). Varying the coefficient to 0.18 ACH (rounded to 0.2 ACH) increases the modeled radon risk by approximately three-fold in the sensitivity analysis (US EPA, 2023a, Attachment C-4). However, that lower end range does not appropriately capture a future resident scenario. For example, current design standards include a minimum of 0.35 ACH to maintain sufficient indoor air quality (US EPA, 2023f). A future house design would likely have air handling consistent with such design standards.

Finally, US EPA does not adequately account for background radionuclide concentrations in soil when presenting risk results. While they note that radon risks from CCR are not distinguishable from background, they make no such comparison for risks from gamma radiation (US EPA, 2023a, p. 5-11). Such a comparison is particularly important when considering gamma radiation risks with thinner amounts of cover soil (*e.g.*, the lower-end sensitivity test with 0.3 meters of fill). US EPA's model uses 50th percentile radium activity concentrations for CCRMU fill of 6.7 pCi/g (Ra-226 + Ra-228), derived from data in COALQUAL (US EPA, 2023a, p. 5-4).[12] However, they do not account for background radium concentrations in soil, which average 2.1 pCi/g (Ra-226 + Ra-228) (as noted elsewhere in the draft risk assessment (US EPA, 2023a, p. 6-11)). Similarly, the Electric Power Research Institute (EPRI) has estimated background soil concentrations of 2.36 pCi/g (Ra-226 + Ra-228) at plants associated with the Tennessee Valley Authority (TVA) (EPRI, 2022, p. 3-9). Thus, the risks posed by radionuclides present in background soil are meaningful and should be accounted for in the risk assessment (*i.e.*, the risk results should evaluate the risks above background).

11.2 US EPA appends a generic and flawed mixing analysis for a new exposure scenario to allege risks meriting regulation.

As described in Section 11.1, US EPA's main radiological assessment concludes that radon risks are indistinguishable from background. However, US EPA develops an entirely separate analysis in Section 6.2.2 of the draft risk assessment to address a new exposure scenario: potential mixing of CCR with surface soil (US EPA, 2023a, pp. 6-9 to 6-11). US EPA evaluates a 100 m^2 area of mixture, with no clean soil cover (US EPA, 2023a, pp. 6-10). This new scenario therefore effectively assumes that CCRMU fill would be disturbed in the subsurface, fully mixed with soil, then deposited onto the surface in a 100 m^2 area directly accessed by future residents, under the foundation and in the yard. The scenario assumptions are poorly defined and untested, with no discussion of input selection or uncertainties. Yet the results from this scenario drive US EPA's findings in the draft risk assessment that regulation is needed.

US EPA claims it chose not to model this new scenario, as was done in the main analysis, because it would "require additional assumptions about the degree of disturbance and mixing, which would inject additional uncertainty into the calculated risks" (US EPA, 2023a, p. 6-9). Instead, they develop a separate mixing analysis by relying on health-based benchmarks for the Th-232 and U-238 decay chains, as well as arsenic,

[12] US EPA reports the average value for CCR to be 7.7 pCi/g (US EPA, 2023a, p. 6-11).

then scaling the results to concentrations found in undiluted CCR in the COALQUAL database (US EPA, 2023a, p. 6-10). The results from this analysis (*i.e.*, the progressive risk displayed in Figure 6-2 in US EPA, 2023a) is essentially linear from 0% to 100% undiluted CCR, assuming the mixture is completely exposed at the surface beneath a future resident. Further, the disturbed area would need to remain exposed with no cover placed on it as part of the building or landscaping process.

This new scenario is not considered or modeled sufficiently to determine if results are reasonable. For example, US EPA could have tested the upper-end scenario of undiluted CCR exposure by running 0-meter soil cover in their main modeling scenario sensitivity test (Section 5 of the draft risk assessment). This test would provide a more conservative limit of the new mixing scenario, yet otherwise allow for the same scenario-specific assumptions that US EPA originally modeled. Importantly, testing the model with an input of 0 meters cover would gauge the reasonableness of its new mixing analysis introduced in Section 6.2.2 of the draft risk assessment.

