Identification and Evaluation of National Priority List (NPL), Superfund Alternative Approach (SAA), and Coal Combustion Residual (CCR) Cleanup/Damage Cases in the Electric Power Generation, Distribution, and Transmission Industry

USEPA

Office of Land and Emergency Management

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Identification of Cleanup Case Universe:

EPA is in the process of evaluating the need for CERCLA 108(b) financial responsibility regulations among three classes of industrial sectors in the U.S. These include facilities in the Chemical Manufacturing Industry (NAICS 325), Petroleum and Coal Products Manufacturing Industry (NAICS 324), and the Electric Power Generation, Transmission and Distribution Industry (NAICS 2211). Specifically, EPA sought to identify whether there were examples of pollution caused by activities within those industries, that occurred under a regulatory structure like today's, that also required a taxpayer funded cleanup under Superfund. Examples of this type of cleanup case EPA believes could be indicative of the potential need for CERCLA 108(b) financial responsibility requirements. To make this determination, EPA first prioritized the identification and analysis of Superfund National Priority List (NPL) sites and Superfund Alternative Approach (SAA) sites, as those tend to be the largest cleanups with the greatest likelihood of significant taxpayer expenditures.[1, 2]

This individual background document is limited to covering only the analyses related to the Electric Power Generation, Transmission and Distribution Industry (NAICS 2211). Separate background documents will be used to cover the analyses conducted for the other two sectors under consideration. Regarding NAICS 2211, EPA also recognized the importance of reviewing proven damage cases associated with Coal Combustion Residual (CCR) byproducts (a large quantity byproduct from Coal-fired Electric Power Generation), since such cases were used as the basis for EPA's original decision to further consider NAICS 2211 for financial responsibility regulations back in its 2010 CERCLA 108(b) Advanced Notice of Proposed Rulemaking (ANPRM).[3]

2010 ANPRM Related Analyses

EPA initiated its updated review of potential CERCLA 108(b) cleanup cases by first re-examining the cleanup cases identified in the January 6, 2010 Additional Classes ANPRM. In that notice, EPA explained its rationale for the selection of the three identified additional classes that the Agency would examine regarding the development of financial responsibility requirements. The ANPRM relied primarily upon information related to sites Listed on the National Priorities List (NPL), data on the hazardous waste generation from the 2007 RCRA Biennial Report (BR), and data from the Toxic Release Inventory (TRI), as well as evidence from CCR Damage Cases. As noted above and explained in the 2017 Final Action regarding CERCLA 108(b) financial responsibility for classes of facilities in the hardrock mining industry[4], EPA recognizes the concerns of some commenters who argue that TRI and BR data are insufficient as sole indicators of risk for the purposes of evaluating the necessity of financial responsibility regulations under CERCLA 108(b). Accordingly, EPA first prioritized its current analysis on the damage cases

[1] The National Priorities List (NPL) is the list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories.
[2] A "Superfund Alternative (SAA) site" is one that has a SAA agreement in place. The SAA uses the same investigation and cleanup process and standards that are used for NPL sites but can potentially save time and resources associated with listing a site on the NPL. To qualify for the SAA, a site must have contamination significant enough to make it eligible for listing on the NPL (i.e., with a Hazard Ranking Score (HRS) ≥ 28.5) and must have a capable PRP who will sign an agreement with EPA to perform the investigation or cleanup.
[3] See Advanced Notice of Proposed Rulemaking (ANPRM) 75 Fed Reg 816. *Identification of Additional Classes of Facilities for Development of Financial Responsibility Requirements under CERCLA Section 108(b).* January 6, 2010.
[4] See 83 FR 7556, Page:7556-7588, CFR:40 CFR 320, Financial Responsibility Requirements Under CERCLA Section 108(b) for Classes of Facilities in the Hardrock Mining Industry, Final Rule published on 02/21/2018.

previously identified in the ANPRM, using an updated methodology for the evaluation of risk. These ANPRM cases were first reanalyzed, since they served as an underpinning for the ANPRM.

The ANPRM refers to a total of 27 damage cases involving Coal Combustion Residuals (CCRs) that comprised the universe of cases initially evaluated. And, there were 2 NPL sites within the original 27 CCR related damage cases that were considered as part of the ANPRM analyses for NAICS 2211.[5]

Additional NPL Sites Evaluated

To further augment the information evaluated from the ANPRM, EPA also sought to identify additional potential damage cases by looking outside the scope of the ANPRM. To this end, EPA first queried the EPA's SEMS database in March 2018. EPA searched within this pull for additional NPL sites and SAA sites that either (i) may have been missed by EPA's review pre-2010, or that (ii) post-dated the data collection supporting the 2010 ANPRM. To conduct this query EPA first filtered the approximately 83,000 records in the March 2018 SEMS data pull by NPL status. Specifically, EPA filtered out sites identified in SEMS as either "Not on the NPL" or "Not a Valid Site". This yielded 2,365 sites that may presently be, or have been on the NPL, as well as sites designated as SAA sites. These sites include those proposed (but not yet finalized), those on the final NPL, those deleted from the NPL, those removed from the NPL, and those that are identified as part of another NPL site. This approach erred on the side of over identifying potential damage cases, as some of these candidate sites would be already accounted for as part of other NPL sites. Next, EPA filtered the 2,365 sites by Primary Sub Category Name in SEMS. EPA used this as a proxy to identify only those sites classified under NAICS 2211.

