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SUMMARY OF EPA COAL COMBUSTION WASTE DAMAGE CASES INVOLVING SAND & GRAVEL MINES/PITS/OPERATIONS

This document provides summary information on five damage cases that EPA has concluded involved the placement of coal combustion waste into sand and gravel mines or pits. These five cases are among the proven or potential damage cases discussed in EPA's May 22, 2000 Regulatory Determination on Wastes from the Combustion of Fossil Fuels (65 FR 32214). These five cases are:

- City of Beverly/Vitale Brothers Fly Ash Pit, Massachusetts
- Virginia Power Yorktown Power Station Chisman Creek Disposal Site, Virginia
- WEPCO Cedar-Sauk Landfill, Wisconsin
- Lemberger Landfill, Wisconsin
- WEPCO Highway 59 Landfill, Wisconsin

Also, EPA is currently collecting and analyzing information on an additional case that involved placement of coal combustion waste into a quarry. In the 2000 Regulatory Determination, this case was counted among the 18 cases with insufficient documentation and data to verify and draw a conclusion about whether they should be considered potential or proven damage cases. Because EPA's data collection and analysis for this case is not yet complete, it is not summarized here.

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City of Beverly/Vitale Brothers Fly Ash Pit, Massachusetts

History: This site is an abandoned gravel and sand mine that was used as an unpermitted landfill from the 1950's until the mid-1970's. The site was operated by the Vitale Brothers until 1980, when the City of Beverly Conservation Commission gained ownership because of failure to pay property taxes. On the site, the Vitale Brothers accepted and disposed saltwater-quenched fly ash from New England Power Company along with other wastes. Leaking underground storage tanks containing petroleum products were also located at the site. In 1973, fly ash at the site eroded into a nearby swamp and a stream that is a tributary to a surface drinking water supply. The erosion created a damming effect and resulted in flooding of neighboring property. In 1988, surface water sampling of the stream revealed levels of iron and manganese significantly greater than upstream levels. Additionally, there were complaints of fugitive dust from the site from neighbors located 500 feet away. Air sampling on one occasion in 1988 revealed arsenic concentrations of 2 parts per billion. Finally, 1988 groundwater sampling found arsenic and selenium in excess of their primary MCLs and aluminum, iron, and manganese in excess of secondary MCLs. According to the State, fly ash is the suspected source of contamination in all of these media.

The site has a long history of noncompliance with local and State laws and regulations. The site is currently undergoing Comprehensive Site Assessment and Risk Characterization in preparation for potential remedial action under Massachusetts regulations for the assessment and cleanup of hazardous waste sites.

Basis for Consideration as a Damage Case: This case was not counted as a proven damage case in the 1999 Report to Congress although it should have been. The case does meet the criteria for a proven damage case for the following reasons: (1) selenium and arsenic exceeded (health-based) primary MCLs, (2) there is evidence of contamination of nearby (offsite) wetlands and surface waters, and (3) the facility was the subject of several citations and the State is assessing potential remedial actions.

Causative Factors: Fly ash is disposed at the site at depths from 14 to 36 feet. Not only is the site unlined, but groundwater depth at the site is between 10 and 21 feet, indicating the likelihood of direct contact with fly ash. Fly ash also is observed to be present at the surface of the site with no cover or other surface runoff, erosion, or fugitive dust controls. Finally, the site is located in close proximity to a wetland and a surface water body.

Virginia Power Yorktown Power Station Chisman Creek Disposal Site, Virginia

History: This site consists of three parcels of land that cover 27 acres. Between 1957 and 1974, abandoned sand and gravel pits at the site received fly ash from the combustion of coal and petroleum coke at the Yorktown Power Station. Disposal at the site ended in 1974 when Virginia Power began burning oil at the Yorktown plant. In 1980, nearby shallow residential wells became contaminated with vanadium and selenium. Water in the wells turned green and contained selenium above the primary MCL and sulfate above the secondary MCL. Investigations in response to the discolored drinking water found heavy metal contamination in the groundwater around the fly ash disposal areas, in onsite ponds, and in the sediments of Chisman Creek and its tributaries. Arsenic, beryllium, chromium, copper, molybdenum, nickel, vanadium, and selenium were detected above background levels.

In September 1983, EPA added the site to the National Priorities List (NPL) under the Comprehensive Environmental Response, Compensation, and Liabilities Act (CERCLA). Cleanup began in late 1986 and was conducted in two parts. The first part addressed the fly ash pits and contaminated groundwater and included the following steps:

- extension of public water to 55 homes with contaminated well water,
- capping the disposal pits with soil (2 pits) or compacted clay (1 pit) overlain with topsoil and vegetative growth,
- groundwater and leachate collection for treatment and to lower the water table beneath the pits, and
- post-closure monitoring.

The second part addressed the onsite ponds, a freshwater tributary stream, and the Chisman Creek estuary and included the following steps:

- relocation of a 600-foot portion of the tributary to minimize contact with the fly ash disposal areas,
- diversion of surface runoff, and
- long-term monitoring for the ponds, tributary, and estuary.

Construction of all cleanup components was completed on December 21, 1990. The site has been redeveloped as a public park.

Basis for Consideration as a Damage Case: EPA has categorized this case as a proven damage case for the following reasons: (1) drinking water wells contained selenium above the (health-based) primary MCL; (2) there is evidence of surface water and sediment contamination; and (3) the site was remediated under CERCLA.