There are several issues with the new scenario mixing analysis that have a meaningful effect on the risks calculated by US EPA:

- The radiological benchmarks US EPA uses come from a generic online calculator of Preliminary Remediation Goals (PRGs) that requires no scenario-specific inputs, other than US EPA modifying the disturbed area size to 100 m^2. The Residential Soil PRGs are intended for soil (US EPA, 2020) and are not appropriate for undiluted CCRMU fill. Notably, US EPA's use of a PRG calculator instead of the RESRAD model means that this mixing analysis does not consider the effect of the radon emanation coefficient. Even if soil were mixed with CCR fill, the ability of radon to emanate from the CCR particles in the first place would be unaffected at the particulate level. The US EPA mixing analysis in Section 6.2.2 of the draft risk assessment contains none of the custom modifications for a future resident scenario that are otherwise addressed in the main modeling assessment (US EPA, 2023a).
- The PRGs (and thus US EPA's risk calculations) are sensitive to scenario inputs. There are options to include specific information in the PRG calculator that US EPA does not utilize, even though it does so for the main modeling analysis (US EPA, 2020). For example, adding just 50 cm of clean soil cover under a future building raises the PRGs to less stringent values of 0.5 pCi/g for Th-232 and 0.528 pCi/g for U-238, as compared with the currently-used values of 0.127 pCi/g and 0.162 pCi/g, respectively, that US EPA uses in the draft risk assessment. Changing this single input reduces the scaled risks by more than two-fold at each of the mixing percentages considered. Similarly, applying an exposure duration of 9 years (as US EPA does in its initial, moderate scenario), reduces the stringency of the PRGs to 0.36 pCi/g for Th-232 and 0.44 pCi/g for U-238, and scales risks down again by more than two-fold.
- US EPA does not account for the portion of calculated risks contributed by background radionuclides. As noted above, the background concentrations in soil are not negligible compared to CCR. For example, background radium concentrations in soil are approximately 2.1 to 2.36 pCi/g (Ra-226 + Ra-228), as compared with the 50th percentile concentration of 6.7 pCi/g that US EPA uses for modeling undiluted CCRMU fill. In its new mixing analysis, US EPA should incrementally calculate risks from baseline to reflect the difference from background, rather than attributing all risk from mixing to the undiluted fill.
    - Notably, US EPA bases its mixing analysis on radionuclide PRGs that are well below the mean concentrations found in background soil (US EPA, 2023a, pp. 6-10, 6-11). US EPA also notes that the average activity of Ra-226 + Ra-228 in CCR is more than 5 pCi/g above background, used to rationalize their finding of risk to future residents (US EPA, 2023a, p. 6-11). However, they do not adjust this comparison to account for the mixture alleged

in the new, disturbed fill scenario. The difference between background soil and soil mixed with 8 to 17 percent CCRMU fill (as described on page 6-10, for example) would not exceed 5 pCi/g. It is not appropriate to use undiluted CCRMU fill as a basis for the comparison to background. The new, disturbed fill scenario inherently assumes fill would already be mixed into soil with existing background concentrations of arsenic and radionuclides, and associated risks.

- For this mixing analysis, US EPA uses 50th and 90th percentile values of Th-232 and U-238 from COALQUAL to represent CCRMU fill, despite acknowledging that thorium activity concentrations are uniquely overestimated in the COALQUAL database (US EPA, 2023a, pp. 6-4 to 6-5). The COALQUAL values for Th-232 are 20% higher than the measured 50th percentile fly ash values and 85% higher than the measured 90th percentile fly ash values.[13] Similarly, the COALQUAL values for U-238 are 30% higher and 19% higher than measured fly ash values for the 50th and 90th percentiles, respectively. These differences would have meaningful, downward effects on risks estimated in US EPA's mixing analysis, given that the risks are calculated simply by scaling the COALQUAL activity concentrations to the PRGs.

Overall, US EPA's mixing analysis is very simplistic and does not consider uncertainty in the hypothesized scenario or risk outputs. The only variable US EPA considers is the amount of mixing with buried CCRMU fill, although it still assumes that mixing is 100% complete and results in direct exposure on the surface beneath future residents. Despite these limitations, the risks US EPA derives from this analysis are the only radiological risks claimed above 1×10^{-4} in the draft risk assessment (US EPA, 2023a, pp. 6-12, 7-2).

[13] Note that the units for Th-232 and U-238 concentrations in Table 6-1 of the draft risk assessment appear to be mislabeled as mg/kg, but they appear as pCi/g in other sections of the draft risk assessment (US EPA, 2023a, pp. 5-3, 6-3, 6-4).

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Attachment B

Examples of State/Local Zoning Restrictions or Other Institutional Controls on Property Redevelopment

1. Zoning Restrictions in Montana for the Colstrip Plant: In Montana, zoning is implemented at the local level upon the election of the locality. The City of Colstrip has enacted zoning regulations that prohibit the Colstrip power plant from being re-developed as a residential property. Specifically, the Colstrip plant is zoned as its own power generation district.[1] Residential uses are not authorized within the power generation district.[2] The only permitted development in the power generation district is development related to electric power generation.[3] The purpose of the power generation district is to ensure that the "power generation plants" operate "without interference from any other use."[4] Thus, the City of Colstrip's local zoning regulations presently prevent the power plant site property from being developed or redeveloped as residential property.