For NAICS 2211, the NPL filtering described above resulted in the identification of just 2 additional NPL sites and 1 additional SAA site, beyond the 2 CCR-related NPL sites previously considered as part of the 2010 ANPRM. None of the newly identified NPL or SAA sites are associated with coal-fired power generation (NAICS 221112). Rather, these NPL sites are associated with Nuclear Power (NAICS 221113) and Hydroelectric Power Generation and Distribution (NAICS 221111 & 22112). And the one SAA site is a power plant that produces electricity from a combination of oil burners and gas turbines (under NAICS 221112), rather than from coal-fired combustion.

Additional Proven CCR Damage Cases Evaluated

Although there were few NPL or SAA sites in this industry overall, evidence of major groundwater and surface water damages associated with CCRs from coal-fired power generation was deemed sufficient to further consider this industry for possible regulation under CERCLA 108b, at the time of the 2010 ANPRM. For NAICS 2211, analyses for the ANPRM therefore instead focused solely on damage cases involving CCRs. Subsequent to the ANPRM, in 2014 EPA completed an updated listing of CCR damage cases as part of its ongoing promulgation of the Final CCR Rulemaking.[6] For this update, a consistent set of criteria were used to identify a specific list of "Proven CCR Damage Cases".[7] Given the reliance upon

[5] In addition to the two coal power generation NPL sites considered in the ANPRM analyses, a third SAA site was also included in the original list of sites evaluated for the ANPRM, but was removed from review in this updated analysis, because it was determined to be an off-site waste disposal facility not represented by NAICS 2211.

[6] Final Rule: Disposal of Coal Combustion Residuals from Electric Utilities, 80 FR 21301, Pages 21301 - 21501, Oct. 14, 2015.

[7] Proven CCR Damage Cases, are so determined based on strict criteria where the subject damages must be confirmed as being attributable to Fossil Fuel Combustion Wastes, based on documented evidence from Scientific Results, Administrative Rulings, and/or Court Findings.

CCR damage cases both for the 2010 ANPRM and for USEPA's Final CCR Disposal Rule, this updated list was relied upon as the best source for evaluating CCR damage cases moving forward.

The updated 2014 list of "Proven CCR Damage Cases" includes 40 cases (inclusive of the 2 CCR-related NPL sites previously evaluated for the ANPRM as noted above). However, because these 40 cases were compiled without consideration of their associated NAICS, 11 of the cases were found to be off-site disposal facilities. Such off-site disposal facilities, while more germane to the CCR Rulemaking, do not qualify as NAICS 2211 establishments. These 11 cases therefore should not be counted within NAICS 2211 for purposes of these analyses, and they were therefore removed from further consideration. With the removal of these 11 non-2211 cases, and the 2 CCR related NPL cases, there remain a total of 27 proven non-NPL damage cases associated with CCRs that were ultimately evaluated in addition to the 4 NPL sites and 1 SAA site identified within NAICS 2211 of primary concern.[8]

Before any screening or in-depth evaluation of any of these damage cases were initiated, the total number of NPL, SAA, and CCR cases identified for review are presented in Table 1. Table 1 also further shows that there are NPL and SAA sites within just three of the ten 6-digit level subsectors comprising NAICS 2211.[9]

Table 1- Industry Subsectors where Damage Cases were Identified within the Electric Power Generation, Distribution, and Transmission Industry NAICS 2211

Total No. of NPL Sites, SAA Sites, & Proven CCR Damage Cases Reviewed	Industry Subsectors Represented	Relative Percentage of Subsectors Identified
No. of NPL & SAA Sites	**Only Three Subsectors Identified**	
5	(NAICS 221112) • Coal-fired Power (2 NPL) • Oil & Gas -fired Power (1 SAA)	40% 20%
	(NAICS 221111) Hydroelectric Power (1 NPL)	20%
	(NAICS 221113) Nuclear Power (1 NPL)	20%
No. of non-NPL Proven CCR Damage Cases Reviewed	**All are in just One Subsector**	
27	(NAICS 221112) Coal-fired Power	100%

[8] The final list of 27 proven non-NPL CCR damage cases used for the current analyses is not to be confused with the separate list of 27 CCR damage cases originally evaluated for the 2010 ANPRM. While the total numbers are the same, these lists are different as a result of updated research as of 2014. Only 20 of the original 27 cases considered at the time of the ANPRM, now remain in the updated list of 27 cases used for this analysis.

[9] Analyses were also conducted for a small number of CERCLA Removal Actions, to expand our understanding of risks that may exist at other types of cases beyond just that of the priority NPL, SAA, and CCR Damage Cases covered here. EPA used the same methodology as described above, to evaluate these Superfund Removal Actions. A summary of the results from these evaluations is included both in the preamble, as well as in a separate background document dedicated solely this analysis of CERCLA Removal Actions.

