RECORD OF DECISION

Operable Unit 8
American Cyanamid Superfund Site
Bridgewater Township, Somerset County, New Jersey

United States Environmental Protection Agency
Region 2
New York, New York
September 2018

550185

DECLARATION STATEMENT
RECORD OF DECISION

SITE NAME AND LOCATION

American Cyanamid Superfund Site
Bridgewater Township, Somerset County, New Jersey

Superfund Site Identification Number: NJD002173276
Operable Unit 8

STATEMENT OF BASIS AND PURPOSE

This Record of Decision (ROD) documents the U.S. Environmental Protection Agency's (EPA's) selection of a remedy for Operable Unit 8 (OU8) at the American Cyanamid Superfund site (site) located in Bridgewater Township, Somerset County, New Jersey, which was selected in accordance with the requirements of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 U.S.C. §§ 9601-9675 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. Part 300. This decision document explains the factual and legal basis for selecting a remedy to address OU8 at the site. The attached index (see Appendix III) identifies the items that comprise the administrative record upon which the selected remedy is based.

The New Jersey Department of Environmental Protection (NJDEP) was consulted on the proposed remedy in accordance with CERCLA Section 121(f), 42 U.S.C. § 9621(f), and concurs with the selected remedy (see Appendix IV).

ASSESSMENT OF THE SITE

Actual or threatened releases of hazardous substances from the site, if not addressed by implementing the response action selected in this ROD, may present an imminent and substantial endangerment to public health, welfare or the environment.

DESCRIPTION OF THE SELECTED REMEDY

The selected remedy described in this document addresses a discrete portion of the site involving highly toxic acid tar and the soil and clay impacted by the acid tar. The acid tar is located within two disposal areas, referred to as Impoundments 1 and 2, and are considered Principal Threat Wastes (PTW), as defined later in this ROD. Specifically, the media being addressed by OU8 include the PTW contained within the berms surrounding Impoundments 1 and 2, and the soil and clay impacted by the PTW, out to the toe of the berms and down to the groundwater table. Prior RODs address other portions of the site, including site-wide groundwater. OU8 is expected to be the last operable unit at the site.

The major components of the OU8 remedy include the following:

- Excavation and dewatering of the PTW (impoundment material) from Impoundments 1 and 2;
- Emission and odor control measures to protect workers and the surrounding community;
- Off-site shipment of the PTW for treatment/destruction;
- Collection of aqueous phase liquid for either treatment and discharge on-site or for off-site disposal;
- Treatment of any soil and/or clay in the impoundments impacted by the PTW with concentrations above remediation goals via in-situ stabilization and solidification (ISS);
- Backfilling the excavated areas with existing berm materials from the impoundments not requiring treatment;
- Installing a protective cover over the entire OU8 footprint; and,
- Implementing institutional controls, monitoring, and periodic reviews to ensure that the remedy remains protective of public health and the environment.

The impoundment material will be sent through a machine referred to as a dewatering screw equipped with a conveyor belt system. The dewatering screw will separate the PTW semi-solids from the liquids, resulting in two waste streams: a semi-solid to solid material suitable for shipping off-site and an aqueous phase liquid which would be collected. It is estimated that 44,700 tons of the solid to semi-solid dewatered PTW will be transported to an off-site facility, such as a cement kiln, for destruction. An estimated 9,600 tons (2.3 million gallons) of aqueous phase liquid will be collected in a proper containment vessel (i.e., above-ground storage tank or tanker truck) for storage prior to on-site treatment or transportation to an off-site treatment facility. The goal is to excavate all of the PTW from Impoundments 1 and 2. Any remaining impacted soil and/or clay containing contaminant concentrations above established remediation goals will undergo ISS treatment. The impoundments will then be backfilled to grade or near-grade and a protective cover will be constructed over the entire OU8 footprint (approximately 4 acres). Institutional controls such as a deed notice restricting future use will be implemented.

The footprint of OU8 is located entirely within the footprint of OU4 of the site, which is referred to as the site-wide remedy and addresses soil and groundwater contamination. As such, groundwater monitoring is not part of the OU8 remedy. Monitoring of the capping system will be required as part of the ongoing operation plan at the site. The details of the maintenance and monitoring requirements will be determined in the design phase.

DECLARATION OF STATUTORY DETERMINATIONS

The selected remedy meets the requirements for remedial actions set forth in CERCLA Section 121, 42 U.S.C. § 9621, because it: 1) is protective of human health and the environment; 2) meets a level or standard of control of the hazardous substances, pollutants and contaminants which at least attains the legally applicable or relevant and appropriate requirements under federal and state laws; 3) is cost-effective; and 4) utilizes permanent solutions and alternative treatment (or resource recovery) technologies to the maximum extent practicable. In addition, Section 121 of CERCLA includes a preference for remedies that employ treatment that

permanently and significantly reduce the volume, toxicity or mobility of hazardous substances as a principal element (or requires a justification for not satisfying the preference). Treatment is a principal element of the remedy selected herein because it is anticipated that the excavated PTW will require treatment through destruction to meet the requirements of off-site disposal and will significantly reduce the volume, toxicity or mobility of hazardous substances at the site.

Five-year reviews will be required because the selected remedy will result in hazardous substances, pollutants, or contaminants remaining above levels that allow for unlimited use and unrestricted exposure. A statutory review will be conducted within five years of initiation of remedial activities to ensure the remedial action is, or will be, protective of human health and the environment.

ROD DATA CERTIFICATION CHECKLIST

The following information is included in the Decision Summary section of this ROD:

- chemicals of concern and their respective concentrations may be found in the "Results of Site Investigations" section;
- current and reasonably anticipated future land use assumptions are discussed in the "Current and Potential Future Site and Resource Uses" section;
- baseline risk represented by the chemicals of concern may be found in the "Summary of Site Risks" section:
- a discussion of remediation goals may be found in the "Remedial Action Objectives" section;
- estimated capital, annual operation and maintenance (O&M) and total present worth costs are discussed in the "Description of Remedial Alternatives" section;
- key factors that led to selecting the remedy (i.e., how the selected remedy provides the best balance of tradeoffs with respect to the balancing and modifying criteria, highlighting criteria key to the decision) may be found in the "Comparative Analysis of Alternatives" and "Statutory Determinations" sections; and
- a discussion of principal threat waste may be found in the "Principal Threat Waste" section.

Additional information can be found in the administrative record for the site.

AUTHORIZING SIGNATURE

Andrew Wheeler, Acting Administrator
U.S. Environmental Protection Agency

9-25-18
Date

DECISION SUMMARY

Operable Unit 8
American Cyanamid Site
Bridgewater Township, Somerset County, New Jersey

United States Environmental Protection Agency
Region 2
New York, New York
September 2018

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APPENDICES

SITE NAME AND LOCATION

The American Cyanamid Superfund site (site), U.S. Environmental Protection Agency (EPA) Superfund site Identification Number NJD002173276, is located in Bridgewater Township, Somerset County, New Jersey. The selected remedy described herein addresses a discrete portion of the site, referred to as Operable Unit 8 (OU8), involving highly toxic acid tar and the soil and clay impacted by the acid tar. The acid tar is located within two disposal areas, referred to as Impoundments 1 and 2, and is considered Principal Threat Wastes (PTW), as defined later in this document. To avoid confusion, acid tar is also called "impoundment material" or PTW throughout this document. This is anticipated to be the last operable unit at the site. EPA is the lead agency and the New Jersey Department of Environmental Protection (NJDEP) is the support agency.

SITE DESCRIPTION

The 435-acre site is located within the southeastern section of Bridgewater Township, Somerset County, in the north-central portion of New Jersey (Figure 1). Bridgewater Township has a population of approximately 45,000 people.

Due to its size, the site is divided into five identifiable areas: North Area, South Area, West Area, East Area, and the Impound 8 Facility. The Impound 8 Facility has been designated as a Corrective Action Management Unit (CAMU), included as part of a previous Group III 1998 Record of Decision (ROD) and regulated under the Resource Conservation and Recovery Act (RCRA). Impoundments 1 and 2, the subjects of this ROD, are located in the South Area which is west of Interstate Highway 287 and between the Conrail rail line to the adjacent north and the Raritan River nearby to the south (Figure 2).

The site was used for more than eight decades to manufacture a range of products including rubber-based chemicals, dyes, pigments, chemical intermediates, petroleum-based products, and pharmaceuticals. Previous investigations identified that several surface impoundments, which are constructed waste lagoons, the surrounding soil and the groundwater aquifers below the site have been contaminated with waste chemicals from previous manufacturing processes.

The surrounding land use is a mix of light industrial and residential. The nearest residences are towards the southeast approximately 1,800 feet away from OU8. The nearest local business is approximately 400 feet to the north of both the impoundments. To the immediate north of the site, a baseball stadium, a commuter train rail station and several commercial businesses are located on redeveloped land that was once part of the site. That specific portion of the site was deleted from the National Priorities List (NPL) in 1998, when no contamination was found in that area, thus allowing for redevelopment.

According to the Federal Emergency Management Agency, the entire site, with the exception of the Impound 8 facility located in the far northwest portion, lies within a Special Flood Hazard Area designated as Zone AE. Zone AE is a zone where the base flood elevations are established using a 100-year flood event. Because of the proximity of the site to the Raritan River and frequency of flooding, a flood control dike was constructed around the entire North Area which

housed the former Main Plant area. Over the past several years, the area has been subject to frequent, and sometimes intense flooding, such as from Hurricanes Irene (2011) and Floyd (1999).

SITE HISTORY AND ENFORCEMENT ACTIVITIES

Site History

Site-Wide - The site has had several owners/operators since a chemical and dye manufacturing facility was built in 1915. The American Cyanamid Company purchased the facility in 1929 and expanded it into one of the nation's largest dye and organic chemical plants. As production increased from the 1930s through the 1970s, buildings and support services were expanded to accommodate increased demands for the products. The manufacture of bulk pharmaceuticals continued throughout the early 1990s, generating untreated waste material that was managed in on-site waste impoundments.

Preliminary investigations that were completed in 1981 verified that approximately one-half of the site was utilized to support manufacturing, waste storage, or waste disposal activities, and that contaminated source areas were confined primarily to the north area; however, on-site waste storage impoundments were located throughout the site. Twenty-seven impoundments were constructed in all. Most of the wastes from past manufacturing operations were stored in these on-site surface impoundments, while general facility wastes, debris and other materials were primarily disposed of on the ground at various locations. On September 8, 1983, the site was placed on the NPL.

Site impoundments were initially characterized through investigations conducted in the late 1980s and early 1990s. Sixteen of the 27 impoundments used for storing wastewater treatment residuals and manufacturing byproducts originating from production of rubber intermediates and products, organic dyes, and coal tar distillation were identified for remediation under CERCLA. The remaining 11 impoundments generally contain non-hazardous substances[1]. Past waste storage and disposal practices, along with other releases typically associated with normal operations of a manufacturing facility with such a long, diverse history, resulted in extensive on-site soil and groundwater impacts.

In 1988, the American Cyanamid Company agreed to perform a site-wide Feasibility Study (FS) and corrective actions for the 16 CERCLA impoundments. At that time, those 16 impoundments were organized into three groups according to impoundment contents, location, and potential remedial alternatives. A ROD followed for each of the three groups:

- Group I – Impoundments 11*, 13, 19*, and 24

[1] The other impoundments are not addressed by the CERCLA response action for the following reasons: Impoundments 9, 10 and 12 were never used, Impoundment 22 previously contained emergency fire water, Impoundment 23 contains only river sediment from the facility's former river water treatment plant, Impoundment 21 contains emergency fire water, Impoundment 25 was closed with NJDEP approval in 1988, and Impoundments 6,7,8 and 9A are being closed in accordance with approved RCRA closure plans, because they were classified under RCRA as Treatment/Storage/Disposal (TSD) facilities.

- Group II – Impoundments 1, 2, 15, 16, 17, and 18*
- Group III – Impoundments 3, 4, 5, 14*, 20*, and 26*

("*" – Remediation complete)

Due to the toxicity of Impoundments 1 and 2, EPA subsequently decided to move them into Group III.

A ROD for the revised listing of Group III Impoundments was issued in September 1998. However, a pilot test confirmed that the selected remedy for Impoundments 1 and 2 (low temperature thermal treatment and placement of material in the CAMU) was technically infeasible due to anticipated difficulties in both the extensive handling of the acid tar material and complications with controlling air emissions during the treatment phase of remedy implementation. This finding resulted in the suspension of some remediation activities for the Group III Impoundments. However, some impoundments under the 1998 ROD (Impoundments 14, 20, and 26) have since been remediated and the contents permanently placed in the CAMU.

The remaining Group III Impoundments (1, 2, 3, 4, and 5) presented significant technical challenges based on their physical setting and complex characteristics. In 2004, American Cyanamid, NJDEP, and EPA recognized the complexity of these impoundments and agreed that a comprehensive site-wide FS should be completed to re-evaluate remedial alternatives. In mid-2009, due to the complexity of the contaminants present within Impoundments 1 and 2, EPA moved the remedial evaluation of Impoundments 1 and 2 into a separate Focused Feasibility Study (FFS). As a result, a separate OU was created and called OU8 while a site-wide FS was concurrently being completed for the remainder of the site (known as Operable Unit 4 (OU4)).

Under the revised approach, six impoundments (3, 4, 5, 13, 17, and 24) were grouped into OU4 along with all site-wide contaminated soil and groundwater. The site-wide FS was completed and led to the OU4 ROD issued on September 27, 2012. The remediation of OU4 is currently being implemented.

Impoundments 1 and 2 - The location of Impoundments 1 and 2 within the Raritan River floodplain, along with the acidic, high volatile compound content and complex nature of the material, make addressing Impoundments 1 and 2 very different from the other materials elsewhere at the site.

Between 1947 and 1965, the American Cyanamid facility produced, among other things, benzene, toluene, naphthalene and xylene from coal light-oil refining. The residual byproduct of refining coal light oil was acid tar. The byproducts were managed and stored within Impoundments 1 and 2 with the idea that in the future some of this material would be able to be recycled and reused as appropriate.

Impoundment 1 was constructed in 1956 and used until 1965. The Impoundment encompasses 2.1 acres and is approximately 15 feet deep from the top of the impoundment berm to its overall lowest extent, approximately 6 feet below the existing grade (Figure 3). This impoundment is constructed of sand, silt, and fine gravel and has a 1foot layer of clay and silt placed at the

bottom. The base of the clay layer is approximately 1 foot above the top of the water table in the overburden aquifer.

Impoundment 2 was constructed in 1947 and used until 1956. It is 2.3 acres in size, is also approximately 15 feet deep from the top of the impoundment berms and it extends approximately 6 feet below the surrounding grade. Similar to Impoundment 1, the berms are constructed of sand, silt, and fine gravel, have a 1-foot layer of clay and silt at the bottom, and are located within approximately 1 foot above the top of the water table in the overburden aquifer.

Corrective action on groundwater discharges near Impoundments 1 and 2 - In late 2010, Wyeth Holdings Corporation, now known as Wyeth Holdings LLC (Wyeth Holdings) and the current site owner, observed groundwater seeps at the site on the banks of the Raritan River downgradient of Impoundments 1 and 2. Laboratory analysis of the seeps reported concentrations up to 20,000 parts per billion (ppb) of benzene. Soon thereafter, Wyeth Holdings implemented an interim plan consisting of the installation of activated carbon-filled sand bags along the river banks at the seep discharge points. Given the proximity of Impoundments 1 and 2 to the groundwater seeps and the known chemical contents of these impoundments, they are considered the source of the seeps.

Beginning in late 2011 and into 2012, a groundwater removal system was constructed to capture and prevent releases of contaminated site groundwater from reaching the Raritan River. This system consists of an interim groundwater treatment facility, groundwater collection trench, and hydraulic barrier wall located downgradient of Impoundments 1 and 2. The system continues to operate today and monitoring efforts have indicated that the seeps have been successfully intercepted. All work on this removal system is currently being managed under OU4. The OU4 remedy has since included plans to enhance the interceptor system.

Enforcement Activities

The American Cyanamid Company entered into several Administrative Consent Orders (ACOs) with the NJDEP in 1982 and 1988 (amended in 1994) to investigate and remediate the site. In 1983, EPA listed the site on the NPL, and environmental remediation and restoration activities have been ongoing at the site since that time under CERCLA.

In December 1994, American Home Products Corporation purchased the American Cyanamid Company, and assumed full responsibility for environmental remediation as required under the NJDEP ACO for this site. In December 2002, American Home Products Corporation changed its name to Wyeth Corporation (Wyeth). In October 2009, Wyeth was purchased by Pfizer Inc., and became a wholly-owned subsidiary of Pfizer. Ownership of the site is held in the name of Wyeth Holdings, a wholly-owned subsidiary of Wyeth.

NJDEP was the lead agency for the site until March 2009, when EPA assumed the lead role.

On July 19, 2011, Wyeth Holdings entered an Administrative Settlement Agreement and Order on Consent with EPA requiring Wyeth Holdings to design and construct a removal system engineered to intercept and capture contaminated groundwater in the overburden and prevent it

from seeping into the Raritan River. These activities have been completed and the system is currently operational.

Under a December 8, 2015 Consent Decree (CD) between EPA (in consultation with NJDEP) and Wyeth Holdings, the remediation of OU4 is now underway.

COMMUNITY PARTICIPATION

EPA has encouraged and received public involvement throughout the regulatory history of the site. A Community Involvement Plan was established in 1988 by NJDEP and implemented for a series of RODs in the 1990s. An updated Community Involvement Plan was established in January 2011 to serve as a guide for Wyeth and EPA in sharing information and obtaining public input on the OU4 and OU8 remedies. In 1992, EPA awarded a Technical Assistant Grant (TAG) to CRISIS, Inc. This grant continues today to provide funding for activities that help the community participate in decision making at eligible Superfund sites. Since that time, CRISIS has been the primary community-based group serving as liaison between the NJDEP, EPA, and the community. CRISIS has consistently participated in monthly project calls and served in a technical review capacity on behalf of the community.

The Proposed Plan for the site (see Attachment A of Appendix V) was released for public comment on May 23, 2018. The notice of availability of the Proposed Plan and supporting documents was published in the *Home News Tribune* newspaper on May 30, 2018. The Proposed Plan and other site-related documents were made available to the public in the administrative record file maintained online at https://www.epa.gov/superfund/american-cyanamid.

The public comment period began on May 29, 2018 and lasted 31 days, closing on June 28, 2018. In addition, a public meeting was held on June 12, 2018, at the Bridgewater Township Municipal Building, 100 Commons Way, Bridgewater, New Jersey to discuss the Proposed Plan, all the alternatives presented in the FFS Report and to present EPA's preferred remedy for OU8 to the community. Comments that were received by EPA at the public meeting and in writing during the public comment period are addressed in the Responsiveness Summary (see Appendix V).

SCOPE AND ROLE OF THIS OPERABLE UNIT

As with many Superfund sites, the contamination at this site is complex, and the site-wide cleanup is currently being managed through OU4, discussed previously in the Site History section, above. This ROD addresses the final planned OU for the site, OU8.

OU8 is comprised of Impoundments 1 and 2, each approximately 2 acres in size and approximately 15 feet in depth. Both currently have a synthetic sheeting cover and water cap over the impoundment materials to limit odors and provide protection during flooding. The media being addressed by OU8 include the impoundment material (PTW) contained within the berms, and soil and clay impacted by OU8 impoundment material out to the toe of the berm and underlying the impoundments down to the groundwater table.

Groundwater beneath Impoundments 1 and 2 and the area outside the toe of the berms of Impoundments 1 and 2 are considered part of the site-wide remedy (OU4).

RESULTS OF SITE INVESTIGATIONS

Over the last 30 years, Impoundments 1 and 2 have been the subject of several comprehensive studies through multiple site investigations and treatability studies targeting the management, treatment, and potential remediation of the material within each impoundment. Historical samples collected prior to 2010 were generally obtained from areas along the impoundment berms and very little, if any, sampling occurred near the center of the impoundments.

The 2010 characterization effort represents the most thorough data set summarizing the chemical content of the impoundment materials. Previous investigations addressed material properties and considered the application of specific technologies. The sampling from those previous investigations, including pertinent parameters such as calorific value, sulfur content, moisture content, density, corrosion potential, flash point, etc., were also compiled to support evaluation of technologies and develop alternatives. A statistical summary of the most representative site characterization is presented in Table 1. Characterization is segregated by impoundment location and material type.

The current contents of the two impoundments, considered PTW, are similar in that the materials are very acidic (average pH of 1.5 SU) with a solid to semi-solid consistency and contain volatile organic compounds (VOCs), primarily benzene, toluene, and xylene; and semi- volatile organic compounds (SVOCs), primarily naphthalene. Malodorous sulfur compounds, including hydrogen sulfide, sulfur dioxide, mercaptans, and carbon disulfide, are also present in these materials.

Site Geology and Hydrogeology

Geologically, the site is situated in the New Jersey Piedmont geomorphologic province, which is an area of rolling, low-lying terrain interrupted only by the Watchung Mountains, about 1.5 miles to the north. Overall, the site is generally flat, with a natural slope and direction of approximately 2% to the south-southeast toward the Raritan River.

Surface geology - The natural soil of the site is a mixture of sand, silt, and clay (loam). Man-made fill/general solid wastes and disturbed soil and gravel also exist at ground surface in portions of the site.

Geology of unconsolidated deposits - The general area around the site is covered by naturally occurring unconsolidated sediment ranging in thickness from 5 to 30 feet. This sediment is either the weathering product (soil) of the underlying bedrock, or it is fluvial deposits related to the adjacent Raritan River.

Bedrock geology - The unconsolidated deposits are underlain by bedrock. This bedrock layer is part of the Passaic Formation, which consists of a series of reddish-brown shale, siltstone, and fine-grained sandstone units. The bedrock contains highly fractured zones which allow vertical groundwater flow. These bedrock fractures control the composition and distribution of the

overlying water-bearing units and the groundwater flow regime in the overburden aquifer system.

The site is underlain by a shallow overburden aquifer system and a deeper semi-confined bedrock aquifer system, including the area beneath Impoundments 1 and 2. The two aquifers are separated by a zone of weathered bedrock.

Overburden - Overburden at the site consists of a combination of fabricated fill and Quaternary alluvial deposits exhibiting a fining upward sequence. The overburden aquifer consists of two water-bearing units – an unconfined surficial fabricated fill unit and an underlying confined-to-semiconfined sand and gravel zone. A low-permeability silt and clay unit generally separates the two units.

In the vicinity of Impoundments 1 and 2, groundwater is generally encountered at 6 to 7 feet below ground surface and flow is to the south toward the Raritan River.

Bedrock - The site is located in the Newark Basin section of New Jersey's Piedmont province and is underlain by the Passaic Formation. The Passaic Formation is a Late Triassic to Early Jurassic-age reddish-brown shale, siltstone, and mudstone with green and brown shale interbeds. Bedrock near the site strikes northeast-southwest and dips gently to the northwest.

Near Impoundments 1 and 2, bedrock is generally encountered at an elevation of approximately 15 feet below ground surface. Under natural conditions groundwater flow in the bedrock aquifer in the vicinity of Impoundments 1 and 2 is largely controlled by bedding planes and fracture systems.

Nature and Extent of Contamination

The area of OU8 (Impoundments 1 and 2) consists of impoundment media that include the impoundment berms out to the toe of the slope (where the end of the berm is located and the natural floodplain terrain begins), impoundment material contained within the berms, the soil and clay impacted by OU8 impoundment material, and all material underlying the impoundments potentially down to the groundwater table. Groundwater beneath the impoundments and the area outside the toe of the berms of Impoundments 1 and 2 is being addressed as part of the site-wide remedy under OU4.

The 2010 investigation was designed to characterize each impoundment as a whole by collecting samples from a representative horizontal grid and multiple depth intervals within each impoundment. In total, 53 spatially distributed samples were collected from Impoundments 1 and 2 and analyzed for metals, VOCs and SVOCs. Sample results confirmed the presence of VOCs, SVOCs, and metals. Benzene, toluene, and naphthalene were the predominant compounds encountered in samples collected from both impoundments and are considered the primary contaminants of concern (COCs). Nitrobenzene and xylene are also considered COCs for OU8.

In Impoundment 1 samples, the three primary COCs account for more than 83 percent of the contaminant mass. Other VOCs and SVOCs were detected in the Impoundment 1 samples;

however, their individual contribution to total contaminant mass is considered less significant in comparison to benzene, toluene, and naphthalene. To streamline data presentation and future discussion of remedial alternatives going forward, summary sampling results of 25 samples obtained from the 2010 characterization effort were parsed to determine compounds that accounted for more than 0.2 percent of total contaminant mass detected in Impoundment 1 materials. In total, 20 compounds exceeding the 0.2 percent threshold (and accounting for 96.3 percent of the total contaminant mass) were identified in Impoundment 1 materials. All 20 compounds are presented in Table 2.

Similar to Impoundment 1, benzene, toluene, and naphthalene are the primary COCs present in Impoundment 2 samples. Collectively, these three compounds account for nearly 70 percent of the total contaminant mass in samples analyzed. Summary results from 28 samples collected from Impoundment 2 in 2010 were parsed as previously described using an identical mass threshold (0.2 percent). The Impoundment 2 data evaluation returned 21 compounds exceeding the 0.2 percent threshold, which accounted for 96.7 percent of the total contaminant mass identified in Impoundment 2 materials. A selected summary of these organics detected in Impoundment 2 samples is shown in Table 3.

Comparison of Impoundment 1 and 2 sampling results summarized in Tables 2 and 3 indicate strong similarities with respect to chemical composition. In general, the mean concentrations of benzene, toluene, and naphthalene are consistent between Impoundments 1 and 2.

Although differences are noted in the speciation and concentration of organic compounds detected in the impoundment materials, the chemical composition of Impoundment 1 and Impoundment 2 materials is similar and of comparable concentration magnitude. As previously identified, the three primary COCs are benzene, toluene, and naphthalene, with benzene concentrations often an order of magnitude higher (nitrobenzene and xylene are also considered COCs).

Benzene is typically found at concentrations near 60,000 parts per million (ppm), or 6 percent by mass. However, as noted in Tables 2 & 3, benzene levels have been found up to 207,000 ppm (Impoundment 1) and 183,000 ppm (Impoundment 2). The material in these two impoundments is very acidic, with an average pH of 1.5 standard units (SU) and as low as 0.56 SU.

The location of the impoundments in the Raritan River floodplain, along with the acidity and complex nature of the materials, make addressing these impoundments technically challenging.

The FFS report for OU8 was finalized in May 2018.

CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

Though currently vacant, the site is zoned for industrial use. While this is not expected to change after completion of the remedy, the expectation is that the area will not be utilized as an industrial property. At most, the expectation is that some limited passive recreational use may occur.

The OU4 ROD included the following institutional controls to maintain the long-term protectiveness of the remedy: deed restrictions to maintain the protectiveness and functional integrity of engineered capping systems; restrictive covenants to prevent future land uses that interfere with the implementation or protectiveness of the selected remedy; and a groundwater Classification Exception Area (CEA)/Well Restriction Area to prohibit future use of the groundwater in this area and to restrict the installation of wells (other than for monitoring or remediation purposes) in the area for the duration of the CEA. These will be reviewed to make sure the footprint of OU8 is covered by these institutional controls. If not, appropriate institutional controls, such as a deed notice and CEA, will be implemented for OU8.

SUMMARY OF SITE RISKS

A Superfund baseline risk assessment is an analysis of the potential adverse human health and ecological effects of releases of hazardous substances from a site if no actions or controls to mitigate such releases are taken, under current and future land uses. The baseline risk assessment includes a human health risk assessment (HHRA) and an ecological risk assessment (ERA). It provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action.

As part of the FFS for OU8, baseline risk assessments prepared for the overall site were reviewed and used to support the OU8 decision process. The process and findings are described in more detail below.

Human Health Risk Assessment

A four-step process is utilized for assessing site-related human health risks for a reasonable maximum exposure scenario:

- *Hazard Identification* – In this step, the chemicals of potential concern (COPCs) at the site in various media (i.e., soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation;

- *Exposure Assessment* – In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a “reasonable maximum exposure” scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

- *Toxicity Assessment* – In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of

adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health hazards, such as changes in the normal functions of organs within the body (e.g., changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and noncancer health hazards.

- *Risk Characterization* – This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one in ten thousand excess cancer risk" or that one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one-in-ten-thousand to a one-in-a-million excess cancer risk[2]. For noncancer health effects, a "hazard index" (HI) is calculated. The key concept for a noncancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which noncancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site.

Two HHRAs that relate to OU8 have been conducted for the site. The process described above was generally followed for each of these assessments.

2006 HHRA

In 2006, a full baseline HHRA was conducted as part of the RI/FS for OU4 of the site. This HHRA included an evaluation of the exposure risks for the area surrounding, but not including, Impoundments 1 and 2. The assessment evaluated potential risks to several receptors (i.e., site worker, on-site security personnel, maintenance worker, adolescent trespasser, recreational visitor, swimmer and potential future resident). This assessment included evaluating air, soil, nearby Cuckold's Creek (aka Cuckel's Brook), and the Raritan River, but did not evaluate risks posed by the impoundment material itself.

2010 Streamlined HHRA

In 2010, a streamlined HHRA was conducted to evaluate the potential cancer risks and non-cancer hazards associated with exposure to surface soil, groundwater and site impoundments, including Impoundments 1 and 2. Since the current zoning of the site is industrial, the streamlined HHRA focused on industrial workers. Data used for the assessment were summarized in the American Cyanamid Comprehensive Site Wide Feasibility Study (December 2008), and were collected after the data that were used in the 2006 HHRA.

[2] In accordance with its regulations, NJDEP uses 10^{-6} as a point of departure for cancer risk.

In order to determine the cancer risks and noncancer hazards associated with exposure to impacted media, the maximum detected concentrations in each impoundment were compared to their respective human health risk-based screening levels. This ratio yielded a cancer risk or noncancer hazard (whichever is the most sensitive endpoint) associated with each chemical. The surface soil risk-based screening levels are based on a worker's direct exposure (via ingestion, inhalation of particulates and dermal contact) while working at the site over a period of 25 years (see Table 4).

Industrial workers' potential exposure to material in Impoundments 1 and 2 was found to exceed the acceptable risk range of $1x10^{-4}$ to $1x10^{-6}$ and the noncancer Hazard Index of 1. As is shown in Table 5, the Impoundment 1 material is associated with a cancer risk of 7×10^{-2} and a non-cancer HI of 34. Impoundment 2 is associated with a cancer risk of 1.1×10^{-2} and an HI of 7.

The COCs contributing to the greatest risk in both impoundments are benzene, toluene, xylene, naphthalene and nitrobenzene.

Uncertainties

The procedures and inputs used to assess risks in this evaluation, as in all such assessments, are subject to a wide variety of uncertainties. In general, the main sources of uncertainty include:

- environmental chemistry sampling and analysis
- environmental parameter measurement
- fate and transport modeling
- exposure parameter estimation
- toxicological data.

Uncertainty in environmental sampling arises in part from the potentially uneven distribution of chemicals in the media sampled. Consequently, there is significant uncertainty as to the actual levels present. Environmental chemistry-analysis error can stem from several sources including the errors inherent in the analytical methods and characteristics of the matrix being sampled. Uncertainties in the exposure assessment are related to estimates of how often an individual would actually come in contact with the chemicals of concern, the period of time over which such exposure would occur, and in the models used to estimate the concentrations of the chemicals of concern at the point of exposure.

Uncertainties in toxicological data occur in extrapolating both from animals to humans and from high to low doses of exposure, as well as from the difficulties in assessing the toxicity of a mixture of chemicals. These uncertainties are addressed by making conservative assumptions concerning risk and exposure parameters throughout the assessment. As a result, the risk assessment may provide an upper-bound estimate of the risks by OU8. In this case, risks may be underestimated due to the presence of very high concentrations of some COCs which may mask the presence of other COCs.

Additional information regarding the human health risks posed by OU8 can be found in the administrative record for OU8.

Ecological Risk Assessment

Since OU8 focused on Impoundments 1 and 2, no ecological risk assessment was conducted. However, ecological risks assessments for the overall site are presented in the 1992 *Baseline Site-wide Endangerment Assessment* (BEA) (Blasland, Bouck, & Lee [BBL] 1992) and the 2005 *Baseline Ecological Risk Assessment* (BERA). These documents are available in the administrative record file.

Currently Impoundments 1 and 2 do not represent a viable habitat and therefore an ecological risk assessment was not performed. Further, since any remedy selected for OU8 will address the PTW in the impoundments down to the surrounding soil and clay located around 5 to 6 feet below ground surface, the potential for ecological risks due to exposure to the impoundment material will be eliminated.

Basis for Taking Action

Based on the results of the quantitative human health risk assessment, EPA has determined that actual or threatened releases of hazardous substances from OU8, if not addressed by the response action selected in this ROD, may present a current or potential threat to human health.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) provide a general description of what the remedial action is intended to accomplish. Development of the RAOs considered the understanding of the contaminants in Impoundments 1 and 2, and is based upon an evaluation of risk to human health and the environment and reasonably anticipated future use. RAOs have been developed to address the threat posed by PTW in the floodplain. While the site is zoned industrial, the reasonably anticipated future use of the site is for limited passive recreation, such as walking. As such, a performance objective for the selected remedy is to make the associated floodplain areas available for this type of use, wherever practicable, within a timeframe that is reasonable given the characteristics of the site. The RAOs for OU8 have been developed to satisfy these expectations.

The following RAOs were established for OU8:

- Remove, treat, and/or contain material that is considered PTW;
- Prevent human exposure (direct contact) to COCs above remediation goals in soil; and,
- Minimize or reduce current or future migration of COCs from Impoundments 1 and 2 to groundwater.

The footprint of OU8 is contained entirely within the footprint of OU4, which addresses site-wide soil and groundwater. OU8 includes all soil and clay material and PTW in Impoundments 1 and 2, to the outside toe of the berm surrounding them; it does not include groundwater. As such, there is no RAO specifically for groundwater since groundwater will be managed entirely as part

of, and consistent with, the remedy selected in the 2012 ROD for OU4[3]. The OU8 remedy will prevent or minimize future migration of COCs from the OU8 impoundments, including to groundwater, but if migration does occur, it will be addressed through the OU4 treatment processes. The OU4 remedy includes the use of hydraulic barrier walls and extraction wells to capture contaminant mass and maintain an inward gradient around the site, and these controls extend beyond the limits of OU8.

Remediation Goals

Remediation goals were developed during the FFS process. Typically, they are based on Applicable or Relevant and Appropriate Requirements (ARARs), including state remediation standards, and other readily available information, such as concentrations associated with 10^{-6} cancer risk or a hazard quotient equal to one for non-carcinogens calculated from EPA toxicity information.[4] Initial remediation goals may also be modified based on exposure, uncertainty, and technical feasibility factors.

The source area remediation goals for OU8 were calculated using the same methodology used to calculate remediation goals for OU4. It should be noted that toluene and xylene were not COCs for OU4 because exposure to these chemicals did not result in an unacceptable risk for OU4; however, they do present an unacceptable risk in Impoundments 1 and 2. Similarly, 1,2-dichlorobenzene and n-nitrosodiphenylamine were COCs for OU4 but are not COCs for OU8. Each remediation goal that was developed for OU4 was reviewed to make sure it is still appropriate. The source area remediation goals are established based on risk thresholds that define PTW, as well as visual evidence of mobile, source material.[5]

In summary, the following remediation goals, consistent with the OU4 ROD, will be used to identify any waste that must be addressed to meet RAOs:

[3] The RAOs for groundwater selected in the OU4 ROD are as follows:

- Restore, as practicable, the overburden and bedrock aquifers within the area of attainment to its expected beneficial use and to concentrations below the more stringent of federal MCLs and NJ GWQS within a reasonable period; and
- Eliminate the migration of contaminants exceeding the more stringent of federal MCLs and NJ GWQS in the overburden and bedrock aquifers beyond the point of compliance through a combination of source actions and hydraulic controls to the extent practicable.

[4] NJDEP soil remediation standards are based on a 10^{-6} cancer risk or hazard quotient of 1.

[5] Source area remediation goals are described in the OU4 ROD generally as follows:

- Source area Remediation Goals were developed for areas requiring movement control and vapor control. Numerical criteria were developed to aid in defining the extent of contaminated media requiring movement control. The visual observation of acid tar will also be utilized to identify areas requiring movement control, regardless of whether these tarry substances exceed the numerical criteria.

Source Area Remediation Goals

COC	Remediation Goal (ppm)
Benzene	4,460
Nitrobenzene	12,300
Naphthalene	6,180
Toluene	460,000
Xylene	25,000

DESCRIPTION OF REMEDIAL ALTERNATIVES

Section 121(b)(1) of CERCLA, 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, be cost-effective, and use permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. CERCLA Section 121(b)(1) also establishes a preference for remedial actions which employ, as a principal element, treatment to permanently and significantly reduce the volume, toxicity, or mobility of the hazardous substances, pollutants and contaminants at a site. CERCLA Section 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must require a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. § 9621(d)(4).

Remedial alternatives for OU8 are summarized below. Capital costs are those expenditures that are required to construct a remedial alternative. Operation and maintenance (O&M) costs are those post-construction costs necessary to ensure or verify the continued effectiveness of a remedial alternative and are estimated on an annual basis. Present worth is the amount of money which, if invested in the current year, would be sufficient to cover all the costs over time associated with a project, calculated using a discount rate of seven percent and a 30-year time interval. Construction time is the time required to construct and implement the alternative and does not include the time required to design the remedy, negotiate performance of the remedy with the responsible parties, or procure contracts for design and construction.

Detailed information regarding the alternatives can be found in the 2018 *Focused Feasibility Study Report* (FFS Report).

Common Elements

All of the remedial alternatives except Alternative 1 (No Action) address the PTW within the impoundments. To ensure OU8 does not have any remaining unacceptable risks to human health or the environment after remedy completion, all alternatives would employ a protective cap. In addition, all alternatives except for Alternative 1 would include long-term monitoring and institutional controls to prevent future residential land use over the 4-acre impoundment footprint, as well as restrictions on land use of capped floodplain soil. The degree of monitoring that would be required is different for each alternative based upon whether a significant amount of PTW is removed (Alternatives 5 and 6) or would remain in place (Alternatives 3 and 4). All

alternatives would employ a comprehensive health and safety program and a perimeter air monitoring program would be developed during the remedial design phase to ensure worker and community protection during construction/remediation activities.

Because benzene and toluene are similar in structure and physical properties, and because benzene is considered more toxic, it is often used as a surrogate when discussing VOC treatment. Potential remedial alternatives assembled and evaluated in the FFS and in this document are capable of addressing the range of VOCs and SVOCs detected in the impoundment materials. However, the relative technical feasibility of the alternatives evaluated was dependent on the ability of each alternative to effectively address benzene and naphthalene in the proportions in which they are detected in the impoundment materials. Furthermore, since benzene and naphthalene respectively represent the typical environmental behavior of VOCs and SVOCs that require remediation, these compounds are considered representative of VOCs and SVOCs in discussions below regarding technology application and the overall feasibility and efficacy of the assembled alternatives.

Another common element of the alternatives is the application of in-situ stabilization and solidification (ISS) technology, as described below. For ISS (alone or in combination with other remedial components), the variability of the waste material within the impoundments may require the use of a range of different treatment additives (such as Portland cement, lime kiln dust and cement kiln dust) to achieve the remedial performance criteria (also discussed in the remedial alternatives, below).

Because OU8 is located entirely within the footprint of the OU4 site-wide remedy, which addresses soil and groundwater contamination, costs for each alternative do not include groundwater monitoring. This monitoring will be conducted as part of the OU4 remedy.

Because hazardous substance will be left behind at levels that do not allow for unlimited use and unrestricted exposure, five-year reviews will be required for each alternative, as required by CERCLA Section 121(c) and the NCP [40 C.F.R. § 300.430(f)(4)(ii)].

Alternative 1 - No Action

The NCP requires that a “No Action” alternative be developed as a baseline for comparing other remedial alternatives. Under this alternative, no action would be taken to remediate the PTW or impacted soil and clays within the impoundments or berms at OU8. No other controls would be included under Alternative 1.

Capital Cost:	$0
O&M Costs:	$0
Periodic Costs:	$0
Implementation Timeframe:	Not Applicable

**** Note: Alternative 2 from the FFS was screened out and was not considered further.**

Alternative 3 – ISS Treatment, Inner Hydraulic Barrier Wall (HBW), Protective Cover

Alternative 3 involves ISS treatment of the PTW and soil and clays found to have been impacted by the OU8 impoundment material. This remedial approach would provide for permanent, long-term treatment and reduction of contaminant mass and solidification of impoundment material including pH adjustment, installation of a hydraulic barrier wall (HBW - which is a physical barrier designed to reduce lateral migration of groundwater or waste materials), placement of a low-permeability engineered cover with active vapor control, berm armoring, and infrastructure upgrades to allow for closure-in-place. The anticipated duration of field activities for Alternative 3 is 20 months. A comprehensive health and safety program and perimeter air monitoring program would be developed to ensure worker and community protection.

Details - This alternative consists of three major components:

- ISS treatment of impoundment material (PTW)
- Installation of an inner HBW
- Installation of a protective cover

ISS would be applied to provide for permanent, long-term reduction of contaminant mass and solidification of all impoundment material. Treatment would result in pH adjustment and increased material strength to support construction equipment and the engineered cover, and would create a low-permeability monolith that reduces leaching of COCs. Based on treatability and pilot study findings, ISS of material in both Impoundments 1 and 2 can meet the required ISS performance criteria goals established for OU8, which are:

- Hydraulic conductivity: less than 10^{-6} cm/s
- Unconfined Compressive Strength (UCS): greater than 40 psi
- Benzene leachability reduction: greater than 90 percent
- pH: 4 to 12 SU

Note: UCS is a measure directly related to the material's ability to support loads such as an engineered cover.

ISS would be completed using large-diameter mixing augers to incorporate ISS reagents into the impoundment material creating a series of overlapping, treated columns. Columns would extend to a depth of approximately 2 feet below the bottom of the impoundments.

Assuming one shift per day, a 5-day work week and 90 percent operating time (to account for severe weather and holidays), it would take approximately 8 months to complete the ISS mixing process in both impoundments.

A measurable amount of VOC mass reduction would occur with ISS, resulting from the agitation/auger-mixing and exothermal nature of ISS chemical reactions. For the duration of mixing operations, vapors would be controlled using a vented outer shroud on the mixing augers. Each vented shroud would be used to actively collect (via vacuum) and direct vapors to a thermal oxidizer and caustic scrubber (two units, one per ISS rig). As part of the remedial design, additional testing would be completed to determine the emissions expected during remedy

implementation to ensure proper capture and public safety. A water cap would be maintained on untreated material within the impoundments to minimize VOC emissions.

While VOC-mass reduction will occur during ISS, the primary method of treatment for this alternative is sequestration within a solidified matrix.

An inner HBW would be installed to minimize contact of upgradient groundwater with the treated monolith. Details of the HBW (e.g., construction, materials, monitoring, etc.) would be determined during design.

Following completion of ISS operations, curing, and removal of the temporary vented cover, a protective cover would be installed over the impoundments to prevent direct contact with treated material, control vapors as needed, and protect against flooding. For purposes of this evaluation, it was assumed that this would consist of a lowpermeability engineered cover with a vapor control component, however, the specific cover design would be established during the design phase.