Causative Factors: The facility was operated with no dust or erosion controls. The facility is unlined and located in close proximity to drinking water wells. A surface water tributary passed through or near the disposal areas. In addition, the documentation on the site and design of remedial measures suggest that groundwater at the site was very shallow and possibly in contact with disposed waste. (Note also that the facility is located in close proximity to a wetland, although there is no documentation of impact to flora in the wetland.)

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WEPCO Cedar-Sauk Landfill, Wisconsin

History: This facility is an abandoned sand and gravel pit that received coal combustion waste from the WEPCO Port Washington Power Plant from 1969 to 1979. After closure of the facility, groundwater monitoring revealed exceedences of the primary MCL for selenium, the State standard for boron, and the secondary MCL for sulfate. Vegetative damage resulting from boron uptake also was observed in a nearby wetland. Presumably, this damage is the result of groundwater migration to the wetland. As a result, the State required installation of relief wells to confine and remediate the contamination plume and installation of an upgraded cover at the site.

Basis for Consideration as a Damage Case: EPA has categorized this case as a proven damage case for the following reasons: (1) selenium in groundwater exceeded the (health-based) primary MCL, (2) there was clear evidence of vegetative damage, and (3) the State required remedial action. (This case was not counted as a proven damage case in the 1999 Report to Congress, however, because there was no evidence of comanagement of low-volume wastes at the site.)

Causative Factors: The facility is not only unlined, but was constructed over shallow groundwater[1] in highly permeable (10^{-3} to 10^{-2} cm/sec) media. Some time after closure, the water table rose, saturating portions of the ash fill. Furthermore, the original soil cover installed at closure was found to be insufficient, less than 2 feet in places. Finally, the site was located in close proximity to a wetland.

[1] Quantative data on the original depth to groundwater are not available, but documentation on the site reports that the water table was near the base of the original pit.

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Lemberger Landfill, Wisconsin

History: This site is an old gravel pit that was used by the Township of Franklin as an open dump from about 1940 to 1969. Lemberger Landfill, Inc., operated the site as a sanitary landfill under a license from the State from about 1970 to 1976. Under the license, the site was permitted to receive municipal solid waste and power plant fly ash and bottom ash. The available records show that, in addition to municipal solid waste and possibly industrial waste, the landfill received power plant fly ash and bottom ash starting in 1969. In 1976, the site ceased operations except for disposal of fly ash to bring the site to final grade. A second cap was placed on the landfill in May 1981.

Damages at the site include the seepage of landfill leachate onto adjacent property. Groundwater at the site is contaminated with VOC and inorganic constituents including arsenic, barium, chromium, cadmium, and lead. VOCs were present in residential wells in the vicinity of the site, according to monitoring conducted by the State in 1984 and 1985. A river near the site also is potentially impacted; VOCs and inorganics including cadmium and lead are present in surface water.

The site was proposed to the National Priorities List (NPL) under the Comprehensive Environmental Response, Compensation, and Liabilities Act (CERCLA) on September 18, 1985 and added to the final NPL on June 10, 1986. In 1991, EPA selected the final remedy for the site, which included the following:

- clearing and regrading the waste area to smooth out the existing cap,
- constructing a multi-layer cap with a vegetative cover,
- constructing a slurry wall around the perimeter of the wastes,
- extraction and treatment of contaminated groundwater, and
- groundwater monitoring and temporary groundwater use restrictions.

A group of potentially responsible parties entered into a consent decree with EPA in 1992 to implement the remedy. Construction was completed in September 1996.

Basis for Consideration as a Damage Case: Because the available documentation does not clearly implicate, or rule out, coal combustion waste as a source of the contamination, EPA has categorized this case as a potential damage case. Because coal combustion wastes were disposed along with other, non-utility wastes, EPA considered this case in its discussion of non-utility coal combustion wastes in the 1999 Report to Congress.

Causative Factors: Not only is the facility unlined, but four residences are located within 1,000 feet of the site and the Branch River is located one-half mile away. In addition, State inspections showed that fly ash and bottom ash were used as cover material instead of being buried along with the other wastes. CERCLA documentation for the site implies that this practice was not authorized by the State.

WEPCO Highway 59 Landfill, Wisconsin

History: This site is located in an old sand and gravel pit and received fly ash and bottom ash between 1969 and 1978. Groundwater monitoring between 1988 and 1998 found sulfate, boron, manganese, chloride, and iron above the State's Enforcement Standards (ES) and arsenic above the State's Preventive Action Level (PAL) in nearby private wells. Other downgradient monitoring wells showed sulfate, boron, iron, and manganese in excess of the ES and selenium and chloride in excess of PALs. State agency staff consider this site one of the most seriously affected coal ash sites in the State. The State required a continuation of monitoring at this closed facility In 1982 and an investigation into groundwater contamination in 1994.

Basis for Consideration as a Damage Case: EPA has categorized this case as a proven damage case for the following reasons: (1) although the boron standard was not health-based at the time of the exceedences, the boron levels reported for the facility would have exceeded the State's recently promulgated health-based ES for boron; (2) contamination from the facility appears to have migrated to off-site private wells; and (3) as a result of the various PAL and ES exceedences, the State required a groundwater investigation.

Causative Factors: The facility is unlined and the soil underlying the site consists of fine to coarse sands and gravel with minor amounts of silt and clay and is believed to be relatively permeable. The original sand and gravel pit included an area of standing water. The presence of the standing water is attributed to the elevation of the groundwater table exceeding the base of the pit in this area. Waste was disposed directly into this area to a depth of 5 to 10 feet below the water table. (Note also that the facility is located in close proximity to a wetland, although there is no documentation of impact to flora in the wetland.)

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