Analytical Steps and Methodology:

EPA first collected additional information on the 5 electric power utility NPL and SAA sites that were ultimately identified. As a primary matter, EPA collected information on the timing and nature of releases or threatened releases at these NPL sites. Specifically, EPA sought to identify, as applicable, facility commission, operation, and end dates, release dates, incident discovery dates, sources of contamination, NPL proposal dates, types of contaminant and contaminated media, and the designated lead for cleanup/construction, as well as information on Superfund expenditures at these sites, among other information. For this collection, EPA relied on information either previously collected as part of the ANPRM, and/or from Superfund site documents (e.g. NPL listing narratives, Records of Decision, Five-Year Reviews), as well as from EPA's Superfund Enterprise Management System (SEMS) as of March 2018. For our review of proven CCR damage cases, EPA also relied on site-specific information compiled in support of the 2015 coal ash rulemaking.[10] Collecting this type of information for each site, once compared against the contemporary regulatory landscape and industry practices, would allow EPA to evaluate whether or not each site demonstrated the type of risk that would support the promulgation of regulations under CERCLA 108(b).

In this stage of the analysis regarding the prevalent sources of contamination, EPA noted that discharges to ground & surface water were commonly present at a majority of the NAICS 2211 sites. Significant sources of contamination included unlined/leaking surface impoundments and surface water discharges, as well as the collapse of dikes at surface impoundments, etc. Table 2 shows the types and frequency of contamination sources identified among the NPL sites and CCR damage cases reviewed.

Table 2- Sources of Contamination Identified at Electric Power Generation, Distribution, and Transmission Industry (NAICS 2211) Cleanup Cases

Primary Sources of Contamination	Number of Sites Where Observed	Percentage of Sites with Source
Electric Power Generation, Transmission, Distribution (2211) (n = 4 NPL sites, + 1 SAA site, + 27 non-NPL CCR Damage Cases)		
Unlined or Leaking Surface Impoundments and/or Landfills impacting Ground Water	15	30%
Discharges to Surface Water	24	48%
Fugitive CCR Dust Emissions Exceedances	3	6%
Failure/Collapse of Dikes, Ponds, or Surface Impoundments	4	8%
Collapse of Dry Ash Pile/Stack	1	2%
PCB contamination from Transformer/Capacitor Testing	21	4%
Radiation Contamination from Nuclear Operations & Power Generation	1	2%

[10] Damage Case Compendium, Technical Support Document, Volume 1: Proven Damage Cases, Alexander Livnat, Ph.D., 12/18/2014 (also available in the Public Docket for the Final 2015 CCR Rule)

Screening-out of Legacy Issues and PRP Funded Actions

After compiling information about the risks and history of each site EPA sought to identify instances where environmental issues arose under a regulatory structure similar to todays that also resulted in taxpayer funded response actions. To do so, EPA first screened out the NPL sites, SAA sites, and CCR damage cases where the date of the pollution incident or release activity occurred pre-1980. EPA chose 1980 as a cutoff point to screen out legacy issues for all 3 of the industrial sectors under consideration, as well as all associated subsectors within these industries. This date was chosen because it was the year that the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980 was enacted, as well as the initial establishment of regulations under RCRA Subtitle C governing hazardous waste treatment, storage, and disposal facilities in May 1980. EPA believes this is a conservative screen in that only the initial RCRA regulations were in place in 1980 and would be refined, expanded and enhanced several times over the next decade, and beyond. Moreover, the Agency's enforcement authorities expanded in the 1980s, as the RCRA program matured. Notably, the passage in 1984 of Hazardous and Solid Waste Amendments (HSWA) resulted in many regulatory changes and enhanced enforcement mechanisms. The dates of RCRA and CERCLA were given greatest consideration due to instances of waste management, land disposal and contaminated soil issues identified in the review of the NPL, SAA, and CCR damage cases.[11] The advent of such regulations would undoubtedly send clear signals to industry for the institution of policies and practices necessary to avoid violations of such regulations and associated enforcement actions, as well as that of potential future liabilities.

In many cases, the Superfund site documents would note dates where specific releases occurred or polluting activities (e.g., land disposal in unlined impoundments) ceased. As noted above, separate background documents from the Final CCR Rulemaking were relied upon for a majority of the information used in EPA's evaluation of the 27 proven CCR damage cases reviewed. For these CCR cases, two key dates were generally available, including both the year(s) when the power generation facilities themselves were commissioned and/or the year(s) when the subject damage case(s) were first identified. At sites where there were multiple releases and/or activities with varying dates, EPA used the most recent date to err on the side of being over inclusive. That is, if an NPL site had documented contamination issues that were identified in 1968 and 1981, the site would not have been screened out because at least one of the dates was 1980 or later. In instances where EPA could not identify pollution activity or release dates with sufficient confidence, EPA used the relevant operation's end date. For example, at a facility where the exact dates of releases were unknown, but operations ceased at the site in 1985, EPA would have used 1985 as the date for applying the screen. In such an example, this site would not have been screened out of the analysis. When the timeframe of a release of hazardous substance, it's identification, nor the operation's end date, could be determined for a site, the site was