The engineered cover would be maintained through routine inspections and implementation of corrective measures, as necessary. Vegetated areas would be maintained once annually, or as needed. Site inspections would include evaluating the impoundment area for evidence of erosion, cracking, sloughing, animal burrows, stressed vegetation, etc. Maintenance for the engineered cover during post-closure care would be performed semiannually in perpetuity.

Capital Costs	$44,000,000
Operation & Maintenance Costs	$3,900,000
Periodic Costs	$150,000
Total Present Value	$48,000,000
Construction Timeframe	20 months

Alternative 4 – Steam-Enhanced ISS Treatment, Inner HBW, Protective Cover

This alternative involves heating the impoundment contents via steam injection to provide enhanced reduction of contaminant mass, implemented in conjunction with ISS treatment. This alternative also includes pH adjustment, installation of an HBW and a low-permeability engineered cover with active vapor control and berm armoring, and infrastructure upgrades to allow for closure-in-place. The anticipated duration of field activities for Alternative 4 is 24 months. A comprehensive health and safety program and perimeter air monitoring program would be developed to ensure worker and community protection.

Details - This alternative consists of four major components:

- Steam-enhanced injection into impoundment materials (PTW)
- ISS treatment of impoundment material (PTW)
- Installation of an inner HBW
- Installation of a protective cover

Steam-enhanced ISS would be applied to increase VOC mass reduction beyond the expectations of Alternative 3, adjust the pH of the impoundment material, increase material strength to support construction equipment and the engineered cover, and create a low-permeability monolith that reduces leaching of COCs to groundwater. Based on treatability and pilot study findings, ISS of material in both Impoundments 1 and 2 can meet the selected ISS performance criteria goals established for OU8, as listed above under Alternative 3.

Steam-enhanced ISS would be completed using large-diameter mixing augers. During the initial mixing operations, steam infused with compressed air would be injected by the mixing equipment to heat the impoundment material and promote contaminant volatilization during homogenization. Following steam-enhanced mixing, ISS reagents would be mixed into the impoundment material creating a series of overlapping, treated columns. Columns would extend to a depth of approximately 2 feet below the bottom of the impoundments.

Assuming one shift per day, a 5-day work week and 90 percent operating time (to account for severe weather and holidays), it would take approximately 12 months to complete the ISS mixing process in both impoundments.

VOC-mass reduction for Alternative 4 would be greater than for ISS alone as described in Alternative 3; however, it is not possible to quantify the greater level of mass reduction that might occur. Similar to Alternative 3, a testing approach would be required during remedial design to determine the emissions expected during remedy implementation to ensure proper capture and public safety. These results would also assist designing both an appropriate air monitoring control and monitoring strategy. The majority of VOCs and SVOCs under this alternative are still expected to be sequestered within a solidified matrix.

An inner HBW would be installed to minimize contact of upgradient groundwater with the treated monolith. Details of the HBW (e.g., construction, materials, monitoring etc.) would be determined during design.

Following completion of ISS operations, curing, and removal of the temporary vented cover, a protective cover would be installed over the impoundments to prevent direct contact with treated material, control vapors as needed, and protect against flooding. For purposes of this evaluation, it has been assumed that this would consist of a lowpermeability engineered cover with a vapor control component; however, the specific cover details would be established during the design phase.

The engineered cover would be maintained through routine inspections and implementation of corrective measures, as necessary. Vegetated areas would be maintained once annually, or as needed. Site inspections would include evaluating the site for evidence of erosion, cracking, sloughing, animal burrows, stressed vegetation, etc. Maintenance for the engineered cover during post-closure care would be performed semiannually in perpetuity.

Capital Costs	$56,000,000
Operation & Maintenance Costs	$3,900,000
Periodic Costs	$150,000

Total Present Value	$60,000,000
Construction Timeframe	24 months

Alternative 5 – Steam-Enhanced ISS Treatment, Excavation and Placement in CAMU, Protective Cover

This alternative involves using steam enhanced ISS to treat PTW in the impoundments, then removing the treated material and placing it in the on-site CAMU. In-situ treatment with steam would promote contamination mass reduction, improve material handling properties, and facilitate treated material removal for final disposal in the on-site CAMU. Following reduction and removal of treated impoundment material, the berms would be backfilled and a protective cover would be installed over any remaining ISS-treated soil and clay materials impacted by OU8 impoundment material to minimize any potential future migration of COCs. The anticipated duration of field activities for Alternative 5 is 30 months. A comprehensive health safety program and perimeter air monitoring program would be developed to ensure worker and community protection.

Details - This alternative consists of the following major components:

- Steam-enhanced ISS treatment of impoundment material (PTW)
- Excavation of treated materials and placement into the CAMU
- Additional treatment through ISS of soil and clay impacted by OU8 impoundment material exceeding remediation goals
- Backfill with existing berm materials
- Installation of a protective cover

Steam-enhanced ISS would be applied to increase VOC mass reduction, adjust the pH of the impoundment material, and improve material handling properties to facilitate excavation and placement in the CAMU. This alternative would be designed to meet the performance criteria for the CAMU liner compatibility specified in the FFS.

Assuming a 5-day work week and 90 percent operating time (to account for severe weather and holidays), it would take approximately 12 months to complete the ISS mixing process in both impoundments.

After ISS operations are completed, treated material would be removed from the impoundments using conventional excavation methods and transported by truck to the on-site CAMU for final deposition. It is estimated that a rate of 500 cubic yards (yd^3) per day (approximately 25 trucks per day) of treated materials would be excavated and placed in the CAMU. Odor and emissions would be controlled using a temporary fabric structure or suppressing foam, as needed. Similar to both Alternatives 3 and 4, additional testing would be completed during the remedial design to determine the controls required to capture all emissions expected during remedy implementation. This would also ensure worker and community safety.

Once transfer to the CAMU is completed, extra Portland cement is expected to be added to the treated material to further solidify the material and reduce hydraulic conductivity/leaching. As with other alternatives involving ISS or steam-enhanced ISS, the performance criterion for pH of

the treated material is a non-corrosive pH (4 to 12 SU), and other performance criteria including treatment levels for contaminants established as part of 1998 ROD/CAMU for the Group III Impoundments would be adjusted to meet the requirements of the CAMU.

Following excavation of treated material, the remaining impoundment berms not requiring treatment (i.e., concentrations below the remediation goals) would be folded down into the excavated area. Any soil or clay material impacted by OU8 impoundment material with concentrations exceeding the remediation goals would be treated via ISS and closed in place.

A protective cover would then be installed over the impoundment areas, which would be maintained through routine inspections and implementation of corrective measures, as necessary. Vegetated areas would be maintained once annually, or as needed. Site inspections would include evaluating the impoundment area for evidence of erosion, cracking, sloughing, animal burrows, stressed vegetation, etc. Maintenance for the protective cover during post-closure care would be performed semiannually in perpetuity.

Capital Costs	$62,900,000
Operation & Maintenance Costs	$1,700,000
Periodic Costs	$150,000
Total Present Value	$65,000,000
Construction Timeframe	30 months

Alternative 6 – Excavation, Dewatering, Treatment/Destruction Off Site, Protective Cover

This alternative involves excavation and mechanical dewatering of impoundment material, followed by off-site treatment. The anticipated duration of field activities for Alternative 6 is 38 months. A comprehensive health and safety program and perimeter air monitoring program would be developed to ensure worker and community protection. Excavated material would be dewatered, loaded to lined dump trailers and transported off site for destruction, preferably at a cement kiln. Soil and clay materials impacted by OU8 impoundment material within the impoundment floors and berm sidewalls with concentrations exceeding the remediation goals would be treated via ISS. Existing berm materials not requiring treatment (i.e., concentrations below the remediation goals) would be backfilled into the excavated area. A protective cover would be placed over the entire former impoundment area.

Details - This alternative consists of the following major components:

- Excavation and dewatering of impoundment material (PTW)
- Emission and odor control
- Off-site shipment for treatment/destruction
- Treatment of soil and/or clay impacted by OU8 impoundment material with concentrations above remediation goals via ISS
- Backfill with existing berm materials not requiring treatment
- Install a protective cover

Material from the impoundments would be excavated to the depth of the existing clay layer, in such a manner to protect the clay layer to the extent possible. This material would be sent

through a machine referred to as a dewatering screw equipped with a conveyor belt system. The dewatering screw compresses the PTW into two waste streams: a semi-solid material which allows for shipping and an aqueous phase liquid which would be collected. Dewatered semi-solid material would be transferred to a double plastic-lined dump trailer. Based on the results of bench-scale treatability tests, it is estimated that 44,700 tons of dewatered impoundment material would be transported to an off-site facility, preferably at a cement kiln, for destruction. An estimated 9,600 tons (2.3 million gallons) of aqueous phase liquid would be collected in a proper containment vessel (i.e., above ground storage tank or tanker truck) and stored prior to either being treated on-site and discharged consistent with the OU4 remedy, or being transported to an off-site disposal facility.

Excavation and dewatering is expected to be performed from March to November, at a rate aligned with acceptance rates at off-site treatment facilities. If temperatures remain consistently over 40 degrees Fahrenheit, the production season may be extended. It is estimated that excavation and dewatering would be conducted at a rate of 100 yd^3 per day.

Emissions and odors from excavation activities would be controlled, in consultation with NJDEP, using engineering controls such as suppressing foams, fiber-based sprays, and cement-based spray covers. The specific engineering controls to be used would be developed during the remedial design, and would be used as needed during active excavation, both for the material in the excavator bucket and for the open excavation area. Fiber-based and cement-based spray covers would be used as needed at the end of each workday as a daily cover. The surface of loaded dump trailers would be sprayed with a fiber-based or cement-based spray cover and covered with plastic. The trailer weather cover would then be secured for transport. A robust air monitoring system would be implemented to protect the community and on-site workers.

Dewatered material in the dump trailers would be shipped by a licensed transporter to a facility such as a cement kiln for destruction. For purposes of facility acceptance, and cost and treatment estimations, cement kilns were used as one facility option to receive this material. These outlets (in addition to incinerators) are permitted to receive waste from CERCLA sites and are permitted to process materials carrying the RCRA hazardous waste codes applicable to the impoundment material (e.g., D018 [benzene]). If a cement kiln is selected, the facility with the cement kiln where the hazardous waste will be combusted will need to have a Clean Air Act Title V permit issued by the state in which the kiln is located. The primary air regulations that would apply are 40 C.F.R. Part 63, Subpart EEE (National Emission Standards for Hazardous Air Pollutants from Hazardous Waste Combustors), 40 C.F.R. Part 63, Subpart LLL (National Emission Standards for Hazardous Air Pollutants from the Portland Cement Manufacturing Industry), 40 C.F.R. § 52.21 (Prevention of significant deterioration of air quality) and any other state-specific control technology and risk analysis requirements. It is anticipated that more than 415 tons per week can be sent off site to these types of facilities. Overall, removal and off-site shipment of impoundment material is estimated to be completed within 3 years.

Following excavation and removal of the PTW, any remaining soil and/or clay material impacted by OU8 impoundment material with concentrations exceeding the remediation goals would be treated via ISS. The impoundment berms not requiring treatment (i.e., concentrations below the remediation goals) would be used as backfill. A protective cover would then be installed over the

entire impoundment area. This protective cover may include a low permeability engineered layer with a vapor control component, however, the specific cover details would be established during the design phase.

The cover would be maintained through routine inspections and implementation of corrective measures, as necessary. Vegetated areas would be maintained annually, or as needed. Site inspections would include evaluating the site for evidence of erosion, cracking, sloughing, animal burrows, stressed vegetation, etc. Maintenance for the protective cover during post-closure care would be performed semiannually for perpetuity.

Capital Costs	$71,700,000
Operation & Maintenance Costs	$1,700,000
Periodic Costs	$150,000
Total Present Value	$74,000,000
Construction Timeframe	38 months

COMPARATIVE ANALYSIS OF ALTERNATIVES

In selecting a remedy for a site, EPA considers the factors set forth in Section 121 of CERCLA 42 U.S.C. § 9621, and conducts a detailed analysis of the viable remedial alternatives pursuant to Section 300.430(e)(9) of the NCP, 40 C.F.R § 300.430(e)(9), EPA's Guidance for Conducting Remedial Investigations and Feasibility Studies, OSWER Directive 9355.3-01, and EPA's A Guide to Preparing Superfund Proposed Plans, Records of Decision, and Other Remedy Selection Decision Documents, OSWER 9200.1-23.P. The detailed analysis consists of an assessment of the individual alternatives against each of the nine evaluation criteria at 40 C.F.R. § 300.430(e)(9)(iii) and a comparative analysis focusing upon the relative performance of each alternative against those criteria.

A comparative analysis of these alternatives based upon the nine evaluation criteria noted below follows.

Threshold Criteria *– The first two criteria are known as "threshold criteria" because they are the minimum requirements that each response measure must meet in order to be eligible for selection as a remedy.*

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1. Overall Protection of Human Health and the Environment

Overall protection of human health and the environment determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.

Alternative 1, the no action alternative, would not be protective of human health and the environment since it does not include measures to prevent exposure to the PTW and possibly the underlying soil and clays.

Alternatives 3 through 6 would be protective of human health and the environment by addressing the PTW and soil and clay impacted by OU8 impoundment material which would improve the

conditions within the floodplain area. More specifically, Alternatives 3 and 4 would result in PTW and all soils and clay impacted by the PTW being treated and closed in place with a protective cover. These remedies are expected to comply with the RAOs, meet the remediation goals, and would allow for the natural ecosystem within the floodplain to recover. Alternatives 5 and 6 also address the RAOs and meet remediation goals by permanently removing most, if not all, of the PTW from the impoundments and treating any remaining soil and clay impacted by OU8 PTW.

2. Compliance with applicable or relevant and appropriate requirements (ARARs)
Section 121 (d) of CERCLA, 42 U.S.C. § 9621(d), and Section 300.430(f)(1)(ii)(B) of the NCP, 40 CFR §300.430(f)(1)(ii)(B), require that remedial actions at CERCLA sites at least attain legally applicable or relevant and appropriate federal and state requirements, standards, criteria and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under Section 121(d)(4) of CERCLA.

Compliance with ARARs addresses whether a remedy will meet all of the applicable or relevant and appropriate requirements of other Federal and State environmental statutes or provides a basis for invoking a waiver.

A complete list of ARARs can be found in Table 6 in Appendix II.

With the exception of Alternative 1 (No Action), Alternatives 3 through 6 would comply with ARARs and therefore meet this threshold criterion. More specifically, the alternatives would comply with ARARs as follows:

• Floodplain – The proposed remedial activities would be implemented to comply with substantive federal and state regulations regarding remediation and filling in floodplains.
• Wetlands – Wetland mitigation would be conducted in areas adjacent to the impoundments areas or in access areas impacted by construction activities following construction. Consultation with federal and state authorities would occur prior to the start of work to establish compliance with substantive requirements.
• Hazardous waste management and disposal – The processing and disposal of waste material generated during implementation of these alternatives would comply with applicable or relevant and appropriate requirements of RCRA (i.e. CAMU-related), the Toxic Substances Control Act, and state waste management regulations. This includes activities associated with material left in place or transportation of hazardous materials.
• Storm-water – Erosion and sedimentation controls for construction activities would be addressed during the design phase. Consultation with state authorities would occur prior to the start of work to establish compliance with substantive requirements.

The alternatives would achieve chemical specific ARARs by either stabilizing and solidifying or excavating the waste and ensuring confirmation samples are in compliance with remediation goals. Institutional and engineering controls (e.g., a deed notice restricting future use, fencing to restrict access) would be effective in preventing exposure to potential remaining contamination underlying the backfill and protective cover.

Location-specific ARARs (wetlands, floodplains), if required, would be addressed during design and construction of the remedy. Pre-design investigations will determine whether the construction project would need to address migratory birds and wildlife preservation requirements.

Action-specific ARARs would be met for the construction phase by proper design and implementation of the remedial action and engineering controls for erosion, storm water and emissions, and for the disposal phase by proper selection of the disposal facility. For Alternative 5, the CAMU would be used and for Alternative 6, either a cement kiln or incinerator is expected to be utilized.

Primary Balancing Criteria *– The next five criteria, criteria 3 through 7, are known as "primary balancing criteria". These criteria are factors by which tradeoffs between response measures are assessed so that the best options will be chosen, given site-specific data and conditions.*

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3. Long-Term Effectiveness and Permanence

Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.

Alternative 1 is not considered to be effective in the long term because the impoundment materials would not be actively treated. No reduction in the magnitude of residual risk would be achieved, and no additional controls would be implemented to control these risks. In contrast, Alternatives 3 through 6 would offer high long-term effectiveness and permanence, including protecting the impoundments from the impacts of potential flooding, as described below.

In Alternatives 3 and 4, ISS would result in treatment of PTW in the impoundments via reduction of contaminant mass and stabilization. The addition of steam enhancement to ISS operations in Alternative 4 would result in additional reduction of contaminant mass. In both alternatives, the stabilized impoundment material would remain in place and each of the performance criteria would be achieved, including adjustment of the material to a non-corrosive pH, reduction in COC leachability by greater than or equal to 90 percent, hydraulic conductivity less than or equal to 10^{6}cm/s, and compressive strength greater than 40 psi. Compressive strength is an indicator of longterm durability. An engineered cover, which includes vapor control and treatment, would capture vapor phase COCs that are emitted, and would prevent contact of precipitation with the treated materials. The engineered cover would also provide further protection against potential flooding.

In Alternative 5, impoundment materials would be treated, then excavated, and disposed of in the CAMU. Steam-enhanced mixing would result in enhanced VOC mass reduction, reducing the concentration of these contaminants in the impoundment material. ISS treatment would result in adjustment of the material to a non-corrosive pH and significantly reduce COC leachability. Following treatment, the materials would be shipped over and then placed in the CAMU, which would permanently contain the treated waste over the long term. The CAMU has a multi-layer leachate collection system and would include an impermeable cover upon closure. Testing

demonstrates that the CAMU's liner material is compatible with leachate potentially generated from the treated materials. In this alternative, most of the PTW would be removed from the floodplain. Soil and clay impacted by OU8 impoundment material within the berm sidewalls and impoundment floor that exceed the remediation goals would be treated through ISS and the treated materials, along with the materials not requiring treatment, would be graded into the existing impoundment and entirely capped with a protective cover similar to the cover envisioned for Alternatives 3 and 4.

In Alternative 6, most, if not all, of the PTW would be excavated, removed and treated off-site, resulting in a permanent and irreversible remediation of those impoundment materials. In this alternative, PTW would be removed from the floodplain. Soil and clay impacted by OU8 impoundment material within the berm sidewalls and impoundment floor that exceed the remediation goals would be treated through ISS and the treated materials, along with the materials not requiring treatment, would be graded into the existing impoundment and entirely capped with a protective cover similar to the cover envisioned for Alternatives 3 and 4. Statutory five-year reviews would be required for alternatives 3, 4, 5, and 6, and long-term effectiveness and permanence would continue to be evaluated.

4. Reduction of Toxicity, Mobility, or Volume through Treatment
Reduction in Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment and the amount of contamination present.

Alternative 1 does not include any treatment and would not reduce the toxicity, mobility, or volume (TMV) of contaminants. The remaining alternatives would all offer varying degrees of reduction in TMV.

In Alternatives 3 and 4 implementing the ISS technology would effectively and irreversibly reduce the leachability (i.e., mobility) of COCs associated with PTW in the impoundments. ISS would also reduce mobility of COCs potentially present as non-PTW in the inner berm edges and an approximately 2-foot-thick layer of soil located below the existing clay impoundment liners and above the groundwater table. As demonstrated during a 2014 pilot study, Alternative 3 would result in some permanent removal of VOCs during the ISS mixing process (approximately 25 percent VOC mass reduction). Alternative 4 would result in additional VOC mass removal relative to ISS alone due to the addition of steam during the homogenization/mixing process.

As in Alternative 4, steam-enhanced ISS in Alternative 5 would result in VOC mass removal prior to excavation of the treated PTW and placement in the CAMU. ISS would also reduce mobility of COCs potentially present in the inner berm edges and in an approximately 2-foot-thick layer of soil located below the existing clay impoundment liners and above the groundwater table.

In Alternative 6, most, if not all, of the PTW will be removed from the site. Treatment of the PTW at a facility like a cement kiln would irreversibly destroy not only the VOC mass in the impoundment material, but also the SVOC mass and the organic tar material itself. This would result in the greatest possible reduction in TMV. Additional treatment through ISS on the soil

and clay that remain within the impoundments that were impacted by OU8 impoundment material, would also reduce mobility of COCs potentially present in the inner berm edges and in an approximate 2-foot-thick layer of soil located below the existing clay impoundment liners and above the groundwater table.

5. Short-Term Effectiveness

Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents and the environment during implementation.

Short-term effectiveness is not applicable to Alternative 1 since it does not include any active remediation work. The times to achieve the RAOs for Alternatives 3 through 6 are similar to one another in all cases (around 2 to 3 years), but the alternatives vary in their degree of protection of the community, workers, and environment during remedial action. There is increased risk of exposure for alternatives that involve excavation (Alternatives 5 and 6) relative to the alternatives that involve treatment and closure-in-place (Alternatives 3 and 4). Because of this, Alternatives 3 and 4 are expected to provide slightly more favorable short-term effectiveness than Alternatives 5 and 6.

For Alternatives 3 through 5, engineered controls implemented during ISS and steam-enhanced ISS operations for vapor control would provide a high degree of protection to the community, workers, and the environment. These engineered controls include use of a shrouded auger, maintenance of a water cap, installation of stone plenum layer (vented as needed), and treatment of actively collected vapors with a thermal oxidizer and caustic scrubber. In addition, fixed equipment would be staged on an equipment bench constructed at an elevation that would provide protection in the case of a catastrophic flood. In the event of such a flood, transportable equipment and reagents would be moved.

For Alternatives 3 and 4 only, treated materials would be closed in place and there would be no potential exposure of the community, workers, or the environment associated with excavation, transportation, and placement of the material, as it would be managed in place. The air emissions would be lower overall than with an excavation approach. A benefit of Alternatives 3 and 4 is reduced potential for exposure to the community because the wastes are treated. However, the material remains closed in-place.

Alternative 5 is similar to Alternatives 3 and 4 in short-term effectiveness during ISS implementation activities. However, additional engineering controls such as use of vapor suppression foams or temporary fabric structures may be required to protect workers and the community during excavation and transport of the treated material to the on-site CAMU. Some risk may be encountered during transport of treated material to the CAMU, but the material would have reduced concentrations of COCs because of prior steam-enhanced ISS treatment (reducing potential VOC emissions) and would be partially stabilized, increasing ease of handling. The transport distance would be approximately 1.5 miles. Work at the CAMU to further stabilize this material, prior to final placement, would require additional engineering controls due to the proximity of nearby homes.

In Alternative 6 engineering controls would be needed to protect the community, workers, and the environment during implementation due to an increased risk of exposure associated with material excavation, dewatering, and transport. Vapor suppression foams that have been successfully utilized at other sites with similar PTW would be used on surfaces to control vapor emissions and, if needed, additional vapor control measures would be implemented. Lined dump trailers would be used to transport dewatered PTW off site for treatment. During design an evaluation would be conducted to ensure that any short-term impacts to the community and environment from the truck traffic from the site to the off-site facility would be minimized.

Overall, excavation, dewatering, and transport of impoundment materials would pose a moderate degree of risk; however, this risk would be mitigated by a robust emission suppression program and engineering controls. As with Alternatives 3 through 5, it is assumed that fixed equipment would be staged on an equipment bench constructed at an elevation required to provide protection in the case of a catastrophic flood. In the event of such a flood, transportable equipment would be moved.

Alternative 6 also has the longest implementation timeframe at 38 months, as opposed to 20 to 30 months for the other active alternatives. The implementation timeframe is longer primarily because (1) the excavation process would need to occur slowly to reduce the potential for air emissions and (2) the off-site facilities for treatment/destruction of the excavated and dewatered material can only process a limited amount of material at a time.

In summary, because the time to achieve the RAOs is similar for Alternatives 3 through 6, a primary difference between these alternatives is the degree of short-term protection of the community, workers, and the environment. Engineering controls would be designed and implemented to protect these entities.

6. Implementability

Implementability addresses the technical and administrative feasibility of a remedy from design through construction and operation. Factors such as availability of services and materials, administrative feasibility, and coordination with other governmental entities are also considered.

Alternatives 1 and 3 are both clearly implementable. In the case of Alternative 1, because no remedial actions would be implemented there would be no challenges associated with contractors, specialty equipment, etc. In the case of Alternative 3, the primary remedial component, ISS, is a proven, reliable, and implementable technology and its effectiveness can be monitored. ISS has been applied in the remediation of VOCs, SVOCs and PTW at more than 30 federal- or New Jersey state-lead projects. ISS worked successfully on the site's contaminants during the 2014 OU8 pilot study. The engineered cover and inner HBW would help minimize exposure risk. This alternative is administratively feasible, and services and materials are readily available. A disadvantage is that stabilization would reduce the ease of undertaking additional remedial actions, if these should ever be necessary, because the remaining monolith would require a large-scale operation and heavy-duty equipment to break down the material in order to prepare it for further corrective efforts.

Alternatives 4 and 6 are also implementable. In the case of Alternative 4, the ISS portion of the alternative would be implementable, as described above for Alternative 3. The addition of steam-enhanced mixing prior to ISS, however, has not been used as often and would require specialized equipment and operations. Fewer contractors are available with experience implementing steam-enhanced ISS. As with Alternative 3, a disadvantage is that stabilization would reduce the ease of undertaking additional remedial actions, if necessary. For Alternative 6, excavation and dewatering are, in general, commonly performed remediation activities. Use of this approach on the impoundment materials is an emerging technology that has been successfully implemented at a few sites. The determination that this alternative is considered implementable is based on experience with dewatering and successful treatment/destruction off-site of similar acid tar material from another Superfund site in EPA Region 2; however, dewatering acid tar (while successfully performed during a lab treatability study in 2016) is site-specific and may require special operational procedures. Several off-site cement kilns have been identified that can accept the dewatered acid tar. The ease of closing the impoundments is high, as most, if not all, of the PTW would be removed from them. This alternative is administratively feasible, and services are available. Additional remedial actions at the remaining footprints of the impoundments, if necessary, could be undertaken with ease.

Alternative 5 is expected to be implementable but comes with some challenges. The ISS portion of the alternative would be easily implementable, as described for Alternative 3. Similar to Alternative 4, however, steam-enhanced mixing prior to ISS has not been used as often and would require specialized equipment and operations. Implementation of Alternative 5 would require multiple processes involved with in-place treatment, removal, additional treatment and engineering controls at the CAMU, then placement of the material in the CAMU. Fewer contractors are available with experience implementing steam-enhanced ISS. Excavation equipment is readily available; however, emission controls at the point of excavation and placement (CAMU location) may be challenging. This alternative is administratively feasible, and services and materials are available. Additional remedial actions, if necessary, could be undertaken with ease in the impoundment area, but it would be difficult to undertake additional actions on the material once placed in the CAMU.

In accordance with CERCLA, no permits would be required for on-site work (although such activities would comply with substantive requirements of otherwise required permits).

7. Cost

Cost includes estimated capital and annual operation and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent (This is a standard assumption in accordance with EPA guidance).

The total estimated present value cost for each retained alternative is presented below.

- Alternative 1 – $0
- Alternative 3 – $48,000,000
- Alternative 4 – $60,000,000
- Alternative 5 – $65,000,000
- Alternative 6 – $74,000,000

These cost estimates have been developed based on the design assumptions and are presented primarily for comparing the alternatives. The final costs of the selected remedy will depend on actual labor and material costs, competitive market conditions, final project scope, the implementation schedule, and other variables. Consistent with EPA guidance, the cost estimates are order-of-magnitude estimates with an intended accuracy range of plus 50 to minus 30 percent of present value.

The primary cost difference between Alternatives 3 and 4 is for the additional steam component which would need associated materials and safety precautions. While Alternative 5 is similar to Alternative 4 in the treatment of the PTW within the impoundments, the additional cost is attributed to the removal, transportation and additional solidification actions at the CAMU prior to placement.

Alternative 6 is distinct from the others. While its costs are the highest, it provides the most permanent solution to the impoundment material and addresses any remaining contamination within the OU8 footprint.

The costs of protective cover installation and maintenance, even in perpetuity, for all the alternatives are comparable.

Modifying Criteria *– The final two evaluation criteria, criteria 8 and 9, are called "modifying criteria" because new information or comments from the state or the community on the Proposed Plan may modify the preferred response measure or cause another response measure to be considered.*

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8. State Acceptance

State Agency acceptance considers whether the State and/or Support Agency agrees with EPA's analyses and recommendations.

NJDEP concurs with the selected remedy. A letter of concurrence is attached in Appendix IV.

9. Community Acceptance

Community Acceptance considers whether the local community agrees with EPA's analyses and preferred alternative. Comments received on the Proposed Plan are an important indicator of community acceptance.

EPA solicited input from the community on the remedial alternatives proposed for OU8 and received both oral and written comments. The attached Responsiveness Summary (Appendix V) addresses the comments received during the public comment period.

The community (residents, nearby property and business owners) overwhelmingly supported EPA's preferred remedy for OU8. The Mayor of Bridgewater expressed strong support for EPA's preferred remedy, as did representatives from CRISIS, the primary community group and

TAG recipient, and other environmental groups, such as Riverkeeper. Some concerns were expressed, both verbally during the meeting and in writing, regarding the OU4 site-wide remedy, particularly the fact that it includes the capping of contaminated material in-place in a flood hazard area. However, since the preferred OU8 remedy would remove the vast majority of waste from OU8, these concerns were not expressed in relation to the OU8 preferred remedy.

PRINCIPAL THREAT WASTE

The NCP establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (40 CFR §300.430(a)(1)(iii)(A)). Identifying principal threat wastes (PTW) combines concepts of both hazard and risk. In general, PTW are those source materials considered to be highly toxic or highly mobile which generally cannot be contained in a reliable manner or would present a significant risk to human health or the environment should exposure occur. Non-PTW are those source materials that generally can be reliably contained and that would present only a low risk in the event of exposure.

Impoundment material, also referred to as acid tar, within Impoundments 1 and 2 meets the definition of PTW, presenting a significant risk to human health or the environment should exposure occur. The total volume of PTW is estimated to be approximately 55,000 cubic yards, as described in Table 1. The PTW in both Impoundments 1 and 2 acts as a likely source of benzene and other contaminants to groundwater, resulting in contamination of the groundwater aquifers beneath the site.

Notable constituents making up the PTW within both impoundments include benzene, toluene and naphthalene. These contaminants were disposed and/or stored within Impoundments 1 and 2 in large quantities. All three chemicals also make up the primary COCs. PTW may also include soil and clay impacted by OU8 impoundment material and could be found within the berms and soil beneath the impoundments. PTW may also contain contaminants such as nitrobenzene and xylene, which are also COCs.

By utilizing treatment (by either off-site destruction or in-place via ISS technology) as a significant component of the remedy, the statutory preference for remedies that employ treatment as a principal element is satisfied.

SELECTED REMEDY

Based upon the requirements of CERCLA, the results of the site investigations, the FFS, input from EPA’s National Remedy Review Board (NRRB), the detailed analysis of the alternatives, and public comments, EPA’s selected remedy for OU8 is Alternative 6. The alternatives were discussed with the NRRB in October 2017 as part of the EPA’s evaluation of an appropriate remedy for OU8, and consideration of their comments is incorporated into this decision document.

The major components of the remedy include the following:

- Excavation and dewatering of the PTW (impoundment material) from Impoundments 1 and 2;
- Emission and odor control measures to protect workers and the surrounding community;
- Off-site shipment of the PTW for treatment/destruction;
- Collection of aqueous phase liquid for either treatment and discharge on-site or for off-site disposal;
- Treatment of any soil and/or clay in the impoundments impacted by the PTW with concentrations above remediation goals via in-situ stabilization and solidification (ISS);
- Backfilling the excavated areas with existing berm materials from the impoundments not requiring treatment;
- Installing a protective cover over the entire OU8 footprint; and
- Implementing institutional controls, monitoring, and periodic reviews to ensure that the remedy remains protective of public health and the environment.

Principal threat waste from OU8 will be excavated to the depth of the existing clay layer located at the bottom of each impoundment. This impoundment material will be sent through a machine referred to as a dewatering screw equipped with a conveyor belt system. The dewatering screw separates the PTW semi-solids from impoundment liquids resulting in two waste streams: a semi-solid to solid material which allows for shipping and an aqueous phase liquid which would be collected. Dewatered material will be transferred to a double plastic-lined dump trailer. It is estimated that 44,700 tons of dewatered PTW will be transported to an off-site facility, preferably at a cement kiln, for destruction. An estimated 9,600 tons (2.3 million gallons) of aqueous phase liquid collected in a proper containment vessel (i.e., above ground storage tank or tanker truck) will be stored prior to either being treated on-site and discharged, consistent with the OU4 remedy, or being transported to an off-site disposal facility.

Once the PTW has been excavated, any remaining impacted soil and/or clay containing contaminant concentrations above established remediation goals will undergo ISS treatment. The impoundments will then be backfilled to grade or near-grade and a protective cover will be constructed over the entire OU8 footprint (approximately 4 acres). Institutional controls such as a deed notice restricting future use will be implemented. Monitoring of the capping system will be required as part of the ongoing operation plan at the site. The details of the maintenance and monitoring requirements will be determined in the design phase.

The total estimated present-worth cost for the selected remedy is $74,000,000. A more detailed, itemized list of costs for the selected remedy may be found in the FFS. The cost estimates, which are based on available information, are order-of magnitude engineering cost estimates that are expected to be within plus 50 to minus 30 percent of the actual cost of the project.

Expected Outcomes of the Selected Remedy

Implementation of Alternative 6 will protect human health and the environment through removal and off-site treatment/destruction of PTW, and if necessary, additional stabilization and solidification of any remaining soil and/or clay impacted by OU8 impoundment materials. This

remedy will eliminate potential pathways of human exposure and will minimize or reduce migration of site contaminants.

Summary of the Rationale for the Selected Remedy

Alternative 6 is a treatment and containment-based alternative consisting of proven technologies that would be effective in significantly reducing the risks associated with the exposure pathways identified at the site. By excavating and dewatering PTW and eventually destroying the material off-site resulting in the most permanent solution, this preferred alternative is the most favorable approach. In addition, implementing a proven ISS technology on the remaining impacted soil and clay materials followed by an appropriately selected capping system will effectively control direct contact, eliminate the release of contaminants into the air and address potential movement of contaminants beyond the OU8 impoundment footprint. ISS will further reduce contaminant mass through media transfer (enhanced desorption), capture of the emissions, and destruction in a vapor treatment system if that is shown to be needed, and would also serve to reduce mobility of contaminants through the binding of treated mass and limiting infiltration through the less permeable, treated waste material.

Alternative 6 will be implementable using common excavation activities and through the use of an emerging dewatering technology. This approach is developed based on experience with the successful implementation and destruction off-site of similar acid tar-like material from another Superfund site in EPA Region 2. While the cost to perform this alternative is the highest, it provides the most permanent solution to the highly toxic nature of the material in these impoundments, with an estimated implementation timeframe of 38 months.

The remedy will also be effective in reducing the risks posed by the impoundment contents that remain in the floodplain, should the area be compromised by flooding.

Based on the information currently available, EPA believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. EPA expects the preferred alternative to satisfy the following statutory requirements of CERCLA Section 121(b), 42 U.S.C. § 9621(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment as a principal element.

Consistent with EPA Region 2's Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect to any remedial alternative selected for the site.

STATUTORY DETERMINATIONS

EPA has determined that the selected remedy complies with the CERCLA and NCP provisions for remedy selection, meets the threshold criteria, and provides the best balance of tradeoffs among the alternatives with respect to the balancing and modifying criteria. These provisions

require the selection of remedies that are protective of human health and the environment, comply with ARARs (or justify a waiver from such requirements), are cost-effective, and utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable. In addition, CERCLA includes a preference for remedies that employ treatment that permanently and significantly reduce the volume, toxicity, or mobility of hazardous substances as a principal element (or justify not satisfying the preference). The selected remedy is a permanent solution which will be protective in the long term. The following sections discuss how the selected remedy meets these statutory requirements.

Protection of Human Health and the Environment

The selected remedy will protect human health and the environment by permanently removing the vast majority, if not all, of the PTW associated with this OU from the site. The remedy will address all the RAOs and will meet remediation goals. Treatment of the waste at a facility such as a cement kiln or incinerator will irreversibly destroy not only the VOC mass in the impoundment material, but also the presence of SVOC mass and the organic tar material itself resulting in the greatest possible reduction in toxicity, mobility and volume. Additional ISS treatment on any soil and/or clay found to have been impacted by the OU8 impoundment materials would provide additional protective measures. Following treatment, the remaining materials will be further secured through the installation of a protective cover designed to eliminate direct-contact risks to human health and the environment. These actions will result in the reduction of exposure levels to risk levels within EPA's generally accepted risk range of 10^{-4} to 10^{-6} for carcinogens and to below a HI of 1.0 for noncarcinogens. Any short-term risks posed by implementation of the selected remedy can be mitigated with engineering controls and the timeframe of 38 months is considered to be relatively short given the complexity of OU8.

Compliance with ARARs

The selected remedy, Alternative 6, complies with chemical-specific, location-specific and action-specific ARARs. A complete list of the ARARs, TBCs and other guidance that concern the selected remedy is presented in Appendix II, Table 6.

Cost-Effectiveness

EPA has determined that the selected remedy is cost-effective. A cost-effective remedy is defined as a remedy whose costs are proportional to its overall effectiveness (NCP § 300.430(f)(1)(ii)(D)). EPA evaluated the "overall effectiveness" of those alternatives that satisfied the threshold criteria (i.e. were both protective of human health and ARAR-compliant). Overall effectiveness is based on the evaluations of long-term effectiveness and permanence; reduction in toxicity, mobility, and volume through treatment; and short-term effectiveness. Overall effectiveness was then compared to costs to determine cost-effectiveness.

Each of the alternatives was subjected to a detailed cost analysis. In that analysis, capital and annual O&M costs were estimated and used to develop present-worth costs. The estimated present worth cost of the selected remedy for OU8 is $74,000,000. Although Alternative 6 is the most expensive protective alternative, EPA concluded that the long-term effectiveness of

excavating and removing the vast majority, if not all, of the impoundment material out of OU8 and away from the Raritan River floodway is superior to treatment in-place when considering permanent solutions. EPA believes that the selected remedy's additional cost for excavation provides proportionally greater protection of human health and is overall cost-effective. A more detailed cost estimate is presented in the FFS.

Utilization of Permanent Solutions and Alternative Treatment Technologies (or Resource Recovery) Technologies to Maximum Extent Practicable

EPA has determined that the selected remedy represents the maximum extent to which permanent solutions and treatment technologies can be utilized in a practicable manner for the site. Of those alternatives that are protective of human health and the environment and comply with ARARs (or provide a basis for invoking an ARAR waiver), EPA has determined that the selected remedy provides the best balance of trade-offs in terms of the five balancing criteria, while also considering the statutory preference for treatment as a principal element, and state/support agency and community acceptance.

The selected remedy treats source materials constituting principal threats at OU8, achieving significant reductions in the mobility, toxicity and volume of PTW materials. The selected remedy satisfies the criteria for long-term effectiveness by removal and destruction of highly toxic PTW, employing ISS to any remaining contaminated materials and installing a protective cap that will effectively reduce or eliminate the risk to human receptors in the future.

Preference for Treatment as a Principal Element

The selected remedy results in the removal of PTW from OU8. Excavation activities will provide for an immediate reduction in the volume of waste. Off-site treatment/destruction will reduce the toxicity permanently and utilizing ISS technology on any remaining soil and/or clay impacted by OU8 impoundment materials will be addressed.

By utilizing treatment (by either off-site destruction or in place via ISS technology) as a significant component of the remedy, the statutory preference for remedies that employ treatment as a principal element is satisfied.

Five-Year Review Requirements

Because this remedy will result in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unrestricted use and unlimited exposure, the statutory requirement for a five-year review is triggered by the implementation of this action to ensure that the remedy is, or will be, protective of human health and the environment.

DOCUMENTATION OF SIGNIFICANT CHANGES

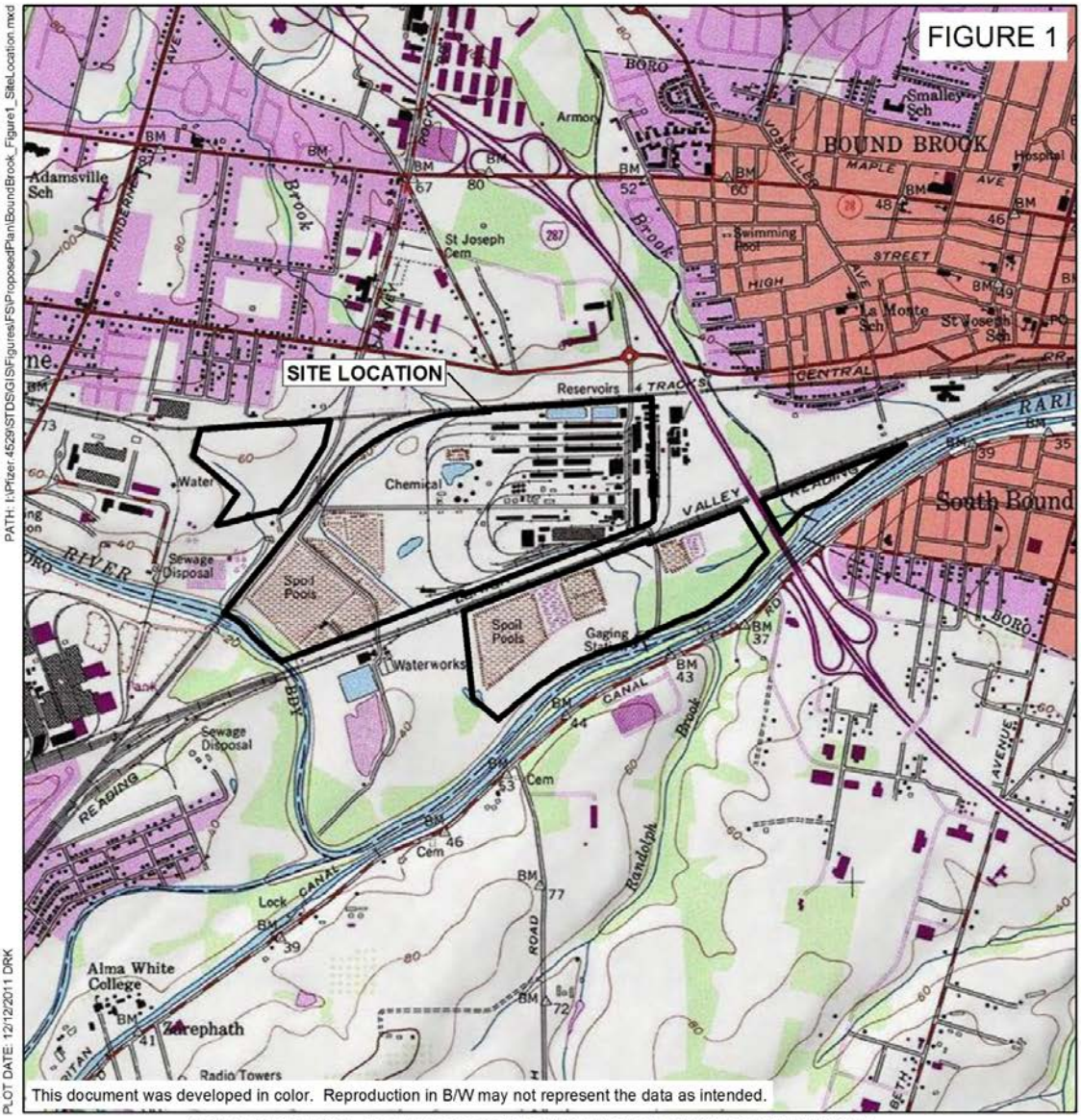
The Proposed Plan for OU8 of the American Cyanamid site was released for public review on May 23, 2018. The public comment period ran from May 29th until June 28, 2018. The Proposed

Plan identified Alternative 6 as the preferred alternative. EPA reviewed all written (including electronic formats such as e-mail) and verbal comments submitted during the public comment period and has determined that no significant changes to the remedy, as it was originally identified in the Proposed Plan, are necessary or appropriate.