2. State Institutional Controls in Pennsylvania and Maryland Regarding Re-Development of Industrial Properties: In both Pennsylvania and Maryland (states in which EPA has identified multiple legacy impoundments or CCRMUs), state laws would prevent the redevelopment of power plant properties without remediation or other types of controls.

   For example, Pennsylvania's Land Recycling Program[5] ("Act 2") establishes environmental remediation standards for cleanups related to specific environmental laws. Remediation and the resulting liability relief provided by Act 2 is specific to the contamination identified at each specific site or sites, and the future use defined for the site, such as non-residential use or one that prohibits the use of groundwater. In addition, Pennsylvania has specific regulations that provide for such property use restrictions under its Uniform Environmental Covenants Act ("UECA").[6] The UECA provides a standardized process for creating, documenting and assuring the enforceability of activity and use limitations on contaminated sites. Under the UECA, an environmental covenant recorded on the property will be required whenever an engineering or institutional control is used to demonstrate the attainment of a remediation standard for any cleanup conducted under an applicable Pennsylvania environmental law.[7]

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[1] Colstrip Zoning Regulation §8-4J.
[2] *See id.* at §8-4J-2 (Ord. 01-07, 12-11-2001).
[3] *Id.* (restricting authorized development to "building, structure, facility, equipment, use or activity associated with electric power generation.").
[4] Colstrip Zoning Regulation Section 8-4J-1 (Ord. 01-07, 12-11-2001).
[5] 25 Pa. Code. § 250 et. seq.
[6] 25 Pa. Code § 253 et. seq.
[7] Pennsylvania Department of Environmental Protections, Uniform Environmental Covenants Act (last visited Dec. 10, 2023), https://www.dep.pa.gov/Business/Land/LandRecycling/Pages/Uniform-Environmental-Covenants.aspx.

Similar to Pennsylvania, Maryland also has enacted a Uniform Environmental Covenants Act ("UECA").[8]

3. State Requirements in Kentucky to Notify Potential Purchasers regarding Past Disposal Activities: In Kentucky, another state where EPA's updated list includes potential legacy impoundments and CCRMUs at member company facilities, state regulations require owner/operators of a special waste landfill to provide a notice in perpetuity to any potential purchaser of the property regarding "the location and time of the operation of the facility [and] the nature of waste placed in the site" that also cautions against future development of the site.[9] This requirement applies to special waste landfills, which would include state landfill permits issued for CCR unit pond closures.

4. Navajo Generating Station (NGS): The Navajo Nation agreed that the former NGS site is not suitable for unrestricted use, and the Nation agreed that no residential, multifamily, school, child care, farm, hospice or other use (whether commercial, for profit or non-profit) that would reasonably be expected to pose an unacceptable human health risk shall be permitted on the leased premises unless the Nation conducts additional remediation to render the site suitable for the proposed use. The terms of the agreement exist in perpetuity. In addition, a perpetual restrictive covenant applies to the solid waste landfill and all ponds that have been closed in place.

5. State Institutional Controls in Texas: For properties remediated pursuant to the Texas Risk Reduction Program ("TRRP"), the Texas Commission on Environmental Quality (TCEQ) may require institutional controls, such as a restrictive covenant or deed notice. TCEQ's guidance on institutional controls provides model restrictive covenants and deed notices restricting a property from future residential use.[10] Additionally, companies may apply for a Municipal Setting Designation (MSD) with TCEQ.[11] An MSD prohibits groundwater at a property from being used as potable water in the future. These examples highlight that there are numerous state-level institutional controls that could restrict future residential use.

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[8] Maryland Department of the Environment, Facts about Maryland's Uniform Environmental Covenants Act (last visited Dec. 10, 2023), https://mde.maryland.gov/programs/land/MarylandBrownfieldVCP/Documents/www.mde.state.md.us/assets/document/Maryland%20UECA%20Fact%20Sheet%285%29.pdf.

[9] 401 KAR 45:110 § 5(7).

[10] TCEQ Regulatory Guidance, Institutional Controls under TRRP (May 2010) at Appendices A, B. (May 2010), https://www.tceq.texas.gov/downloads/remediation/trrp/rginstitutional-controls-trrp-16-366-trrp-16.pdf.

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