[11] The basis for using 1980 as a cut-off date to initially screen for legacy cases of CCR related damages is somewhat different for the coal power generation subsector within NAICS 2211, since Coal Power and CCR wastes where not directly regulated under either CERCLA or RCRA, as were other industries during this same period. Given the uniform absence of contemporary environmental regulations before 1980, releases occurring before this date may be considered as legacy cases regardless of the industry involved. However, damage incidents involving CCRs also predate the CCR disposal regulations recently promulgated in 2015 by roughly 35 years. Therefore, using the same 1980 cut-off was determined appropriate as a means of initially screening from further review the oldest legacy damage cases among NAICS 2211, while also allowing for a consistent methodology to be applied across all 3 of the additional classes. The applicability of the Final CCR Rule is then considered in relation to the more recent post 1980 damage cases.

carried through the analysis for further consideration. This analytic approach resulted in EPA erring, again, on the side of being over inclusive.

As shown in Table 3 below, for the 5 NAICS 2211 NPL and SAA sites identified, the 2 CCR-related NPL sites were deemed to have resulted from operations that occurred prior to 1980, leaving 3 sites that occurred in 1980 or later for further consideration. In the case of the 27 non-NPL CCR damage cases evaluated, 9 were determined to have occurred prior to 1980, leaving 18 for further consideration. Appendix 1 includes a list of the respective dates used to make these necessary screening determinations.

Table 3- Results of Pre-1980 Pollution Screen on NPL Sites, SAA Sites, & non-NPL CCR Damage Cases in the Electric Power Generation, Distribution, and Transmission (NAICS 2211) Industry

Category of Damage Cases	**Results of Pre-1980 Pollution Screen for NAICS 2211 NPL, SAA, & non-NPL CCR Damage Cases**		
	Total # of NPL & SAA Sites Identified	**# of NPL Sites Screened Out (Due to Pollution Occurring pre-1980)**	**# of NPL Sites Remaining (Due to Pollution Occurring in 1980 or Later)**
NPL & SAA Sites	5	2 (both CCR NPL sites)	3 (2 non-CCR NPL & 1 SAA site)
	Total # of non-NPL Proven CCR Cases Identified	**# of non-NPL CCR Cases Screened Out (Due to Pollution Occurring pre-1980)**	**# of non-NPL CCR Cases Remaining (Due to Pollution Occurring in 1980 or Later)**
Non-NPL CCR Damage Cases	27	9	18

EPA also sought to remove sites where significant taxpayer expenditures had not occurred from the subsequent stages of the analysis as those, the Agency believes, do not indicate a need for CERCLA 108(b) financial responsibility regulations. To do so, EPA used the Action Lead field in SEMS associated with each NPL site, to understand the role of Potentially Responsible Parties (PRPs) in the cleanup of their own individual sites. NPL cleanup sites reviewed in this analysis had one of three values for action lead in the SEMS database: 1. Mixed Lead Construction; 2. PRP Performed Construction; or 3. Govt Performed Construction. For the purposes of this analysis, EPA focused on the sites that were either Mixed Lead Construction or Government Performed Construction under the assumption that PRP Performed Construction sites are so designated because they are covering all or a large majority of the cleanup expenses at the site.[12]

EPA consulted SEMS to identify the Action Lead field for the non-NPL CCR damage cases in our universe as well. However, only a subset of the CCR damage cases could be located in SEMS. Of those in SEMS,

[12] It is however at those sites identified as "Mixed Lead Construction" or "Government Performed Construction" sites, where there are Superfund expenditures of concern that are the primary focus of the analyses.

even fewer included a value for the Action Lead field. In cases where there was no Action Lead designation, EPA consulted data on the historical expenditures at these sites to help ascertain the extent to which taxpayers were burdened with the costs of cleanup. In circumstances where the case was logged into SEMS, but did not stipulate the Action Lead, the cases was assumed to be a PRP lead site when there was an accounting record of no, or few, government funds being expended. Lastly, any sites known to be federally operated facilities, are noted and treated as PRP Lead sites, since federal facilities possess the same fiduciary responsibilities as do PRPs for conducting and paying for the cleanup at their facilities.

As shown below in Table 4, there were two NPL sites that are Federal Facilities, as well as one SAA site that PRP-led. These 3 sites were therefore excluded from further consideration for reasons as explained above. For the additional non-NPL CCR Damage Cases also included in the analyses, 8 of the 27 cases could be screened from further review because the cleanup and construction were determined to have been performed at the expense of either the PRP or by a Federal Facility. A list of the NPL sites and non-NPL CCR damage cases and their associated action lead designations are available in Appendix 2.