APPENDIX I

FIGURES

Figure 1



ADAPTED FROM: BOUND BROOK, NEW JERSEY USGS QUADRANGLE

MAP LOCATION

WYETH HOLDINGS CORPORATION
AMERICAN CYANAMID
SUPERFUND SITE
SITE-WIDE FEASIBILITY STUDY

SITE LOCATION

N

0 1,000 2,000 4,000 6,000 8,000

Feet

DECEMBER 2011
4529/47194

1:24,000

O'BRIEN & GERE

Figure 2

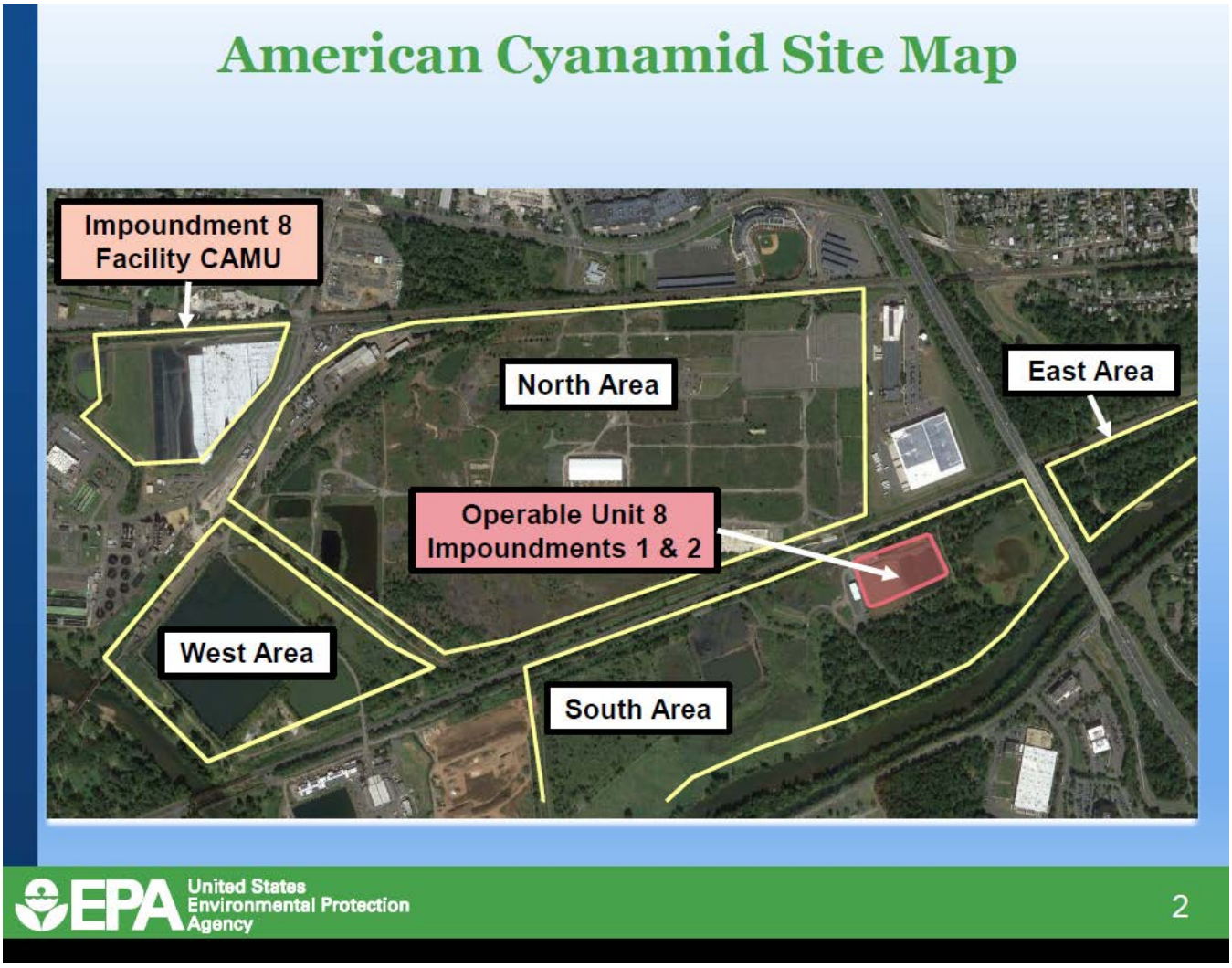
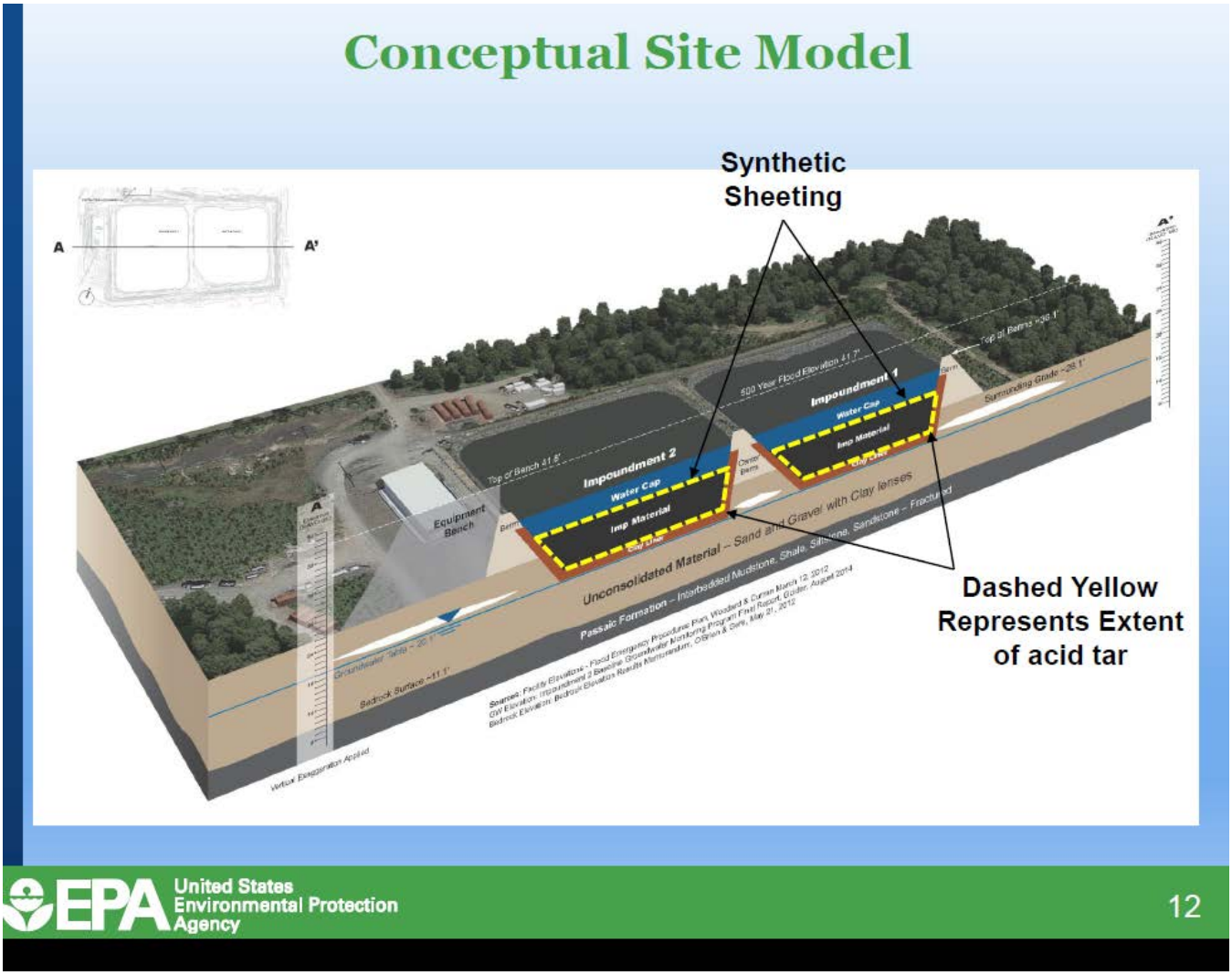

American Cyanamid Site Map
Impoundment 8
Facility CAMU
North Area
East Area
Operable Unit 8
Impoundments 1 & 2
West Area
South Area
EPA United States Environmental Protection Agency
2

Figure 3


Conceptual Site Model
Synthetic Sheeting
A
A'
Impoundment 2
Water Cap
Imp Material
Impoundment 1
Water Cap
Imp Material
Equipment Bench
Top of Bench 41.6'
500 Year Flood Elevation 41.7'
Top of Berm 136.1'
Surrounding Grade ~26.1'
Unconsolidated Material – Sand and Gravel with Clay lenses
Passaic Formation – Interbedded Mudstone, Shale, Siltstone, Sandstone – Fractured
Bedrock Surface ~11.1'
Vertex Exaggeration Applied
Dashed Yellow Represents Extent of acid tar
United States Environmental Protection Agency
12

APPENDIX II

TABLES

Table 1

Impoundment Composition

Material Type	Impoundment 1	Impoundment 2
VR (upper Layer)	900 yd^3	10,900 yd^3
Mixed VR and HC (middle layer)	-	6,500 yd^3
HC (lower layer)	13,700 yd^3	12,900 yd^3
CL (mixed)	2,700 yd^3	-
SSL (mixed)	1,900 yd^3	-
CA (mixed)	5,000 yd^3	-
Total Volume	24,200 yd^3	30,300 yd^3

yd^3 – cubic yards

Key:

VR – Viscous Rubbery

HC – Hard Crumbly

CL – Clay-Like

SSL – Sand & Silt-Like

CA – Coal Aggregate

Table 2. Impoundment 1 Organics Summary

Parameter	CAS #	Valid Samples	Unique Samples	Detects	Units	Minimum Detected	Maximum Detected	Mean	Standard Deviation	Mean + 1 Std. Dev
Benzene	71-43-2	25	24	25	µg/kg	78,500	207,000,000	47,762,304	58,054,409	105,816,713
Toluene	108-88-3	25	25	25	µg/kg	1,440	40,700,000	11,425,122	12,264,223	23,689,345
Naphthalene	91-20-3	25	25	25	µg/kg	5,010	12,600,000	3,111,321	3,172,052	6,283,373
Xylene (Total)	1330-20-7	25	25	25	µg/kg	4,500	6,910,000	2,400,192	2,142,678	4,542,870
Nitrobenzene	98-95-3	25	23	23	µg/kg	29	6,600,000	1,169,016	1,599,540	2,768,556
1,2-Dichlorobenzene	95-50-1	25	24	25	µg/kg	3,390	2,550,000	761,381	687,954	1,449,335
Aniline	62-53-3	25	25	25	µg/kg	189	36,707	672,158	1,237,244	1,909,402
Chlorobenzene	108-90-7	25	16	17	µg/kg	233	2,400,000	499,194	640,422	1,139,616
1,3,5-Trimethylbenzene	108-67-8	25	24	24	µg/kg	2,300	1,110,000	347,202	320,227	667,429
Isopropylbenzene	98-82-8	25	25	25	µg/kg	6,580	1,710,000	531,564	531,072	1,062,636
Benzoic acid	65-85-0	25	18	18	µg/kg	285	1,410,000	298,767	410,639	709,406
1,3-Dichlorobenzene	541-73-1	25	5	5	µg/kg	153	1,200,000	292,545	332,982	625,527
Cyclohexane	1735-17-7	25	2	2	µg/kg	1,000	1,200,000	301,640	328,184	629,824
Acetophenone	98-86-2	25	25	25	µg/kg	94	1,190,000	275,708	341,652	617,360
MethylCyclohexane	108-87-2	25	6	6	µg/kg	2,400	1,200,000	303,129	326,802	629,931
1,4-Dichlorobenzene	106-46-7	25	18	18	µg/kg	197	850,000	195,197	283,453	478,650
Carbon Disulfide	75-15-0	25	14	14	µg/kg	100	1,200,000	195,466	262,019	457,485
Methanol	67-56-1	25	2	2	µg/kg	2,000	275,000	154,504	83,508	238,012
2-Methylnaphthalene	91-57-6	25	25	25	µg/kg	506	678,000	174,110	171,242	345,352
Ethylbenzene	100-41-4	25	25	25	µg/kg	1,480	529,000	168,443	155,607	324,050

Data excerpt from O'Brien & Gere (OBG). 2010a. Former American Cyanamid Site Impoundments 1 and 2 Characterization Program Summary Report. November.

Table 3. Impoundment 2 Organics Summary

Parameter	CAS #	Valid Samples	Unique Samples	Detects	Units	Minimum Detected	Maximum Detected	Mean	Standard Deviation	Mean + 1 Std. Dev
Benzene	71-43-2	28	28	28	ug/kg	16,700,000	183,000,000	52,246,429	39,882,369	92,128,798
Toluene	108-88-3	28	28	28	ug/kg	3,930,000	40,200,000	11,867,857	8,700,937	20,568,794
Naphthalene	91-20-3	28	28	28	ug/kg	1,040,000	13,700,000	4,879,643	3,408,717	8,288,360
Chlorobenzene	108-90-7	28	13	28	ug/kg	18,200	13,000,000	823,157	2,407,139	3,230,296
Methyl Acetate	79-20-9	28	4	4	ug/kg	55,000	6,500,000	597,929	1,254,329	1,852,258
Xylene (total)	1330-20-7	28	25	27	ug/kg	970,000	6,950,000	2,344,286	1,442,152	3,786,438
Acetone	67-64-1	28	1	1	ug/kg	110,000	12,500,000	842,536	2,302,436	3,144,972
Cyclohexane	1735-17-7	28	4	4	ug/kg	23,000	6,500,000	413,786	1,202,826	1,616,612
Chloromethane	74-87-3	28	11	11	ug/kg	24,600	6,500,000	384,021	1,206,098	1,590,119
1,3-Dichlorobenzene	541-73-1	28	19	19	ug/kg	15,300	6,500,000	359,782	1,216,478	1,576,260
Carbon Disulfide	75-15-0	28	27	27	ug/kg	37,100	6,500,000	330,771	1,211,285	1,542,056
1,2-Dichlorobenzene	95-50-1	28	24	27	ug/kg	500,000	6,500,000	1,863,429	1,169,362	3,032,791
Isopropylbenzene	98-82-8	28	26	27	ug/kg	163,000	6,500,000	634,107	1,191,127	1,825,234
MethylCyclohexane	108-87-2	28	6	6	ug/kg	65,000	6,500,000	485,429	1,207,970	1,693,399
1,3,5-Trimethylbenzene	108-67-8	28	24	27	ug/kg	102,000	6,500,000	487,071	1,188,025	1,675,096
1,4-Dichlorobenzene	106-46-7	28	23	27	ug/kg	50,800	6,500,000	376,336	1,202,024	1,578,360
Ethylbenzene	100-41-4	28	25	27	ug/kg	74,600	1,250,000	225,339	237,350	462,689
2-Methylnaphthalene	91-57-6	28	27	28	ug/kg	65,600	656,000	246,050	155,315	401,365
Acetophenone	98-86-2	28	28	28	ug/kg	34,600	652,000	241,450	129,977	371,427

Data excerpt from O'Brien & Gere (OBG). 2010a. Former American Cyanamid Site Impoundments 1 and 2 Characterization Program Summary Report. November.

Table 4

Summary of Chemicals of Concern and Medium Specific Exposure Point Concentrations for Impoundments 1 and 2

Scenario Timeframe: Current/Future
Medium: Impoundment
Exposure Medium: Impoundment

Exposure Point	Chemical of Concern	Exposure Point Concentration[1] (mg/kg)	Regional Screening Level[2] (mg/kg)	Cancer Risk	Hazard Index
Impoundment 1	Benzene	390,000	5.6	6.96×10^{-2}	-
	Toluene	150,000	46,000	-	3.26
	Xylene	34,000	2,600	-	13.08
	Naphthalene	6,470	20	3.24×10^{-4}	-
	Nitrobenzene	4,800	280	-	17.14
Impoundment 2	Benzene	61,000	5.6	1.09×10^{-2}	-
	Xylene	3,440	2,600	-	1.32
	Naphthalene	9,860	20	4.93×10^{-4}	-
	Nitrobenzene	1,330	280	-	4.75

1 – Maximum Detected Concentration was used to estimate risk
2 – RSLs were obtained in 2009 as part of the 2010 streamlined risk assessment. The industrial screening criteria were used as a conservative measure to evaluate the industrial/commercial receptor considering the designated use and zoning of the property is industrial/commercial. The screening criteria are identified on the following website: http://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables.

Table 5

Summary of Hazards and Risks Associated with Impoundments 1 and 2

Receptor	Hazard Index	Cancer Risk
Industrial Worker (adult)		
Impoundment 1	**34**	**7×10^{-2}**
Impoundment 2	**7**	**1.1×10^{-2}**
The COCs driving the risk in impoundments 1 and 2 are benzene, toluene, xylene, naphthalene and nitrobenzene. It should be noted that the list of risk drivers in the impoundment areas is underestimated.		

Note: Prior to finalizing the OU8 FS, the data and assumptions used to conduct the 2010 streamlined HHRA were reviewed.

As per EPA's Risk Assessment Guidance for Superfund Volume 1 Human Health Evaluation Manual (Part A) (EPA/540/1-89/002), the calculation of risks in excess of 1×10^{-2} should be conducted utilizing the one-hit equation. The one-hit equation is only applied to scenarios where the exposure dose is high, and it assumes any single "hit" of an amount of a carcinogen at a cellular target (e.g. DNA) can initiate a series of events leading to a tumor. The one-hit equation is an exponential model that limits the single chemical risk to less than one, whereas the regular linear cancer model may calculate values greater than one.

The site is currently vacant; however, it is zoned for industrial use. Therefore, the reassessment focused on the industrial worker exposure pathway. The reassessment only focused on the ingestion pathway as it is the critical exposure pathway driving risks at the site. The risks are underestimated because the inhalation and dermal pathways are not included.

The reassessment found a cancer risk of 2.6×10^{-2} for Impoundment 1 and 4.2×10^{-3} for Impoundment 2. These risks are similar to those calculated in the 2010 streamlined assessment and still exceed the acceptable risk range.

Table 6(a). Summary of Action-Specific ARARs

Operable Unit 8, American Cyanamid Superfund Site, Bridgewater, New Jersey

Activity	Requirement / Citation	Status	Synopsis of Requirement	Comments
Air Emissions	Clean Air Act, 42 U.S.C. § 7401, *et seq.* National Emissions Standards for Hazardous Air Pollutants (NESHAPs): Organic Hazardous Air Pollutants from the Synthetic Organic Chemical Manufacturing Industry for Process Vents, Storage Vessels, Transfer Operations, and Wastewater 40 C.F.R. Part 63, Subpart G	Relevant and Appropriate	Provides specific design and operating requirements for tanks, process vents, surface impoundments, oil/water and organic/water separators, and transfer systems for site remediations that emit hazardous air pollutants (HAPS) including benzene. Also includes requirements for performance testing, site-specific air monitoring, and records.	Air emissions controls will be incorporated into the design of the remediation system and for moving materials to the treatment systems. The design also will incorporate performance testing, air monitoring system, and required records.
Air Emissions	Clean Air Act, 42 U.S.C. § 7401, *et seq.*, NESHAPs: Benzene Waste Operations 40 C.F.R. Part 61, Subpart FF	Relevant and Appropriate	Provides specific design and operating requirements for tanks, surface impoundments, containers, individual drain systems, oil/water separators, treatment process, closed vent systems and control devices. Also includes requirements for specific monitoring of carbon adsorption units, thermal treatment, by-pass lines, vacuum systems, etc. Monthly samples and continuous emissions monitoring are required depending on the design.	Requirements will be incorporated into the design of the remediation system, including the air emissions treatment system. Requirements for equipment monitoring and record keeping also will be incorporated.
Air Emissions	Clean Air Act, 42 U.S.C. § 7401, *et seq.* New Source Performance Standards (NSPS) for Stationary Compression Ignition Internal Combustion Engines, 40 C.F.R. Part 60 Subpart IIII NSPS for Spark Ignition Internal Combustion Engines, 40 C.F.R. Part 60, Subpart JJJJ NESHAP for Stationary Reciprocating Internal Combustion Engines, 40 C.F.R. Part 63, Subpart ZZZZ	Applicable if stationary engines of a certain size are used during remediation	Specific emissions limitations and fuel requirements apply to engines of a certain size and after certain manufacturing dates.	Generators and similar engines may be used during remediation. Design specifications should state that any engines used on-site should comply with these regulations.
Hazardous Waste Accumulation	Resource Conservation and Recovery Act (RCRA), 42 U.S.C. § 6921, *et seq.*	Applicable, if hazardous wastes are generated	Provides specific requirements for generator hazardous waste management in tanks, containers, and containment buildings. Includes items such as labeling, inspections, emergency preparedness/response, coordination with local response agencies, etc.	The remedial action specifications will require hazardous waste generated to be stored in a manner that meets the hazardous waste generator requirements.
Hazardous Waste Accumulation	Hazardous Waste Generator Standards 40 C.F.R. Part 262, adopted by N.J.A.C. 7:26G-6.1	Applicable, if hazardous wastes are generated	Also includes requirement to comply with the RCRA air emissions control regulations for tanks, surface impoundments and containers in 40 C.F.R. 265 Subpart CC.	As above.
Hazardous Waste Management	RCRA, 42 U.S.C. § 6921, *et seq.* Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities (TSDFs) – General Facility Standards 40 C.F.R. §§ 264.10–264.19, adopted by N.J.A.C. 7:26G-8.1	Relevant and Appropriate, if hazardous wastes are generated	Provides general facility requirements including general waste analysis, security measures, inspections, and training requirements.	Facility will be designed, constructed, and operated in accordance with this requirement. All workers will be properly trained.

Table 6(a). Summary of Action-Specific ARARs

Operable Unit 8, American Cyanamid Superfund Site, Bridgewater, New Jersey

Activity	Requirement / Citation	Status	Synopsis of Requirement	Comments
Hazardous Waste Management	RCRA, 42 U.S.C. § 6921, *et seq*. Standards for Owners and Operators of Hazardous Waste TSDFs – Preparedness and Prevention 40 C.F.R. §§ 264.30–264.37, adopted by N.J.A.C. 7:26G-8.1	Relevant and Appropriate, if hazardous wastes are managed	Identifies requirements for safety equipment and spill control.	Safety and communication equipment will be installed at the Site. Local authorities will be familiarized with the Site.
Hazardous Waste Management	RCRA, 42 U.S.C. § 6921, *et seq*. Standards for Owners and Operators of Hazardous Waste TSDFs – Contingency Plan and Emergency Procedures 40 C.F.R. §§ 264.50–264.56, adopted by N.J.A.C. 7:26G-8.1	Relevant and Appropriate, if hazardous wastes are managed	Requires a contingency plan to minimize hazardous from fires, explosions, or unplanned releases of hazardous waste or hazardous constituents.	Contingency and Emergency Procedures Plans will be developed and implemented during remedial action. Copies of the plans will be kept onsite.
Hazardous Waste Management	RCRA, 42 U.S.C. § 6921, *et seq*. Standards for Owners and Operators of Hazardous Waste TSDFs – Use and Management of Containers 40 C.F.R. §§ 264.170–264.179, adopted by N.J.A.C. 7:26G-8.1	Relevant and Appropriate, if hazardous wastes are managed	Identifies requirements for managing hazardous waste in containers, including inspections, containment, closure, and air emissions requirements.	As above.
Hazardous Waste Management	RCRA, 42 U.S.C. § 6921, *et seq*. Standards for Owners and Operators of Hazardous Waste TSDFs – Tank Systems 40 C.F.R. §§ 264.190–264.200, adopted by N.J.A.C. 7:26G-8.1	Relevant and Appropriate, if hazardous wastes are managed	Identifies requirements for managing hazardous waste in tanks, including specific design requirements; containment and detection of releases; general operating requirements; inspections (such as weekly visual inspections of all hazardous waste piping); response to leaks or spills or unfit equipment; closure/post-closure care; special requirements for ignitable wastes; and air emissions standards.	Approximately 300,000 gallons of NAPL will be generated and recycled. This material will likely be a hazardous waste and will likely need to be accumulated in tanks. Contract specifications will address hazardous waste tank design requirements.
Hazardous Waste Management	RCRA, 42 U.S.C. § 6921, *et seq*. Standards for Owners and Operators of Hazardous Waste TSDFs – Air Emissions Standards for Process Vents, 40 C.F.R. Part 264, Subpart AA, adopted by N.J.A.C. 7:26G- 8.1 Air Emissions Standards for Equipment Leaks, 40 C.F.R. Part 264, Subpart BB, adopted by N.J.A.C. 7:26G- 8.1, Air Emissions Standards for Tanks, Surface Impoundments, and Containers 40 C.F.R. Part 264, Subpart CC, adopted by N.J.A.C. 7:26G- 8.1	Relevant and Appropriate, if hazardous wastes are managed	Requires specific emissions control and monitoring requirements for various types of equipment, tanks, containers, and surface impoundments managing hazardous wastes with volatile organic compounds at certain levels.	Requirements will be incorporated into the design of treatment systems.

Table 6(a). Summary of Action-Specific ARARs
Operable Unit 8, American Cyanamid Superfund Site, Bridgewater, New Jersey

Activity	Requirement / Citation	Status	Synopsis of Requirement	Comments
Staging of Remediation Waste	RCRA, 42 U.S.C. § 6921, *et seq*. Standards for Owners and Operators of Hazardous Waste TSDFs – Staging Piles, 40 C.F.R. § 264.554	Applicable if hazardous wastes are managed	A staging pile is a temporary solution for holding and handling hazardous remediation waste before offsite disposal or before movement to a corrective action management unit (CAMU). A staging pile is defined as "an accumulation of solid, non-flowing remediation waste (as defined in § 260.10 of this chapter) that is not a containment building and is used only during remedial operations for temporary storage at a facility." 40 C.F.R. § 264.554(a). Wastes stored in a staging pile do not need to meet Land Disposal Restrictions (LDRs), and staging piles are not RCRA units subject to minimum technological requirements. For the purposes of staging piles, "storage" includes mixing, sizing, blending, or other similar physical operations as long as they are intended to prepare the wastes for subsequent management or treatment. Wastes are only temporarily stored in a staging pile and once removed from a staging pile become subject to LDR treatment standards unless moved to a corrective action management unit (CAMU). Specific staging pile design standards include: two-year limit from first use, preventing runoff and air emissions from the pile, professional engineer certification of the design, clean closure after operation is complete (if located in an uncontaminated area), etc.	Requirements will be incorporated into the design of remedy.
Hazardous Waste Disposal	RCRA, 42 U.S.C. § 6921, *et seq*. Land Disposal Restrictions 40 C.F.R. Part 268, adopted by N.J.A.C. 7:26G-11.1	Applicable, if hazardous wastes are generated	Identifies hazardous wastes that are restricted from land disposal and defines those limited circumstances under which an otherwise prohibited waste may continue to be land disposed.	LDRs must be met before wastes can be land disposed off-site.

Table 6(a). Summary of Action-Specific ARARs

Operable Unit 8, American Cyanamid Superfund Site, Bridgewater, New Jersey

Activity	Requirement / Citation	Status	Synopsis of Requirement	Comments
Transport of Hazardous Materials	Hazardous Material Transportation Act, 49 U.S.C. §§ 1801-1819 Hazardous Materials Transportation 49 C.F.R. Chapter I, Subchapter C (Parts 171-177)	Applicable	49 C.F.R. Chapter I, Subchapter C (49 C.F.R. Parts 170 through 179) discuss requirements for hazardous materials in transport such as HazMat employee training requirements (49 C.F.R. 172 Subpart H) and design requirements for containers used to ship hazardous materials (49 C.F.R. Part 178).	Contract specifications will require that personnel who load/unload, and otherwise affect transportation of hazardous materials to be trained in accordance with 49 C.F.R. Part 172 Subpart H and to handle the hazardous materials per the DOT requirements and that containers used for transport meet DOT requirements. (Hazardous wastes do not need to be manifested since the transport is within or along a public round bounding the facility [40 C.F.R. § 262.20(f)]).
Hazardous Materials Onsite	Hazardous Chemical Reporting Community Right-To-Know 40 C.F.R. Part 370	Applicable, if materials with an MSDS or Safety Data Sheet are onsite	Notification of the presence of hazardous chemicals to State Emergency Planning Commissions, and to local Emergency Planning Committees if the hazardous chemical is present in quantities greater than a regulatory specified amount.	Requirements will be incorporated into the design of remedy.
Oils Onsite	Clean Water Act, 33 U.S.C. § 1251, *et seq.* Oil Pollution Act, 33 U.S.C. § 2701, *et seq.* Spill Prevention Control and Countermeasures Planning 40 C.F.R. Part 112	Applicable, if >1,320 gallons of oils are stored onsite	SPCC Plans are required for a facility whenever there is 1320 gallons or more of oil in 55-gallon or larger containers or equipment. As used in this regulation, the definition of oil is very broad, and the NAPL may meet the definition of oil. Specific requirements in 40 C.F.R. Part 112 include 100% secondary containment (with allowance for rainfall) with overfill prevention for each oil container/tank, security and adequate lighting, monthly inspections of containers and tanks, general secondary containment for the expected spill for loading and unloading areas (drainage from these areas should be directed away from a water body), etc.	Requirements will be incorporated into the design of remedy.

Table 6(a). Summary of Action-Specific ARARs

Operable Unit 8, American Cyanamid Superfund Site, Bridgewater, New Jersey

Activity	Requirement / Citation	Status	Synopsis of Requirement	Comments
Air Emissions	New Jersey Air Pollution Control Act, N.J.S.A. § 26:2C-1 et seq., Permits and Certifications for Minor Facilities (and Major Facilities without an Operating Permit) N.J.A.C. 7:27-8	Applicable	Provides requirements for obtaining a permit for air emissions. NJDEP has said that cement batch plants and associated materials handling equipment at construction sites require a permit (NJDEP Air Quality interpretive memo, January 26, 2010); grout plants are usually considered a type of concrete batch plant. Particulate matter (dust) emissions usually need permit equivalents. Group 1 toxics (TXS) (including benzene) emissions are also regulated and may need a permit, if the source has the potential to emit more than 0.1 lb/hr of Group 1 and Group 2 TXS. Equipment used to treat "waste soils" is also regulated and may need a permit.	Under CERCLA Section 121(e)(1), 42 U.S.C. §9621(e)(1), no permits are required work that is conducted entirely on-site, although such work will comply with substantive requirements of otherwise required permits. The permit exemption does not apply to off-site work.
Air Emissions	New Jersey Air Pollution Control Act, N.J.S.A. § 26:2C-1, et seq., Ambient Air Quality Standards N.J.A.C. 7:27-13.3	Applicable	Provides ambient air quality standards for suspended particulate matter. Primary air quality standards state that, during any 12 consecutive months, the geometric mean value of all 24-hour averages of suspended particulate matter concentrations in ambient air shall not exceed 75 micrograms per cubic meter. During any 12 consecutive months, 24-hour average concentrations may exceed 260 micrograms per cubic meter no more than once.	Air emissions could be caused by grading, excavation, etc. Primary air quality standards are ambient air quality standard intended to protect the public health.
Air Emissions	New Jersey Air Pollution Control Act, N.J.S.A. § 26:2C-1, et seq., Control and Prohibition of Air Pollution by Volatile Organic Compounds N.J.A.C. 7:27-16	Applicable	Any stationary source or group of sources must use reasonably available control technology (RACT) to control VOC emissions. Emissions control and management requirements are specified for tanks, and depend on the size and the type of tank (including addressing tank loading, inspection, and emissions calculations). Additional emissions calculations and control are required for other source operations.	Requirements will be incorporated into the design of remedy.
Air Emissions	New Jersey Air Pollution Control Act, N.J.S.A. § 26:2C-1, et seq., Control and Prohibition of Air Pollution by Toxic Substances and Hazardous Air Pollutants N.J.A.C. 7:27-17	Relevant and Appropriate	Prohibits discharges of Table 1 toxic substances (including benzene). Emission must be controlled in accordance with NJDEP source registration requirements. Applies to any transfer operation that exceeds 0.1 lbs/hour emissions.	Toxic substance air emissions could be caused by grading, excavating, and COC removal.
Noise	Noise Control Act N.J.S.A. 13:1G N.J.A.C. 7:29-1	Applicable	The established continuous airborne sound level standards are 50 decibels during nighttime (10:00 p.m. to 7:00 a.m.) and 65 decibels during daytime. Additional specific decibel limits are provided in the regulation	Requirements will be incorporated into the design of remedy.

Table 6(a). Summary of Action-Specific ARARs

Operable Unit 8, American Cyanamid Superfund Site, Bridgewater, New Jersey

Activity	Requirement / Citation	Status	Synopsis of Requirement	Comments
Solid Waste Left in Place	New Jersey Solid Waste Management Act (NJSWMA), N.J.S.A. §13:1E-1, *et seq.*, Solid Waste General Engineering Design Requirements N.J.A.C. 7:26-2.10	Relevant and Appropriate	A final cover system shall comply with the following performance standards: i. The permeability of the final cover shall be less than or equal to that of the bottom-liner system or natural subsoils present, or 1 x 10[-5] cm/sec., whichever is less. The depth of final cover shall be a minimum of 18 inches overlain by a minimum of a six-inch erosion layer. ii. If the landfill has a synthetic membrane in the bottom-liner system, then the final cover shall include a synthetic membrane. (1) The synthetic membrane of the final cover does not have to be the same type or thickness as the membrane in the bottom-liner system. However, a minimum thickness of 30 mils shall be used. In the case of High Density Polyethylene, a minimum thickness of 60 mils is required to ensure proper seaming of the synthetic membrane. Side slopes must no more than 3:1, except as specified in the regulations. The final grades of the final cover system shall have a surface drainage system capable of conducting run-off across the final grades without the development of erosion rills or gullies. The cover shall accommodate initial settlement so that the integrity of the impermeable liner is maintained throughout the closure and post-closure period.	
Storm Water Discharges	Storm Water Permit Requirements N.J.A.C. 7:14A-24.7	Applicable	Specific storm water management procedures (e.g., a storm water pollution prevention plan [SPPP], storm water best management practices [BMPs]) must be implemented to minimize the potential for erosion and sediment to migrate to a water body. The SPPP should include a construction site waste control component, addressing material management to prevent or reduce waste, waste handling, and spills, discharges of hazardous substances, and federally reportable releases (	The selected remedy will comply with substantive requirements for otherwise required permits.
Construction Storm Water	Soil Erosion and Sediment Control Act N.J.S.A. 4:24-39, N.J.A.C. 2:90, *et. seq*	Applicable	Provides soil erosion and sediment control measures, including vegetative, engineering, and runoff treatment standards to prevent or limit soil erosion and promote sediment control on and off-site.	These measures will be considered during the development of alternatives. A soil erosion and sediment control plan may be developed and filed with Somerset County Soil Conservation District, if required.
Hazardous Materials Onsite	Worker and Community Right to Know Regulations N.J.A.C. 7:1G-5.1	Applicable, if ≥10,000 lbs of materials with an MSDS are onsite	Notification of the presence of hazardous chemicals by March 1 electronically to NJDEP, and by hard copies to the local police department, fire department, County Right-to-Know Lead Agency, and the local emergency planning committee	
Site Investigation / Remediation	Technical Requirements for Site Remediation N.J.A.C. 7:26E	Relevant and Appropriate	Provides minimum technical requirements to remediate contamination. Administrative requirements, including specific wording of deed notices, is provided in N.J.A.C. 7:26C	Substantive requirements potentially relevant and appropriate

Table 6(a). Summary of Action-Specific ARARs
Operable Unit 8, American Cyanamid Superfund Site, Bridgewater, New Jersey

Activity	Requirement / Citation	Status	Synopsis of Requirement	Comments
Hazardous Materials Onsite	Spill Compensation and Control Act N.J.S.A. 58:10-23.11, *et seq*. N.J.A.C. 7:1E	Applicable	The facility could be considered a major facility if there are more than 20,000 gallons of hazardous material stored at any one time; the NAPL may collected may exceed this quantity. A discharge prevention, control, and countermeasure (DPCC) Plan reviewed and certified by a Professional Engineer is required for major facilities. This Plan is similar to an SPCC Plan (see federal Spill Prevention Control and Countermeasures Planning, above). Requirements include testing and inspection of aboveground storage tanks, secondary containment, high level alarms, training employees, maintaining security, keeping required records, developing standard operating procedures, and related requirements. A discharge response, cleanup, and removal contingency plan is also required, which includes having trained personnel and adequate quantities of emergency equipment should an incident occur.	

Table6(b). Summary of Location-Specific ARARs
Operable Unit 8 Focused Feasibility Study, American Cyanamid Superfund Site, Bridgewater, New Jersey

Location	Requirement / Citation	Status	Synopsis of Requirement	Comment
Surface Water/ Wetlands	Clean Water Act Section 404, 33 U.S.C. § 1344 40 C.F.R. 230, Guidelines for Specifications of Disposal Sites for Dredged or Fill Materials, and	Relevant and Appropriate, if wetlands are disturbed in non-delegable waters	Section 404 regulates the discharge of dredged or fill material into waters of the United States, including wetlands. This program is implemented through regulations set forth in the 404(b)(1) guidelines at 40 C.F.R. Part 230. The guidelines specify the types of information and environmental conditions that need to be evaluated for impacts on the aquatic ecosystem and provide for compensatory mitigation when there will be unavoidable impacts to waters of the United States. Enhancement, restoration, creation, or replacement of wetlands should be based on functional equivalence. Mitigation should be based on an EPA assessment of the values provided by the wetland. NJDEP is responsible for administering the Section 404 Program for delegable freshwaters in NJ under the NJ Freshwater Wetlands Protection Act. Remedial work that occurs entirely on-site in non-delegable waters is required to meet substantive requirements of both Section 404 and the NJ Freshwater Wetlands Protection Act.	If Impoundments 1 and 2 are located in non-delegable waters, then these provisions will apply.
Migratory Bird Habitat	Migratory Bird Treaty Act 16 U.S.C. §§ 703-712	Applicable, if migratory birds are identified during the action	Prohibits the taking, possessing, buying, selling, or bartering of any migratory bird, including feathers or other parts, nests, eggs, or products except as allowed by regulations. This includes disturbing nesting birds.	
Treated Impoundment Material Placement Location	Location Standards for New Hazardous Waste Facilities 40 C.F.R. 264.18, adopted by N.J.A.C. 7:26G-8	Relevant and Appropriate, if hazardous wastes are left in place	Hazardous waste facilities must not be located within 200' of a fault that has moved in Holocene times and, if located within the 100-year floodplain, must be designed, constructed, and maintained to prevent washout of any hazardous waste by a 100-year flood.	This ARAR would be met by specifying the substantive requirements in the remedial design and by maintaining compliance with the requirements through remedial action monitoring
Hazardous Waste Accumulation Area	Hazardous Waste: Use and Management of Containers, Special Requirements for Ignitable and Reactive Wastes 40 C.F.R. 264.176, adopted by N.J.A.C. 7:26G-8	Applicable, if ignitable hazardous wastes are generated	Containers holding ignitable or reactive wastes must be more than 50' from the property line.	Any hazardous wastes generated would be accumulated or stored more than 50' from the property line.

Table6(b). Summary of Location-Specific ARARs
Operable Unit 8 Focused Feasibility Study, American Cyanamid Superfund Site, Bridgewater, New Jersey

Location	Requirement / Citation	Status	Synopsis of Requirement	Comment
STATE				
Wetlands	New Jersey Freshwater Wetlands Protection Act, N.J.S.A. 13:9B-1, Freshwater Wetlands Protection Act Rules N.J.A.C. 7:7A	Applicable	Regulates construction or other activities (including remedial action) that will have an impact on wetlands. Flood hazard area is defined as land, and the space above that land, which lies below the flood hazard area design flood elevation. The flood hazard design flood is equal to the 100-year flood plus an additional amount of water in fluvial are. Any disturbance, dredging, fill, construction, plant life destruction, or similar activity in freshwater wetlands is required to have a Freshwater Wetlands Protection Act permit equivalent. A permit issued under the Freshwater Wetlands Protection Act Rules is also considered a CWA 401 Water Quality Certification.	NJDEP provided a wetlands letter of interpretation dated December 12, 2011. The letter identified wetlands of intermediate value and wetlands of exeptional value in the area of Impoundments 1 and 2. The transition area of these wetlands extends across most of the northern, all of the eastern, and most of the southern berm of Impoundments 1 and 2. Regulated activities such as construction in the wetlands and transition areas that occur entirely on-site will comply with substantive Freshwater Wetlands Act requirements. A permit is required for off-site regulated activities.
Floodplains	New Jersey Flood Hazard Area Control Act, N.J.S.A. 58:16A-50 Flood Area Hazard Control Act Regulations N.J.A.C. 7:13	Applicable	These regulations include Stream Encroachment and Sediment Control (SESC) permit requirements for construction within a flood hazard area.	The regulations define the entire extent of the Impoundment 2 berms and the northern- and northeastern-most corners of the Impoundment 1 berms to be in the flood fringe. The remainder of the Impoundment 1 berm is in the floodway. Armoring can be permitted. Construction that requires greater than 5 cubic yards of fill materials in the flood fringe requires an individual permit equivalent. The remedial action will comply with substantive SECS permit requirements.