Table 4- Summary Results of PRP-Lead Screen on NPL Sites, SAA Sites, & non-NPL CCR Damage Cases in the Electric Power Generation, Distribution, and Transmission (NAICS 2211) Industry

Category of Damage Cases	**Results of PRP-Lead Screen for NAICS 2211 NPL Sites & non-NPL CCR Damage Cases**		
	Total # of NPL & SAA Sites Screened	**# of NPL & SAA Sites Screened Out (Due to PRPs or Federal Facilities Having Performed Construction)**	**# of NPL & SAA Sites Remaining (Due to Mixed or Govt. Performed Construction)**
NPL and SAA Sites	5	3 (1 PRP Lead, 2 Fed. Owned)	0
	Total # of non-NPL Proven CCR Cases Screened	**# of Proven CCR Cases Screened Out (Due to PRPs or Federal Facilities Having Performed Construction)**	**# of Proven CCR Cases Remaining (Due to Mixed or Govt. Performed Construction)**
non-NPL CCR Damage Cases	27	8[13]	up to 19?[14]

[13] Many CCR damage cases may never become managed or tracked within the Superfund program, and such sites therefore don't appear in the SEMS database. Consequently, there may not be readily available data on who is leading/paying for the cleanup at CCR sites. In cases where there are no official records of who holds the lead responsibility for cleanup of the site, the relevant record of actual expenditures was instead used as an indicator. In the case of the 8 CCR Damage Cases above, the record shows that the government's expenditures from the Superfund allow us to assume with relative confidence that they are "PRP lead sites".

[14] No data on Lead Status nor Fund Expenditures were found in SEMS for the remaining 19 non-NPL CCR cases.

Detailed Review of Sites That Have Had Pollution Issues Arise in 1980 or Later, and May Also Have Incurred Significant Taxpayer Expenditures

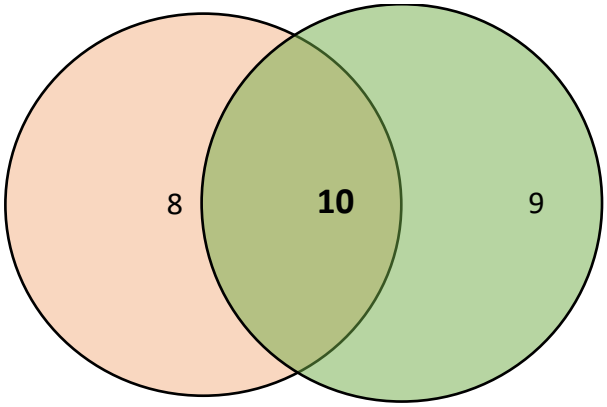
Ultimately, EPA was interested in identifying instances where releases arose both under a regulatory structure similar to todays, and that resulted in taxpayer funded response actions. EPA compared the universe of sites at which the most recent pollution date was estimated to be in 1980 or later and the universe of sites designated as mixed lead or government performed construction in SEMS to identify which sites met both of those criteria. As described above, all NPL and SAA sites in NAICS 2211 were screened out based on these initial 2 criteria, yet 10 of the non-NPL CCR Damage Cases did warrant further review even after applying both filtering criteria. Appendix 3 includes a complete list of these non-NPL CCR damage cases warranting further detailed review, along with relevant site information.

In the case of the 5 NPL and SAA sites in NAICS 2211, no such cases of further concern were identified where both the contamination occurred in 1980 or later and the site was also a mixed or govt. led cleanup. Instead, all the sites either occurred prior to 1980 and/or they were government-owned facilities with PRPs leading the respective cleanup at their sites. Therefore, none of the NPL nor SAA sites in NAICS 2211 were ultimately determined to be representative of the types of cleanup cases that might warrant FR regulations. And no further detailed analyses of these sites were therefore necessary, per the analytical approach outlined above.

However, there were 10 cases of concern identified within the 27 non-NPL CCR damage cases reviewed, where the pollution incident occurred in 1980 or later and where there was a possibility that the site was a mixed or govt. led cleanup. For these 10 cases, while we have dates for when the incidents occurred, we unfortunately have no data on the Action Lead or the Fund Expenditures associated with their cleanup. Therefore, because it was not possible to ascertain whether the cleanup costs have been paid by PRPs or with taxpayer funds, these sites were retained for further detailed review.

Provided in Figure 1 is a simple venn diagram that further demonstrates how reliance upon the subject filtering criteria leads to a specific set of cases of most concern. Figure 1 shows that for the non-NPL CCR damage cases, there exits an overlapping intersection of 10 sites of most concern. It's these 10 CCR damage cases that become the focus of the next phase of analyses.

Figure 1 - Overlapping Universe of non-NPL CCR Damage Cases of Most Concern



EPA proceeded to conduct a detailed case-by-case review of each of these ten NAICS 2211 CCR cases of most concern. To do so, EPA consulted site profiles and data spreadsheets that had already been compiled for these CCR Damage Cases, in association with promulgation of the 2015 Final CCR Rule. EPA relied primarily on these CCR Damage Case profiles and associated data tables, as the most recent and thorough source of information for each of the cases.[15] In a few cases, data from the SEMS database was also consulted (e.g. in search of Superfund expenditures information, etc.).

These site profiles and available data were then analyzed in consideration of the regulations that are applicable to the electric power generation, distribution and transmission industry, in addition to the key implementation dates for those said regulations. Separate information was compiled by EPA to fully describe the array of current regulations of most relevance to NAICS 2211, which is available in industry-specific spreadsheets and associated background documents in the docket to this rulemaking[16].