Table 6(c). Summary of Chemical-Specific ARARs

Operable Unit 8 Focused Feasibility Study, American Cyanamid Superfund Site, Bridgewater, New Jersey

Medium	Requirement / Citation	Status	Synopsis of Requirement	Comments
Generated wastes (including water, soil, sediment)	RCRA, 42 U.S.C. § 6921, *et seq*. Identification and Listing of Hazardous Waste 40 C.F.R. Part 261, as adopted by N.J.A.C. 7:26G- 5.1	Applicable, if hazardous wastesare generated	Identifies those solid wastes which are regulated as hazardous wastes.	Action-specific and location-specific ARARs would apply if hazardous wastes are generated
STATE				
Air	New Jersey Air Pollution Control Act, N.J.S.A. § 26:2C, *et seq.* Prohibition of Air Pollution N.J.A.C. 7:27-5	Applicable	States that no one "shall cause, suffer, allow or permit to be emitted into the outdoor atmosphere substances in quantities which shall result in air pollution".	The remedial action will be designed and constructed to minimize the potential for air emissions.
Air	New Jersey Air Pollution Control Act, N.J.S.A. § 26:2C, et seq. Ambient Air Quality Standards N.J.A.C. 7:27-13	Applicable	NJDEP's air quality objective is for air within the state to meet the ambient air quality standards. Standards exist for particulates, sulfur dioxide, carbon monoxide, ozone, lead, and nitrogen dioxide (criteria pollutants).	The remedial action will be designed and constructed to minimize the potential for air emissions. Air monitoring (e.g., including fenceline monitoring) will be performed to assess the surrounding air and ensure the workers and communities are not impacted by remedial activities.
Air	New Jersey Air Pollution Control Act, N.J.S.A. § 26:2C, et seq. Air Pollution Control Regulations N.J.A.C. 7:27-22 (Operating Permits) and N.J.A.C. 7:27-8 (Permits and Certificates for Minor Facilities)	Applicable	Provides regulations that govern activities that result in emissions that introduce contaminants into the ambient atmosphere.	The remedial action will comply with substantive requirements of N.J.A.C. 7:27-22 and 7:27-8. Air emission units will comply with associated limits, and emission treatments, containment and monitoring program will be designed to meet the limits

APPENDIX III

ADMINISTRATIVE RECORD INDEX

ADMINISTRATIVE RECORD INDEX OF DOCUMENTS

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Action:

DocID:	Doc Date:	Title:	Image Count:	Doc Type:	Addressee Name/Organization:	Author Name/Organization:
538470	05/29/2018	ADMINISTRATIVE RECORD INDEX FOR OU8 FOR THE AMERICAN CYANAMID SITE	7	Administrative Record Index		(US ENVIRONMENTAL PROTECTION AGENCY)
114060	10/03/2012	ADMINISTRATIVE RECORD INDEX FOR OU4 FOR THE AMERICAN CYANAMID COMPANY SITE	2	Administrative Record Index		(US ENVIRONMENTAL PROTECTION AGENCY)
540506	10/05/1982	SLUDGE CHARACTERIZATION REPORT FOR THE AMERICAN CYANAMID COMPANY SITE	61	Report		
540527	12/01/1982	SOURCE ASSESSMENT AND REMEDY PROGRAM FOR LAGOONS 1 AND 2 FOR THE AMERICAN CYANAMID COMPANY SITE	25	Report		
540495	03/06/1984	LAGOON 1 AND 2 CLOSURE SUMMARY FOR THE AMERICAN CYANAMID COMPANY SITE	18	Report		
114062	05/25/1988	ADMINISTRATIVE CONSENT ORDER FOR THE AMERICAN CYANAMID COMPANY SITE	163	Legal Instrument		(STATE OF NEW JERSEY, DEPARTMENT OF ENVIRONMENTAL PROTECTION)
114064	03/01/1992	BASELINE SITE-WIDE ENDANGERMENT ASSESSMENT FOR THE AMERICAN CYANAMID COMPANY SITE	524	Report	(AMERICAN CYANAMID COMPANY)	(BLASLAND, BOUCK & LEE, INCORPORATED)
114063	05/04/1994	ADMINISTRATIVE CONSENT ORDER AMENDMENT FOR THE AMERICAN CYANAMID COMPANY SITE	7	Legal Instrument		(STATE OF NEW JERSEY, DEPARTMENT OF ENVIRONMENTAL PROTECTION)
255486	11/01/1997	FINAL CORRECTIVE MEASURES STUDY / FEASIBILITY STUDY REPORT FOR GROUP III IMPOUNDMENTS - VOLUME 1 OF 4 FOR THE AMERICAN CYANAMID COMPANY SITE	469	Report		(O'BRIEN & GERE ENGINEERS INCORPORTED)
255487	11/01/1997	APPENDIX A OF FINAL CORRECTIVE MEASURES STUDY / FEASIBILITY STUDY REPORT FOR GROUP III IMPOUNDMENTS - VOLUME 2 OF 4 FOR THE AMERICAN CYANAMID COMPANY SITE	328	Report		(O'BRIEN & GERE ENGINEERS INCORPORTED)
255488	11/01/1997	APPENDIX B OF FINAL CORRECTIVE MEASURES STUDY / FEASIBILITY STUDY REPORT FOR GROUP III IMPOUNDMENTS - VOLUME 3 OF 4 FOR THE AMERICAN CYANAMID COMPANY SITE	439	Report		(O'BRIEN & GERE ENGINEERS INCORPORTED)
109482	09/28/1998	RECORD OF DECISION FOR OU3, GROUP III IMPOUNDMENTS (1, 2, 3, 4, 5, 14, 20, & 26) FOR THE AMERICAN CYANAMID COMPANY SITE	82	Report		(STATE OF NEW JERSEY, DEPARTMENT OF ENVIRONMENTAL PROTECTION)

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114075	09/30/2004	SECOND FIVE-YEAR REVIEW REPORT FOR THE AMERICAN CYANAMID COMPANY SITE	16	Report		(US ENVIRONMENTAL PROTECTION AGENCY)
114076	01/01/2005	BASELINE ECOLOGICAL RISK ASSESSMENT FOR THE AMERICAN CYANAMID COMPANY SITE	707	Report	(WYETH HOLDINGS CORPORATION)	(O'BRIEN & GERE ENGINEERS INCORPORTED)
114077	02/01/2005	IMPOUNDMENT REMEDY APPROPRIATENESS EVALUATION FOR THE AMERICAN CYANAMID COMPANY SITE	176	Report	(WYETH HOLDINGS CORPORATION)	(O'BRIEN & GERE ENGINEERS INCORPORTED)
114083	12/01/2006	FINAL HUMAN HEALTH RISK ASSESSMENT FOR THE AMERICAN CYANAMID COMPANY SITE	431	Report	(WYETH HOLDINGS CORPORATION)	(O'BRIEN & GERE ENGINEERS INCORPORTED)
123757	07/13/2009	CORRESPONDENCE REGARDING THE US EPA ASSUMING THE RESPONSIBILITY OF LEAD AGENCY FROM THE NEW JERSEY DEPARTMENT OF ENVIRONMENTAL PROTECTION FOR THE AMERICAN CYANAMID COMPANY SITE	2	Letter	DONOHUE,THOMAS (WYETH)	CARPENTER,ANGELA (US ENVIRONMENTAL PROTECTION AGENCY)
114086	10/07/2010	SUMMARY MEMO, SITE WIDE CHARACTERIZATION PROGRAM FOR THE AMERICAN CYANAMID COMPANY SITE	202	Report	(WYETH HOLDINGS CORPORATION)	(O'BRIEN & GERE ENGINEERS INCORPORTED)
255537	11/16/2010	SUMMARY REPORT FOR IMPOUNDMENTS 1 AND 2 CHARACTERIZATION PROGRAM FOR THE AMERICAN CYANAMID COMPANY SITE	193	Report		(O'BRIEN & GERE ENGINEERS INCORPORTED)
540486	06/29/2011	IMPOUNDMENTS 1 AND 2 FOCUSED FEASIBILITY STUDY WORK PLAN FOR THE AMERICAN CYANAMID COMPANY SITE	29	Work Plan	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(O'BRIEN & GERE)|CARACCIOLO,ANGELO (O'BRIEN & GERE)
113246	07/19/2011	ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMOVAL ACTION FOR THE AMERICAN CYANAMID COMPANY SITE - DOCKET NO. CERCLA-02-2011-2015	42	Agreement		KEMP,STEVEN,F (WYETH HOLDINGS CORPORATION)|MUGDAN,WALTER,E (US ENVIRONMENTAL PROTECTION AGENCY)
540534	09/26/2011	TREATMENT ALTERNATIVES EVALUATION FOR IMPOUNDMENTS 1 AND 2 FOR THE AMERICAN CYANAMID COMPANY SITE	179	Report		
113250	02/09/2012	SITE WIDE FEASIBILITY STUDY FOR THE AMERICAN CYANAMID COMPANY SITE	1257	Report		ROLAND,STEVEN,J (O'BRIEN & GERE ENGINEERS INCORPORTED)
255624	03/22/2012	FLOOD EMERGENCY PROCEDURES PLANT FOR THE AMERICAN CYANAMID COMPANY SITE	55	Work Plan	(PFIZER, INC)	(WOODWARD AND CURRAN)

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540488	08/21/2012	IMPOUNDMENT 2 LINER INSTALLATION AND INSPECTION FOR THE AMERICAN CYANAMID COMPANY SITE	24	Report		
123552	09/27/2012	RECORD OF DECISION FOR OU 4 FOR THE AMERICAN CYANAMID COMPANY SITE	825	Report		(US ENVIRONMENTAL PROTECTION AGENCY)
540511	10/01/2012	IMPOUNDMENTS 1 AND 2 TREATABILITY STUDY RESULTS FOR THE AMERICAN CYANAMID COMPANY SITE	1465	Work Plan		
684230	03/18/2013	ADMINISTRATIVE SETTLEMENT AGREEMENT AND ORDER ON CONSENT FOR REMEDIAL DESIGN, OPERABLE UNIT 4 (OU4) AND FOCUSED FEASIBILITY STUDY, OPERABLE UNIT 8 (OU8) FOR THE AMERICAN CYANAMID COMPANY SITE	69	Legal Instrument		KEMP,STEVEN,F (WYETH HOLDINGS CORPORATION)|MUGDAN,WALTER,E (US ENVIRONMENTAL PROTECTION AGENCY)
318446	07/10/2013	PROPOSED BERM PROTECTION FOR IMPOUNDMENTS 1 AND 2 FOR THE AMERICAN CYANAMID COMPANY SITE	6	Memorandum	CARUSO,MARY (QUANTUM MANAGEMENT GROUP INCORPORATED)|D'ACO,VINCENT J. (QUANTUM MANAGEMENT GROUP INCORPORATED)	BATTISTELLI,MICHAEL (WOODWARD AND CURRAN)
540523	07/10/2013	SOIL EROSION AND SEDIMENT CONTROL PLAN FOR OU8 PILOT STUDY FOR THE AMERICAN CYANAMID COMPANY SITE	10	Memorandum	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)
255582	08/19/2013	APPROVAL OF 02/05/2013 SITE-WIDE WASTE WATER TREATMENT PLANT - NEW JERSEY POLLUTION DISCHARGE ELIMINATION SYSTEM - DISCHARGE TO SURFACE WATER PERMIT EQUIVALENCE APPLICATION FOR THE AMERICAN CYANAMID COMPANY SITE	2	Letter	CARPENTER,ANGELA (US ENVIRONMENTAL PROTECTION AGENCY)	ZERVAS,GWEN (NJ DEPT OF ENVIRONMENTAL PROTECTION)
255551	09/01/2013	SUMMARY OF AMBIENT AIR MONITORING RESULTS - JULY 2012 TO APRIL 2013 FOR THE AMERICAN CYANAMID COMPANY SITE	604	Report	(PFIZER, INC)|(US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)
255539	10/25/2013	100 PERCENT DESIGN OF PILOT STUDY FOR OU 8 FOR THE AMERICAN CYANAMID COMPANY SITE	145	Report	(PFIZER, INC)	(CH2M HILL)
255540	10/25/2013	IMPOUNDMENT NO. 2 PILOT-SCALE DEMONSTRATION WYETH HOLDINGS CORPORATION FOR THE AMERICAN CYANAMID COMPANY SITE	50	Figure/Map/ Drawing	(PFIZER, INC)	(CH2M HILL)

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540464	11/26/2013	CAISSON PLACEMENT AND IMPOUNDMENT MATERIAL CHARACTERIZATION MEMORANDUM FOR THE IMPOUNDMENT 1 AND 2 PILOT STUDY OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	8	Memorandum	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)
540475	12/06/2013	EVALUATION OF THE CLAY LAYER AND TAR SURFACE ELEVATION IN IMPOUNDMENT 2 FOR THE AMERICAN CYANAMID COMPANY SITE	19	Memorandum	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)
540472	12/12/2013	US EPA'S APPROVAL OF THE 100 PERCENT DESIGN OF THE PILOT STUDY, SITE-SPECIFIC WORK PLAN, AND THE ADDENDUM TO THE FLOOD EMERGENCY PROCEDURES PLAN FOR THE AMERICAN CYANAMID COMPANY SITE	1	Letter	(PFIZER GLOBAL ENGINEERING)|DOWNEY,RUSSELL (PFIZER GLOBAL ENGINEERING)	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)
540501	01/06/2014	NJDEP CERTIFICATE TO OPERATE CONTROL APPARATUS AND OR EQUIPMENT FOR THE AMERICAN CYANAMID COMPANY SITE	24	Other		
255552	02/01/2014	SUMMARY OF AMBIENT AIR MONITORING RESULTS - OCTOBER 2013 FOR THE AMERICAN CYANAMID COMPANY SITE	98	Report	(PFIZER, INC)|(US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)
255550	06/01/2014	FINAL SUMMARY OF AMBIENT AIR MONITORING RESULTS - MARCH 2014 FOR THE AMERICAN CYANAMID COMPANY SITE	90	Report	(PFIZER, INC)|(US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)
540532	06/06/2014	SUMMARY OF THE TIER IV LABORATORY TREATABILITY STUDIES, IMPOUNDMENT 2 FOR THE AMERICAN CYANAMID COMPANY SITE	832	Memorandum	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)
267631	06/26/2014	FOURTH FIVE-YEAR REVIEW REPORT FOR THE AMERICAN CYANAMID COMPANY SITE	58	Report		(US ENVIRONMENTAL PROTECTION AGENCY)
540484	08/01/2014	IMPOUNDMENT 2 BASELINE GROUNDWATER MONITORING PROGRAM FINAL REPORT FOR THE AMERICAN CYANAMID COMPANY SITE	158	Report		
540468	09/09/2014	DRAFT FIELD-SCALE DEMONSTRATION STUDY RESULTS REPORT FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	28	Report		
540490	09/18/2014	IN-SITU STABILIZATION/SOLIDIFICATION PILOT TEST RESULTS OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	32	Report	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)

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540491	09/19/2014	IN-SITU THERMAL TREATMENT PILOT TEST RESULTS OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	41	Report	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)
540476	02/26/2015	FINAL FIELD-SCALE DEMONSTRATION STUDY RESULTS REPORT FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	28	Report		
540526	08/01/2015	REVISED IMPOUNDMENTS 1 AND 2 TREATABILITY STUDY RESULTS FOR THE AMERICAN CYANAMID COMPANY SITE	103	Report		
540456	09/09/2015	TECHNOLOGY SCREENING MEMORANDUM TO SUPPORT ALTERNATIVES DEVELOPMENT FOR IMPOUNDMENTS 1 AND 2 FOR THE AMERICAN CYANAMID COMPANY SITE	12	Memorandum	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	
540504	09/11/2015	PROPOSED PERFORMANCE CRITERIA FOR REMEDIAL ALTERNATIVES FOR IMPOUNDMENTS 1 AND 2 FOR THE AMERICAN CYANAMID COMPANY SITE	20	Memorandum	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(QUANTUM MANAGEMENT GROUP INCORPORATED)|D'ACO,VINCENT J. (QUANTUM MANAGEMENT GROUP INCORPORATED)
540474	10/15/2015	US EPA'S APPROVAL OF THE TECHNOLOGY SCREENING MEMORANDUM AND THE PROPOSED PERFORMANCE CRITERIA FOR REMEDIAL ALTERNATIVES MEMORANDUM FOR THE AMERICAN CYANAMID COMPANY SITE	1	Letter	(PFIZER GLOBAL ENGINEERING)|DOWNEY,RUSSELL (PFIZER GLOBAL ENGINEERING)	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)
376867	12/03/2015	CONSENT DECREE, CIVIL ACTION NO. 15-7153 FOR THE AMERICAN CYANAMID COMPANY SITE	244	Legal Instrument		CRUDEN,JOHN,C (U.S. DEPARTMENT OF JUSTICE)|MUGDAN,WALTER (US ENVIRONMENTAL PROTECTION AGENCY)|THOMPSON,ANNE,E (US DEPARTMENT OF JUSTICE)
540492	05/15/2016	PFIZER STEAM MIXING AND STABILIZATION TREATABILITY STUDY FINAL REPORT FOR THE AMERICAN CYANAMID COMPANY SITE	100	Report	(CH2M HILL)	(KEMRON ENVIRONMENTAL SERVICES INCORPORATED)
540465	05/20/2016	BENCH SCALE LINER COMPATIBILITY STUDY FOR THE IMPOUNDMENT 8 FACILITY FOR THE AMERICAN CYANAMID COMPANY SITE	168	Memorandum	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)

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540531	05/27/2016	THERMALLY ENHANCED IN-SITU SOLIDIFICATION / STABILIZATION BENCH SCALE TEST RESULTS FOR THE AMERICAN CYANAMID COMPANY SITE	524	Report	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)
540496	05/31/2016	MECHANICAL DEWATERING BENCH SCALE TESTING REPORT FOR THE AMERICAN CYANAMID COMPANY SITE	19	Report	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(O'BRIEN & GERE ENGINEERS INCORPORTED)
540535	12/09/2016	CORRESPONDENCE REGARDING THE USE OF CORRECTIVE ACTION MANAGEMENT UNIT FOR IMPOUNDMENT 1 AND 2 FOR THE AMERICAN CYANAMID COMPANY SITE	17	Memorandum	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(CH2M HILL)
537992	06/09/2017	NJDEP COMMENTS REGARDING THE DRAFT FOCUSED FEASIBILITY STUDY FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	6	Letter	AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	SHAH,HAIYESH (NJ DEPARTMENT OF ENVIRONMENTAL PROTECTION)
540479	08/08/2017	DRAFT NO. 3 OF THE FOCUSED FEASIBILITY STUDY REPORT OF OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	966	Report	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	
537996	10/10/2017	WYETH HOLDINGS, LLC COMMENTS REGARDING THE SELECTION OF THE REMEDY FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	3	Letter	AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	DOWNEY,RUSSELL (PFIZER GLOBAL ENGINEERING)
537995	10/11/2017	CORRESPONDENCE REGARDING CRISIS VIEWS ON REMEDY SELECTION FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	7	Letter	AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	
540460	03/09/2018	ACID TAR SITE IN NEW YORK - AIR EMISSION AND ODOR CONTROL TECHNIQUES FOR THE AMERICAN CYANAMID COMPANY SITE	6	Memorandum	(US ENVIRONMENTAL PROTECTION AGENCY)|AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(PFIZER GLOBAL ENGINEERING)|DOWNEY,RUSSELL (PFIZER GLOBAL ENGINEERING)
537994	04/11/2018	CORRESPONDENCE REGARDING ASSESSMENT OF RISKS USING THE ONE-HIT MODEL AT THE AMERICAN CYANAMID COMPANY SITE	2	Memorandum		MCPHERSON,JULIE (US ENVIRONMENTAL PROTECTION AGENCY)
537993	04/27/2018	NJDEP COMMENTS REGARDING THE FINAL DRAFT FOCUSED FEASIBILITY STUDY FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	2	Letter	AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	SHAH,HAIYESH (NJ DEPARTMENT OF ENVIRONMENTAL PROTECTION)

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528419	05/18/2018	CORRESPONDENCE REGARDING COMMENTS ON THE UPDATED FOCUSED FEASIBILITY STUDY REPORT FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	2	Email	AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	SHAH,HAIYESH (NJ DEPARTMENT OF ENVIRONMENTAL PROTECTION)
528418	05/21/2018	UPDATED FOCUSED FEASIBILITY STUDY REPORT FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	976	Report	AUSTIN,MARK (US ENVIRONMENTAL PROTECTION AGENCY)	(WYETH HOLDINGS CORPORATION)
528380	05/22/2018	PROPOSED PLAN FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	25	Publication		(US ENVIRONMENTAL PROTECTION AGENCY)
538040	05/23/2018	NATIONAL REMEDY REVIEW BOARD RECOMMENDATIONS ON THE PROPOSED CLEANUP PLAN FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	6	Memorandum	PRINCE,JOHN (US ENVIRONMENTAL PROTECTION AGENCY)	AMMON,DOUGLAS,C (US ENVIRONMENTAL PROTECTION AGENCY)
538041	05/29/2018	US EPA RESPONSES TO NATIONAL REMEDY REVIEW BOARD RECOMMENDATIONS ON THE PROPOSED CLEANUP PLAN FOR OU8 FOR THE AMERICAN CYANAMID COMPANY SITE	6	Memorandum	AMMON,DOUGLAS,C (US ENVIRONMENTAL PROTECTION AGENCY)	PRINCE,JOHN (US ENVIRONMENTAL PROTECTION AGENCY)

APPENDIX IV

STATE LETTER OF CONCURRENCE

State of New Jersey
DEPARTMENT OF ENVIRONMENTAL PROTECTION
Site Remediation & Waste Management Program
Mail Code 401-06
P.O. Box 420
Trenton, New Jersey 08625-0420

PHILIP D. MURPHY
Governor

SHEILA Y. OLIVER
Lt. Governor

CATHERINE R. McCABE
Commissioner

September 18, 2018

Angela Carpenter, Acting Director
Emergency and Remedial Response Division
USEPA Region 2
290 Broadway
New York, NY 10007-1866

Dear Ms. Carpenter:

Re: Operable Unit 8 (Impoundments 1 & 2) Record of Decision
Former American Cyanamid Superfund Site

The New Jersey Department of Environmental Protection (Department) completed its review of the September 2018 Record of Decision (ROD) for Operable Unit 8 (OU-8), consisting of Impoundments 1 and 2, at the former American Cyanamid Superfund Site.

The selected remedy, Alternative 6, consists of excavation of the material in the impoundments down to the existing clay layer. The excavated material will be dewatered and then transported off-site to a licensed facility for destruction (by cement kiln or incinerator). Any remaining clay impacted by the OU-8 impoundment materials will undergo in-situ stabilization, the impoundments will then be backfilled with berm remnants and an engineered protective cover will be placed over the entire OU-8 footprint.

The selected remedy is protective of public health and the environment and removes waste material from the Raritan River floodplain. Therefore, the Department concurs with the selected remedy with the understanding that applicable NJDEP air emission standards will be met during all phases of the remediation, as stated in the ROD.

Thank you for the opportunity to participate in the decision-making process to select an appropriate remedy. If you have any questions, please contact Stephen Maybury, Chief, Bureau of Case Management at (609) 633-1455.

Sincerely,

Mark J. Pedersen
Assistant Commissioner

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APPENDIX V

RESPONSIVENESS SUMMARY

RESPONSIVENESS SUMMARY
American Cyanamid Superfund Site
Operable Unit 8
Bridgewater, New Jersey

INTRODUCTION

This Responsiveness Summary provides a summary of the public's comments and concerns regarding the Proposed Plan for Operable Unit 8 of the American Cyanamid Superfund site, and the U.S. Environmental Protection Agency's (EPA's) responses to those comments. All comments summarized in this document have been considered in EPA's final decision for the selection of the remedy for the site.

This Responsiveness Summary is divided into the following sections:

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS
This section provides the history of community involvement and interests regarding the site; and

II. COMPREHENSIVE SUMMARY OF SIGNIFICANT QUESTIONS, COMMENTS, CONCERNS AND RESPONSES
This section contains summaries of written and verbal comments received by EPA at the public meeting and during the public comment period, and EPA's responses to these comments.

The last section of this Responsiveness Summary includes attachments, which document public participation in the remedy selection process for this site. They are as follows:

Attachment A contains the Proposed Plan that was distributed to the public for review and comment;

Attachment B contains the public notice that appeared in a prominent local newspaper, *Home News Tribune* on May 30, 2018;

Attachment C contains the transcripts of the public meeting held on June 12, 2018 at the Bridgewater Township Municipal Building; and

Attachment D contains the public comments received during the public comment period.

I. BACKGROUND ON COMMUNITY INVOLVEMENT AND CONCERNS

Since the placement of the site on the National Priorities List (NPL) in 1993, public interest in the site has been high. EPA has strongly encouraged and received public input throughout the history of the site. A Community Involvement Plan was established in 1988 by the New Jersey Department of Environmental Protection (NJDEP). This 1988 Community Involvement Plan outlined specific outreach tools to facilitate communication with the community in the decision-making process and was implemented for a series of Records of Decision (RODs) in the 1990s. An updated Community Involvement Plan was established in January 2011 to serve as a guide for the site owner (Wyeth Holdings, LLC) and EPA in sharing information and obtaining public input on the site activities. This Community Involvement Plan includes outreach tools to ensure a transparent and accessible decision-making process and meaningful community stakeholder participation.

In 1992, EPA awarded a Technical Assistance Grant (TAG) to CRISIS, Inc. Since that time, CRISIS has been the primary community based group serving as a liaison between the NJDEP, EPA, and the community. CRISIS has consistently participated in monthly project calls and serves in a technical review capacity on behalf of the community. CRISIS membership includes representatives from Bridgewater Township, Bound Brook Borough, Somerset County, and other community residents. CRISIS regularly engages local media outlets to ensure project information is broadcast widely. In addition, CRISIS maintains an email list to disseminate project-related information, including the dates of upcoming meetings and milestones.

On May 23, 2018, EPA released the Proposed Plan and supporting documentation for this action, OU8, to the public for comment**.** EPA made these documents available to the public in the administrative record repository maintained online at www.epa.gov/superfund/american-cyanamid.

EPA published a notice of availability for these documents in the *Home News Tribune*, and opened a public comment period on May 29, 2018. The comment period ended on June 28, 2018. A public meeting was held on June 12, 2018, at the Bridgewater Township Municipal Building, 100 Commons Way, Bridgewater, New Jersey. The purpose of this meeting was to inform residents, local officials and interested citizens about the Superfund process, to discuss the Proposed Plan and receive comments on the Proposed Plan, and to respond to questions from area residents and other interested parties.

The sign-in sheet from the June 12, 2018 public meeting identified that 40 people, not including federal and state officials, attended the meeting. The meeting attendees included residents, interest groups, local business representatives, elected officials, and members of the site owner's project team and their consultants.

EPA received written comments from 19 individuals or parties in addition to verbal comments made during the public meeting. The transcript and written public comments are found in Attachments C and D, respectively. Responses to the comments received at the public meeting are included in this Responsiveness Summary.

II. COMPREHENSIVE SUMMARY OF SIGNIFICANT QUESTIONS, COMMENTS, CONCERNS AND RESPONSES

PART 1. Written Comments

This section provides a summary of written comments received from the public during the public comment period and EPA's responses. The written comments received are included in Attachment D of this Responsiveness Summary.

Support for Alternative 6

1.1 All commenters, including elected officials, the site owner, interest groups, and residents expressed overwhelming support for Alternative 6.

Response: Comment noted.

Opposition for Alternative 6

2.1 No comments received expressing opposition.

Response: None warranted.

A comment letter (via electronic format) was submitted from Pfizer, on behalf of its subsidiary Wyeth Holdings LLC, the site owner of record

3.1 Pfizer noted that EPA's Proposed Plan presented an effective approach for addressing the complex characteristics associated with Impoundments 1 and 2 that is protective of human health and the environment and that it remains committed to working with EPA, NJDEP and other stakeholders to continue to advance the site remediation process.

Response: Comment noted.

3.2 Pfizer noted that it is prepared to invest appropriate resources to implement an OU8 remedy.

Response: Comment noted.

3.3 Pfizer mentioned that the Proposed Plan refers to the various materials within Impoundments 1 and 2 using several terms, including "acid tar," "impoundment material," "soil and clay impacted by impoundment material," "soil and clay impacted by impoundment material exceeding PRGs" and "Principal Threat Waste" (PTW) and that the terms "acid tar" and "impoundment material" are used synonymously. Pfizer also states that these materials are clearly distinguished from soil and clay that might be impacted by impoundment material in the Proposed Plan. However, Pfizer is concerned that there is some ambiguity with the term PTW, since both "acid tar" and "soil and clay impacted by impoundment material exceeding PRGs" may be considered to be PTW by others.

Response: Pfizer's position on this is noted and the Record of Decision (ROD) is written to clarify the use of these terms. Specifically, EPA thinks the term PTW better represents the material being described and, as such, "acid tar" is defined as PTW in the ROD and the term PTW is used throughout the document.

3.4 Pfizer suggested that when describing the preliminary remediation goals (PRGs) and applying those PRGs to any remaining soil and clay, if a portion of the remaining soil and clay is deemed to exceed the PRGs and thus be deemed PTW, the ROD must be clear that the remaining soil and clay will remain within the footprint of OU8 beneath a protective cover following treatment. Pfizer believes the ROD should clearly state that, after excavation, any remaining soil and clay exceeding the PRGs, even if containing some incidental acid tar, can safely be closed in-place following in-situ solidification and stabilization (ISS) and placement of an engineered protective cover.

Response: EPA agrees. The ROD has been written to clearly describe this situation.

3.5 Pfizer's last comment relates to a statement in the Proposed Plan that "ISS would further reduce contaminant mass through media transfer (enhanced desorption), capture of emissions, and destruction in a vapor system." Pfizer agrees that ISS treatment of soil and clay exceeding the PRGs and possibly containing minor amounts of acid tar will further reduce contaminant mass and its fate and transport mechanisms. Pfizer also agrees that emissions associated with the media transfer must be managed to assure compliance with applicable emission limits. However, Pfizer notes that currently it is anticipated that capture and destruction of emissions will not be the necessary or appropriate means to meet these limits, and that the actual approach to managing emissions will be finalized during remedy design. The company goes on to note that one key benefit of Alternative 6 is the ability to quickly demobilize equipment in the event of an imminent flood, which can occur frequently within the vicinity of Impoundments 1 and 2. Alternative 6, as presented in the FFS Report, was the only alternative (other than Alternative 1 — No Action), that did not depend on a thermal oxidizer to be permanently installed and operating within the floodplain. Consequently, design flexibility should be maintained to consider other means and methods for control of air emissions and odors when conducting ISS under the remedy selected in the ROD.

Response: EPA agrees. The ROD has been written to reflect this concern. A robust emission and odor control plan will be developed during remedial design, for approval by EPA. This plan will have the flexibility to address the types of emissions/odors expected while the remedy is being implemented.

A comment letter was submitted from the Mayor of Bridgewater

4.1 The Mayor of Bridgewater wrote to voice his support for EPA's preferred alternative (Alternative 6). He further noted that Alternative 6 represents the best available alternative for site remediation at this time, and that it encompasses the public safety, timeliness and reuse goals the site commands and will serve to benefit Bridgewater and the surrounding community.

Response: Comment noted.

4.2 The Mayor also notes that his comment letter serves to reinforce his commitment as a local official to advocate for an expeditious and environmentally sound clean-up of the former facility.

Response: Comment noted.

4.3 The Mayor mentioned that, as Mayor, his priority is for the health and safety of the community. In this regard it is imperative that these aspects be paramount during any remedial actions as directed by EPA.

Response: EPA agrees with the Mayor in that the priority for site workers, nearby residents and businesses and the surrounding communities will be on health and safety throughout the remedial activity process. EPA is committed to ensuring the remedy is performed in accordance with federal, state and local laws with as little impact to the surrounding community as possible.

4.4 The Mayor states that it is obligatory that Township residents and the surrounding communities be recognized as the primary stakeholders in the remediation and viable restoration of the property. All remediation plans from a technical perspective should be designed and reviewed with full recognition and acknowledgement of the needs and protection of the immediate community.

Response: EPA recognizes the Bridgewater residents and surrounding communities as vital stakeholders. We will continue to update the community on the progress of the remedy as well as important site-wide activities. All remedy activities with potential impacts to the community will be reviewed carefully with the community's interests in mind.

A comment letter was submitted from CRISIS (Technical Assistant Grant Recipient)

5.1 This letter is a recap of CRISIS' statements made during the public meeting held on June 12, 2018.

Response: Please see responses to CRISIS' statements and concerns in Section II, Part 2, Item 2.

A comment letter was submitted from Sierra Club, New Jersey Chapter

6.1 The New Jersey Sierra Club wrote commending the EPA for some parts of its clean-up plan for the American Cyanamid Superfund site and expressing concern for other parts. In particular, the Sierra Club noted support for EPA's preferred alternative for OU8.

Response: Comment noted.

6.2 The Sierra Club is concerned that without a full-cleanup of the entire site, the community could still be impacted, especially because the site is along the Raritan River in the flood plain. The Sierra Club is concerned that capping this area could lead to major leaks or spills.

Response: EPA notes that this comment does not relate to OU8, which is the subject of this ROD. The Agency signed a ROD for OU4 of the site in 2012 addressing site-wide soil and groundwater, as well as six impoundments. This remedy, referred to as the site-wide remedy, is currently being designed and implemented.

More information about the OU4 site-wide remedy can be found in the 2012 ROD. As is discussed in the OU4 ROD Responsiveness Summary, the site will employ engineered caps designed and constructed to withstand a 500-year flood event, at a minimum, and will incorporate all site-specific aspects that may pose a threat to their integrity. In addition, a strict inspection and maintenance program will be developed as part of the on-going operation plan for the engineered capping systems. Engineered capping systems have been successfully used in flood hazard areas at a number of Superfund sites.

OU8 is expected to be the final operable unit for the site. Once the OU4 and OU8 remedies are fully implemented, all site-related contamination at site will either have been removed, capped and secured, solidified and capped, and/or captured entirely (groundwater),

6.3 Sierra Club went on to state that there are other options that could work better to remove all contamination from the site rather than leaving some of it in place. In particular, the Sierra Club is concerned with discharge from the water treatment plant impacting the Raritan River, the large size of the surrounding community (over one million people and wildlife habitat) that could be affected by any failure of the cleanup plan, and leakage of contamination from the site into groundwater and surface water. The Sierra Club urges reconsideration of the site-wide remedy.

Response: The OU4 ROD concluded that a remedy of in-situ stabilization and solidification of impoundments 3, 4 and 5 followed by capping, along with capping site soils and complete site groundwater capture/restoration will be protective of human health and the environment and utilize permanent solutions. For detailed discussion of the OU4 site-wide remedy, including responses to concerns related to the long-term protectiveness, EPA refers Sierra Club to the OU4 ROD including the Responsiveness Summary. Further, EPA is overseeing regular operations and maintenance of the site, which includes sampling of soil, groundwater and surface water, and also conducts formal reviews of the remedies at the site every five years, as part of its five-year review process.

A resident submitted comments via electronic format

7.1 A resident noted that EPA's Proposed Plan states that Baseline Human Health Risk Assessments were completed in 2006 and 2010, and asked if these should be updated, or a new assessment performed, to see if the risks have changed in a way that would impact the nature of the remediation.

Response: Prior to EPA completing the OU8 FFS, the data and assumptions used to conduct the 2010 streamlined HHRA were reviewed. The site is currently vacant but it is zoned for industrial use. Therefore, a 2018 reassessment focused on the industrial worker exposure pathway. The reassessment found a cancer risk of 2.6×10^{-2} for Impoundment 1 and 4.2×10^{-3} for Impoundment 2. These risks are similar to those calculated in the 2010 streamlined assessment and still exceed the acceptable risk range.

7.2 The commenter also noted that the Proposed Plan says "…the list of risk drivers in the impoundment areas is under-estimated. Due to the high concentration of several chemicals, the presence of other potential risk drivers is masked." (Page 8 of plan). Does this mean the remediation may be changed in part, once the other risk drivers are identified, so these risks can also be mitigated/eliminated?

Response: The Proposed Plan noted that the presence of benzene, toluene and naphthalene in such high concentrations would "mask" or exceed the risks posed by the other chemicals present. One of the objectives of the remedy is to prevent human exposure through direct contact with contaminants above cleanup levels, and the remedy includes excavation of the impoundment material, solidification in place of any residual contamination and capping of the impoundments. This will prevent exposure to all contaminants present in the impoundments, whether they are driving the risk or not.

7.3 The resident asked if anyone (workers, residents, etc.) ever reported symptoms or illnesses, which could be associated with chemicals, hazards, etc., in Impoundments 1 & 2? And if so, will measures be taken during remediation to reduce the chances of these symptoms occurring again?

Response: EPA is not aware of any reports connecting Impoundments 1 and 2 with illness. However, full scale remedy implementation will have heightened health and safety measures in place at all times. The breadth of these measures will be determined in the remedial design stage.

7.4 Regarding the Baseline Site-Wide Endangerment Assessment (BEA) done in 1992, the commenter mentioned that, with the exception of the great blue heron, the on-site habitat does not support threatened or endangered species. The commenter also noted, however, that sometimes one can catch a glimpse of a heron drinking from an impoundment (P. 7 of plan) and asked what protections will be afforded the great blue heron?

Response: The impoundments themselves currently have a water cap to suppress odors. Because the remedy for OU8 will address the PTW in the impoundments down to the surrounding soil and clay, the potential for ecological risks due to exposure to the impoundment material will be eliminated. The water cap will no longer be needed.

7.5 The commenter asks if any fish have been tested in the Raritan River or its tributaries, etc. to see if any contaminants in Impoundments 1 and 2 have leaked into the river through the groundwater? Parts of the river are periodically stocked with fish as fishing is a popular sport.

Response: Fish testing has not been done as it relates to this site. As noted in the Proposed Plan, in 2011-2012 a corrective action was completed on groundwater discharges near Impoundments 1 and 2. In 2010, groundwater seeps containing high concentrations of benzene were observed on the banks of the Raritan River downgradient of Impoundments 1 and 2. An interim plan consisting of the installation of activated carbon-filled sand bags along the river at the seep discharge points was then completed and, in 2012, a more robust groundwater removal system was constructed that intercepted and captured/prevented releases of these seeps from reaching the Raritan River. The system continues to operate and is being upgraded as part of the OU4 site-wide remedy. Surface water and sediment from both the Raritan River and Cuckold's Brook, a tributary to the river located on the site, are tested regularly for site-related contamination, and additional actions will be taken if it is determined to be necessary, consistent with the OU4 remedy.

7.6 Lastly, the commenter asked if it was possible to obtain a copy of the slides used in EPA's presentation to the public?

Response: The presentation has been added to the administrative record for OU8 and is available online at www.epa.gov/superfund/american-cyanamid .

The Bridgewater Environmental Commission submitted comments via electronic format

8.1 The Commission stated that if there is adequate funding to physically remove the material then it is the best to do so.

Response: Comment noted.

8.2 The Commission mentioned the following concerns related to conducting excavations of this size:

a) What is the traffic plan / truck plan for the transportation of contaminated materials? The Commission estimates that if approximately 415 tons of soil/sludge from the impoundments is available for disposal each week, then this would equate to approximately 4 to 5 trucks per day.

Response: The final traffic plan will be determined during the design. EPA is aware of the community's concerns on the impact of truck traffic and will take this into consideration when developing the design. The current estimate is that 2 to 3 additional trucks per day will leave the site 4 to 5 times a week.

b) Truck washing/tire washing stations should be set up prior to any vehicle leaving the site and entering public roadways.

Response: All trucks leaving the site will be decontaminated and washed as suggested by the commenter. This is a common practice at all Superfund sites.

c) Was rail considered as a transportation method?

Response: Yes, rail was considered during the feasibility study. While it would be feasible to transport the material by rail, EPA concluded that the anticipated receiving facility or facilities (most likely a cement kiln) might not be able to utilize the material quickly enough if a large quantity were to arrive via rail, and most likely would not have the capability to hold this kind of waste for long periods of time. However, the use of rail will be further considered during the design, and could be an option in the future if the limitations can be overcome.

d) Thirty-eight months of excavation work/trucking, etc., will produce a large amount of vehicle emissions to the community. Was there any consideration given to the expected level of "diesel" emissions from the equipment/trucks?

Response: The 38-month estimation is for all remediation work. The work, including trucking, can only be completed when temperatures remain above 40 degrees F, and so there will not be 38 continuous months of operation. EPA expects that an early April to late November work period per year will be utilized. In addition, truck traffic through the community will be minimized to the extent practicable. Emissions from the excavation work will be controlled and a strong worker and community health and safety plan will be developed during the design of the remedial action. Finally, consistent with EPA Region 2's Clean and Green policy, EPA will evaluate the use of sustainable technologies and practices with respect implementing the remedy. In particular, unless technically impracticable, the policy requires the use of clean diesel fuels and technologies.

e) Strict adherence to the site health and safety plan is very important, including air and dust monitoring, and erosion and sedimentation controls, etc. The commenter expects this will be a priority for EPA and NJDEP, and that the Township will be kept informed.

Response: A strong health and safety plan will be developed during the design. Strict adherence to it during remedy implementation will be a priority and the Township will be kept informed. See also response to Section II, Part 1, Comments 4.3 and 4.4.

f) Preparing for catastrophic flooding to the area?

Response: During implementation of the remedy, the weather will be monitored closely. If flooding conditions are anticipated, the equipment needed to conduct the remedy can quickly and relatively easily be transported away from the impoundments and the OU8 area itself can be secured to withstand impacts of flooding or other severe weather. In fact, the mobility of the equipment needed to implement the selected remedy is one of the reasons EPA preferred it over other alternatives during the evaluation process. In addition, the existing EPA-approved flooding impact strategy plan already in place for the site will be updated to include the OU8 remedy.

g) Long-term Operation & Maintenance. The Township should be made aware of annual / biennial inspections, repairs/maintenance, and overall progress, for the foreseeable future.

Response: The Township has been and will continue to be made aware of these operations out at the site.

8.3 The Commission asked if any of the health assessments found any contaminated fish in Cuckel's Brook and/or the Raritan River, and noted that sometimes parts of the River are stocked with fish in the spring as fishing is a popular sport.

Response: See response to Comment 7.5, above.

8.4 The Commission asked several questions related to the site-wide (OU4) cleanup plan, including

a) Are protections being made for the great blue heron?

Response: See response to Comment 7.4.

b) Has the additional ecological risk assessment to determine if additional work on any portions of OU4 been completed yet?

Response: Yes, work related to the additional assessment has been completed, and the results are being compiled into a report. If additional actions are indicated, they will be implemented as part of the OU4 remedy.

c) Has the flood wall constructed around the North Area, which is also in the Raritan River floodplain, ever needed reinforcements, or can these reinforcements be brought in if necessary?

Response: The barrier wall currently around the north area has been reinforced throughout the years and continues to be part of the yearly monitoring and maintenance plan. Once the OU4 remedy is fully implemented, and the site is capped and graded, the wall will no longer be needed and is expected to be removed. This effort is many years away and planning of this has yet to be started.

Geo-Solutions, a Consultant, submitted comments via electronic format

9.1 The consultant asked about the planned start date for the project, the estimated ISS volume in cubic yards at the end of the process for stabilizing the soil and clay impacted by the PTW, and what company is responsible for the project in Syracuse, New York?

Response: Regarding schedule, once the ROD is signed, the site owner and EPA will work together to approve a plan going forward that includes legal documents for remedy performance and financing, remedial design efforts and finally the remedial action

(implementation). As such, there is no current start date but it is expected that design work will commence within a year of the ROD being signed, and that the design will take at least one to two years to complete.

Regarding the estimated volume, the goal of the remedy is to remove 100% of the acid tar. Any remaining amounts of tar co-mingled with soils or clays, or soils and clays found to have been impacted by the tar, will undergo ISS treatment. The volume to be treated is unknown at this time. Once the remedial design work has been concluded, an estimate should be available.

The company responsible for implementing the work in Syracuse is Honeywell, overseen by the New York State Department of Environmental Conservation and EPA.

A resident submitted a request via electronic format

10.1 The resident noted that their home is about 2,500 feet east of the site, across the river. They are concerned that contamination from the site could have contaminated, or will contaminate, their well water. The resident asked if EPA could include testing of their well as part of this cleanup project to assure this is not the case.

Response: This request was also previously submitted during the OU4 public comment period. For additional information, please refer to the Responsiveness Summary for the 2012 OU4 ROD.

In addition, EPA performed an additional review of all currently available site-related information, including groundwater sampling results from the surrounding area and found no changes to the information provided in the OU4 Responsiveness Summary are necessary.

Based upon these findings, the sampling of the requestor's well or private wells in his community is not warranted at this time.

Several residents in the community submitted the following general comment via electronic format

11.1 The residents indicated full support of the preferred remedy but were concerned who would pay for the remedy. They do not think the taxpayer should pay for it.

Response: As noted above, EPA expects to enter into negotiations with the site owner to finance and perform the remedy. Note that the purpose of the Responsiveness Summary is to respond to public comments on the alternatives evaluated in the FFS and Proposed Plan, not to address questions of funding or liability in any detail.

TAG (CRISIS) Member and resident submitted the following comment via electronic format

12.1 The commenter is very much in favor of the cleanup alternative selected by EPA, and preferred by CRISIS, and noted that the truck traffic expected to be created by

implementation of the remedy should not be significant, especially since the site is near a major interstate and not in a residential area.

Response: Comment noted. Regarding truck traffic, please see response to Comment 8.2.a, above.

A consultant submitted comments via electronic format

13.1 The consultant asked when the public comment period will end.

Response: The public comment period ended on June 28, 2018. It lasted 31 days from May 29, 2018 to June 28, 2018.

13.2 Is there any estimate as to when the responsible party would issue a request for proposal for the OU8, or when field work for implementation of the remedy is expected to begin?

Response: Please see response to Comment 9.1, above.

PART 2. Verbal Comments

This section provides a summary of verbal comments received from the public during the public comment period and EPA's responses. A transcript of the public meeting held on June 12, 2018 is included in Attachment C to this Responsiveness Summary.

V1: The Mayor of Bridgewater Township provided a statement strongly supporting EPA's preferred remedy and commended the effort by EPA on the public presentation as well as the overall work at the American Cyanamid site. The Mayor also noted the property owner's willingness to address the contamination at the site as well as being an informative partner in the community. Lastly, he requested that the community be kept abreast of all site related activities and be recognized as a primary stakeholder in the remediation and restoration of the property.

Response: EPA thanks the Mayor and the Township for their support. It should be noted that EPA considers Bridgewater Township residents as stakeholders and will continue to keep them informed of all site-related activities as they arise. Also see responses to the Mayor's written statement included in Section II, Part 1, Comments 4.1 through 4.4., above.

V2: A few members of CRISIS provided their formal comments.

V 2.1: The first commenter stated that he is the technical advisor to CRISIS, the technical assistance grant recipient for the site. CRISIS is an independent environmental community group that has served for many years as the watchdog for Bridgewater and Somerset County residents regarding this highly contaminated Superfund Site.

The commenter noted that for six years he has been advising CRISIS, reviewing technical reports on the site, written technical reports for CRISIS that are posted on their website,

toured the property several times to observe remediation activity, reviewed monthly progress reports from Wyeth Holdings (Pfizer) and regularly participated in bimonthly conference calls with EPA, NJDEP, Bridgewater Township, Pfizer and their consultants. Much attention was given to the most highly contaminated location on the property, Impoundments 1 and 2, which are in the floodplain barely 700 feet from the Raritan River.

The commenter continued on to note that in October 2017, CRISIS was invited by EPA to submit its position on Impoundments 1 and 2 just before the meeting of the National Remediation Review Board, who also reviewed the alternatives. In a letter that was authored by both the commenter and the chairman of CRISIS, with input from other members of the CRISIS board, they set forth the criteria that they think EPA's decision should be based on. These included destruction of volatile organics, protection of the Raritan River, groundwater protection, preference for long term solutions, and the final destination of Impoundment 1 and 2 waste material. CRISIS stressed concern for public health and safety, and the environment.

The letter then went on to state that "CRISIS' preferred remedial solution for Impoundments 1 and 2 is destruction of the waste at an offsite permanent cement kiln facilitated by onsite mechanical dewatering." During the public meeting, the commenter noted that CRISIS is very gratified by EPA's selection of Alternative Six, which "coincides with CRISIS' analysis and with our key principles."

Response: Comment noted.

V 2.2: The commenter stated that once the ROD is signed, CRISIS' work and the following public concerns will continue:

- Impoundments 1 and 2 are 400 feet from the nearest business and a third of a mile from the nearest residence, close enough to need to need attention on issues of safety, air quality and high levels of toxicity in the chemicals and the impoundments. The commenter noted that EPA will require the monitoring of vapors and air contaminants, which is very important.
- Discharges to the Raritan have gone down as noted by EPA since implementation of interim groundwater actions. Prevention of discharges must continue to protect the river.
- Floods will happen. The contractors cleaning up these impoundments must be nimble in how they anticipate and protect against floods.
- And after a flood, notifications should be made to the public if the floodwater was, or may have been, exposed to the hazardous substances.
- The rate of progress: the public has to keep pushing on EPA to get this completed.
- The empty impoundments must be detoxified and filled in and closed.
- Truck safety: there are likely to be three, four or five trucks a day, four days a week, 40 weeks a year for three years. Truck safety should be paramount because these wastes are highly toxic and very difficult.
- There should be coordination with local and state police, no trucks on local roads when the school buses are operating, and only drivers who are thoroughly OSHA and safety trained should be used.

The commenter closed his thoughts by stating that this is not the easiest alternative and it is not the least cost alternative, but with the right controls and vigilance, CRISIS thinks it is the safest alternative. The commenter and CRISIS support this alternative because they think it benefits Bridgewater, Bound Brook, Somerset County and the state as the best long term permanent solution to a difficult waste problem.

And finally, the commenter thanked both Pfizer and EPA for being very communicative, informative and helpful during the six years that he has been involved in this process.

Response: Comment noted. EPA shares the same concerns that the commenter identified above and will continue to address them as they arise. EPA will remain committed to keeping the community aware of site actions.

V 2.3: The second commenter, who identified himself as CRISIS' Chairman, stated that CRISIS is a community action group involved and engaged in the remediation cleanup of the American Cyanamid Site for last 25 years and consists of around 150 members covering primarily Bridgewater, but also Somerset County overall. In addition, they are the Technical Assistant Grant recipient since 1999 that has been focused mainly on the contaminated groundwater and on the eight primary toxic waste sites (impoundments), of which Impoundment 1 and 2 are included.

The commenter also stated CRISIS' support for Alternative 6 and thinks this alternative is the best option. He added, "Crucially, it removes the toxic material from the riverside, protecting it from the river and flooding. That's always been our bottom line when it comes to Impoundment 1 and 2. And the second bottom line is that at the end of the process, the toxic materials are destroyed in a regulated kiln." The chairman went on to express that EPA and Pfizer know that the remedy will need to be completed very safely.

Response: Comment noted.

V 2.4: The commenter further noted four additional items:

- Is there a concern with EPA Headquarters in Washington, D.C., and whether they will change the preferred remedy of EPA Region 2 staff? The commenter was aware that the EPA Administrator has been briefed.

  Response: EPA personnel in EPA Headquarters reviewed and approved the Proposed Plan.

- A second item for concern is the funding for this project? The Chairman notes that Pfizer will pay for the cleanup.

  Response: Pfizer, on behalf of Wyeth Holdings LLC, in its written comments on the Proposed Plan indicated a willingness to perform the work associated with this

remedy and take on the financial burden, the details of which are expected to be discussed and resolved in the coming months.

- The commenter stated that a recent newspaper article stating that nothing had been done at the site was incorrect, and noted that several actions have been taken and additional actions continue to be taken.

  Response: Comment noted. EPA (along with both the NJDEP and property owner) continues to work on all contaminated areas of the site. The site-wide remedy (OU4) is currently being implemented.

- The commenter also noted that for OU4, CRISIS thinks that more than just the top two feet of material should be removed from Impoundments 13, 17, 24.

  Response: Comment noted. The Predesign Investigation Summary report that includes remediation recommendations for Impoundments 13, 17, 24 is currently under review by EPA.

V3: A business-related stakeholder provided a statement in support of EPA's preferred remedy. Also, the stakeholder commended the Mayor and his team, CRISIS (the TAG recipient) and EPA for the efforts made in accelerating the cleanup at the American Cyanamid site. He further noted that the Somerset County Business Partnership on behalf of the Somerset Country Freeholders is able to obtain federal grants in efforts relating to a comprehensive economic development plan for Somerset County. This economic development plan is designed to come up with strategies to drive job creation and private sector investment and he felt that the OU8 work and post remedy implementation, meets the plan objectives. Once the remedy is completed and if redevelopment is possible, he suggested that consideration should be given to obtaining an economic development grant that hopefully would assist in moving the project forward quickly.

Response: Comment noted. It should be noted that the site is privately owned. The landowner has indicated that efforts could be made to redevelop some additional portions of the site once all the remedial actions are implemented (previous successful redevelopment efforts on portions of the site include the ball field and the commuter train station parking lot). These areas have not yet been identified but will be discussed with the stakeholders in the future. The current redevelopment thoughts for the area encompassing OU8 is to restore the natural vegetation as best as possible on the four-acre footprint and to keep it secure from trespassers and future flooding.

V4: A resident asked that during flooding conditions, were the impoundments' contaminants ever found beyond the impoundment berms or even within the berms themselves?

Response: Over the past several major flooding events, including Hurricane Irene, there has been one instance where PTW from the impoundments was displaced from within the impoundments and found on the tops and sides of the berms. There was no evidence that the material was displaced any further. The material has since been removed from the berm tops

and placed back into the impoundments. The berms remain secure. During implementation of the OU8 remedy, any PTW found within the berms themselves will be addressed, either through excavation or through ISS, and a protective cap will be placed over the entire OU8 footprint.

V5: A resident asked whether any of the contaminants in Impoundments 1 and 2 reached the Raritan River during past flooding events, and was any testing required to test for impacts to the fish?

Response: As noted above, there was no evidence that the tar material moved beyond the top and sides of the berms. An investigation was performed into whether further contaminants impacted the area surrounding the impoundments, but no impacts were found. Surface water and sediment from both the Raritan River and Cuckold's Brook, a tributary to the river located on the site, are tested regularly for site-related contamination, and additional actions will be taken if any are determined to be necessary.

V6: A commenter, who also is a member of the Lawrence Harbor Raritan Community Advisory Group, expressed his support for EPA's preferred alternative and thanked both EPA and Pfizer for taking on the responsibilities. He also mentioned that CRISIS has kept everyone informed at all times and thanked them for their efforts.

Response: Comment noted.

V7: A member of the Raritan Valley Group of the Sierra Club provided a statement on EPA's preferred remedy (OU8) and the overall site-wide (OU4) remedial decisions. The member followed the verbal statement with a written statement, dated June 27, 2018, for the record.

Response: Please see Sierra Club's entire comments and our responses to those comments in Section II, Part 1, Comments/Responses 6.1 through 6.3.

V8: A resident (and former employee of American Cyanamid) noted that over the years, flooding has been a big problem at the site. He is in support of EPA's preferred remedy, Alternative 6, but is concerned with air emissions and any impacts to the surrounding businesses and specifically, the adult day center (located due northwest of OU8). He asked whether air emission controls would be protective of the elderly, and, if any releases were to occur, what would happen? He also noted that the property owner has done a great job of keeping the residents and community informed.

Response: EPA shares the commenter's concern about flooding in this area and has selected a remedy that will remove most, if not all, of the waste from OU8, thereby eliminating current and future health and environmental risks in an area that floods frequently. In addition, while the remedy is being implemented, the equipment required to complete the work would also be able to be moved to a safe area in the case of a catastrophic flood.

Regarding the resident's concern about contaminant emission releases, emissions and odors from excavation activities would be controlled using engineering controls such as

suppressing foams, fiber-based sprays, and cement-based spray covers. The specific engineering controls to be used would be developed during remedial design, and be used as needed during active excavation, both for the material in the excavator bucket and for the open excavation area. It is anticipated that fiber-based and cement-based spray covers would be used as needed at the end of each workday as a daily cover. Any loaded dump trucks containing contaminated material would similarly be secured.

In addition, a comprehensive health and safety program and a robust perimeter air monitoring program will be developed during the remedial design phase to ensure worker and community protection during construction/remediation activities. These programs will have monitoring systems that alert the construction operators of emission releases. Standard procedures according to the health and safety program will be followed should an alert be triggered.

An emergency management plan, similar to the one utilized during the treatability studies, will also be prepared and approved to address any unfortunate event of an emission release that contains unacceptable levels of contaminants. The specifics of this plan will be determined in design, and local, state and federal emergency response teams will be consulted development of this plan and provided a copy of the final plan in order to respond quickly if need be.

V9: A representative from the Raritan Riverkeeper asked if there was a chance that since there is excess capacity within the Corrective Action Management Unit (CAMU), any hazardous materials from another site might be placed in the CAMU?

Response: No, the CAMU was specifically built for waste generated at this site only. The site's other remaining active remedy (OU4) does not utilize the CAMU. Once this remedy is approved and does not include using the CAMU, the CAMU is expected to be closed permanently.

V10: A resident supports EPA's preferred remedy and asked why not build a cement kiln on site to avoid truck traffic impacts to the community.

Response: There are only three or four cement kilns in the country that can handle the waste present in Impoundments 1 and 2 (acid tar). Also, in the past, there has been strong opposition from CRISIS and the Township, in general, to the construction of any kind of facility, such as a cement kiln, on site. This concern has been going on for many years. In addition, any newly built kiln facility located in New Jersey would be required to have extensive air pollution controls as well as it would be very expensive to build and operate. Since these kinds of facilities already exist with the best available emission control equipment, have the proper permits in place and could readily accept this material as presented in the ROD, utilizing them is the favorable approach.

V11: A resident asked if the current administration will affect the EPA monitoring standards at this site?

Response: EPA Headquarters in Washington, D.C., reviewed and approved the Proposed Plan.

V12: A resident noted that he reviewed the Hazardous Materials Transportation Act which was passed in 1975, amended in 1990, again in 1994 and again after September 2011. One of his concerns is the ability of the public to stay informed about the transportation of this material, and he noted that EPA is supposed to be launching a new E-Manifest system by the end of the month. The resident also asked if first responders could be made aware of those trucks carrying hazardous waste exiting from the facility and over the active rail lines?

Response: EPA, NJDEP and the site owner will work with the local government on the coordination of all transportation plans and ensure that the community is involved. A public availability session, or sessions, will likely be held before the remedial activities start and additional information and updates will be provided to the community throughout the implementation of the remedy, as needed. These updates may be provided through written site updates distributed through the Township or CRISIS.

In addition, first responders will be made aware of site activities and will be kept informed. Note that when the treatability studies were being performed at the impoundments over the last few years, an extensive meeting/discussion with all OEM divisions, including local, state and federal, was held. They were notified and extensively informed on all the details of the work at that time.

ATTACHMENT A

PROPOSED PLAN

Superfund Program
Proposed Plan

U.S. Environmental Protection Agency
Region 2

American Cyanamid Superfund Site

Township of Bridgewater, New Jersey

May 2018

EPA ANNOUNCES PROPOSED PLAN

This Proposed Plan identifies the preferred alternative for addressing Impoundments 1 and 2, also referred to as Operable Unit 8 (OU8), at the American Cyanamid Superfund site and provides the rationale for the preference.

The site is being addressed under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA, also known as the Superfund law) in large part because of the type of waste and number of waste impoundments (disposal areas) that are present. OU8 includes acid tars that are considered Principal Threat Wastes (PTW), defined later in this plan, and the soil and clay impacted by the acid tars. OU8 is the last operable unit remaining at American Cyanamid. The U.S. Environmental Protection Agency's (EPA's) preferred alternative to address the acid tars and associated impacted materials made up of mainly volatile organic compounds (VOCs) and semi-volatile organic compounds (SVOCs) is Alternative 6, Excavation, Dewatering, Treatment/Destruction Off Site, Protective Cover.

EPA, the lead agency, in consultation with the New Jersey Department of Environmental Protection (NJDEP), the support agency, is issuing this Proposed Plan as part of its community relations program under Section 117(a) of CERCLA and Section 300.430(f)(2) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). This Proposed Plan summarizes information that can be found in greater detail in the Focused Feasibility Study (FFS). This and other documents are part of the publicly available administrative record file and are located in the information repository for the site. EPA encourages the public to review these documents to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted.

EPA, in consultation with NJDEP, will select the remedy for OU8 after reviewing and considering all information submitted during a 30-day public comment period. EPA, in consultation with NJDEP, may modify the preferred alternative or select another response action presented in this Proposed Plan based on new information or public comments. Therefore, the public is encouraged to review and comment on all the information presented in this Proposed Plan.

SCOPE AND ROLE OF ACTION

As with many Superfund sites, the contamination at this site is complex, and the cleanup is being managed through several operable units, or OUs. Additional information regarding OUs 1 through 7 is provided in the

MARK YOUR CALENDAR

PUBLIC COMMENT PERIOD:
May 29, 2018– June 28, 2018
EPA will accept written comments on the Proposed Plan during the public comment period. Written comments should be addressed to:

Mark Austin
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007
Email: austin.mark@epa.gov

PUBLIC MEETING:
June 12, 2018
6:00 P.M. Information Session, 7:00 P.M. Formal Meeting
EPA will hold a public meeting to explain the Proposed Plan and all of the alternatives presented in the Focused Feasibility Study. Oral and written comments will also be accepted at the meeting. The meeting will be held at:

Bridgewater Township Municipal Building
100 Commons Way
Bridgewater, New Jersey 08807

In addition, documents from the administrative record are available on-line at:
https://www.epa.gov/superfund/american-cyanamid

Site History section, below. This Proposed Plan addresses the final planned OU for the site, OU8. OU8 is comprised of Impoundments 1 and 2, each approximately 2 acres in size and ranging from 13 to 16 feet in depth. Both have a synthetic sheeting cover and water cap to limit odors and provide protection during flooding. The media being addressed by OU8 include the impoundment material (acid tars) contained within the berms, and soil and clay impacted by OU8 impoundment material out to the toe of the berm and underlying the impoundments down to the groundwater table.

Groundwater beneath the impoundments and the area outside the toe of the berms of Impoundments 1 and 2 are considered part of the site-wide remedy, which is currently being implemented and is referred to as Operable Unit 4 (OU4).

SITE DESCRIPTION

The 435-acre site is located in the southeastern section of Bridgewater Township, Somerset County, in the north-central portion of New Jersey (Figure 1). Bridgewater Township has a population of approximately 45,000 people.

For ease of reference, the site is divided into five areas: North Area, South Area, West Area, East Area, and the Impound 8 Facility. The Impound 8 Facility is designated as a Corrective Action Management Unit (CAMU), addressed as part of a previous Group III 1998 Record of Decision (ROD), regulated under the Resource Conservation and Recovery Act (RCRA). Impoundments 1 and 2, the subjects of this Proposed Plan, are located in the South Area which is west of Interstate Highway 287 and between the Conrail rail line and the Raritan River (Figure 2).

The site was used for more than eight decades to manufacture a range of products including rubber-based chemicals, dyes, pigments, chemical intermediates, petroleum-based products, and pharmaceuticals. Previous investigations identified that several surface impoundments, which are constructed waste lagoons, the surrounding soil and the groundwater aquifers below the site have been contaminated with waste chemicals from previous manufacturing processes.

The surrounding land use is a mix of light industrial and residential. The nearest residences are approximately 1,800 feet away from OU8. Of note, the nearest local business is approximately 400 feet to the north of both the impoundments. To the immediate north of the American Cyanamid site, a minor league ballfield, a commuter train rail station and several commercial businesses are located on redeveloped land that was once part of the site. That portion of the site was deleted from the National Priorities List (NPL) in 1998, when no contamination was found in that area, thus allowing for redevelopment.

According to the Federal Emergency Management Agency, the entire site, with the exception of the CAMU located in the far northwest portion, lies within a Special Flood Hazard Area designated as Zone AE. Zone AE is a zone where the base flood elevations are established based on a 100-year flood event. Because of the proximity of the overall site to the Raritan River and frequency of flooding, a flood control dike was constructed around the entire North Area which housed the former Main Plant area. Over the past several years, the area has been subject to frequent, and sometimes intense flooding, such as from Hurricanes Irene (2011) and Floyd (1999).

SITE HISTORY

Site-Wide - The site has had several previous owners/operators since a chemical and dye manufacturing facility was built in 1915. The American Cyanamid Company purchased the facility in 1929 and expanded it into one of the nation's largest dye and organic chemical plants. As production increased from the 1930s through the 1970s, buildings and support services were expanded to accommodate increased demands for the products. The manufacture of bulk pharmaceuticals continued throughout the 1990s, generating untreated waste material that was managed in on-site waste impoundments.

Preliminary investigations that were completed in 1981 verified that approximately one-half of the site was utilized to support manufacturing, waste storage, or waste disposal activities, and that contamination source areas were confined primarily to the north area; however, on-site waste storage impoundments were located throughout the site. Twenty-seven impoundments were constructed in all. Most of the wastes from past manufacturing operations were stored in these on-site surface impoundments, while general plant wastes, debris and other materials were primarily disposed of on the ground at various locations. On September 8, 1983, the American Cyanamid site was placed on the NPL.

Site impoundments were initially characterized through investigations conducted in the late 1980s and early 1990s. Sixteen of the 27 impoundments used for storing wastewater treatment residuals and manufacturing byproducts originating from production of rubber intermediates and products, organic dyes, and coal tar

distillation were identified for remediation under CERCLA. The remaining 11 impoundments are regulated under RCRA and generally contain non-hazardous substances. Past waste storage and disposal practices, along with other releases typically associated with normal operations of a manufacturing facility with such a long, diverse history, resulted in on-site soil and groundwater impacts.

In 1988, the American Cyanamid Company agreed to perform a site-wide Feasibility Study (FS) and corrective actions for the 16 CERCLA impoundments. At that time, those 16 impoundments were organized into three groups according to impoundment contents, location, and potential remedial alternatives. A ROD followed for each of the three groups:

- Group I – Impoundments 11, 13, 19, and 24
- Group II – Impoundments 1, 2, 15, 16, 17, and 18
- Group III – Impoundments 3, 4, 5, 14, 20, and 26

Due to the toxicity of Impoundments 1 and 2, EPA subsequently decided to move them into Group III.

A ROD for the revised listing of Group III Impoundments was issued in September 1998. However, a pilot test confirmed that the selected remedy for Impoundments 1 and 2 (low temperature thermal treatment and placement of material in the CAMU) was technically infeasible due to anticipated handling and air emission issues during the treatment phase of remedy implementation and could not be performed as originally determined. This finding resulted in the suspension of some remediation activities for the Group III Impoundments. However, Impoundments 5 (dry portion), 14, 20, and 26 have since been remediated and placed in the CAMU.

The remaining Group III Impoundments (1, 2, 3, 4, and 5 (wet portion)) presented significant technical challenges based on their physical setting and complex characteristics. In 2004, American Cyanamid, NJDEP, and EPA recognized the complexity of these impoundments and agreed that a comprehensive site-wide FS should be completed to re-evaluate remedial alternatives. In mid-2009, due to the complexity of the contaminants present in the acid tar waste within Impoundments 1 and 2, EPA moved the remedial evaluation of Impoundments 1 and 2 into a separate FFS, and continued with preparation of a site-wide FS for the remainder of the site (OU4).

Under the revised approach, six impoundments (3, 4, 5, 13, 17, and 24) were grouped into OU4 along with all site-wide contaminated soil and groundwater. The site-wide FS was completed and led to the final OU4 ROD issued on September 27, 2012. The remediation of OU4 is now underway.

Impoundments 1 and 2 - The location of Impoundments 1 and 2 within the Raritan River floodplain, along with the acidic, high volatile compound content and complex nature of the material, make addressing Impoundments 1 and 2 very different from the other materials elsewhere at the site.

Between 1947 and 1965, the American Cyanamid facility produced, among other things, benzene, toluene, naphthalene and xylene from coal light-oil refining. The residual byproduct of refining coal light oil was acid tar. The byproducts were managed and stored on site through the use of Impoundments 1 and 2.

Impoundment 1 was constructed in 1956 and used until 1965. The Impoundment encompasses approximately 2.1 acres and is approximately 15 feet deep from the top of the impoundment berm to its overall lowest extent, approximately 6 feet below the existing grade (Figure 3). This impoundment is constructed of sand, silt, and fine gravel and has a 1-foot layer of clay and silt placed at the bottom. The base of the clay layer is approximately 1 foot above the top of the water table in the overburden aquifer.

Impoundment 2 was constructed in 1947 and used until 1956. It is approximately 2.3 acres in size, is also approximately 15 feet deep from the top of the impoundment berms and it extends approximately 6 feet below the surrounding grade. Similar to Impoundment 1, the berms are constructed of sand, silt, and fine gravel, have a 1-foot layer of clay and silt at the bottom, and are located within approximately 1 foot above the top of the water table in the overburden aquifer.

Corrective action on groundwater discharges near Impoundments 1 and 2 - In late 2010, Wyeth Holdings Corporation, now known as Wyeth Holdings LLC (Wyeth Holdings) observed groundwater seeps on the banks of the Raritan River downgradient of Impoundments 1 and 2. Laboratory analysis of the seeps reported concentrations up to 20,000 parts per billion (ppb) of benzene. Soon thereafter, Wyeth Holdings implemented an interim plan consisting of the installation of activated carbon-filled sand bags along the river at the seep discharge points. Given the proximity of Impoundments 1 and 2 to the groundwater seeps, they are considered a likely source of the seeps.

Beginning in late 2011 and into 2012, a groundwater removal system was constructed to intercept and capture/prevent releases of groundwater originating from the site into the Raritan River. This system consists of an interim groundwater treatment facility, groundwater collection trench, and hydraulic barrier wall located downgradient of Impoundments 1 and 2. The system continues to operate today and monitoring efforts have indicated that the seeps have been successfully intercepted. The OU4 remedy includes plans to enhance the interceptor system and treatment facility.

ENFORCEMENT HISTORY

The American Cyanamid Company entered into Administrative Consent Orders (ACOs) with the NJDEP in 1982 and 1988 (amended in 1994) to investigate and remediate the site. In 1983, EPA listed the site on the NPL, and environmental remediation and restoration activities have been ongoing at the site since that time under CERCLA.

In December 1994, American Home Products Corporation purchased the American Cyanamid Company, and assumed full responsibility for environmental remediation as required under the NJDEP ACO for this site. In December 2002, American Home Products Corporation changed its name to Wyeth Corporation (Wyeth). In October 2009, Wyeth was purchased by Pfizer Inc., and became a wholly-owned subsidiary of Pfizer. Ownership of the site is held in the name of Wyeth Holdings, a wholly-owned subsidiary of Wyeth.

NJDEP was the lead agency for the site until March 2009, when EPA assumed the lead role.

On July 19, 2011, Wyeth Holdings entered an Administrative Settlement Agreement and Order on Consent with EPA requiring Wyeth Holdings to design and construct a removal system engineered to intercept and capture contaminated groundwater in the overburden and prevent it from seeping into the Raritan River. These activities have been completed and the system has been operating successfully to date.

Under a December 8, 2015 Consent Decree (CD) between EPA (in consultation with NJDEP) and Wyeth Holdings, the remediation of OU4 is now underway.

SITE GEOLOGY AND HYDROGEOLOGY

With regard to hydrogeological aspects, the site is underlain by a shallow overburden aquifer system and a deeper semi-confined bedrock aquifer system, including the area beneath Impoundments 1 and 2. The two aquifers are separated by a zone of weathered bedrock.
Overburden - Overburden at the site consists of a combination of fabricated fill and Quaternary alluvial deposits exhibiting a fining upward sequence. The overburden aquifer consists of two water-bearing units – an unconfined surficial fabricated fill unit and an underlying confined-to-semi-confined sand and gravel zone. A low-permeability silt and clay unit generally separates the two units.

In the vicinity of Impoundments 1 and 2, groundwater is generally encountered at 6 to 7 feet below ground surface and flow is to the south toward the Raritan River.

Bedrock - The site is located in the Newark Basin section of New Jersey's Piedmont province and is underlain by the Passaic Formation. The Passaic Formation is a Late Triassic to Early Jurassic-age reddish-brown shale, siltstone, and mudstone with green and brown shale interbeds. Bedrock near the site strikes northeast-southwest and dips gently to the northwest.

Near Impoundments 1 and 2, bedrock is generally encountered at an elevation of approximately 15 feet below ground surface. Under natural conditions groundwater flow in the bedrock aquifer in the vicinity of Impoundments 1 and 2 is largely controlled by bedding planes and fracture systems.

Geologically, the site is situated in the New Jersey Piedmont geomorphologic province, which is an area of rolling, low-lying terrain interrupted only by the Watchung Mountains, about 1.5 miles to the north. Overall, the site is generally flat, with a natural slope and direction of approximately 2% to the south-southeast toward the Raritan River.

Surface geology - The natural soil of the site is a mixture of sand, silt, and clay (loam). Man-made fill/general solid wastes and disturbed soil and gravel also exist at ground surface in portions of the site.

Geology of unconsolidated deposits - The general area around the site is covered by naturally occurring unconsolidated sediment ranging in thickness from 5 to 30 feet. This sediment is either the weathering product (soil) of the underlying bedrock, or it is fluvial deposits related to the adjacent Raritan River.

Bedrock geology - The unconsolidated deposits are underlain by bedrock. This bedrock layer is part of the Passaic Formation, which consists of a series of reddish-brown shale, siltstone, and fine-grained sandstone units. The bedrock contains highly fractured zones which allow

vertical groundwater flow. These bedrock fractures control the composition and distribution of the overlying water-bearing units and the groundwater flow regime in the overburden aquifer system.

SITE INVESTIGATION SUMMARY

Over the last 30 years, Impoundments 1 and 2 have been the subject of several comprehensive studies through multiple site investigations and treatability studies targeting the management, treatment, and potential remediation of the material within each impoundment. Historical samples collected prior to 2010 were generally obtained from areas along the impoundment berms and very little, if any, sampling occurred near the center of the impoundments.

The 2010 characterization effort represents the most thorough data set summarizing the chemical content of the impoundment materials. Previous investigations addressed material properties and considered the application of specific technologies. The sampling from those previous investigations, including pertinent parameters such as calorific value, sulfur content, moisture content, density, corrosion potential, flash point, etc. were also compiled to support evaluation of technologies and develop alternatives. A statistical summary of the most representative site characterization is presented in Table 1. Characterization is segregated by impoundment location and material type.

The current contents of the two impoundments are similar in that the materials are very acidic (average pH of 1.5 SU) with a solid to semi-solid consistency and contains VOCs (primarily benzene, toluene, and xylene) and SVOCs (primarily naphthalene). Malodorous sulfur compounds, including hydrogen sulfide, sulfur dioxide, mercaptans, and carbon disulfide, are also present in these materials.

NATURE AND EXTENT OF CONTAMINATION

The subject of this Proposed Plan, OU8, is comprised of the acid tar waste associated with Impoundments 1 and 2 only. The area of OU8 consists of impoundment media that include the impoundment berms out to the toe of the slope (where the end of the berm is located and the natural floodplain terrain begins), acid tar waste or "impoundment material" contained within the berms, the soil and clay impacted by OU8 impoundment material, and all material underlying the impoundments potentially down to the groundwater table. Groundwater beneath the impoundments and the area outside the toe of the berms of Impoundments 1 and 2 is being addressed as part of the site-wide remedy under OU4.

The 2010 investigation was designed to characterize each impoundment as a whole by collecting samples from a representative horizontal grid and multiple depth intervals within each impoundment. In total, 53 spatially distributed samples were collected from Impoundments 1 and 2 and analyzed for metals, VOCs and SVOCs Sample results confirmed the presence of VOCs, SVOCs, and metals. Benzene, toluene, and naphthalene were the predominant compounds encountered in samples collected from both impoundments and are considered the primary contaminants of concern (COCs).

In Impoundment 1 samples, these three compounds account for more than 83 percent of the COC mass. Other VOCs and SVOCs were detected in the Impoundment 1 samples; however, their individual contribution to total COC mass is considered less significant in comparison to benzene, toluene, and naphthalene. To streamline data presentation and future discussion of remedial alternatives going forward, summary sampling results of 25 samples obtained from the 2010 characterization effort were parsed to determine compounds that accounted for more than 0.2 percent of total COC mass detected in Impoundment 1 materials. In total, 20 compounds exceeding the 0.2 percent threshold (and accounting for 96.3 percent of the total COC mass) were identified in Impoundment 1 materials. All 20 organics are shown in Table 2.

Similar to Impoundment 1, benzene, toluene, and naphthalene are the primary COCs present in Impoundment 2 samples. Collectively, these three compounds account for nearly 70 percent of the total COC mass in samples analyzed. Summary results from 28 samples collected from Impoundment 2 in 2010 were parsed as previously described using an identical mass threshold (0.2 percent). The Impoundment 2 data evaluation returned 21 compounds exceeding the 0.2 percent threshold, which accounted for 96.7 percent of the total COC mass identified in Impoundment 2 materials. A selected summary of these organics detected in Impoundment 2 samples is shown in Table 3.

Comparison of Impoundment 1 and 2 sampling results summarized in Tables 2 and 3 indicate strong similarities with respect to chemical composition. In general, the mean concentrations of benzene, toluene, and naphthalene are consistent between Impoundments 1 and 2.

Although differences are noted in the speciation and concentration of organic compounds detected in the impoundment materials, the chemical composition of Impoundment 1 and Impoundment 2 materials is similar and of comparable concentration magnitude. As

WHAT IS A "PRINCIPAL THREAT"?

The National Oil and Hazardous Substances Pollution Contingency Plan (NCP) establishes an expectation that EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)). The "principal threat" concept is applied to the characterization of "source materials" at a Superfund Site. A source material is material that includes or contains hazardous substances, pollutants or contaminants that act as a reservoir for migration of contamination to ground water, surface water or air, or acts as a source for direct exposure. Contaminated ground water generally is not considered to be a source material; however, Non-Aqueous Phase Liquids (NAPLs) in ground water may be viewed as source material. Principal threat wastes are those source materials considered to be highly toxic or highly mobile that generally cannot be reliably contained, or would present a significant risk to human health or the environment should exposure occur. The decision to treat these wastes is made on a site-specific basis through a detailed analysis of the alternatives using the nine remedy selection criteria. This analysis provides a basis for making a statutory finding that the remedy employs treatment as a principal element.

previously identified, the three primary COCs are benzene, toluene, and naphthalene, with benzene concentrations often an order of magnitude higher. Benzene is typically found at concentrations near 60,000 parts per million (ppm), or 6 percent by mass. However, as noted in Tables 1 & 2, benzene levels have been found up to 207,000 ppm (Imp. 1) and 183,000 ppm (Imp. 2). The material in these two impoundments is very acidic, with an average pH of 1.5 standard units (SU) and as low as 0.56 SU.

Because benzene and toluene are similar in structure and physical properties, and because benzene is considered more toxic, it is often used as a surrogate when discussing VOC treatment. Alternatives assembled and evaluated are capable of addressing the range of VOCs and SVOCs detected in the impoundment materials. However, based on the proportion of benzene and naphthalene detected in the impoundment materials, the technical feasibility of the alternatives considered was dependent on each alternative's ability to effectively address these compounds. Furthermore, since benzene and naphthalene respectively represent the typical environmental behavior of VOCs and SVOCs subject to remediation, these compounds are considered representative of VOCs and SVOCs in discussions below regarding technology application and the overall feasibility and efficacy of assembled alternatives.

The location of the impoundments in the Raritan River floodplain, along with the acidity and complex nature of the materials, make addressing these impoundments technically challenging.

PRINCIPAL THREAT WASTE

Impoundment material, also referred to as acid tars, within Impoundments 1 and 2 meets the definition of Principal Threat Waste (PTW), presenting a significant risk to human health or the environment should exposure occur. Please refer to the text box entitled, "What is a Principal Threat" for more information on the principal threat concept, and the Summary of Site Risks Section for more information. The total volume of PTW is expected to be approximately 55,000 cubic yards, as described in Table 1. The PTW in Impoundments 1 and 2 acts as a likely source of benzene and other contaminants to groundwater, resulting in contamination of the groundwater aquifers beneath the site.

Notable constituents making up the PTW within both impoundments include: benzene, toluene and naphthalene. These contaminants were disposed and/or stored within Impoundments 1 and 2 in large quantities. All three chemicals also make up the primary COCs. PTW may also include soil and clay impacted by OU8 impoundment material (acid tar) and found within the berms and soil beneath the impoundments. PTW may also contain contaminants such as nitrobenzene and xylene.

SUMMARY OF SITE RISKS

A CERCLA response action is generally warranted if one or more of the following conditions is met:

- Cumulative excess carcinogenic risk to an individual exceeds 1×10^{-4}
- The non-carcinogenic hazard index is greater than one
- Site contaminants cause adverse environmental impacts
- Chemical-specific standards or other measures that define acceptable risk levels are exceeded (e.g., Federal Maximum Contaminant Levels or Ambient Water Quality Criteria)

Impoundments 1 and 2 contain PTW, which is a highly toxic and highly mobile source material that generally cannot be reliably contained and presents a significant risk to human health or the environment should exposure occur.

Baseline ecological and human health risk assessments were conducted for the area where Impoundments 1 and 2 are located to estimate the risks associated with exposure to contaminants based on current and likely

future uses of the site. Relevant information associated with these risk assessments is summarized below.

Baseline Ecological Risk Assessment

Ecological risks assessments for the overall site are presented in the 1992 *Baseline Site-wide Endangerment Assessment* (BEA) (Blasland, Bouck, & Lee [BBL] 1992) and the 2005 *Baseline Ecological Risk Assessment* (BERA). These documents are available in the Administrative Record established for the OU4 ROD.

The BEA indicated that, with the exception of the great blue heron, the on-site habitat does not support threatened or endangered species. The most significant potential exposure pathway identified in the BEA involves aquatic biota exposure in the Raritan River. This pathway was subsequently addressed by installation of a groundwater collection trench and hydraulic barrier wall constructed downgradient of Impoundments 1 and 2 and upgradient of both Cuckel's Brook and the Raritan River.

Currently Impoundments 1 and 2 do not represent a viable habitat and therefore an ecological risk assessment was not included in the previous assessments. Further, since any remedy selected for OU8 will address the PTW in the impoundments down to the surrounding soil and clay, the potential for ecological risks due to exposure to the impoundment material will be eliminated.

Baseline Human Health Risk Assessment

Two human health risk assessments (HHRAs) have been completed for the site, and they are available in the administrative record file for OU8.

A 2006 HHRA evaluated exposure risks for the area surrounding Impoundments 1 and 2. The assessment evaluated potential risks to several receptors (i.e., patrol worker, site worker, adolescent trespasser, recreational visitor). It was concluded that site conditions in these areas do not represent an unacceptable risk to these receptors, either on or off the site. This assessment included evaluating air, soil, nearby Cuckold's Creek (aka Cuckel's Brook), and the Raritan River. Except for the unlikely scenario of a future resident using Cuckel's Brook for potable water, cancer risks for the exposure scenarios did not exceed the acceptable range of 10^{-4} to 10^{-6}.

The objective of a 2010 streamlined HHRA was to evaluate the potential cancer risks and non-cancer hazards associated with exposure to surface soil, groundwater and site impoundments. Since the current zoning of the site is industrial, the streamlined HHRA

WHAT IS RISK AND HOW IS IT CALCULATED?

A Superfund baseline human health risk assessment is an analysis of the potential adverse health effects caused by hazardous substance releases from a site in the absence of any actions to control or mitigate these under current- and future-land uses. A four-step process is utilized for assessing site-related human health risks for reasonable maximum exposure scenarios.

Hazard Identification: In this step, the chemicals of potential concern (COPCs) at the site in various media (*i.e.*, soil, groundwater, surface water, and air) are identified based on such factors as toxicity, frequency of occurrence, and fate and transport of the contaminants in the environment, concentrations of the contaminants in specific media, mobility, persistence, and bioaccumulation.

Exposure Assessment: In this step, the different exposure pathways through which people might be exposed to the contaminants identified in the previous step are evaluated. Examples of exposure pathways include incidental ingestion of and dermal contact with contaminated soil and ingestion of and dermal contact with contaminated groundwater. Factors relating to the exposure assessment include, but are not limited to, the concentrations in specific media that people might be exposed to and the frequency and duration of that exposure. Using these factors, a "reasonable maximum exposure" scenario, which portrays the highest level of human exposure that could reasonably be expected to occur, is calculated.

Toxicity Assessment: In this step, the types of adverse health effects associated with chemical exposures, and the relationship between magnitude of exposure and severity of adverse effects are determined. Potential health effects are chemical-specific and may include the risk of developing cancer over a lifetime or other noncancer health hazards, such as changes in the normal functions of organs within the body (*e.g.*, changes in the effectiveness of the immune system). Some chemicals are capable of causing both cancer and noncancer health hazards.

Risk Characterization: This step summarizes and combines outputs of the exposure and toxicity assessments to provide a quantitative assessment of site risks for all COPCs. Exposures are evaluated based on the potential risk of developing cancer and the potential for noncancer health hazards. The likelihood of an individual developing cancer is expressed as a probability. For example, a 10^{-4} cancer risk means a "one in ten thousand excess cancer risk;" or one additional cancer may be seen in a population of 10,000 people as a result of exposure to site contaminants under the conditions identified in the Exposure Assessment. Current Superfund regulations for exposures identify the range for determining whether remedial action is necessary as an individual excess lifetime cancer risk of 10^{-4} to 10^{-6}, corresponding to a one in ten thousand to a one in a million excess cancer risk. For noncancer health effects, a "hazard index" (HI) is calculated. The key concept for a noncancer HI is that a "threshold" (measured as an HI of less than or equal to 1) exists below which noncancer health hazards are not expected to occur. The goal of protection is 10^{-6} for cancer risk and an HI of 1 for a noncancer health hazard. Chemicals that exceed a 10^{-4} cancer risk or an HI of 1 are typically those that will require remedial action at the site.

groundwater and site impoundments. Since the current zoning of the site is industrial, the streamlined HHRA evaluated site workers and trespassers exposed to surface soil and impoundments at the site. The groundwater is a designated potable water supply; therefore, the residential exposure to groundwater pathway was also evaluated. Groundwater is being addressed under OU4 and is not the subject of this Proposed Plan.

Industrial worker's exposure to surface soil and site impoundments, including Impoundments 1 and 2, was found to exceed the acceptable risk range of $1x10^{-4}$ to $1x10^{-6}$ and the non-cancer Hazard Index of 1, as shown in the table below. In order to determine the cancer risks and non-cancer hazards associated with exposure to impacted media, the maximum detected concentrations in each impoundment were compared to their respective human health risk-based screening levels. This ratio yielded a cancer risk or non-cancer hazard (whichever is the most sensitive endpoint) associated with each chemical. The surface soil risk-based screening levels are based on a worker's direct exposure (via ingestion, inhalation of particulates and dermal contact) while working at the site over a period of 25 years.