Discussion of Final Results for NAICS 2211:

Tables 5 & 6 below, respectively summarize the results from EPA's review of the 4 NPL sites, 1 SAA site, and 27 CCR damage cases that were evaluated. Based upon the review process described above, none of these cases were ultimately considered to represent "post-modern regulatory incidents".

Of the 5 NPL and SAA sites noted in Table 5, 2 are associated directly with CCR wastes generated from Coal Combustion operations, where ground water and surface water have been significantly contaminated due to un-lined and/or leaking on-site surface impoundments. The other 3 sites include Hydroelectric and Oil & Gas Power Plants with PCB contamination, as well as one Nuclear Plant with significant releases from uranium-based power generation. In all 5 cases, either the evident dates of release were prior to 1980, and/or the power plants were government-owned facilities or were cleaned up by the PRP. Because there was no evidence of post-modern regulatory releases or significant taxpayer expenditures at the 5 NPL and SAA sites, none were found to merit more detailed review.

Table 5 - Summary Results from the Review of the Electric Power Generation, Distribution, and Transmission Industry (NAICS 2211) NPL & SAA Sites

Total # of NPL & SAA Sites	Cases Not Representing Modern Risks, & Not Requiring Taxpayer Expenditures			Cases of Continued Concern
	Number of Sites Screened Out Based on Pre-1980 Release, or PRP Lead Status	Detailed Review Concluded Release Occurred Before Modern Regulation	Detailed Review Identified a Possible Post-Modern Regulation Release, but no Significant Taxpayer Expenditures	Cases with Release(s) Occurring After Modern Regulation that also Required Taxpayer Funded Response
5	5	(no such detailed review was necessary)	(no such detailed review was necessary)	0

[15] CCR Damage Case Compendium, Technical Support Document, Vol. 1: Proven Damage Cases & Database, Alexander Livnat, Ph.D., Dec. 18, 2014.

[16] Summary Report: Federal & State Environmental Regulations and Voluntary Programs in Place to Address CERCLA Hazardous Substances at Facilities in the Electric Power Generation, Transmission, and Distribution Industry, May 2019

In the case of the 27 non-NPL CCR damage cases shown below in Table 6, 17 of the cases were screened from further consideration as either having occurred prior to 1980, and/or as being designated as a PRP Lead cleanup. Regarding the 10 remaining cases of concern, EPA further evaluated these cases in relation to their date of occurrence. EPA determined that these cases still represent legacy damages that stem from historical CCR management practices not representative of current day standards. That is because, while these cases occurred post-1980, they still occurred prior to promulgation of the 2015 Final CCR Rulemaking. In addition, as with the results for the NPL sites in NAICS 2211, there were also no cases of non-NPL CCR damage cases with releases under post-modern regulations that were cleaned up with taxpayer funds from Superfund.

Table 6 – Summary Results from the Review of NAICS 2211 non-NPL CCR Damage Cases

Total # of non-NPL CCR Damage Cases (before screening)	Cases Not Representing Modern Risks and Not Requiring Taxpayer Expenditures			Cases of Continued Concern
	Number of Sites Screened Out Based on Pre-1980, Pre-1980 Release, or PRP Lead Status	Detailed Review Concluded Release Occurred Before Modern Regulation (per the Final CCR Rule)	Detailed Review Identified a Possible Post-Modern Regulation Release, but No Significant Taxpayer Expenditures	Cases with Release(s), that Occurred Under Modern Regulations, that required taxpayer funded response
27	17	10[17]	0	**0**

To elaborate further, the provisions of the 2015 Final CCR Rule were specifically identified and designed using the Agency's List of Proven CCR Damage Cases. The Rule sets forth a comprehensive list of requirements that address the significant sources of damages observed to have occurred at all of the CCR damages cases evaluated by EPA. Therefore, despite examples of releases in more recent years (as recent as 2014 in the case of a breach at Duke Energy's Dan River Steam Station in North Carolina, and in the case of a dike failure in 2008 at the Tennessee Valley Authority (TVA) Kingston Plant, etc.[18]), such cases still represent incidents that occurred prior to current day regulatory standards (even though these regulations only came into effect in 2015). For example, the CCR Rule codifies numerous new design standards for structural integrity to prevent the breach or failure of surface impoundments, including conducting periodic hazard potential assessments, developing emergency action plans, etc. As an added example, specific location restrictions now exist under the new CCR Rule to prevent placement of CCRs in unstable areas susceptible to sinkholes, etc. Please also see Appendix 4 for a more detailed summary table that categorizes all the various sources of observed CCR damages, and then lists the corresponding requirements from the Final CCR Rule designed to help prevent such damage sources from occurring in the future.

[17] After consideration of the information available for the 10 non-NPL CCR damage cases of concern, EPA's detailed review showed that each of the types and sources of contamination at these sites are now specifically addressed under provisions of the Final CCR Rule that was published in 2015. Consequently, while these regulations were only recently promulgated, these cases still represent pre-regulatory incidents that would now be addressed and mitigated per the CCR management requirements set forth in the current regulations.