Summary of hazards and risks associated with impoundments 1 and 2

Receptor	Hazard Index	Cancer Risk
Industrial Worker (adult)		
Impoundment 1	**34**	**7×10^{-2}**
Impoundment 2	**7**	**1.1×10^{-2}**
The COCs driving the risk in impoundments 1 and 2 are benzene, toluene, xylene, naphthalene and nitrobenzene. It should be noted that the list of risk drivers in the impoundment areas is underestimated. Due to the high concentrations of several chemicals, the presence of other potential risk drivers is masked.		

It is the lead agency's current judgment that the Preferred Alternative identified in this Proposed Plan, or one of the other active measures considered in the Proposed Plan, is necessary to protect public health or welfare or the environment from actual or threatened releases of hazardous substances into the environment.

REMEDIAL ACTION OBJECTIVES

Remedial Action Objectives (RAOs) provide a general description of what the remedial action is intended to accomplish. Development of the RAOs considered the understanding of the contaminants in Impoundments 1 and 2, and is based upon an evaluation of risk to human health and the environment and reasonably anticipated future use. A performance objective for the selected remedy is to make the associated floodplain areas available for the reasonably anticipated future use of limited passive recreational use, such as walking, wherever practicable within a timeframe that is reasonable given the characteristics of the site. The RAOs for OU8 have been developed to satisfy these expectations.

The following RAOs have been developed for OU8:

- Remove, treat, and/or contain material that is considered PTW.
- Prevent human exposure (direct contact) to COCs above cleanup levels in soil.
- Minimize or reduce current or future migration of COCs from Impoundments 1 and 2 to groundwater.

The footprint of OU8 is contained entirely within the footprint of OU4, which addresses site-wide soil and groundwater. OU8 includes all soil and clay material and PTW in Impoundments 1 and 2, to the outside toe of the berm surrounding them; it does not include groundwater. As such, there is no RAO specifically for groundwater since groundwater will be managed entirely as part of, and consistent with, the remedy selected in the 2012 ROD for OU4. The OU8 remedy will prevent or minimize future migration of COCs from the OU8 impoundments, including to groundwater, but if migration does occur, it will be addressed through the OU4 treatment processes. The OU4 remedy includes the use of hydraulic barrier walls and extraction wells to capture contaminant mass and maintain an inward gradient around the site, and these controls extend beyond the limits of OU8.

Preliminary Remediation Goals

Preliminary Remediation Goals (PRGs) are typically developed during the Remedial Investigation (RI)/FS process and are based on Applicable or Relevant and Appropriate Requirements (ARARs) and other readily available information, such as concentrations associated with 10^{-6} cancer risk or a hazard quotient equal to one for non-carcinogens calculated from EPA toxicity information. Initial PRGs may also be modified based on exposure, uncertainty, and technical feasibility factors. As data are gathered during the RI/FS, PRGs are refined into final contaminant-specific cleanup levels. Based on consideration of factors during the nine criteria analysis and using the PRG as a point of departure, the final cleanup level may reflect a different risk level within the

acceptable risk range (10^{-4} to 10^{-6} for carcinogens) than the originally identified PRG.

To meet RAOs, EPA typically identifies PRGs to aid in defining the extent of contaminated media requiring remedial action. In this case, the PRGs for OU8 are identical to those selected in the 2012 ROD for OU4 that apply to the COCs for OU8. It should be noted that toluene and xylene were not COCs for OU4 because exposure to these chemicals did not result in an unacceptable risk for OU4, but they do present an unacceptable risk in Impoundments 1 and 2. Therefore, PRGs were calculated for these contaminants using the same methodology as was used to calculate PRGs for OU4. Similarly, 1,2-dichlorobenzene and n-nitrosodiphenylamine were COCs for OU4 but are not COCs for OU8, so PRGs for these contaminants are not included in this Proposed Plan. Each PRG that was developed for OU4 was reviewed to make sure it is still appropriate.

In summary, the vast majority of PTW in Impoundments 1 and 2 will be excavated and disposed of off-site. For any remaining soil and/or clay material impacted by the OU8 PTW, which includes the entire footprint of OU8 out to the outside toe of the berms, the following PRGs, consistent with the OU4 ROD, will be used to identify any remaining waste requiring treatment to meet RAOs:

Preliminary Remediation Goals
Material Impacted by Impoundment 1 and 2 Waste

COC	PRG (ppm)
Benzene	4,460
Nitrobenzene	12,300
Naphthalene	6,180
Toluene	460,000
Xylene	25,000

SUMMARY OF REMEDIAL ALTERNATIVES

Section 121(b)(1) of CERCLA, 42 U.S.C. § 9621(b)(1), mandates that remedial actions must be protective of human health and the environment, be cost-effective, and use permanent solutions and alternative treatment technologies and resource recovery alternatives to the maximum extent practicable. CERCLA § 121(d), 42 U.S.C. § 9621(d), further specifies that a remedial action must require a level or standard of control of the hazardous substances, pollutants, and contaminants that at least attains ARARs under federal and state laws, unless a waiver can be justified pursuant to CERCLA Section 121(d)(4), 42 U.S.C. § 9621(d)(4).

Remedial alternatives for OU8 are summarized below. Capital costs are those expenditures that are required to construct a remedial alternative. Operation and maintenance (O&M) costs are those post-construction costs necessary to ensure or verify the continued effectiveness of a remedial alternative and are estimated on an annual basis. Present worth is the amount of money which, if invested in the current year, would be sufficient to cover all the costs over time associated with a project, calculated using a discount rate of seven percent and a 30-year time interval. Construction time is the time required to construct and implement the alternative and does not include the time required to design the remedy, negotiate performance of the remedy with the responsible parties, or procure contracts for design and construction.

Remedial Alternatives	
Alternative	**Description**
1	No Action
2	Alternative 2 was screened out and was not considered further
3	In-situ Stabilization and Solidification (ISS) Treatment, Inner Hydraulic Barrier Wall (HBW), Protective Cover
4	Steam-Enhanced ISS Treatment, Inner HBW, Protective Cover
5	Steam-Enhanced ISS Treatment, Excavation and Placement in CAMU, Protective Cover
6	Excavation, Dewatering, Treatment/Destruction Off Site, Protective Cover

Common Elements

All of the remedial alternatives except Alternative 1 (No Action) address the PTW within the impoundments. To ensure OU8 does not have any remaining unacceptable risks to human health or the environment post-remedy completion, all alternatives would employ an engineered cap. In addition, all alternatives except for Alternative 1 would include long-term monitoring, institutional controls to prevent future residential land use over the 4-acre impoundment footprint, and further institutional controls consisting of restrictions on land use of capped floodplain soil. The degree of monitoring that would be required is different for each alternative based upon

whether a significant amount of PTW is removed (Alternatives 5 and 6) or would remain in place (Alternatives 3 and 4). All alternatives would employ a comprehensive health and safety program and a perimeter air monitoring program would be developed to ensure worker and community protection during construction/remediation activities.

Another common element of the alternatives is the application of the ISS (In-situ Stabilization and Solidification) technology. For ISS (alone or in combination with other remedial components), the variability of the waste material within the impoundments may result in the use of a range of different treatment additives (such as Portland cement, lime kiln dust and cement kiln dust) to achieve the remedial performance criteria (discussed in the remedial alternatives, below).

Because the footprint of OU8 is located entirely within the footprint of the OU4 site-wide remedy, which addresses soil and groundwater contamination, costs for each alternative do not include groundwater monitoring. This monitoring will be conducted as part of the OU4 remedy, as the OU8 remedy cannot be considered completely separate from the OU4 remedy.

Because hazardous substance will be left behind at levels that do not allow for unlimited use and unrestricted exposure, five-year reviews will be required for each alternative, as required by CERCLA Section 121(c) and the NCP [40 C.F.R. § 300.430(f)(4)(ii)].

Alternative 1 - No Action

Capital Cost:	$0
O&M Costs:	$0
Periodic Costs :	$0
Implementation Timeframe:	Not Applicable

The NCP requires that a "No Action" alternative be developed as a baseline for comparing other remedial alternatives. Under this alternative, no action would be taken to remediate the PTW or impacted soil and clays within the impoundments or berms at OU8. No other controls would be included under Alternative 1.

Note: Alternative 2 from the FFS was screened out and was not considered further.

Alternative 3 – ISS Treatment, Inner Hydraulic Barrier Wall (HBW), Protective Cover

Capital Costs	$44,000,000
Operation & Maintenance Costs	$3,900,000
Periodic Costs	$150,000
Total Present Value	$48,000,000
Construction Time Frame	20 months

Alternative 3 involves ISS treatment on the PTW and soil and clays found to have been impacted by the OU8 impoundment material. This remedial approach would provide for permanent, long-term treatment and reduction of contaminant mass and solidification of impoundment material including pH adjustment, installation of a hydraulic barrier wall or HBW (which is a physical barrier designed to reduce lateral migration of groundwater or waste materials), placement of a low-permeability engineered cover with active vapor control, berm armoring, and infrastructure upgrades to allow for closure-in-place. The anticipated duration of field activities for Alternative 3 is 20 months. A comprehensive health and safety program and perimeter air monitoring program would be developed to ensure worker and community protection.

Details - This alternative consists of three major components:

- ISS treatment of impoundment material
- Installation of an inner HBW
- Installation of a protective cover

ISS would be applied to provide for permanent, long-term reduction of contaminant mass and solidification of all impoundment material. Treatment would result in pH adjustment and increased material strength to support construction equipment and the engineered cover, and would create a low-permeability monolith that reduces leaching of COCs. Based on treatability and pilot study findings, ISS of material in both Impoundments 1 and 2 can meet the required ISS performance criteria goals established for OU8, which are:

- Hydraulic conductivity: less than 10^{-6} cm/s
- Unconfined Compressive Strength (UCS): greater than 40 psi
- Benzene leachability reduction: greater than 90 percent
- pH: 4 to 12 SU

Note: UCS is a measure directly related to the material's ability to support loads such as an engineered cover.

ISS would be completed using large-diameter mixing augers to incorporate ISS reagents into the impoundment material creating a series of overlapping, treated columns. Columns would extend to a depth of approximately 2 feet below the bottom of the impoundments.

Assuming one shift per day, a 5-day work week and 90 percent operating time (to account for severe weather and holidays), it would take approximately 8 months to complete the ISS mixing process in both impoundments.

There is a measurable amount of VOC mass reduction associated with ISS, resulting from the agitation/auger-mixing and exothermal nature of ISS chemical reactions. During mixing operations, vapors would be controlled using a vented outer shroud on the mixing augers. Each vented shroud would be used to actively collect (via vacuum) and direct vapors to a thermal oxidizer and caustic scrubber (two units, one per ISS rig). A water cap would be maintained on untreated material within the impoundments to minimize VOC emissions.

While VOC-mass reduction will occur during ISS, the primary method of treatment for this alternative is sequestration within a solidified matrix.

An inner HBW would be installed to minimize contact of upgradient groundwater with the treated monolith. Details of the HBW (e.g., construction, materials, monitoring, etc.) would be determined during design.

Following completion of ISS operations, curing, and removal of the temporary vented cover, a protective cover would be installed over the impoundments to prevent direct contact with treated material, control vapors as needed, and protect against flooding. For the purposes of this Proposed Plan, it has been assumed that this would consist of a low-permeability engineered cover with a vapor control component, however, the specific cover design would be established during the design phase.

The engineered cover would be maintained through routine inspections and implementation of corrective measures, as necessary. Vegetated areas would be maintained once annually, or as needed. Site inspections would include evaluating the impoundment area for evidence of erosion, cracking, sloughing, animal burrows, stressed vegetation, etc. Maintenance for the engineered cover during post-closure care would be performed semiannually in perpetuity.

Alternative 4 – Steam-Enhanced ISS Treatment, Inner HBW, Protective Cover

Capital Costs	$56,000,000
Operation & Maintenance Costs	$3,900,000
Periodic Costs	$150,000
Total Present Value	$60,000,000
Construction Time Frame	24 months

This alternative involves heating the impoundment contents via steam injection to provide enhanced reduction of contaminant mass, implemented in conjunction with ISS treatment. This alternative also includes pH adjustment, installation of an HBW and a low-permeability engineered cover with active vapor control and berm armoring, and infrastructure upgrades to allow for closure-in-place. The anticipated duration of field activities for Alternative 4 is 24 months. A comprehensive health and safety program and perimeter air monitoring program would be developed to ensure worker and community protection.

Details - This particular alternative consists of four major components:

- Steam-enhanced injection into impoundment materials
- ISS treatment of impoundment material
- Installation of an inner HBW
- Installation of a protective cover

Steam-enhanced ISS would be applied to increase VOC mass reduction beyond the expectations of Alternative 3, adjust the pH of the impoundment material, increase material strength to support construction equipment and the engineered cover, and create a low-permeability monolith that reduces leaching of COCs to groundwater. Based on treatability and pilot study findings, ISS of material in both Impoundments 1 and 2 can meet the selected ISS performance criteria goals established for OU8, as listed under Alternative 3.

Steam-enhanced ISS would be completed using large-diameter mixing augers. During the initial mixing operations, steam infused with compressed air would be injected by the mixing equipment to heat the impoundment material and promote contaminant volatilization during homogenization. Following steam-enhanced mixing, ISS reagents would be mixed into the impoundment material creating a series of overlapping, treated columns. Columns would extend to a depth of approximately 2 feet below the bottom of the impoundments.

Assuming one shift per day, a 5-day work week and 90 percent operating time (to account for severe weather and holidays), it would take approximately 12 months to complete the ISS mixing process in both impoundments.

VOC-mass reduction for Alternative 4 will be greater than for ISS alone; however, it is not possible to quantify the greater level of mass reduction that might occur. The majority of VOCs and SVOCs under this alternative are still expected to be sequestered within a solidified matrix.

An inner HBW would be installed to minimize contact of upgradient groundwater with the treated monolith. Details of the HBW (e.g., construction, materials, monitoring etc.) would be determined during design.

Following completion of ISS operations, curing, and removal of the temporary vented cover, a protective cover would be installed over the impoundments to prevent direct contact with treated material, control vapors as needed, and protect against flooding. For the purposes of this Proposed Plan, it has been assumed that this would consist of a low-permeability engineered cover with a vapor control component, however, the specific cover details would be established during the design phase.

The engineered cover would be maintained through routine inspections and implementation of corrective measures, as necessary. Vegetated areas would be maintained once annually, or as needed. Site inspections would include evaluating the site for evidence of erosion, cracking, sloughing, animal burrows, stressed vegetation, etc. Maintenance for the engineered cover during post-closure care would be performed semiannually in perpetuity.

Alternative 5 – Steam-Enhanced ISS Treatment, Excavation and Placement in CAMU, Protective Cover

Capital Costs	$62,900,000
Operation & Maintenance Costs	$1,700,000
Periodic Costs	$150,000
Total Present Value	$65,000,000
Construction Time Frame	30 months

This alternative involves using steam enhanced ISS to treat PTW in the impoundments, then removing the treated material and placing it in the on-site CAMU. Following removal, a protective cover would be installed over any remaining treated soil and clay materials impacted by OU8 impoundment material to minimize any potential future migration of COCs. The anticipated duration of field activities for Alternative 5 is 30 months. A comprehensive health and safety program and perimeter air monitoring program would be developed to ensure worker and community protection. In-situ treatment with steam would promote contamination mass reduction, improve material handling properties, and facilitate treated material removal for final disposal in the on-site CAMU. Following reduction of treated impoundment material, the berms would be backfilled and a protective cover would be installed.

Details - This alternative consists of the following major components:

- Steam-enhanced ISS treatment of impoundment material
- Excavation of treated materials and placement into the CAMU
- Additional treatment through ISS of soil and clay impacted by OU8 impoundment material exceeding PRGs
- Backfill with existing berm materials
- Installation of a protective cover

Steam-enhanced ISS would be applied to increase VOC mass reduction, adjust the pH of the impoundment material, and improve material handling properties to facilitate excavation and placement in the CAMU. This alternative will be designed to meet the performance criteria for the CAMU liner compatibility specified in the FFS.

Assuming a 5-day work week and 90 percent operating time (to account for severe weather and holidays), it would take approximately 12 months to complete the ISS mixing process in both impoundments.

After ISS operations are completed, treated material would be removed from the impoundments using conventional excavation methods and transported by truck to the on-site CAMU for final deposition. It is estimated that a rate of 500 cubic yards ($yd^{3)}$ per day (approximately 25 trucks) of treated materials would be excavated and placed in the CAMU. Odor and emissions would be controlled using a temporary fabric structure or suppressing foam, as needed.

Once transfer to the CAMU is completed, additional Portland cement is expected to be added to the treated material to further solidify the material and reduce hydraulic conductivity/leaching. As with other alternatives involving ISS or steam-enhanced ISS, the performance criterion for pH of the treated material is a non-corrosive pH (4 to 12 SU), and other performance criteria including treatment levels for contaminants established as part of 1998 ROD/CAMU for the Group III Impoundments would be adjusted to meet the requirements of the CAMU.

Following excavation of treated material, the remaining impoundment berms not requiring treatment (i.e., concentrations below the PRGs) would be folded down into the excavated area. Any soil or clay material impacted by OU8 impoundment material with

concentrations exceeding the PRGs would be treated via ISS and closed in place.

A protective cover would then be installed over the impoundment areas, which would be maintained through routine inspections and implementation of corrective measures, as necessary. Vegetated areas would be maintained once annually, or as needed. Site inspections would include evaluating the impoundment area for evidence of erosion, cracking, sloughing, animal burrows, stressed vegetation, etc. Maintenance for the protective cover during post-closure care would be performed semiannually in perpetuity.

Alternative 6 – Excavation, Dewatering, Treatment/Destruction Off Site, Protective Cover

Capital Costs	$71,700,000
Operation & Maintenance Costs	$1,700,000
Periodic Costs	$150,000
Total Present Value	$74,000,000
Construction Time Frame	38 months

This alternative involves excavation and mechanical dewatering of impoundment material, followed by off-site treatment. The anticipated duration of field activities for Alternative 6 is 38 months. A robust health and safety program and perimeter air monitoring program would be developed to ensure worker and community protection. Excavated material would be dewatered, loaded to lined dump trailers and transported off site for destruction, preferably at a cement kiln. Soil and clay materials impacted by OU8 impoundment material within the impoundment floors and berm sidewalls with concentrations exceeding the PRGs would be treated via ISS. Existing berm materials not requiring treatment (i.e., concentrations below the PRGs) would be backfilled into the excavated area. A protective cover would be placed over the entire former impoundment area.

Details - This alternative consists of the following major components:

- Excavation and dewatering of impoundment material
- Emission and odor control
- Off-site shipment for treatment/destruction
- Treatment of soil and/or clay impacted by OU8 impoundment material with concentrations above PRGs via ISS
- Backfill with existing berm materials not requiring treatment
- Install a protective cover

Material from the impoundments would be excavated to the depth of the existing clay layer. This material would be sent through a machine referred to as a dewatering screw equipped with a conveyor belt system. The dewatering screw separates the tars (PTW) and liquids resulting in two waste streams: a semi-solid material which allows for shipping and an aqueous phase liquid which would be collected. Dewatered material would be transferred to a double plastic-lined dump trailer. Based on the results of bench-scale treatability tests, it is estimated that 44,700 tons of dewatered impoundment material would be transported to an off-site facility, preferably at a cement kiln, for destruction. An estimated 9,600 tons (2.3 million gallons) of aqueous phase liquid would be collected in a proper containment vessel (i.e., above ground storage tank or tanker truck) and stored prior to on-site treatment or transported to an off-site treatment facility.

Excavation and dewatering is expected to be performed from March to November, at a rate aligned with acceptance rates at off-site treatment facilities. If temperatures remain consistently over 40 degrees Fahrenheit, the production season may be extended. It is estimated that excavation and dewatering would be conducted at a rate of 100 yd^3 per day.

Emissions and odors from excavation activities would be controlled using engineering controls such as suppressing foams, fiber-based sprays, and cement-based spray covers. Foam suppression sprays would be used as needed during active excavation and sprayed on the material in the excavator bucket and the open excavation area. Fiber-based and cement-based spray covers would be used as needed at the end of each workday as a daily cover. The surface of loaded dump trailers would be sprayed with a fiber-based or cement-based spray cover and covered with plastic. The trailer weather cover would then be secured for transport. A robust air monitoring system will be implemented to protect the community and on-site workers.

Dewatered material in the dump trailers would be shipped by a licensed transporter to a facility such as a cement kiln for destruction. For purposes of facility acceptance, cost and treatment estimations in this Proposed Plan, cement kilns were used as one facility option to receive this material. These outlets (in addition to incinerators) are permitted to receive waste from CERCLA sites and are permitted to process materials carrying the RCRA hazardous waste codes applicable to the impoundment material (e.g., D018 [benzene]). It is anticipated that more than 415 tons per week can be sent off site to these types of facilities. Overall, removal and

off-site shipment of impoundment material is estimated to be completed within 3 years.

Following excavation and removal of the impoundment material, any remaining soil and/or clay material impacted by OU8 impoundment material with concentrations exceeding the PRGs would be treated via ISS. The impoundment berms not requiring treatment (i.e., concentrations below the PRGs) would be used as backfill. A protective cover would then be installed over the entire impoundment area. This protective cover may include a low-permeability engineered layer with a vapor control component, however, the specific cover details would be established during the design phase.

The cover would be maintained through routine inspections and implementation of corrective measures, as necessary. Vegetated areas would be maintained annually, or as needed. Site inspections would include evaluating the site for evidence of erosion, cracking, sloughing, animal burrows, stressed vegetation, etc. Maintenance for the protective cover during post - closure care would be performed semiannually for perpetuity.

EVALUATION OF ALTERNATIVES

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy (see table below, Evaluation Criteria for Superfund Remedial Alternatives). This section of the Proposed Plan describes the relative performance of each alternative against the nine criteria, noting how each compares to the other options under consideration. A detailed analysis of the alternatives can be found in the FFS Report.

1. Overall Protection of Human Health & the Environment

Alternative 1, No Action, would not be protective of human health and the environment since it does not include measures to prevent exposure to PTW and the contaminated soil used as part of the berms and possibly the underlying soil and clays. Alternatives 3 through 6 are expected to be protective of human health and the environment by addressing the PTW and soil and clay impacted by OU8 impoundment material within the impoundments which would improve the conditions within the floodplain area. More specifically, Alternatives 3 and 4 would result in PTW and COCs being treated and closed in place with a protective cover. These remedies are expected to comply with the RAOs, meet the PRGs, and would allow for the natural ecosystem within the floodplain to recover. Alternatives 5 and 6 also address the RAOs and meet PRGs by permanently removing almost all of the PTW from the impoundments and treating any soil and clay impacted by OU8 impoundment material.

2. Compliance with ARARs

With the exception of Alternative 1 (No Action), Alternatives 3 through 6 would comply with ARARs and therefore meet this threshold criterion. More specifically, the alternatives would comply with ARARs as follows:

• Floodplain – The proposed remedial activities would be implemented to comply with substantive federal and state regulations regarding remediation and filling in floodplains.
• Wetlands – Wetland mitigation would be conducted in areas adjacent to the impoundments areas or in access areas impacted by construction activities following construction. Consultation with federal and state authorities would occur prior to the start of work to establish compliance with substantive requirements.
• Hazardous waste management and disposal – The processing and disposal of waste material generated during implementation of these alternatives would comply with applicable or relevant and appropriate requirements of RCRA (i.e. CAMU-related), CERCLA, the Toxic Substances Control Act, and state waste management regulations. This includes activities associated with material left in place or transportation of hazardous materials.
• Air quality, Air Emissions – Monitoring and controls would be conducted during all phases of the selected remedy including any waste processing to ensure compliance with air emission limits.
• Storm-water – Erosion and sedimentation controls for construction activities would be addressed during the design phase. Consultation with state authorities would occur prior to the start of work to establish compliance with substantive requirements.

3. Long-Term Effectiveness and Permanence

Alternative 1 is not considered to be effective in the long term because PTW would not be actively treated. No reduction in the magnitude of residual risk would be achieved, and no additional controls would be implemented to control these risks. In contrast, Alternatives 3 through 6 would offer high long-term effectiveness and permanence, including protecting the impoundments from the impacts of potential flooding, as described below.

In Alternatives 3 and 4, ISS would result in treatment of PTW in the impoundments via reduction of contaminant

mass and stabilization. The addition of steam enhancement to ISS operations in Alternative 4 would result in additional reduction of contaminant mass. In both alternatives, the stabilized impoundment material would remain in place and each of the performance criteria would be achieved, including adjustment of the material to a non-corrosive pH, reduction in COC leachability by greater than or equal to 90 percent, hydraulic conductivity less than or equal to 10^{-6}cm/s, and compressive strength greater than 40 psi. Compressive strength is an indicator of long-term durability. An engineered cover, which includes vapor control and treatment, would capture vapor phase COCs that are emitted, and would prevent contact of precipitation with the treated materials. A robust engineered cover would provide further protection against potential flooding.

In Alternative 5, PTW would be treated, excavated, and disposed of in the CAMU. Steam-enhanced mixing would result in enhanced VOC mass reduction, reducing the concentration of these contaminants in the impoundment material. ISS treatment would result in adjustment of the material to a non-corrosive pH and significantly reduce COC leachability. Following treatment, PTW would be placed in the CAMU, which would permanently contain the treated waste over the long term. The CAMU has a multi-layer leachate collection system and would include an impermeable cover upon closure. Testing demonstrates that the CAMU's liner material is compatible with leachate potentially generated from the treated materials. In this alternative, most of the PTW would be removed from the floodplain. Soil and clay impacted by OU8 impoundment material within the berm sidewalls and impoundment floor that exceed the PRGs would be treated through ISS and the treated materials, along with the materials not requiring treatment, would be graded into the existing impoundment and entirely capped with a protective cover similar to the cover envisioned for Alternatives 3 and 4.

In Alternative 6, almost all of the PTW would be excavated, removed and treated off site, resulting in a permanent and irreversible remediation of those impoundment materials. In this alternative, PTW would be removed from the floodplain. Soil and clay impacted by OU8 impoundment material within the berm sidewalls and impoundment floor that exceed the PRGs would be treated through ISS and the treated materials, along with the materials not requiring treatment, would be graded into the existing impoundment and entirely capped with a protective cover similar to the cover envisioned for Alternatives 3 and 4.

4. Reduction of Toxicity, Mobility, and Volume of Contaminants through Treatment

Alternative 1 does not include any treatment and would not reduce the toxicity, mobility, or volume (TMV) of contaminants. The remaining Alternatives would all offer varying degrees of reduction in TMV.

In Alternatives 3 and 4 implementing the ISS technology would effectively and irreversibly reduce the leachability (i.e., mobility) of COCs associated with PTW in the impoundments. ISS would also reduce mobility of COCs potentially present as non-PTW in the inner berm edges and an approximately 2-foot-thick layer of soil located below the existing clay impoundment liners and above the groundwater table. As demonstrated during the pilot test, Alternative 3 would result in some permanent removal of VOCs during the ISS mixing process (approximately 25 percent mass reduction). Alternative 4

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
Overall Protectiveness of Human Health and the Environment evaluates whether and how an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
Compliance with ARARs evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that are legally applicable, or relevant and appropriate to the site, or whether a waiver is justified.
Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment evaluates an alternative's use of treatment to reduce the harmful effects of principal contaminants, their ability to move in the environment, and the amount of contamination present.
Short-term Effectiveness considers the length of time needed to implement an alternative and the risks the alternative poses to workers, the community, and the environment during implementation.
Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total cost of an alternative over time in terms of today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
State/Support Agency Acceptance considers whether the State agrees with the EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.

would result in additional VOC mass removal relative to ISS alone due to the addition of steam during the homogenization/ mixing process.

As in Alternative 4, steam-enhanced ISS in Alternative 5 would result in VOC mass removal prior to excavation of the treated PTW and placement in the CAMU. ISS would also reduce mobility of COCs potentially present in the inner berm edges and in an approximately 2-foot-thick layer of soil located below the existing clay impoundment liners and above the groundwater table.

In Alternative 6, almost all of the PTW will be removed from the site. Treatment of the PTW at a facility like a cement kiln would irreversibly destroy not only the VOC mass in the impoundment material, but also the SVOC mass and the organic tar material itself. This would result in the greatest possible reduction in TMV. Additional treatment through ISS on the soil and clay that remain within the impoundments that were impacted by OU8 Impoundment material, would also reduce mobility of COCs potentially present in the inner berm edges and in an approximate 2-foot-thick layer of soil located below the existing clay impoundment liners and above the groundwater table.

5. Short-Term Effectiveness

Short-term effectiveness is not applicable to Alternative 1 since it does not include any active remediation work. The times to achieve the RAOs for Alternatives 3 through 6 are similar to one another in all cases (around 2 to 3 years), but the alternatives vary in their degree of protection of the community, workers, and environment during remedial action. There is increased risk of exposure for alternatives that involve excavation (Alternatives 5 and 6) relative to the alternatives that involve treatment and closure-in-place (Alternatives 3 and 4). Because of this, Alternatives 3 and 4 are expected to provide slightly favorable more short term effectiveness than Alternatives 5 and 6.

For Alternatives 3 through 5, engineered controls implemented during ISS and steam-enhanced ISS operations for vapor control would provide a high degree of protection to the community, workers, and the environment. These engineered controls include use of a shrouded auger, maintenance of a water cap, installation of stone plenum layer (vented as needed), and treatment of actively collected vapors with a thermal oxidizer and caustic scrubber. In addition, fixed equipment would be staged on an equipment bench constructed at an elevation that would provide protection in the case of a catastrophic flood. In the event of such a flood, transportable equipment and reagents would be moved.

For Alternatives 3 and 4 only, treated materials would be closed in place and there would be no potential exposure of the community, workers, or the environment associated with excavation, transportation, and placement of the material, as it would be managed in place. The air emissions would be lower overall than with an excavation approach. A benefit of Alternatives 3 and 4 is reduced potential for exposure to the community because the wastes are treated. However, the material remains closed in-place.

Alternative 5 is similar to Alternatives 3 and 4 in short-term effectiveness during ISS activities. However, additional engineering controls such as use of vapor suppression foams or temporary fabric structures may be required to protect workers and the community during excavation and transport of the treated material to the on-site CAMU. Some risk may be encountered during transport of treated material to the CAMU, but the material would have reduced concentrations of COCs because of prior steam-enhanced ISS treatment (reducing potential VOC emissions) and would be partially stabilized, increasing ease of handling. The transport distance would be approximately 1.5 miles. Work at the CAMU to further stabilize this material, prior to final placement, would require further engineering controls due to the nearby residents' homes.

In Alternative 6 engineering controls would be needed to protect the community, workers, and the environment during implementation due to an increased risk of exposure associated with material excavation, dewatering, and transport. Vapor suppression foams that have been successfully utilized at other sites with similar PTW would be used on surfaces to control vapor emissions and if needed additional vapor control measures would be implemented. Lined dump trailers would be used to transport dewatered PTW off site for treatment. During design an evaluation would be conducted to ensure that any short-term impacts to the community and environment from the passing of trucks from the site to the off-site facility would be minimized.

Overall, excavation, dewatering, and transport of impoundment materials would pose a moderate degree of risk; however, this risk would be mitigated by a robust emission suppression program and engineering controls. As with Alternatives 3 through 5, it is assumed that fixed equipment would be staged on an equipment bench constructed at an elevation required to provide protection in the case of a catastrophic flood. In the event of such a flood, transportable equipment would be moved.

Alternative 6 also has the longest implementation time frame at 38 months, as opposed to 20 to 30 months for

the other active alternatives. The implementation time frame is longer primarily because, one, the excavation process would need to occur slowly to reduce the potential for air emissions and, two, the off-site facilities for treatment/destruction of the excavated and dewatered material can only process a limited amount of material at a time.

In summary, because the time to achieve the RAOs is similar for Alternatives 3 through 6, a primary difference between these alternatives is the degree of short-term protection of the community, workers, and the environment. Engineering controls would be designed and implemented to protect these entities.

6. Implementability

Alternatives 1 and 3 are both clearly implementable. In the case of Alternative 1, because no remedial actions would be implemented there would be no challenges associated with contractors, specialty equipment, etc. In the case of Alternative 3, the primary remedial component, ISS, is a proven, reliable, and implementable technology and its effectiveness can be monitored. ISS has been applied in the remediation of VOCs, SVOCs and PTW at more than 30 federal- or New Jersey state-lead projects. ISS worked successfully on the site's contaminants during the 2014 OU8 pilot study. The engineered cover and inner HBW would help minimize exposure risk. This alternative is administratively feasible, and services and materials are readily available. A disadvantage is that stabilization would reduce the ease of undertaking additional remedial actions, if necessary, because the remaining monolith would require a large scale operation and heavy duty equipment to break down the material in order to prepare it for further corrective efforts.

Alternatives 4 and 6 are also implementable. In the case of Alternative 4, the ISS portion of the alternative would be straightforwardly implementable, as described above for Alternative 3. The addition of steam-enhanced mixing prior to ISS, however, has not been used as often and would require specialized equipment and operations. Fewer contractors are available with experience implementing steam-enhanced ISS. As with Alternative 3, a disadvantage is that stabilization would reduce the ease of undertaking additional remedial actions, if necessary. For Alternative 6, excavation and dewatering are, in general, commonly performed remediation activities. Use of this approach on the acid tar impoundment materials is an emerging technology that has been successfully implemented at a few sites. The determination that this alternative is considered implementable is based on experience with dewatering and successful treatment/destruction off-site of similar acid tar material from another Superfund site in EPA Region 2; however, dewatering acid tar (while successfully performed during a lab treatability study in 2016) is site-specific and may require special operational procedures. Several off-site cement kilns have been identified that can accept the dewatered acid tars. The ease of closing the impoundments is high, as most of the toxic materials would be removed from the site. This alternative is administratively feasible, and services are available. Additional remedial actions at the impoundments' remaining footprints, if necessary, could be undertaken with ease.

Alternative 5 is expected to be implementable but comes with some challenges. The ISS portion of the alternative would be easily implementable, as described for Alternative 3. Similar to Alternative 4, however, steam-enhanced mixing prior to ISS has not been used as often and would require specialized equipment and operations. Implementation of Alternative 5 would involve multiple processes involved with in-place treatment, removal, additional treatment and engineering controls at the CAMU, then placement of the material in the CAMU. Fewer contractors are available with experience implementing steam-enhanced ISS. Excavation equipment is readily available; however, emission controls at the point of excavation and placement (CAMU location) may be challenging. This alternative is administratively feasible, and services and materials are available. Additional remedial actions, if necessary, could be undertaken with ease in the impoundment area, but it would be difficult to undertake additional actions on the material once placed in the CAMU.

In accordance with CERCLA, no permits would be required for on-site work (although such activities would comply with substantive requirements of otherwise required permits). Permits would be obtained as needed for off-site work.

7. Cost

The total estimated present value cost for each retained alternative is presented below.

- Alternative 1 – $0
- Alternative 3 – $48,000,000
- Alternative 4 – $60,000,000
- Alternative 5 – $65,000,000
- Alternative 6 – $74,000,000

These cost estimates have been developed based on the design assumptions and are presented primarily for comparing the alternatives. The final costs of the selected

remedy will depend on actual labor and material costs, competitive market conditions, final project scope, the implementation schedule, and other variables. Consistent with EPA guidance, the cost estimates are order-of-magnitude estimates with an intended accuracy range of plus 50 to minus 30 percent of present value.

The primary cost difference between Alternatives 3 and 4 is for the additional steam component which would need associated materials and safety precautions. While Alternative 5 is similar to Alternative 4 in the treatment of the PTW within the impoundments, the additional cost is attributed to the removal, transportation and additional solidification actions at the CAMU prior to placement. Alternative 6 is entirely different from the other four. Its costs are the highest but it provides the most permanent solution to the PTW and addresses any remaining contamination within the OU8 footprint. The costs of protective cover installation and maintenance, even in perpetuity, for all the alternatives are comparable.

8. State acceptance

The State of New Jersey concurs with the preferred alternative presented in this Proposed Plan.

9. Community acceptance

Community acceptance of the preferred alternative will be addressed in the Record of Decision following review of comments received on the Proposed Plan.

PREFERRED ALTERNATIVE

EPA's preferred alternative is Alternative 6, Excavation, Dewatering, Treatment/Destruction Off Site, Protective Cover. Alternative 6 has the following key components: excavation, dewatering, off-site treatment/destruction, ISS treatment of remaining impoundment materials, and a protective cover.

Alternative 6 involves excavation and mechanical dewatering of the majority of PTW within the OU8 impoundments, followed by destruction off site. Any remaining soil and clay impacted by the OU8 impoundment materials will undergo ISS treatment, followed by backfilling with berm remnants and a protective cover that will be installed over the entire OU8 footprint.

Alternative 6 is a treatment and containment-based alternative consisting of proven technologies that would be effective in dramatically reducing the risks associated with the exposure pathways identified at the site. By excavating and dewatering PTW and eventually destroying the material off-site resulting in the most permanent solution, this preferred alternative holds the most favorable approach. In addition, implementing a proven ISS technology on the remaining impacted soil and clay materials followed by an engineered capping system would effectively control direct contact, eliminate the release of contaminants into the air and address potential movement of contaminants beyond the OU8 impoundment footprint. ISS would further reduce contaminant mass through media transfer (enhanced desorption), capture of the emissions, and destruction in a vapor treatment system, and also serve to reduce mobility of contaminants through the binding of treated mass and limiting infiltration through the less permeable, treated waste material.

The preferred alternative will protect human health and the environment by addressing all the RAOs and will meet PRGs by permanently removing almost all of the PTW from the impoundments and effectively treating any soil and clay impacted by OU8 impoundment materials. Treatment of the waste at a facility such as a cement kiln or incinerator would irreversibly destroy not only the VOC mass in the impoundment material, but also the presence of SVOC mass and the organic tar material itself resulting in the greatest possible reduction in toxicity, mobility and volume.

Alternative 6 would be implementable using common excavation activities and through the use of an emerging dewatering technology. This approach is developed based on experience with the successful implementation and destruction off-site of similar acid tar material from another Superfund site in EPA Region 2. While the cost to perform this alternative is the highest, it provides the most permanent solution to the highly toxic nature of the material in these impoundments, with an estimated implementation timeframe of 38 months.

The remedy would also be effective in reducing the risk of impoundment contents that remain in the floodplain from being compromised by any flooding.

Based on the information currently available, EPA believes the preferred alternative meets the threshold criteria and provides the best balance of tradeoffs among the other alternatives with respect to the balancing criteria. EPA expects the preferred alternative to satisfy the following statutory requirements of CERCLA Section 121(b), 42 U.S.C. § 9621(b): 1) be protective of human health and the environment; 2) comply with ARARs; 3) be cost effective; 4) utilize permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable; and 5) satisfy the preference for treatment (via

the existing groundwater treatment system) as a principal element. EPA will assess the two modifying criteria of state acceptance and community acceptance in the ROD to be issued following the close of the public comment period.

COMMUNITY PARTICIPATION

EPA encourages the public to gain a more comprehensive understanding of the site and the Superfund activities that have been conducted there.

The dates for the public comment period, the date, location and time of the public meeting, and the locations of the Administrative Record files, are provided in the text box entitled, "Mark Your Calendar" located on the front page of this Proposed Plan. Instructions for submitting written comments on the Proposed Plan are provided in the highlight box, below.

EPA Region 2 has designated a public liaison as a point-of-contact for the community concerns and questions about the federal Superfund program in New York, New Jersey, Puerto Rico, and the U.S. Virgin Islands. To support this effort, the Agency has established a 24-hour, toll-free number (1-888-283-7626) that the public can call to request information, express their concerns, or register complaints about Superfund.

For further information on the American Cyanamid Superfund Site, please contact:

Mark Austin	Melissa Dimas
Remedial Project Manager	Community Involvement Coordinator
(212) 637-3954	(212) 637-3677
austin.mark@epa.gov	dimas.melissa@epa.gov

Written comments on this Proposed Plan should be mailed to Mr. Austin at the address below or sent via email.

U.S. EPA
290 Broadway, 19th Floor
New York, New York 10007-1866

The public liaison for EPA's Region 2 is:

George H. Zachos
Regional Public Liaison
Toll-free (888) 283-7626
(732) 321-6621

U.S. EPA Region 2
2890 Woodbridge Avenue, MS-211
Edison, New Jersey 08837-3679

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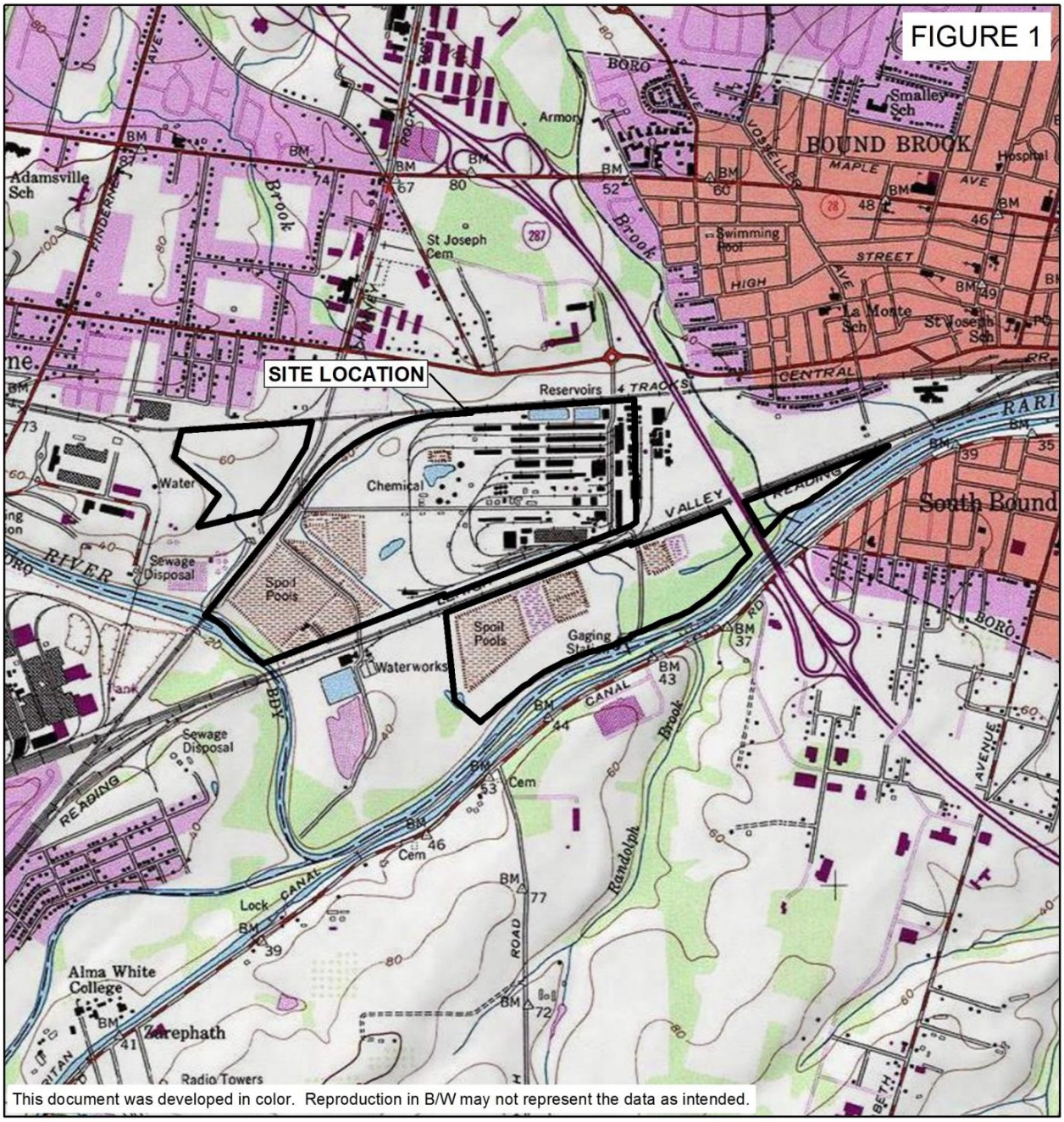
PLOT DATE: 12/12/2011 DRK

FIGURE 1



This document was developed in color. Reproduction in B/W may not represent the data as intended.