[18] See information about these incidents at https://www.epa.gov/tn/epa-response-kingston-tva-coal-ash-spill, and https://www.epa.gov/dukeenergy-coalash

Appendix 1 – List of NPL Sites, CCR Damage Cases, and Associated Pollution Dates

Table 1-A: Pollution/Incident Dates for NAICS 2211 NPL, SAA, and non-NPL CCR Damage Cases

EPA ID	**Name of NPL & SAA Sites**	**Most Recent Incident Date** (if unknown, then operation end date)
VAD000619767	Chisman Creek (CCR NPL case)	Pre- 1980
SC000002394	Savannah River – D Area (CCR NPL case) (DOD Fed. Facility)	Mid 1970s
WA3890090076	Hanford Nuclear Facility (DOE - Federal Facility)	1988
WA1891406349	Bonneville Power - Ross Complex (Federal Facility)	Mid 1980s
PRD987377538	Puerto Rico Elect. Power Auth. (PREPA) – Palo Seco SAA Site	Mid 50s/60s ?
EPA ID (alt. FRS or State ID #s used when EPA ID unknown)[19]	**Name of non-NPL CCR Damage Cases**	**Most Recent Incident Date** (if unknown, then discovery date)
GAD000612986	Plant Bowen, Georgia Power	2008
IND087045621	Eagle Valley Station, Illinois Power & Light	2008
IND980897730	Gibson Generating Station Plant, Duke Energy	2007
MID087050506	JR Whiting Generating Plant, CMS/Consumers Energy	2008
MTD981550023	Colstrip Power Plant, PPL Montana	1982
NVD093065852	Reid Gardner Generating, Nevada Energy	1997
NYD000730366	Cayuga Coal Ash Disposal Landfill, AES	2000
NCD000856591	Belews Lake Station, Duke Energy	1974
NCD024668535	Dan River Steam Station, Duke Energy (Eden NC CCR Spill)	2014
110000346386	Hyco Lake - Now Duke Energy Steam Plant	1964
OHD981530868	Conesville FGD Landfill, AEP	1979/80
PAD000731430	Bruce Mansfield Power Station, First Energy	1993
PAD098435068	Hatfield's Ferry Power Station, Allegheny Energy	2001
PAD000765388	Martins Creek Power Plant, PPL	2005
SCD036073799	Canadys Plant, SCE&G	2008
SCD000825802	Urquhart Station, SCE&G	2007
TN8640006682	Kingston Fossil Station, TVA	2007
110000607521	Oak Ridge Y-12 OU# 2, DOE	1989
TXD000726380	Pirkey Power - Brandy Branch Reservoir, SW Electric Power	1986
TXD000821306	Martin Lake Power Plant, Texas Utilities Electric	1974
TXD981586787	Welsh Reservoir, Southwestern Electric Power	1981
VAD980554596	Clinch River Plant (Carbo power), AEP-Appalachian Power	1967
VAD001894542	Glen Lyn Plant, AEP/Appalachian Power	1978
WVD980554646	John Amos Power Plant, AEP/Appalachian Power Co.	1974
WID076143296	Columbia Energy Center, Alliant Energy	1977
WID000713008	Oak Creek Plant, Wisconsin Energy/Wisc. Electric Power Co.	2002
WID981529985	E.J. Stoneman, Dairyland Power	1976

[19] The Facility Registry Services (FRS) is a centrally managed database that identifies facilities, sites, or places subject to environmental regulations or of environmental interest.

Appendix 2 - List of NAICS 2211 NPL & SAA Sites, and Proven CCR Damage Cases, and their Associated Action Lead Designations in SEMS

Table 2-A: Action Lead Designations for NAICS 2211 NPL, SAA, and non-NPL CCR Damage Cases

EPA ID	**Name of NPL & SAA Sites**	**Action Lead** (? if unknown)
VAD000619767	Chisman Creek (CCR NPL case)	PRP Lead
SC000002394	Savannah River – D Area (CCR NPL case) (DOD)	PRP / Fed. Facility
WA3890090076	Hanford Nuclear Facility	PRP / Fed. Facility
WA1891406349	Bonneville Power - Ross Complex	PRP / Fed. Facility
PRD987377538	Puerto Rico Electric Power Auth. (PREPA) – Palo Seco SAA Site	PRP / Gov.-owned
EPA ID (alt. FRS or State ID #s used when EPA ID is unknown)	**Name of non-NPL CCR Damage Cases**	**Action Lead** (? if unknown)
GAD000612986	Plant Bowen, Georgia Power	PRP Lead (no costs in SEMS)
IND087045621	Eagle Valley Station, Illinois Power & Light	PRP Lead (no costs in SEMS)
ND980897730	Gibson Generating Station Plant, Duke Energy	?
MID087050506	JR Whiting Generating Plant, CMS/Consumers Energy	?
MTD981550023	Colstrip Power Plant, PPL Montana	?
NVD093065852	Reid Gardner Generating, Nevada Energy	PRP Lead (no costs in SEMS)
NYD000730366	Cayuga Coal Ash Disposal Landfill, AES	?
NCD000856591	Belews Lake Station, Duke Energy	?
NCD024668535	Dan River Steam Station, Duke Energy (Eden NC CCR Spill)	PRP Lead
110000346386	Hyco Lake - Now Duke Energy Steam Plant	?
OHD981530868	Conesville FGD Landfill, AEP	?
PAD000731430	Bruce Mansfield Power Station, First Energy	?
PAD098435068	Hatfield's Ferry Power Station, Allegheny Energy	?
PAD000765388	Martins Creek Power Plant, PPL	PRP Lead (no costs in SEMS)
SCD036073799	Canadys Plant, SCE&G	?
SCD000825802	Urquhart Station, SCE&G	?
TN8640006682	Kingston Fossil Station, TVA	PRP / Fed. Facility
110000607521	Oak Ridge Y-12 OU# 2, DOE	PRP / Fed. Facility
TXD000726380	Pirkey Power - Brandy Branch Reservoir, SW Electric Power	PRP Lead (no costs in SEMS)
TXD000821306	Martin Lake Power Plant, Texas Utilities Electric	?
TXD981586787	Welsh Reservoir, Southwestern Electric Power	?
VAD980554596	Clinch River Plant (Carbo power), AEP-Appalachian Power	?
VAD001894542	Glen Lyn Plant, AEP/Appalachian Power	?
WVD980554646	John Amos Power Plant, AEP/Appalachian Power Co.	?
WID076143296	Columbia Energy Center, Alliant Energy	?
WID000713008	Oak Creek Plant, Wisconsin Energy/Wisc. Electric Power Co.	?
WID981529985	E.J. Stoneman, Dairyland Power	?

Appendix 3 – List of NAICS 2211 non-NPL CCR Damage Cases With More Modern Releases

Table 3-A: Incident Dates for NAICS 2211 non-NPL CCR Damage Cases With More Modern Releases, that Warranted More Detailed Review

EPA ID	***Site Name***	***Most Recent Pollution Incident Date***	***Action Lead (? - all unknown)***
IND980897730	Gibson Generating Station Plant, Duke Energy	2007	?
MID087050506	JR Whiting Generating Plant, CMS/Consumers Energy	2008	?
MTD981550023	Colstrip Power Plant, PPL Montana	1982	?
NYD000730366	Cayuga Coal Ash Disposal Landfill, AES	2000	?
PAD000731430	Bruce Mansfield Power Station, First Energy	1993	?
PAD098435068	Hatfield's Ferry Power Station, Allegheny Energy	2001	?
SCD036073799	Canadys Plant, SCE&G	2008	?
SCD000825802	Urquhart Station, SCE&G	2007	?
TXD981586787	Welsh Reservoir, Southwestern Electric Power	1981	?
WID000713008	Oak Creek Plant, Wisconsin Energy/Wisc. Electric Power Co.	2002	?

Appendix 4 – Summary of How the Final CCR Regs. Address All CCR Damage Cases Evaluated

Table 4-A: Summary of How Final CCR Regs Address All Observed Sources of CCR Damages		
Sources of Damage	**# of Damage Incidents***	**How CCR Requirements Address Specific Sources of Damage**
Breaches and Catastrophic Failures of Surface Impoundments (SIs)	4	Design Standards for Structural Integrity of ALL Impoundments call for: - conducting periodic hazard potential assessments; - developing emergency action plans for units deemed as presenting high/significant hazard; and - covering embankment or dike slopes with either vegetation or alternative form of slope protection. Additional Design Standards for Large Impoundments (H > 20', or H > 5' & vol. > 20 acre-ft) call for: - conducting structural stability assessments; and - conducting periodic safety factor assessments for loading conditions (units that fail must close).
Ground & Surface Water Contamination from Unlined or Leaking Landfills	14	Design Standards for Liners stipulate that: - new CCR units must have composite or alternative composite liners; - new CCR units must have leachate collection and removal systems; and - unlined impoundments that exceed a GW protection standard due to leakage must retrofit or close. (+ all other non-liner related requirements protective of GW & SW)
Ground & Surface Water Contamination from Unlined or Leaking SIs	11	
Unit Collapse Due to Sinkhole	1	Specific Location Restrictions apply to placement of CCR such that: - new CCR units are prohibited from being sited in/on the uppermost aquifer, wetlands, fault areas, seismic impact zones, and/or unstable areas (unless specific certified demonstrations are made by a PE); and - existing impoundments are subject to all of the same restrictions (landfills are subject only to stabilty restriction).
Surface Water Discharges from SIs due to Stormwater Events		Operating Standards - Hydrologic & Hydraulic Capacity Requirements for Impoundments: - all CCR SIs must have an inflow design flow control system to meet peek discharge; - "inflow design flood" is determined based on the "hazard potential rating of the SI"; and - facilities must prepare initial and periodic 5 yr "inflow design flood control plans".
Collapse of Dry Stacks from Stormwater Events	1	Operating Standards - Run-on & Run-off (RORO) Controls for Landfills (including Dry Stacks): - CCR Landfills must prepare a RORO control system plan and revise it every 5 years; and - The installed RORO control system must prevent flow onto the active portion of the unit, by collecting and controlling at least the peak discharge from a 24-hour, 25-year storm.
Reuse of CCR as Structural Fill	1	(See Beneficial Reuse Provisions)
Total # of Observed Sources	**32**	