ADAPTED FROM: BOUND BROOK, NEW JERSEY USGS QUADRANGLE

MAP LOCATION

WYETH HOLDINGS CORPORATION
AMERICAN CYANAMID
SUPERFUND SITE
SITE-WIDE FEASIBILITY STUDY

SITE LOCATION

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Feet

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O'BRIEN & GERE

Figure 2

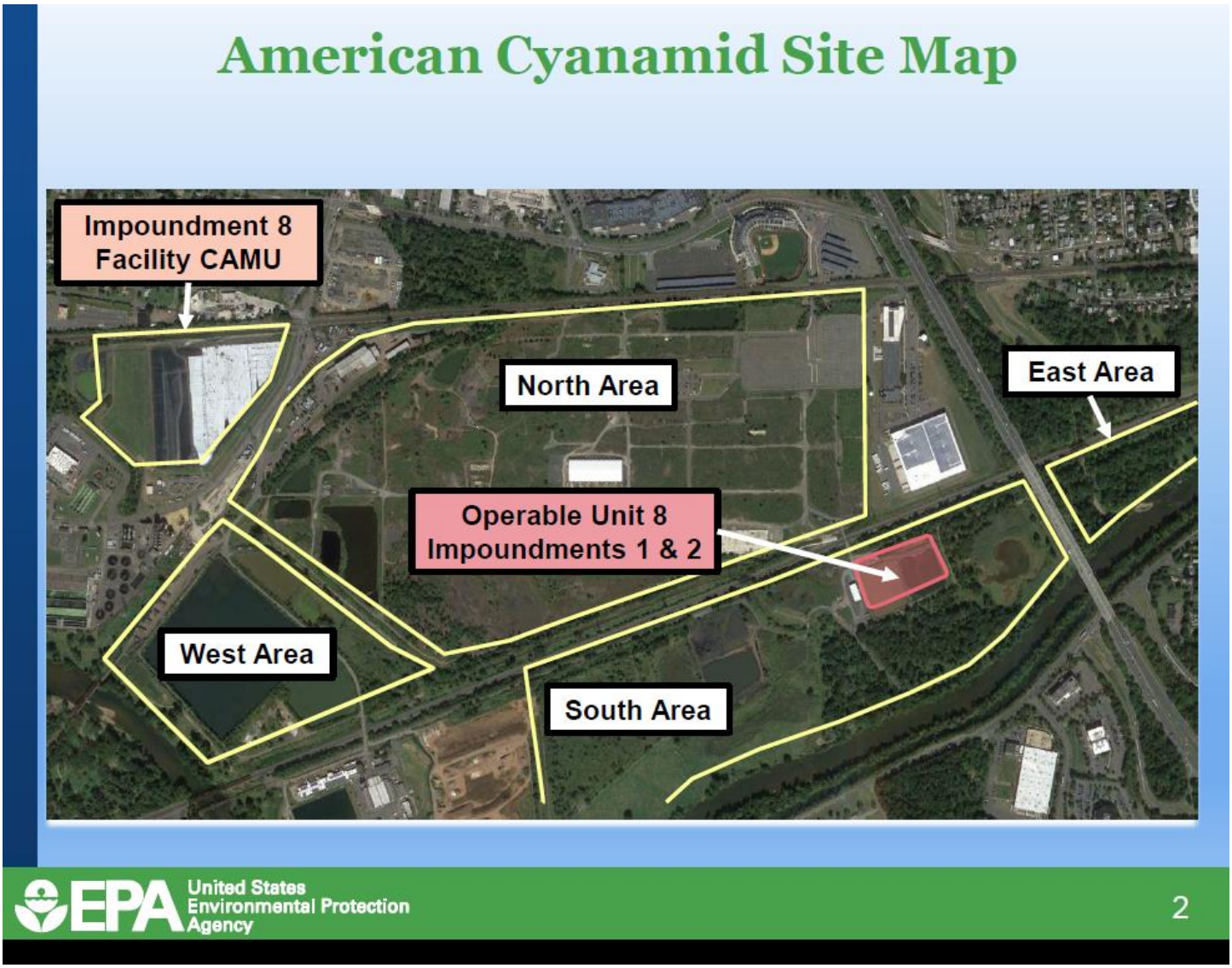
American Cyanamid Site Map
Impoundment 8
Facility CAMU
North Area
East Area
Operable Unit 8
Impoundments 1 & 2
West Area
South Area
EPA United States Environmental Protection Agency
2

Figure 3

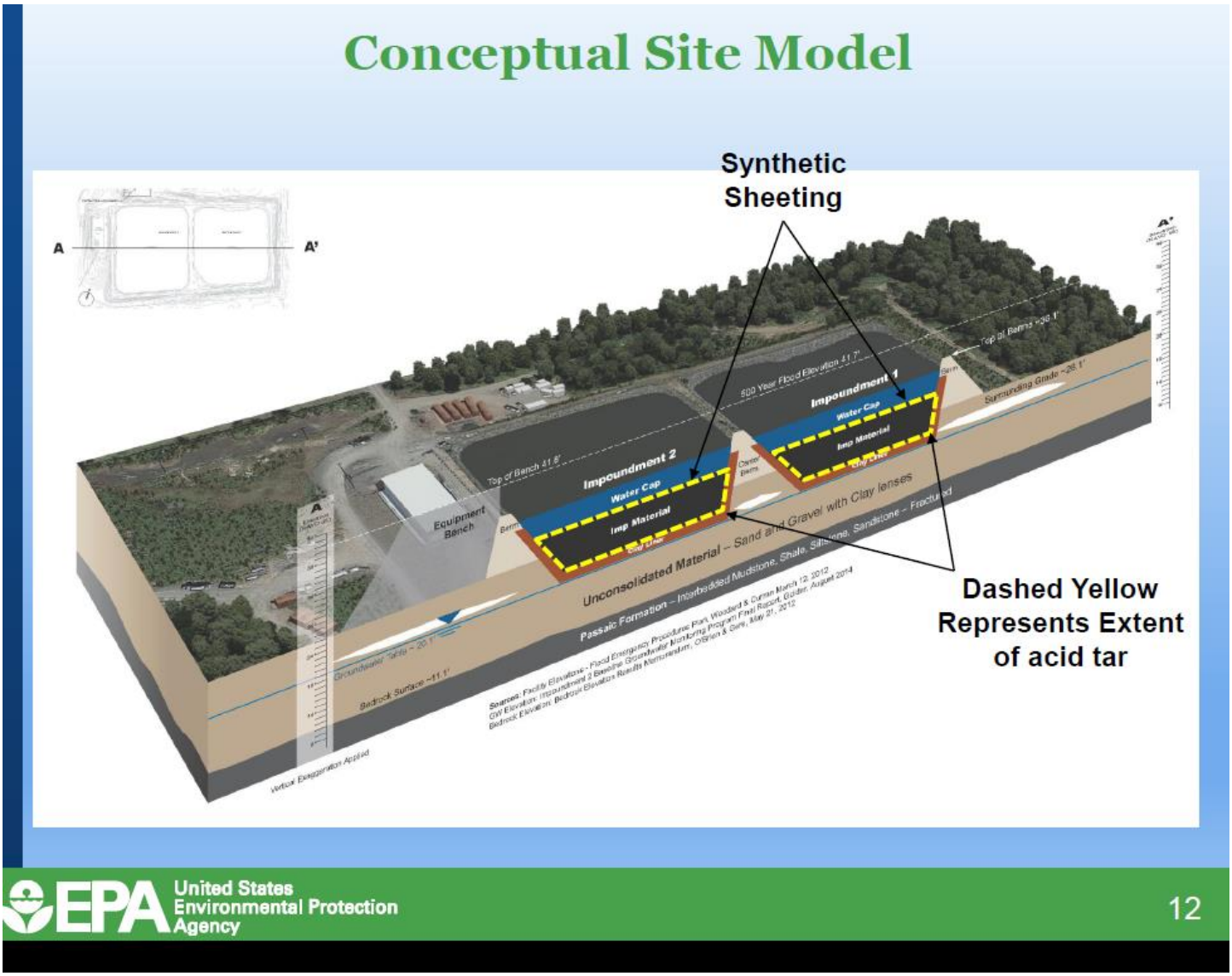
Conceptual Site Model
Synthetic Sheeting
A
A'
Impoundment 2
Water Cap
Imp Material
Impoundment 1
Water Cap
Imp Material
Top of Bench 41.8'
500 Year Flood Elevation 41.7'
Top of Berms +36.1'
Surrounding Grade ~26.1'
Equipment Bench
Berm
Unconsolidated Material – Sand and Gravel with Clay lenses
Passaic Formation – Interbedded Mudstone, Shale, Siltstone, Sandstone – Fractured
Groundwater Table ~ 20.1'
Bedrock Surface ~11.1'
Vertical Exaggeration Applied
Dashed Yellow Represents Extent of acid tar
United States Environmental Protection Agency
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Table 1. Impoundment Composition

Material Type	Impoundment 1	Impoundment 2
VR (upper Layer)	900 yd^3	10,900 yd^3
Mixed VR and HC (middle layer)	-	6,500 yd^3
HC (lower layer)	13,700 yd^3	12,900 yd^3
CL (mixed)	2,700 yd^3	-
SSL (mixed)	1,900 yd^3	-
CA (mixed)	5,000 yd^3	-
Total Volume	24,200 yd^3	30,300 yd^3

yd^3 – cubic yards

Key:
VR – Viscous Rubbery
HC – Hard Crumbly
CL – Clay-Like
SSL – Sand & Silt-Like
CA – Coal Aggregate

Table 2. Impoundment 1 Organics Summary

Parameter	CAS #	Valid Samples	Unique Samples	Detects	Units	Minimum Detected	Maximum Detected	Mean	Standard Deviation	Mean + 1 Std. Dev
Benzene	71-43-2	25	24	25	µg/kg	78,500	207,000,000	47,762,304	58,054,409	105,816,713
Toluene	108-88-3	25	25	25	µg/kg	1,440	40,700,000	11,425,122	12,264,223	23,689,345
Naphthalene	91-20-3	25	25	25	µg/kg	5,010	12,600,000	3,111,321	3,172,052	6,283,373
Xylene (Total)	1330-20-7	25	25	25	µg/kg	4,500	6,910,000	2,400,192	2,142,678	4,542,870
Nitrobenzene	98-95-3	25	23	23	µg/kg	29	6,600,000	1,169,016	1,599,540	2,768,556
1,2-Dichlorobenzene	95-50-1	25	24	25	µg/kg	3,390	2,550,000	761,381	687,954	1,449,335
Aniline	62-53-3	25	25	25	µg/kg	189	36,707	672,158	1,237,244	1,909,402
Chlorobenzene	108-90-7	25	16	17	µg/kg	233	2,400,000	499,194	640,422	1,139,616
1,3,5-Trimethylbenzene	108-67-8	25	24	24	µg/kg	2,300	1,110,000	347,202	320,227	667,429
Isopropylbenzene	98-82-8	25	25	25	µg/kg	6,580	1,710,000	531,564	531,072	1,062,636
Benzoic acid	65-85-0	25	18	18	µg/kg	285	1,410,000	298,767	410,639	709,406
1,3-Dichlorobenzene	541-73-1	25	5	5	µg/kg	153	1,200,000	292,545	332,982	625,527
Cyclohexane	1735-17-7	25	2	2	µg/kg	1,000	1,200,000	301,640	328,184	629,824
Acetophenone	98-86-2	25	25	25	µg/kg	94	1,190,000	275,708	341,652	617,360
MethylCyclohexane	108-87-2	25	6	6	µg/kg	2,400	1,200,000	303,129	326,802	629,931
1,4-Dichlorobenzene	106-46-7	25	18	18	µg/kg	197	850,000	195,197	283,453	478,650
Carbon Disulfide	75-15-0	25	14	14	µg/kg	100	1,200,000	195,466	262,019	457,485
Methanol	67-56-1	25	2	2	µg/kg	2,000	275,000	154,504	83,508	238,012
2-Methylnaphthalene	91-57-6	25	25	25	µg/kg	506	678,000	174,110	171,242	345,352
Ethylbenzene	100-41-4	25	25	25	µg/kg	1,480	529,000	168,443	155,607	324,050

Data excerpt from O'Brien & Gere (OBG). 2010a. Former American Cyanamid Site Impoundments 1 and 2 Characterization Program Summary Report. November.

Table 3. Impoundment 2 Organics Summary

Parameter	CAS #	Valid Samples	Unique Samples	Detects	Units	Minimum Detected	Maximum Detected	Mean	Standard Deviation	Mean + 1 Std. Dev
Benzene	71-43-2	28	28	28	ug/kg	16,700,000	183,000,000	52,246,429	39,882,369	92,128,798
Toluene	108-88-3	28	28	28	ug/kg	3,930,000	40,200,000	11,867,857	8,700,937	20,568,794
Naphthalene	91-20-3	28	28	28	ug/kg	1,040,000	13,700,000	4,879,643	3,408,717	8,288,360
Chlorobenzene	108-90-7	28	13	28	ug/kg	18,200	13,000,000	823,157	2,407,139	3,230,296
Methyl Acetate	79-20-9	28	4	4	ug/kg	55,000	6,500,000	597,929	1,254,329	1,852,258
Xylene (total)	1330-20-7	28	25	27	ug/kg	970,000	6,950,000	2,344,286	1,442,152	3,786,438
Acetone	67-64-1	28	1	1	ug/kg	110,000	12,500,000	842,536	2,302,436	3,144,972
Cyclohexane	1735-17-7	28	4	4	ug/kg	23,000	6,500,000	413,786	1,202,826	1,616,612
Chloromethane	74-87-3	28	11	11	ug/kg	24,600	6,500,000	384,021	1,206,098	1,590,119
1,3-Dichlorobenzene	541-73-1	28	19	19	ug/kg	15,300	6,500,000	359,782	1,216,478	1,576,260
Carbon Disulfide	75-15-0	28	27	27	ug/kg	37,100	6,500,000	330,771	1,211,285	1,542,056
1,2-Dichlorobenzene	95-50-1	28	24	27	ug/kg	500,000	6,500,000	1,863,429	1,169,362	3,032,791
Isopropylbenzene	98-82-8	28	26	27	ug/kg	163,000	6,500,000	634,107	1,191,127	1,825,234
MethylCyclohexane	108-87-2	28	6	6	ug/kg	65,000	6,500,000	485,429	1,207,970	1,693,399
1,3,5-Trimethylbenzene	108-67-8	28	24	27	ug/kg	102,000	6,500,000	487,071	1,188,025	1,675,096
1,4-Dichlorobenzene	106-46-7	28	23	27	ug/kg	50,800	6,500,000	376,336	1,202,024	1,578,360
Ethylbenzene	100-41-4	28	25	27	ug/kg	74,600	1,250,000	225,339	237,350	462,689
2-Methylnaphthalene	91-57-6	28	27	28	ug/kg	65,600	656,000	246,050	155,315	401,365
Acetophenone	98-86-2	28	28	28	ug/kg	34,600	652,000	241,450	129,977	371,427

Data excerpt from O'Brien & Gere (OBG). 2010a. Former American Cyanamid Site Impoundments 1 and 2 Characterization Program Summary Report. November.

ATTACHMENT B

PUBLIC NOTICE

EPA Invites Public Comment on a Proposed Cleanup Plan for the American Cyanamid Superfund Site in Bridgewater, NJ

On May 23, 2018, the U.S. Environmental Protection Agency issued a Proposed Plan for addressing waste contained in two areas of the American Cyanamid Superfund site. A 30-day public comment period on the Proposed Plan, which identifies the EPA's preferred cleanup plan and other cleanup options that were considered by the EPA, begins on May 29, 2019 and ends on June 28, 2018.

The EPA's preferred cleanup plan consists of the following: 1) the excavation and removal of the majority of the waste contained within the areas; 2) the destruction of the excavated waste at an off-site facility such as a cement-kiln; 3) the stabilization of any remaining waste incidentally left in place and backfilling of the excavated areas; and 4) placement of a protective cover over the entire area addressed. After completing the cleanup for these two specific areas, they will be managed consistently with the rest of the site for which soil and groundwater cleanup plans are already in place or underway.

During the public comment period the EPA will hold a public meeting in Bridgewater, NJ to inform the public of EPA's preferred cleanup plan and to receive public comments on the preferred plan and other options that were considered. The public meeting will be Tuesday, June 12 at the Bridgewater Township Municipal Building, 100 Commons Way, Bridgewater, NJ 08807. An informal information session will begin at 6pm, followed by formal public meeting and opportunity for public comment at 7pm.

The Proposed Plan and other site documents are available at www.epa.gov/superfund/american-cyanamid or by calling Melissa Dimas EPA's Community Involvement Coordinator, at (212) 637-3677 and requesting a copy by mail.
Written comments on the Proposed Plan, postmarked no later than June 28, 2018, may be mailed to Mark Austin, EPA Project Manager, U.S. EPA, 290 Broadway, 19th floor, New York, NY 10007-1866 or emailed no later than June 28, 2018 to austin.mark@epa.gov

The Administrative Record file containing the documents used or relied on in developing the alternatives and preferred cleanup plan is available for public review at the following information repositories:

1) www.epa.gov/superfund/american-cyanamid
2) Bridgewater Township Library: 1 Vogt Drive, Bridgewater, NJ (908) 526-4016
3) 2)U.S. EPA Region 2, Superfund Records Center: 290 Broadway, 18th floor, New York, NY 10007 (212) 637-4308
4) NJDEP-Site Remediation Program, Floor 5E-P. O. Box 420—Mail Code 401-05F, 401 East State Street, Trenton, NJ 08625 (609)-633-0718

ATTACHMENT C

PUBLIC MEETING TRANSCRIPT

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 2

AMERICAN CYANAMID SUPERFUND SITE
PUBLIC MEETING

Bridgewater Township
Municipal Building
100 Commons Way
Bridgewater, New Jersey

June 12, 2018
7:00 p.m.

P R E S E N T E R S:

MELISSA DIMAS
Community Involvement Coordinator

MARK AUSTIN
EPA Remedial Project Manager

MAYOR DANIEL HAYES
Bridgewater Township

IRA WHITMAN
Technical Advisor, CRISIS

ROSS STANDARD
Executive Chairman, CRISIS

ALSO PRESENT:

ANGELA CARPENTER
Deputy Director

STEPHANIE VAUGHN
Section Chief

MARK SCHMIDT
Project Manager

SHARISSA SINGH
Geologist

JULIE MCPHERSON
Risk Assessor

ELIAS RODRIGUEZ
Public Affairs Officer

HAIYESH SHAH
NJ DEP

Proceedings

MS. DIMAS: Good evening, everyone. Thank you for coming. If you can take a seat, we can get started.

So, welcome. I'd like to first of all welcome or thank you to Bridgewater Township for hosting us tonight. Special thanks to Mayor Hayes, Christian Shiro our health liaison, and Jessica Mendoza who helped set up tonight. I also want to acknowledge Chris Poulsen who suddenly passed away. She was a big advocate for the community and this site in particular. He would be very pleased that we are all here tonight.

As you know, we will be discussing Operable Unit 8, which is also referred to as Impoundments No. 1 and 2. I hope many of you had an opportunity to talk to some of our EPA colleagues in the other room about the site-wide remedy, which the record decision was in 2012. And we are in the design and construction phase of that remedy. So tonight, or if you can go to the next slide, my name is Melissa Dimas. I am the Community Involvement Coordinator for EPA and specifically for this site. Myself and my

colleague Mark Austin will be presenting our proposed plan tonight. I have some other EPA colleagues in the room: Angela Carpenter, who is the Deputy Director of the superfund; Stephanie Vaughan, Section Chief; Mark Schmidt is the Project Manager for the rest of the site minus Impoundments 1 and 2; Sharissa Singh, Geologist; Julie McPherson, she is our Risk Assessor; Elias Rodriguez, our Public Affairs Officer; and Haiyesh Shah from New Jersey DEP.

Next slide. Just an overview, we will go quickly through the Superfund Program. And then I will hand it over to Mark and he'll talk about site location and background, Operable Unit 8 description and features, source material and some risks, remedial action objectives, treatability studies and then the summary of remediate alternatives, then EPA's preferred alternatives and, ultimately, we will get to Q&A. And so, I would like you -- if you wouldn't mind holding your questions and your comments, it will be a formal comment period or an opportunity to give formal comment till the end.

And what I will do is, first, we will

hear from the Mayor, and then any other elected officials who might be in the room. And then we will go to the technical advisory grantee CRISIS and hear their comments. And then I will ask anyone else who would like to make a comment, to raise their hand. And I will pass out numbers in no particular order so that we are not just standing up in line waiting to make our comments.

So, we will move onto the next slide. We will just do a quick -- very quick overview of the Superfund Program.

So what is Superfund? Next slide please. So in 1980, Congress established a Comprehensive Environmental Response Compensation and Liability Act also knowns as CERCLA, but informally known as Superfund. So, that Is what we are here tonight to talk about.

And what are the goals of Superfund? Well, it is to protect human health and the environment by cleaning up polluted sites, involve the community in the Superfund process, and then ultimately have responsible parties pay for the cleanup.

So, EPA has two types of remedial or

ways to manage polluted sites. We have our removal action, which is to clean up emergency oil spills or just emergency contaminants. And that sort of is a much more short-term. And then we have the remedial action, which is what we are doing here tonight is remedial action. And that is a longer, more complex clean up.

Okay. Where are we in this Superfund process? This is the map. We have a site investigation. And then once the site is determined should be on the Superfund list, it's then put on the National Priorities List. Then we go to a focused feasibility study and site investigation or remedial investigation. And then EPA comes up from that focus feasibility study, comes up with some preferred or proposed alternatives on how to clean up the site. And then we go out to Public Comment, which is where we are here tonight.

Then we take your comments and respond to them. That will be a responsive summary. And then, we will issue a record of decision based on comments from the community. Then we will go to remedial design and remedial action, construction and, ultimately, clean up.

Okay. Pass it over to Mark.

MR. AUSTIN: As you all are aware, the American Cyanamid Superfund Site is located in Bridgewater near the Raritan River in Central New Jersey. The property extends to the east into Bound Brook right here, both townships of Franklin and South Bound Brook over here. There is a mix of residential communities and commercial operations nearby in all directions.

Here is a magnified view highlighting the site's 435 acres. We divided the site into five areas for easier reference. We identified north area is where most of the previous manufacturing occurred. To the west, several lagoons are located. In the east area over here, historical records indicate this area was never used. And within the south area, here is the location of two waste lagoons, also referred to as Impoundments 1 and 2. The subject of our proposed plan and meeting tonight is specifically about these two impoundments. I should mention there is also a Corrective Action Management Unit on site located to the northwest. More on this in the next slide.

The Corrective Action Management Unit is

a landfill designed to hold hazardous waste materials from the site's other impoundments. It was constructed in 1991 and has a capacity of 1 million cubic yards. To date, total material placed into the unit is around 400,000 cubic yards.

So when we developed the potential remedies for Impoundments 1 and 2, the use of this facility as a final destination was examined as you will see later on in the presentation.

For a brief site history, manufacturing started in the early 20th Century and lasted into the '90s. Pharmaceuticals, petroleum-based products, dyes and pigments were manufactured here. There were 27 impoundments constructed consuming up to a total area of 100 acres. Benzene and various other volatile compounds could be found within quite a few of those impoundments. Again, here is 1 and 2.

Here is a more detailed historical information about -- I will point out a few notable highlights. The site was added to the National Priorities List in 1983. Just so you know, when a site is added to the National

Priority List, that allows the site for -- to receive federal funding. Current site-wide groundwater extraction system design to capture the entire site's contaminated ground water went online in the 1980s. CRISIS, a local environmental group who are here tonight, formed in 1992. Their beginning purpose was to ensure any site remedies would be mindful of community concerns. And at the time, were against any remedies involving incineration at American Cyanamid. Overall, environmental activities completed during '90s and early 2000s included construction of the CAMU or Constructive Action Management Unit. Nearly 1 million cubic yards of material was remediated through the various remedies decisions. And over 120,000 tons of iron-oxide material was excavated and recycled offsite.

To handle all this contamination, impoundments and various media were addressed under several operable units over the years. Currently, there are two active operable units. Operable Unit 4, which is the site-wide remedy and OU8, which is Operable Unit 8, includes Impoundments 1 and 2 only. Note that in

addition to addressing the impoundments under the site-wide remedy, OU4 also involves site soil, site groundwater and site wetlands. Also, the impoundments that are on the slide without a colored box are -- have been remediated and are closed or in the process of being closed.

Regarding the Hill Property under OU6, in July of 1996, a remedy -- a No Further Action remedy was issued. In 1997, the 140 acres on the Hill Property was taken off the National Priorities List. And thus, paved the way for redevelopment which involved the ball field, the box stores, Costco, and a commuter train station.

In 2012, a remedy decision for Operable Unit 4, which is a site-wide remedy, was signed. That remedy addressed six impoundments, close to 200 acres of soil and all site groundwater which will be captured and treated. Currently, the groundwater treatment facility is under construction. New extraction wells are being planned and installation of barrier wall is under way. I believe the groundwater facility is scheduled to be ready by the end of this year. Once this work is close to completion

near the end of the year, design will start -- design efforts will start on the impoundment and the actual soils.

In the fall of 2010, groundwater seeps were observed along the property border along the Raritan River banks. The seeps were analyzed and found to contain benzene. As a result in 2012, a collection trench along with a containment wall and groundwater treatment facility was installed and continues to operate today. That Facility is right there. Obviously, here is the trench and the containment wall. To date, the system has successfully prevented the benzene seeps from reaching the Raritan. These operations are now being handled under the site-wide remedy.

OU8, which addresses contaminated materials within the confines of Impoundments 1 and 2. This picture is looking east with Impoundment 2 close, Impoundment 1 in the distance. And if you can see further, it would be 287 through those trees.

The location of OU8 makes it very difficult to access. There is an active rail line that makes entry and exit to the

Impoundments challenging. Trains frequently remain sitting in this area for hours blocking all entry and egress traffic. This fact alone could constrain any emergency response efforts if needed during remedy implementation. 287, as I mentioned, is here is to the east and across the Raritan River. And residential community is located approximately 1800 feet away. And then there is the Raritan. There is a constant risk of severe flooding as I am sure you all know.

The Raritan and potential flooding. This was taken a few days after Hurricane Irene in 2011. The Raritan is in this general direction right here. Note that the Impoundments berms, the edges showing here, are approximately 10 feet above grade. So during this event while it was occurring, the river overtopped these berms. All right.

So, we covered the location very well. Now we are -- now what are the existing conditions? Both Impoundments have a 10 foot high berm that holds the material and are covered with a synthetic sheeting and water caps to prevent odors and vapors. Synthetic sheeting is also installed to prevent erosion during

extreme flooding conditions, like what was shown in the previous slide. This is also considered a successful protective measure for the surrounding communities. Both Impoundments are fenced, and there is a constant security presence.

The Impoundments themselves are approximately 2 acres each and around 13 to 16 feet deep. They are about 6 feet below ground service, so they are 10 above ground and 6 below. What is in these Impoundments? Benzene, toluene and a few other volatiles are extracted through refining coal light-oil. The resulting waste is a form of acid tar. Acid tar contains a very high content of volatile organic materials. Things suspected cancer causing, have potential of strong odors and vapors. They also have a very low pH, corrosive, acidic in nature. Also have a high sulphur content. Among other things, odors combined.

Physically, there are two general types of acid tar in both impoundments. A hard crumbly and a viscous rubbery shown here in these fissures. Both are considered very difficult to handle. Put this slide in here so

everybody can get and visualize how impoundments are constructed.

Impoundments are aligned with a 1 foot clay layer in each one. There is a synthetic sheeting across the top along with a water cap on top of it. And here is the extent of the acid tar. Shown in this table, each 2-acre impoundment holds quite a bit of material. There is around 55,000 cubic yards of acid tar. The acid tar in Impoundments 1 and 2 consist of contaminated material that present high risk to human health and the environment. The tar is considered the source of contamination to the groundwater aquifers to beneath the site in the south area.

Went over the volume, so I won't go over them again. There are five notable contaminants of concern within the acid tar: Benzene, toluene, naphthalene, nitrobenzene and xylene. Benzene is clearly the dominant contaminant since it has been detected as high as 207,000 parts per million. However, it's more regularly found in the mid 40s to mid 50,000 parts per million. For reference, land disposal regulations limits benzene found to 10 parts per

million. And you can't throw this away.

Since we know the risks are extremely high, we conducted a streamlined risk assessment to confirm our conclusions. As shown on this slide, human health risks include cancer risk and non-cancer hazards. Just a note here, a carcinogenic risk is considered unacceptable when the risk is greater than 10 to the minus 4. A non-carcinogenic hazard is considered unacceptable when the hazard index is greater than 1.

Every remedy that is approved must have objectives or goals to achieve the remedial decision results. For Operable Unit 8, three objectives were developed: To remove, treat the acid tar, prevent human contact and to minimize migration of those five contaminants of concern I mentioned previously from impacting the site groundwater.

Since 1983, these impoundments have undergone several pilot and field tests attempting to either recover the material for recycling purposes or simply to remediate the area of toxic materials. None of these earlier tests were successful. The impoundments were

also included in a previous rod in 1998. However, the select environment was found to be -- found not to be implementable. Taking this history into account, we conducted a few more studies on technologies that we thought were promising. Those studies included a thermal treatment technology, a stabilization and solidification technology, a combination of the two. And a deep watering technology proven to be successful at another Superfund site in our area. As a result, most technologies we studied were successful. The most promising were carried forward and developed for potential use in our remedial alternatives. Remember that picture please.

Before we get into the selection process, let's just take a few minutes to get familiar with a few terms. And I know this slide is very wordy, but it's probably worth it to go through them a little bit. Stabilization and solidification. The process involves mixing the acid tar in place with hydrated lime to neutralize corrosive nature of the material. Then mixing slag cement in the material to thicken or congeal the material followed by

adding Portland cement. This creates a solid matrix or block-like result.

Dewatering. As it relates to our project, it's a process that separates the acid tar solids from the liquid using an enclosed press. As a result, there are two-way streams which allows for shipping and improved overall handling.

Protective cover. Cap that prevents direct contact with treated material. The cap itself also controls any vapors generated from treated material, if any exist at all, and protects against flooding.

Offsite treatment. Again, as it relates to our project, wastes shipped off site to a facility where it is completely destroyed.

Based on the final technology screening, five alternatives were retained and developed. As you can see, it's really four alternatives. Alternative one is a No Action alternative. That's required in the analysis for Superfund law. Alternative two is screened out. Just put it there. Alternative three involves using the in-place stabilization and solidification process to treat the tar. This will result in

some contamination reduction through captured-off gases and will lock up the remaining contaminants in a block-like solid material. Following this process, a barrier wall will be installed around the impoundments to prevent any potential leeching. And finally, a protective cover will be installed. It's cost is projected to be 48 million with a construction time frame of 30 months -- 20 months. Sorry.

Alternative four is virtually the same as alternative three, but uses steam injection during the stabilization and solidification process. Which is designed to drive off or evaporate additional contaminants. Its cost is around 60 million with a time frame of 24 months.

Alternative five uses the process in alternative four, but is now excavated out of the impoundments and sent over to the CAMU, Corrective Action Management Unit, where it is resolidified prior to final placement. Following all removal, a protective cover will be installed. The cost of Alternative five is 65 million with a time frame of over 30 months.

Alternative six involves the slow and careful excavation of the acid tar. Placement of the tar into a mechanical dewatering screw press followed by shipping to an offsite facility where it will be completely destroyed. Following this process, any remaining soil or clays will be treated -- any remaining soil or clays that were impacted by the acid tar will be treated using stabilization and solidification technology in place. The protective cover will then be installed. The cost estimate is around 74 million. And will -- with a time frame of 38 months.

There are clearly some common elements associated with these alternatives. I will just mention a few. With the exception of Alternative one, all alternatives will employ a robust air monitoring program to ensure worker and community protection during construction activities. All address the acid tar within the impoundments. All use a cap as a final measure of protection. And all alternatives would include long-term monitoring and institution of controls to limit future land uses over the 4-acre impoundment footprint.

There are nine criteria by which we evaluate potential cleanup alternatives on their own merit and then compare them each to one another. Based on this extensive evaluation, a preferred alternative is reached when it's concluded that it provides the best balance of tradeoffs among the alternatives. The preferred alternative is expected to be protective of human health in the environment, will comply with relevant and appropriate rules and regulations, would be cost effective, and will utilize permanent solution to the maximum extent possible.

All the alternative, with the exception of one, meet the first two criteria which are overall protectiveness of human health in the environment and compliance with ARARs. I should note that for an alternative to be eligible for selection, it must meet both of those first two criteria. For the remaining criteria comparisons, I developed this chart. Blue means it met the criteria but with some challenges. Obtaining a green dot, it meant it met the criteria. I will just define some of the criteria and add a little commentary.

Long term effectiveness and permanence. Really covers how the alternative maintains protection of human health in the environment after remediation has been completed. Three and four address the tar, however, it would remain in place. Five and six, material is excavated out. Reduction of toxicity, both mobility and volume through treatment. This criteria assess whether the alternative reduces the acid tar threats. So three, four and five treat the acid tar, which is a goal. But to some degree the material still remains. Six destroys the tar offsite.

Short-term effectiveness. Criteria assesses the effects on the community or workers during construction. Things like dust from excavation, transportation of hazardous materials and air quality impacts. Three and four were close to green, but a much more robust mixing process is anticipated. Five involved mixing excavation, transportation and then mixing again. Much longer treatment train. Six has some challenges excavating materials slowly. However, the work can be completed using vapor and odor suppressing foams. And transportation

offsite would amount to around eight to twelve trucks per week.

And the last few is implementability. This criteria assesses things such as reliability of the technology and availability of services and materials. Time and costs are fairly straightforward.

State acceptance. The state concurs with the preferred remedy.

Community acceptance. The public is encouraged to review and comment on all the information presented here and in the proposed plan. After review of all comments, we at EPA in consultation with the New Jersey DEP may modify the preferred alternative or select another response based on new information or the public's comments.

Okay. Alternative six is EPA's preference, which includes excavation, dewatering and destruction of materials offsite. All remaining soil and clay materials found to be affected by the acid tar will be treated by stabilization and solidification in place. And finally, protective cap will be installed over the entire 4-acre footprint. While other

alternatives evaluated have lower cost and may take less time to implement, our preferred alternative is the only remedy that permanently removes and destroys contamination from Impoundments 1 and 2. Due to the impoundment's location within the floodway nearby the Raritan River and being prone to constant flooding threats, the preferred remedy has the most flexibility during implementation because equipment used for the remediation can be relocated quickly.

So what do we expect? What kind of results? The goal here is to remove 100 percent of the acid tar. The remedy is expected to remove close to 45,000 tons of tar. The wastes will be out of the flood hazard area and no longer on site and no longer a threat to the environment or the community. This alternative is also the most expensive of all the alternatives, but provides the most permanent ending for the acid tar.

Excavation is projected to be at a rate of 100 cubic yards per day which amounts to eight to twelve trucks per week. So, low impact on the community when it comes to that.

To get an idea of what one of these presses look like, I am showing you this figure. The material is placed in an hopper here where it's sent through the press separating the materials. Liquid is captured and sent to an offsite tank to await disposal. And the solids are extruded an sent off the site. Here is a picture of what one actually looks like. Doesn't look like much, but it works well.

Here are a few pictures of equipment used during the stabilization and solidification process. This is a mixing auger, obviously. Equipment that holds the mixing auger. And then figure that is schematic of it in action.

That's the conclusion of my presentation. We can no go ahead with questions and/or comments you may have.

MS. DIMAS: Okay. We would like to start with Mayor Hayes. He can provide his comments.

MAYOR HAYES: Thank you.

Thank you for the opportunity to comment, and thank you for the opportunity to provide written comments later in a proposed remedial plan for Impounds 1 and 2, also

referred as the Operable Unit 8 and the -- on the American Cyanamid Superfund Site. I want to thank you for the opportunity to be here. Thank you for the presentation and the effort that you put in.

The input provided in this correspondence that serves to reinforce my commitment as a local official to advocate for an expeditious and environmentally sound cleanup of a former facility. My foremost concern as the Mayor of Bridgewater is for the health and safety of the community. In this regard, it is imperative that these aspects be paramount during any remedial action as directed by the United States Environmental Protection Agency for the former American Cyanamid Superfund Site.

It is further obligatory that Township residents in surrounding communities and close proximity to the former industrial site be recognized as the primary stakeholders in the remediation and viable restoration of the property. All remediation plans from a technical perspective should be designed and reviewed with full recognition and acknowledgment of the needs and protection of

the immediate community. I trust the EPA experts, which is the most -- to choose the most suitable remedial plan to restore the site and to take into account the safety, health and welfare of the surrounding community and the cleanup. That being said, I support the approval of Alternative Six, the excavation, dewatering, the treatment, destruction offsite and protective covering for Impoundments 1 and 2 on the site.

The proposed plan represents the best available alternative for site remediation at this time. And I would like to note that the Pfizer Corporation has taken a site that they inherited through acquisition and have continually demonstrated a willingness to invest significant capital resources to invest considerable time with my staff and the residents in communicating their activities, and to use those capital resources to initiate and expedite the site cleanup. Their communication with the Township government and my administration is to be commended. Their remediation team has expressed a willingness and desire to educate the community about the

process throughout the steps, and it will undertake -- that it will take to return to property as an asset to our community and to the surrounding region. Alternative six encompasses the public safety, the timeliness and the reuse goals that the site commands and will serve to benefit Bridgewater in the surrounding area.

I further commend the staff of the U.S. EPA for their diligence or technical expertise in the oversight of this cleanup. They have been a true community partner. And their efforts on behalf of the residents of Bridgewater will be felt for generations to come.

Thank you very much for the time to speak.

MS. DIMAS: Okay. Are there any other elected officials here tonight?

Okay. I think we will now here from CRISIS, their formal comment.

SKWRAO: Thank you.

If you don't mind, I would like to stand up here and not look directly at EPA but to look at the audience.

My name is Ira Whitman. For the past

six years, I have been the technical advisor to CRISIS. CRISIS is the EPS technical assistance grant recipient for the American Cyanamid Site. It's and independent environmental community group that has served for many years as the watchdog for Bridgewater and Somerset County residents regarding this highly contaminated Superfund Site. Ross Stander, the Executive Chairman of CRISIS will be speaking after me.

It's been exactly 50 years since I received my doctorate in environmental engineering science. In that time, I have been a researcher, a regulator and a consultant, all in the field of environmental engineering. I am a licensed professional engineer in New Jersey and other states. I am a New Jersey licensed site remediation professional. So, I have been around the block a couple of times in dealing with this stuff.

For the six years I have been advising CRISIS, I have reviewed technical reports on the Cyanamid Site, written technical reports for CRISIS that are posted on our website, toured the property several times to observe remediation activity, reviewed monthly progress

reports from Wyeth Holdings, Pfizer and regularly participated in bimonthly conference calls with U.S. EPA and NJ DEP, Bridgewater Township, Pfizer and their consultants. Much of my attention was given to the most highly contaminated location on the property, the one we are talking about tonight, Impoundments 1 and 2 which are in the floodplain barely 700 feet from the Raritan River.

In October 2017, CRISIS was invited by EPA to submit its position on Impoundments 1 and 2 just before the meeting of the National Remediation Review Board, which is about to review the alternatives that Mark laid out for you just a few minutes ago. I cowrote that letter with Chairman Ross Stander with input from other members of the CRISIS board. We set forth the criteria that we believe EPA's decision should be based on. And we applied those criteria to each of what we understood the alternatives were likely to be. We had to guess because we weren't given the list of alternatives, but we guessed pretty well. Thank goodness.

The criteria we enumerated, which we

labeled as key principles in the CRISIS analysis are destruction of volatile organics, protection of the Raritan River, groundwater protection, preference for long term solutions, and the final destination of Impoundment 1 and 2 waste material, which is by far the most toxic material on the entire site. And we stressed our concern for the following impacts or potential impacts: Public health, safety, environmental and ecological.

We then assessed each technology we believed was under consideration by EPA and compared what we believe the feasible alternatives to be. With all this considered and about two weeks time, we stated in our letter to EPA the following. And I quote: "CRISIS' preferred remedial solution for Impoundments 1 and 2 is destruction of the waste at an offsite permanent cement kill facilitated by onsite mechanical dewatering. We, therefore, are very gratified by EPA's selection of Alternative Six, which coincides with CRISIS' analysis and with our key principles."

We do appreciate that. With the public announcement of EPA's decision and the formal

record of decision soon to follow, CRISIS' work and the following public concerns are not ending any time soon. Impoundments 1 and 2 are 400 feet from the nearest business and a third of a mile from the nearest residence. Not too close, but close enough to be attentive to issues of safety, air quality and high levels of toxicity in the chemicals and the impoundments. EPA will require the monitoring of vapors and air contaminants. And that's a very important monitoring function.

Other issues to be concerned about moving forward. The river. Discharges to the Raritan had gone down as you heard with Pfizer's interim actions. They must continue to protect the river.

Floods. Floods will happen. The contractors cleaning up these impoundments must be nimble in how they anticipate and protect against floods. And after a flood, should notify the public where the floodwater were exposed to the hazardous substances they are handling.

The rate of progress. One of my favorites. I always talk about the rate of

progress on our bimonthly phone calls. Superfund is, by design, a slow process. But the public has to keep pushing on EPA to get this completed. Before cleanup starts, there will be additional reporting by Pfizer and EPA review and approval which takes time. There will be design and approval steps that take time. There will be preconstruction steps and EPA review and approval.

After all of those appropriate removal -- after all of those, appropriate removal of the wastes to be transported offsite for treatment is estimated to take three years. And then the empty impoundments must be detoxified and filled in and closed. This will be slow, which we understand as long as it is safe.

Truck safety. There are likely to be three -- four or five trucks a day, four days a week, 40 weeks a year for three years. That is not an enormous volume of trucks. But truck safety should be paramount because these wastes are highly toxic and very difficult. There should be coordination with local and state police, no trucks on local roads when the school

buses are operating, and super trained drivers who are thoroughly OSHA and safety trained.

In short, we know that this is not the easiest alternative and it is not the least cost alternative. In fact, as you saw, it is far from it. But with the right controls and vigilance, CRISIS believes it is the safest alternative. Which is why we support it because we believe it benefits Bridgewater, Bound Brook, Somerset County and the state as the best long term permanent solution to one difficult and nasty waste problem at the American Cyanamid Site.

And I would just like to conclude outside of my prepared remarks and thank both Pfizer and EPA for being very communicative and very informative and very helpful during the six years that we have really been reviewing the process and the potential ways of treating cleaning up Impoundments 1 and 2. And I think we believe that you brought us to the right place. We appreciate that.

MS. DIMAS: We will here from Ross Stander.

MR. STANDER: Hi, everybody. I am Ross

Stander. I'm the Chairman of CRISIS. I hope that you are aware that CRISIS has been a community action group involved and engaged in the remediation cleanup of the American Cyanamid Site for last 25 years. Short time, right? We have about 150 members in the group. We are basically cover Bridgewater, primarily, but Somerset County overall.

We are -- we have been focused mostly in that time n the contaminant groundwater and on the eight primary toxic waste sites of which Impoundment 1 and 2, as you have heard several times tonight, has been by far the worst.

We have been the EPA tagged grant holder, so thank you EPA for that since, 1993. That grant primarily pays for us to hire a technical expert who has been Ira Whitman for the last six years. We have, by the way, a website which you can find if you Google us so that you can follow our view of what's going on over the years.

So, let me address the -- our support for the Alternative Six, which Ira mentioned. Having been close to the difficult cleanup of Impoundment 1 and 2 for all these years, we

firmly believe that Alternative Six is the best route to take. As Ira mentioned, we sent the letter to EPA last October just prior to their National Remedy Review Board meeting in which we, having considered the various alternatives expressed of you, that Alternative Six was the way to go.

Crucially, it removes the toxic material from the riverside, protections the river and flooding. That's always been our bottom line when it comes to Impoundment 1 and 2. And the second bottom line is that at the end of the process, the toxic materials are destroyed in a regulated kiln. I don't know that that kiln has been chosen yet, but it presumably will not be in this area. But EPA and Pfizer know very well that all this has to be done very safely.

Let me just spend a couple minutes, if you don't mind, addressing some of the somewhat negative comments that I have seen in various media over the last couple of weeks since the May 23 press when this Alternative Six proposed plan was announced.

Item number one, am I worried about the EPA Washington management? I should really say

mismanagement by the political appointees in Washington, DC? The answer is yes, definitely concerned about that.

Do I think that that situation will impact the eventual proposed plan if it's truly adopted? And I think the answer is no. First of all, it's an EPA Region 2 proposed plan. It has been signed off, I'm told, by the Washington EPA administrator. But it is an EPA Region 2 proposed plan, and it's a good plan. It is one of 21 Superfund priority sites around the USA. Even if that priority situation changes, which I think was suggested in one of the newspaper editorials, we are firmly convinced that EPA Region 2 has always considered this a very high priority site to be cleaned up. And I don't see any reason to think that that's going to change.

Pfizer and EPA, obviously, both want this site to be cleaned up. I shouldn't say obviously, but it's clear to me that they both want it to be cleaned up.

Second issue that I have seen in the newspaper, how about the durability of the funding for this project? So, the most important thing for the newspaper and for all of

us to understand is this is not a government paid-for cleanup. All of the 21 priority sites across the country have a designated responsible party. And that designated responsible party is designated to clean up the site once the plan gets approved and to pay for it. So Pfizer will be legally responsible to pay the approximately $74 million that cleaning up OU8 Impoundment 1 and 2 will cost under Alternative Six. Hopefully, will be chosen.

It is basically guaranteed that Pfizer will pay for it by some mechanism, some financial mechanism, for example, insurance policy. So, there is no real danger there. As a matter of fact as I understand it, and you guys can correct me if I am wrong, Pfizer actually pays for the time and the effort of the EPA staff that is involved in this program all along, not just for the future.

Item three I would like to just touch on for a second is there was some indication in the paper that "nothing had been done" so far on this site in reality other than paper planning. That is not true. Mark just showed a lot of things have been cleaned up over many years.

But I would like to just touch on one particular one. And that was mentioned by, I think, Mark and Ira, as well. But I just want to add a couple points to it. That is the fact that the benzene concentration in the Raritan River close to Impoundments 1 and 2, which would be the worst possible point to measure. The benzene concentration has been reduced from about 200 plus parts per billion pre 2012 to 79.05 parts per billion after 2012 and through today. So, that's about 400 times improvement.

How is that done? Back in early 2000s, CRISIS and Haiyesh Shah, who I think is here of DEP, were recommending or strongly arguing for a dedicated ground treatment plant to be built. Nothing much happened until Pfizer took over in about 2009. They picked up the fight for that. And they put up by 2012 a temporary groundwater treatment plant that was number one. And number two was the isolation barrier wall that Mark showed that was built around Impoundments 1 and 2 at the time. And then there was increased pumping of the groundwaters I think Mark also showed.

So, that got us down to the level of 0.5

or better in benzene. And that basically meets the DEP surface water requirements. And as Mark also showed, there is new groundwater treatment plant which even has better technology for cleaning up the VOCs and the heavy metals which under construction and should be operational by the end of this year. So, that was very good.

I also saw mentioned -- I don't want offload you, but just for a second I saw mentioned in the paper that in the OU4 Impoundments, nothing would be done other than soil capping them. Well, that's not true because Mark Austin showed that the ISS, the solidification in cement and the stabilization process is also going to be used before soil capping. So, that's a much better process than just soil capping by itself.

On Impoundment 13, 17, 24 which actually goes to OU4 also, that's been a kind of sore point for CRISIS over the last year. And we have been pushing hard for that to be more than just soil capping. And in fact, that's true because now the top 2 feet at least of the toxic materials in 13, 17 and 24 are going to be removed. Exactly what's going to be done with

them is still under consideration by EPA, so that's good stuff. I shouldn't say that's good stuff. That's better stuff in, I hope, that EPA comes up with good final decision on 13, 17, 24.

So finally, what to do now about the OU8 Impoundment 1 and 2 plan? From CRISIS point of view, the idea is to accept this very good Alternative Six plan to move forward after some 25 years. It protects the river and flooding. It destroys the VOCs in a regulated kiln. It's going to take some work over the next two or three years to get the legal stuff hammered out and to do further testing of materials and processes. And then three years perhaps with the volume processing and material. But so, we see maybe 2025 as the end point here.

Thank you very much.

MS. DIMAS: Thank you. Okay.

Now I will be opportunity for others to comment. If you would like to comment, please, raise your hand. And I will come around and give you -- anyone else?

(Hands out numbers.)

MS. DIMAS: There will be opportunity again, if something comes up. We will run these

numbers, and I will ask if there are any more.

MR. KERWIN: Hi, everyone. My name is Mike Kerwin. I am the present CEO of Service Side County Business Partners, Chamber of Commerce. In the area since 1919. We are about to celebrate our hundredth anniversary. We also partner with the Somerset County Freeholders to provide economic development services on behalf of business community.

I am here to support the comments previously made. Actually, very proud to be a resident of the area. I want to commend Mayor Hayes and his team, the great work by CRISIS keeping an eye on the community's interest. I want to commend the EPA. Really accelerated progress since you took over from the DEP. And I also work closely with Pfizer. And I can testify firsthand that they are committed to getting this project done. And you can see the results that have happened since they entered the picture. What has happened in the last few year, I know it's gone slow compared to the previous funding going at lightning speed it seems.

I do, also, want to commend that we have

a track record that we can rely on now based on the work that has already taken place by groundwater remediation, for example, so we can have some confidence that this toughest part of the project, this Impoundment will actually get cleaned up hopefully relatively quickly.

For the record, I just want to note that the Somerset County Business Partnership on behalf of the Somerset Country Freeholders is able to get federal grant to do comprehensive economic development strategy for Somerset County, actually known as SETS. This economic development plan was incorporated into the Somerset County master plan as an economic development element. SETS is designed to come up with strategies to drive job creation and private sector investment. I can tell you flat out that this project meets our SETS objectives. So when you are evaluated from a federal point of view and can take into consideration the federally approved comprehensive economic development strategy, supports this plan.

So hopefully, that gives us a little more weight in terms of moving forward quickly and to get the work done. I think that covers

it.

Looking forward to the ground breaking and, hopefully, the day not too long in the future when we are completing the project.

Thank you very much.

MS. DIMAS: Thank you.

I should have said this before. If we can go -- I want to be cognizant of time. It's five of eight. If we can keep our comments under five minutes, that would be helpful since we have many people that want to comment.

MS. DORWICK: Hi. I am Sue Dorwick, Bridgewater resident. I have more of a question than a comment. In thinking about the flooding that you showed on your slide, Mark, got me thinking about the contaminants dispersing beyond the Impoundments or possibly entering into the berm material. And I was wondering if you can address that, if you found that there are -- that it doesn't deserve treatment or what you found.

MR. AUSTIN: The contamination -- first of all, the impoundments are lined with clay there. Clay layer itself is specifically to prevent that kind of -- prevent it from any kind

of contamination to seep into the berms themselves. During our remedying implementation and design work, we will sample that area to ensure that the contamination hasn't moved. Current the way they are now, they have a synthetic liner so the material will not escape or leave the bermed area. So --

MS. DORWICK: I guess I was thinking more about the flooding an contaminants.

MR. AUSTIN: There has been no evidence of contamination moving. I believe it was one of these hurricanes, it could have been Irene, that some of the tar escaped but it was laying on top of the berm. There was no evidence that it went any further. It was cleaned up, and the berms were secured and the synthetic liners reinforced.

MS. LINDA: Linda Sogormer, Bridgewater resident, also. Mine is also more along the lines of a question.

When we had the flooding in the past, Mark, did any of the contaminants get into the river so that you may have seen, like, a need for the fish to be tested at any point? Because I know there is fishing at various points at the

Raritan River at, you know, certain times of the year. And I was wondering if they had been looked at or if you saw a need or anyone.

MR. AUSTIN: There was no evidence that the material had moved outside of on top the berms. There was some investigation to see if it could be because it's tar. It's not going to go that far. If there was evidence there was like a trail --

MS. LINDA: Yes.

MR. AUSTIN: -- breadcrumbs going into the Raritan, then we would go further.

MS. LINDA: I see.

MR. AUSTIN: No evidence to be overly concerned with that.

MS. LINDA: Thank you so much. I didn't see that in the literature.

MS. DIMAS: Thank you.

MR. RAMOW: Good evening. My name is Greg Ramow. I'm the New York/New Jersey gatekeeper. I am taking over for Debbie Manns who went over to DEP. I wanted to lend my support to the comments made tonight and the recommendations. But furthermore, I wanted to thank EPA, Pfizer for -- as oppose to being

recalcitrant party, stepping up to the plate and taking on the responsibilities even though they were inherited and particularly to CRISIS. From a distance, with -- following this from a distance and from a colleague Bill Shawl, Raritan River keep, I've been able to go to CRISIS website, look at the technical paper, look at the comments, keep informed at all times, see how they worked to ensure that EPA is -- done the best that they can.

So, I just wanted to tip my hat and say thank you. It's also helped us. I sit on the Raritan Cag down in Lawrence Harbor. And we have a lawsuit against a less hospitable responsible party National Lead. But your work has certainly helped to inform us. And congratulations, it's been stellar.

MS. DIMAS: Thank you.

MR. FREDERICK: My name is Gary Frederick. And I lead the Raritan Valley Group of the Sierra Club in Somerset County. And I would like to read a statement on behalf of the New Jersey Chapter of Sierra Club.

Before I get into the remarks, I do want to say thank you for the candor and the details

of what you presented here. It was very enlightening actually. And I have read the alternatives before we even got here, so I appreciate the extra detail that you gave out.

However, the American Cyanamid Site, it is one of the most toxic sites in the state. It's been on the list for over 30 years. As Mark has gone through, it sits on the bank of the Raritan River and on a floodplain. And it needs a complete and a full cleanup. The EPA, as we saw, is making real progress on cleaning up this site. But without a complete cleanup, we will still see consequences. Although there will be excavation and removal of much of the toxic materials as we heard, a significant amount of materials will remain and be backfilled into the excavation site that will then be capped. And by capping the site, we feel the EPA is playing Russian roulette.

The EPA should not be resorting to capping the site as a major part of the solution especially since there are better options. There are areas of the site where they can store the remaining contaminated materials after they removed from the ground rather than just capping

them inside. And this provides a place to send them to rather than just get rid of them. In the meantime, these toxic materials will be stored away from the floodplain. By capping much of the site, toxins can be washed into the river in future floods. As we heard, there are even lagoons holding major gallons of toxic waste on the overall site, and they need to be removed, as well. Capping won't work. And even the institutional controls have been damaged or knocked out during floods which have released toxic water into the river as we heard.

By capping the site, this raises serious concerns about the use of the collection trench and containment wall, and the possibility of the failure of lagoons causing a catastrophic spill into the river. And in fact, during the flooding in 2010, seepage did occur into the Raritan River.

The American Cyanamid Site is a location of current waste water treatment plant in Bridgewater, where its discharge is piped downstream pass the river's water supply intakes. The surrounding area is home to over 1 million people providing drinking water,

transportation and recreation opportunities and important habitat for wildlife. There needs to be a complete cleanup of the site, removing the 900,000 tons of waste materials and other toxins that are located there.

The groundwater underlined the site is highly contaminated with benzene and other contaminants. Many of the site contaminants are known or suspected to cause cancer in people and animals. In New Jersey, there has been flood after flood. And it's only a matter of time before another storm happens. The proposed timetable for this project is 38 months, but realistically we know that's going to go longer. If we delay the complete cleanup of this site, the next major an inevitable flood can cause dangerous spill. So, we shouldn't delay the cleanup. Otherwise, we continue to jeopardize the Raritan and the people who depend on it.

This Superfund site has to be fully and properly cleaned to protect the people and the environment of Bridgewater.

MS. DIMAS: Number five.

MR. HATCH: I sat here tonight, and I listened to a lot of people talk. And a lot of

people have the wrong idea about what's happening and what's going on. I worked in American Cyanamid, so if you want to throw rocks, throw them now.

I worked there from 1970 to 1982. And I am familiar with all the contamination that went on over there at that time. The last speaker spoke of it being in a floodplain. And I'd like to alleviate your fears of that. If you look at the fact that most of the dams in that river have been removed within the last five years, so the possibilities of the Raritan coming up as it did in 1970s where we had 16 inches of water inside the buildings in American Cyanamid that were 3 feet above ground level, so we are talking about 9-foot of water that came through there and washed most of the contaminants at that point out of the entire area except what was in the ground that couldn't be washed away. So, I think the fear of flood is a little more pronounced.

The last gentlemen said 30 months is too long for it to take. Well, if we do get -- I guess what you would call Maria down in Puerto Rico, we might have a chance of getting that

area flooded again. But it's my personal and not professional -- but it's my personal fear that the flooding is nominal.

Now according to the number 6 item here, I am with it all the way. But there is a little tweak I would like to add to it seeing as that I am associated with the adult day center. And I watch that -- the wellness center, the ballpark and the promenade. If they are saying they are going to put in air quality control, my fear on the air quality control which has been since day one and Pfizer has advised me that there is control on it, if there is any kind of a spill of any sort that would come our way.

But the adult day center is -- how should I put it? I don't want to insult anybody. But it's for the elderly and those that have Alzheimer and associated illnesses. They are very susceptible to any changes whatsoever. And the only question I have is will the air quality control to protect all of these people, not only the ADC, be of the type that will initiate a response fast enough that some remedial action can be taken?

If something should happen with the

releases of any kind of contaminants in the air, especially a little afraid of the screw action thing. I am not thoroughly, you know, familiar with it. And I will talk to those people at Pfizer that I have contact with to get a better understanding of it. But if something is released into the air, we have to be able to get those people out of the area, and we have to do it fast.

So, I would ask the EPA and Pfizer to both look at the expediency of getting management, emergency management people in and notifying those particular organizations in the area and the residents of Bound Brook in particular. Now I have spent 28 out of 30 days in November in, pardon me, in February just to see the wind velocity and the direction of the wind coming off the Cyanamid place. And 28 out of the 30 days, the direction was in to the ballpark, to the Promenade and to the Wellness Center and the ADC and the SDS tire, which is over there also.

So, I think this is a critical point. Until they can give me a better understanding of what this extraction is going to be. But Pfizer

has done a great job. They have kept us informed. The residents around the perimeter have all been invited along with the water company and the county, Bridgewater. Almost everybody has been involved in a quarterly meeting which they explain every single detail that's going on. They had given us the right to go in there. They have taken us around on tours to show us what went on. And a few times, I've been able to point out to them small factors that they didn't know at that particular point it being I had worked there.

So, don't think has been said in the paper the last few days that this is just a haphazard thing that's going on. I sat with these people. I talked to these people. I have listened to these people. And believe me, 30 months may seem like a long time and $74 million may seem like a lot of money, but the cleanup over there is being done.

Thank you.

MS. DIMAS: Can you state your name?

MR. HATCH: My name is Steve Hatch. I am a resident since 1965 in Bridgewater.

MS. DIMAS: Thank you.

Number six.

MR. SCHULTZ: Good evening. My name is Bill Schultz. I'm the Raritan River keeper. And I just have a couple questions. I understand that tonight was mainly to address Impoundments 1 and 2.

MS. DIMAS: Yes, correct.

MR. SCHULTZ: Any of the actions from the rest of the site I will hold comments back because my attitude is that eventually all caps will fail.

However, you stated that you have created a holding area or an impoundment capable of holding a million cubic yards off site or near the site. Is that true?

MR. AUSTIN: Are you referring to the Corrective Action Management Unit?

MR. SCHULTZ: I believe so.

MR. AUSTIN: The big facility to the northwest of the site, yes.

MR. SCHULTZ: Capable of holding a million cubic yards?

MR. AUSTIN: That's correct.

MR. SCHULTZ: But you -- I have heard mention of up to 400,000 cubic yards of

contaminated material with your --

MR. AUSTIN: Yes. Some of the -- when the other impoundments were remediated, they were placed in that CAMU.

MR. SCHULTZ: Okay. Based on my question, is there a chance that you might -- since you have excess capability of holding additional contaminants, is there a chance that anything from another site might come to this site?

MR. AUSTIN: No. That particular -- the CAMU was built specifically for the sites hazardous wastes. So, no.

MR. SCHULTZ: There is no chance that if you have a smaller site with some moderate contamination, you are not going to bring it here?

MR. AUSTIN: No.

MR. SCHULTZ: And fill that million cubic yard capacity?

MR. AUSTIN: No. In fact, that will most likely -- it was held open for a little while until we made a decision on 1 and 2 just in case we are going to need the capacity. My understanding today is that because we are not

using this -- the rest of the CAMU, they will most likely be closing the CAMU.

MR. SCHULTZ: Okay.

MS. DIMAS: Number seven.

MR. ROWE: I am Mike Rowe, a resident of Bridgewater, professional engineer. This is just a question. Looks to me like the plan is pretty much the way we would remediate similar systems. So, I agree with what you are going along with. I don't understand why you wouldn't try to get a cement kiln locally on site so you can remove the truck traffic.

MR. AUSTIN: The cement kiln -- there is only, like, three or four of them in the country that can handle this waste. There has been some pretty strong opposition from CRISIS and the Township, in general, of any kind of facility being built. This has been going on for many years. It would probably also require extensive air pollution control. It would be very, very expensive. Removing the cost, it would be very complex, as well.

So, if there are facilities in, say, middle of the country that can take this material and want this material, want to burn

it, that's probably the easy route.

MS. DIMAS: Okay. Number eight?

MS. TARSLY: I am just wondering if the present administration will affect the EPA standards of monitoring the site?

MR. AUSTIN: Regarding this particular site, the current administration has reviewed our preferred remedy and has blessed it. So once we sign this record of decision in the next month, two months, there will be no impact. And because they reviewed all the documents that we have submitted in support of our preferred remedy, they offer no changes of any kind of significance. And if the plan goes through like we are hoping it to, they would not oppose it at this point. That's what we expect.

MS. DIMAS: Are there any other comments or questions? Can I get your name for the record?

MS. TARSLY: Linda Tarsly, resident of Bridgewater.

MS. DIMAS: Thank you.

MR. CRANE: I'll be brief. Jim Crane.

One of the things I've been doing since the idea came up about the transportation of

this has been looking at the Hazardous Materials Transportation Act passed in '75, amended in 1990, again in '94 and again after 9-1-1. And one of the concerns I have with that was the ability of the public to be informed about the transportation of this. And as I was going through that, I saw that through -- well, there's a new E-Manifest system that EPA is putting up online, will be online by the end of the month.

But one of the concerns I had was how public the planning for that transportation would actually be. And also, the concern that first responders are made aware of these exiting from the facility, as you mentioned, with the rail line there. That does pose some problems as well in terms of their access. Perhaps at some point as we go through this process, we will get into that a little bit more. But I also wanted to make sure that there was enough public notification to know there is going to be this number of trucks coming through there and how it's going to be handled.

Thank you.

MR. AUSTIN: The -- I will answer the

second piece first. Regarding the emergency management folks, when we perform the treatability studies over the last few years, actually out at the site, we had an extensive discussion with all of the OAM people. They were very aware of what we were doing at the time. I anticipate that when we are close to starting our project, we will get them involved to inform them exactly what's going on, what would be required, what kind of materials are out there so that they are ready and able to assist us, if necessary. So, that will be taken care of.

Frankly, it will be taken care of at any site that we remediate.

The first part, I'm sorry?

MR. CRANE: Just about the public involvement with that part of the process.

MR. AUSTIN: Because of the new requirements coming out?

MR. CRANE: Yes.

MR. AUSTIN: I'm not aware of that yet. Are you more concerned that you would need to be more involved, more in tuned?

MR. CRANE: Will people know about it

and things along those lines in terms of, you know --

MR. AUSTIN: Yeah. Typically, we would engage the public in the remedial design part. But for this particular site, I see no issue with having a public availability session before remedial actions starts where the actual trucks would be going through the community. It would actually -- we can probably present something along the lines of what we really found and what you can truly expect. There can be in the form of public availability session. It can be in form of fact sheet to distribute to the public.

Whatever way -- I mean, it's -- we are fully transparent on this. And I agree with letting everybody know what's going on.

MS. TARSLY: Thank you.

MS. VAUGHN: I would just add, we also coordinate very closely with the local government and -- on any transportation plans and would get community involved.

MS. DIMAS: One last opportunity to comment or ask a question?

(No response.)

MS. DIMAS: Okay. Well, thank you very

much for coming tonight. I did want to mention a couple things in case you would like to make a comment. You can mail written comments to Mark at -- the address is right here. It's also on our website. You can also email Mark at his email address. It's there as well as on our website.

Comment period will end June 28, 2018, so in just a couple weeks. So please, we would love all of your comments. And if you have any questions or feel free to email either Mark or myself, both of us. And thank you so much for your time tonight in coming out to listen to what we have preposed.

Thanks.

(Public Meeting concluded at 8:24 p.m.)

C E R T I F I C A T I O N

I, hereby certify that the proceedings and evidence noted are contained fully and accurately in the stenographic notes taken by me in the foregoing matter, and that this is a correct transcript of the same.

ANGELA M. KING, RPR,
Court Reporter, Notary Public

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ATTACHMENT D

WRITTEN COMMENTS

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June 26, 2018 via electronic mail (austin.mark@epa.gov)

Mark Austin
Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007-1866

Subject: Comments on OU8 Proposed Plan – American Cyanamid Superfund Site

Dear Mr. Austin:

Pfizer is providing the following comments pertaining to the Proposed Plan for environmental cleanup of Operable Unit 8 (OU8 aka Impoundments 1 and 2) located at the American Cyanamid Superfund Site (Site) within the Township of Bridgewater, New Jersey.

USEPA's Proposed Plan presents an effective approach for addressing the complex characteristics associated with Impoundments 1 and 2 that is protective of human health and the environment. As a health care company, Pfizer is committed to the protection of human health and the environment. Our commitment to high standards for quality, safety and effectiveness extends to the work being performed by our subsidiary Wyeth Holdings LLC. We remain committed to working with USEPA, NJDEP and other stakeholders, to continue to advance the Site remediation process and are prepared to invest appropriate resources to implement this final remedy.

The Proposed Plan refers to the various materials within Impoundments 1 and 2 using several terms, including "acid tar," "impoundment material," "soil and clay impacted by impoundment material," "soil and clay impacted by impoundment material exceeding PRGs" and "Principal Threat Waste" (PTW). The terms "acid tar" and "impoundment material" are used synonymously; and these materials are clearly distinguished from soil and clay that might be impacted by impoundment material in the Proposed Plan. However, there is some ambiguity with the term PTW, since both "acid tar" and "soil and clay impacted by impoundment material exceeding PRGs" may be considered to be PTW by others. For example, on page 6 the Proposed Plan states that "PTW may also include soil and clay impacted by OU8 impoundment material (acid tar)." Thus, the statement on page 14 that Alternative 6 would address the RAOs and meet PRGs by "permanently removing almost all of the PTW from the impoundments" could lead to confusion during implementation of the remedy. To avoid this potential confusion, we recommend that this be revised to state, "permanently removing almost all of the acid tar from the impoundments." For the same reason, we urge USEPA to use the term "acid tar" in the ROD when referring to materials to be removed and destroyed off-site.

When describing the PRGs and applying those PRGs to any remaining soil and clay, if a portion of the remaining soil and clay is deemed to exceed the PRGs and thus be deemed PTW, the ROD must be clear that the remaining soil and clay will remain within the footprint of OU8 beneath a protective cover following treatment. The key distinction being that remaining soil and clay exceeding the PRGs, even if containing some incidental acid tar, can safely be closed in-place following in situ solidification and stabilization (ISS) and remaining soil and clay not exceeding the PRGs can remain within the footprint of OU8 beneath an engineered protective cover without further treatment (i.e., it is not a PTW). As summarized in the Proposed Plan, the vast majority of PTW within Impoundments 1 and 2 (i.e. the acid tar) will be excavated, treated and disposed of offsite. The acid tar has significant heat energy value that would be beneficial to a cement kiln as supplemental fuel, contrary to clay and soil that may exceed PRGs that is best treated with ISS.

Under the heading "Preferred Alternative" on page 18, 3rd paragraph, there is a statement that "ISS would further reduce contaminant mass through media transfer (enhanced desorption), capture of emissions, and destruction in a vapor system." We agree that ISS treatment of soil and clay exceeding the PRGs and possibly containing minor amounts of acid tar will further reduce contaminant mass and its fate and transport mechanisms. We also agree that emissions associated with the media transfer must be managed to assure compliance with applicable emission limits. However, we currently do not expect that capture and destruction of emissions will be the necessary or appropriate means to meet these limits. The actual approach to managing emissions would be finalized during remedy design. One key benefit of the remedial approach under Alternative #6, as presented in the FFS Report, is the ability to quickly demobilize equipment in the event of an imminent flood, which can occur frequently within the vicinity of Impoundments 1 and 2. Alternative #6, as presented in the FFS Report, was the only alternative (other than Alternative #1 – No Action), that did not depend on a thermal oxidizer to be permanently installed and operating within the floodplain. Consequently, design flexibility should be maintained to consider other means and methods for control of air emissions and odors when conducting ISS under the remedy described in the Proposed Plan.

We look forward to working with USEPA on carrying out the Proposed Plan to cleanup Impoundments 1 and 2.

Please contact me should you have any questions.

Very truly yours,

Russell Downey

Russell Downey
Director – Environmental Engineering, Remediation & Transactions
Global Engineering
Pfizer Inc

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DAN HAYES
Mayor

June 12, 2018

Mr. Mark Austin
Remedial Project Manager
USEPA
290 Broadway, 19th Floor
New York, New York 10007

RE: Public Comments
American Cyanamid Superfund Site Proposed Plan

Dear Mr. Austin:

Thank you for the opportunity to provide written comments on the Proposed Remedial Plan for impounds 1 and 2, also referred to as Operable Unit Eight (OU8) on the American Cyanamid Superfund Site. The input provided in this correspondence serves to reinforce my commitment as a local official to advocate for an expeditious and environmentally sound clean-up of the former facility.

My foremost concern as the Mayor of Bridgewater is for the health and safety of the community. In this regard it is imperative that these aspects be paramount during any remedial actions as directed by the United States Environmental Protection Agency (USEPA) for the former American Cyanamid Superfund Site. It is further obligatory that Township residents and the surrounding community in close proximity to the former industrial site be recognized as the primary stakeholders in the remediation and viable restoration of the property. All remediation plans from a technical perspective should be designed and reviewed with full recognition and acknowledgement of the needs and protection of the immediate community. I trust the EPA experts have determined which is the most suitable remedial plan to restore the site and takes into account the safety, health and welfare of the surrounding community during the cleanup.

That being said I support the approval of Alternative 6, Excavation, Dewatering, Treatment/Destruction Off Site, and Protective Cover, for impounds 1 and 2 on this site. The proposed plan represents the best available alternative for site remediation at this time. It is noted that Pfizer Corporation has taken a site they inherited through acquisition and demonstrated a willingness to invest significant capital resources to initiate and expedite site clean-up. Their communication with Township government and my Administration is to be commended. Their remediation team has expressed a willingness and desire to educate the community about the process and the steps it will undertake to return the property as an asset to the community and surrounding region. Alternative 6 encompasses the public safety, timeliness and reuse goals the site commands and will serve to benefit Bridgewater and the surrounding community.

I would further commend the staff at the USEPA for their diligence, support and technical expertise in the oversight of this cleanup. They have been a true community partner and their efforts on behalf of the residents of Bridgewater will be felt for generations to come.

Sincerely,

Daniel J. Hayes, Jr.
Mayor

CRISIS

Community Environmental Advocate
662 Cedarbrook Road
Bridgewater, NJ 08807
908-526-1566

June 21, 2018

Mark Austin
Remedial Project Manager
U.S. Environmental Protection Agency, Region 2
290 Broadway, 19th Floor
New York, NY 10007-1866

Re: American Cyanamid Superfund Site
Bridgewater, New Jersey

Dear Mr. Austin:

CRISIS, Inc. appreciates this opportunity to comment on EPA's proposed plan for remediation of the OU 8 area of the American Cyanamid site – Impoundments 1 & 2.

As we expressed at the public meeting held in Bridgewater on June 12, we support EPA's recommended Alternative 6 for this portion of the site – known as ***"Excavation, Dewatering, Treatment/Destruction Off Site, Protective Cover".*** We favor this alternative because it best meets CRISIS' key principles for protecting the site, which we enumerated in our letter to you in October 2017 in advance of the National Remedy Review Board. These principles are:

- Complete Destruction of the Volatile Organic Compounds
- Protection of the Raritan River
- Ground Water Protection
- Preference for Long term Solutions
- A Final Destination for the Contaminants Outside of the Flood Plain and Off-Site

A copy of Ira Whitman's comments at the June 12 meeting are attached for the record.

As you know, CRISIS has had a long history as the EPA Technical Assistance Grant recipient for the American Cyanamid Site, and an even longer history as a responsible and effective Community Environmental Advocate. We have advocated for both the permanent and temporary ground water treatment plants at the Cyanamid site, as well as the HBW barrier walls and other measures that prevent contaminated ground water from entering into the Raritan River. We recently had the opportunity to tour the site and to observe the site-wide ground water collection and treatment system under construction. We will be excited and gratified when the facility construction is complete and fully operational.

We understand that the purpose of this letter is to comment on the selection of remediation methods for OU 8. However, because we are so familiar with the site and have had such a long history with it, we do wish to comment on a few aspects of the OU 4 remediation as the design is about to be completed and contractors selected for remediation of the site- wide soils and for many of the impoundments.

CRISIS

Community Environmental Advocate
662 Cedarbrook Road
Bridgewater, NJ 08807
908-526-1566

The presence of Impoundments 13, 17 & 24 in the flood plain has always been troubling to CRISIS. Due to their precarious location near the river, we urge you to consider removing all untreated waste material from those lagoons, not just the top 2 feet. We reiterate that soil caps for these lagoons, and others on the property will be highly vulnerable to floods, particularly at locations where high velocity flood waters can be anticipated. We believe all soil caps on the site should be hardened, and where necessary materials treated by In-Situ Solidification and Stabilization be anchored in place.

Additional measures with respect to OU 4 that we believe should be considered include:

- Periodic scheduled inspections of all soil caps, indefinitely
- All pumping equipment and emergency electrical power supplies should be raised on platforms to ensure protection during the occurrence of floods

CRISIS appreciates the valuable information provided by EPA during this long effort to remediate the site, and the open communication that you have had with our organization. We wish you success with getting the remediation for OU 4 fully functional and operational, and in implementing the selected remediation for OU 8 at the earliest possible date. The citizens of Bridgewater and surrounding communities deserve to see and to benefit from your actions, and as a community based organization we will continue to interact with EPA on their behalf.

Very truly yours,

Ross Stander (KK)

Ross Stander
Executive Chairman

Ira L. Whitman, PhD, P.E.
Technical Advisor

RS/IW/kk
Attachment

cc: Melissa Dimas, USEPA
Mark Schmidt, USEPA
Haiyesh Shah, NJDEP

PRESENTATION AT EPA PUBLIC MEETING, JUNE 12, 2018, BRIDGEWATER, NJ

Good evening – my name is Ira Whitman. For the past 6 years I have been the Technical Advisor to CRISIS.

CRISIS is the EPA Technical Assistance grant recipient for the American Cyanamid site. It is an independent environmental community group that has served for many years as a watchdog for Bridgewater and Somerset County residents regarding this highly contaminated Superfund site. Ross Stander, the Executive Chairman of CRISIS will be speaking after me.

In the 50 years since I received my doctorate in Environmental Engineering Science I have been a researcher, a regulator, and a consultant, all in the field of Environmental Engineering. I am a Licensed Professional Engineer in New Jersey and 5 other states, and I am a New Jersey Licensed Site Remediation Professional.

For the 6 years I have been advising CRISIS I have reviewed technical reports on the Cyanamid site, written technical reports for CRISIS that are posted on our web site, toured the property several times to observe remediation activity, reviewed monthly progress reports from Wyeth Holdings/Pfizer and regularly participated in bi-monthly conference calls with USEPA, NJDEP, Bridgewater Township, Pfizer, and their consultants. Much of my attention was given to the most highly contaminated location on the property, Impoundments 1 & 2, which are in the flood plain, barely 700' from the Raritan River.

In October 2017 CRISIS was invited by EPA to submit its position on Impoundments 1 & 2 just before the meeting of the National Remediation Review Board which was about to review the alternatives for remediation. I co-wrote that letter with our Chairman, Ross Stander, with input from other members of the CRISIS Board. We set forth the criteria that we believed EPA's decision

should be based on, and applied those criteria to each of what we understood the alternatives were to be. The criteria we enumerated, which we labeled as Key Principles in the CRISIS analysis, were:

- Destruction of Volatile Organic Compounds
- Protection of the Raritan River
- Ground Water Protection
- Preference for Long Term Solutions
- Final Destination of Impoundment 1 & 2 Waste Material (which is by far the most toxic material on the entire site)

We stressed our concern for the following impacts:

- Public Health
- Safety
- Environmental
- Ecological

We then assessed each technology we believed was under consideration by EPA, and compared what we believed the feasible alternatives to be.

With all this considered, we stated in our letter to EPA **"CRISIS' preferred remedial solution for Impoundments 1 & 2 is destruction of the waste at an off-site permitted cement kiln, facilitated by on-site mechanical dewatering".** We are gratified by EPA's selection of Alternative 6, which coincides with CRISIS' analysis and our key principles.

With the public announcement of EPA's decision, and the formal Record of Decision soon to follow, CRISIS' work, and the following public concerns are not ending anytime soon.

Impoundments 1 & 2 are 400' from the nearest business and 1/3 mile from the nearest residence. Not too close – but close enough to be attentive to issues of safety, air quality and the high levels of toxicity of the chemicals in the impoundments. EPA will require the monitoring of vapors and air contaminants.

The River – Discharges to the Raritan have gone down with Pfizer's interim actions. They must continue to protect the river.

Floods – Floods will happen – the contractors cleaning up these impoundments must be nimble in how they anticipate and protect against floods, and after a flood must notify the public whether flood waters were exposed to the hazardous substances they are handling.

Rate of Progress - Superfund is by design a slow process, but the public has to keep pushing on EPA to get this completed. Before cleanup starts there will be additional reporting by Pfizer – and EPA review and approval; there will be design and approval steps that take time; there will be pre-construction steps- and EPA review and approval; after all of those approvals removal of the wastes – to be transported off-site for treatment is estimated to take 3 years, and then the empty impoundments must be detoxified and filled in and closed. This will be slow – which is understood, as long as it is safe.

Truck Safety - There are likely to be 4 or 5 trucks a day, 4 days a week, 40 weeks a year, for 3 years. This is not an enormous volume of trucks – but truck safety should be paramount because these wastes are highly toxic and difficult! There should be coordination with local and state police, no trucks on local roads when school busses are operating, and super-trained drivers who are thoroughly OSHA and safety trained.

In short, we know that this is not the *easiest* alternative, and it is not the *least cost* alternative (far from it). But, with the right controls and vigilance CRISIS

believes it is the ***safest*** alternative, which is why we support it, because we believe it benefits Bridgewater, Bound Brook, Somerset County, and the state as the best long term, permanent solution to one difficult and nasty waste problem on the American Cyanamid site.

For questions or comments please contact Dr. Ira Whitman at iwhitman@whitmanco.com

SIERRA CLUB
FOUNDED 1892

NEW JERSEY CHAPTER
145 West Hanover St., Trenton, NJ 08618
TEL: [609] 656-7612 FAX: [609] 656-7618
www.SierraClub.org/NJ

June 27, 2018

Mark Austin, Remedial Project Manager
U.S. Environmental Protection Agency
290 Broadway, 19th Floor, New York, NY 10007
austin.mark@epa.gov

Re: American Cyanamid Superfund site in Bridgewater Township, NJ

Dear Mr. Austin:

The New Jersey Sierra Club wants to commend the EPA for some parts of its clean-up plan for the American Cyanamid Superfund site in Bridgewater Township while expressing concern for other parts. It's taken way too long to get to this stage of the clean-up and we still have a long way to go. We support your plan to completely remove the acid tar in the site's impoundments. While we commend the Agency for making progress, we're concerned that without a full-clean up of the entire site, the community will still see major consequences from this site. This is especially because the site lays on the Raritan River in the flood plain and capping this area could lead to major leaks or spills.

We believe that simply capping the site is not the best action for the environment or the people of Bridgewater. There are other options that could work better to remove and store the contaminated materials until they can be completely removed from the area. Storing them elsewhere rather than capping them keeps the contamination out of the floodplain in the meantime. All the metals, VOCs, and cyanide have to be removed from the system because institutional controls will not work here in the long term.

During future floods, toxins could be washed into the river. There are even lagoons holding millions of gallons of toxic waste on the site and they need to be removed before they rupture. We have seen institutional controls damaged or knocked out during floods, releasing toxic water into the River. By capping the site, this raises serious concerns about the use of the collection trench and containment wall and the possibility of the failure of the lagoons causing a catastrophic spill into the river. During flooding in 2010 seepage on the site entered the Raritan River.

The American Cyanamid site is the location of the current waste water treatment plant in Bridgewater where its discharge is piped downstream past the River's water supply intakes. The surrounding area is home to over one million people, providing drinking water, transportation and recreation opportunities and important habitat for wildlife. This site has been dangerous to human health for far too long. There needs to be a complete clean-up of the site removing the

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900,000 tons of waste materials and other toxins that are on the site. Since this is in a flood prone area and a flood plain we need a permanent clean up. Institutional controls can fail and be washed away during the next flood.

Pollution from contaminated sites leaks into the river and harms the environment and public health. The groundwater underlying the site is highly contaminated with benzene and other contaminants. Many of the site contaminants are known or suspected to cause cancer in people and animals, and benzene can cause cancer in people. We should not delay the real clean-up otherwise we continue to jeopardize the Raritan and the people who depend on it.

We are urging the EPA to update their clean-up plan for the American Cyanamid site in Bridgewater to include a complete removal of contaminates from all areas of the site. We need to get rid of the impoundments because the pump-and-treat system shuts off during a power failure or flooding. This could leave to contaminated water getting into the River. Hardening area in floodplain doesn't work either. We believe that no contaminates should be left in the ground with a cap because it presents a future risk.

If you have any questions or would like to discuss this matter further, please feel free to call me at (609) 558-9100.

Sincerely,

Jeffrey H Tittel

Jeff Tittel
Director, New Jersey Sierra Club

CC:

Austin, Mark

From: linda sikora <lsikora@optonline.net>
Sent: Thursday, June 28, 2018 1:23 PM
To: Austin, Mark
Subject: Ques. re: American Cyanamid Superfund Site- Bridgewater, NJ
Attachments: EPA AMERICAN CYANAMID QUES. jUNE 2018.doc

Mr. Austin:
Attached are questions relating to the Proposed Alternative Plan 6 for the above site.

Lastly, is it possible to obtain a copy of the slides used for the EPA's presentation to the public?

I've requested a delivery receipt. Thank you very much for this opportunity.

Linda Sikora
908.231.1710
lsikora@optonline.net

June 27, 2018

1035 Carteret Rd.
Bridgewater, NJ 008807

Mr. Mark Austin
Remedial Project Manager
US Environmental Protection Agency
290 Broadway, 19th Floor
New York, NY 10007

Re: American Cyanamid Superfund Site, Bridgewater, NJ

Dear Mr. Austin:
Thanks very much for this opportunity for public comment on the above site.
My questions follow:

1) EPA's Proposed Plan states that Baseline Human Health Risk Assessments were done in 2006 and 2010. In 2010 it was done to evaluate potential cancer risks and non-cancer hazards associated with exposure to surface soil, groundwater (I realize groundwater is addressed in OU4 and not this plan) and site impoundments. (P. 8 of proposed plan).

   a) Shouldn't a more recent Human Health Assessment be done to see if the risks have changed in a way that would impact the nature of the remediation?

   b) The Plan states "...the list of risk drivers in the impoundment areas is under-estimated. Due to the high concentration of several chemicals, the presence of other potential risk drivers is masked." (P. 8 of plan).

      Does this mean the remediation may be changed in part, once the other risk drivers are identified, so these risks can also be mitigated/eliminated?

   c) Has anyone (workers, residents, etc.) ever reported symptoms or illnesses, which could be associated with chemicals, hazards, etc. in impoundments 1 & 2? And if so, will measures be taken during remediation to reduce the chances of these symptoms occurring again?

2) The Baseline Site-Wide Endangerment Assessment (BEA) done in 1992 said with

the exception of the great blue heron, the on-site habitat does not support threatened or endangered species, and sometimes one can catch a glimpse of a heron drinking from an impoundment. (P. 7 of plan). What protections will be afforded the great blue heron?

3) Have any fish been tested in the Raritan River or its tributaries, etc. to see if any contaminants in impoundments 1 and 2 have leaked into the River through the groundwater? Parts of the River are periodically stocked with fish as fishing is a popular sport.

4) Lastly, is it possible to obtain a copy of the slides used in EPA's presentation to the public?

A copy of these questions will be emailed to you today and also mailed today in snail mail. Thank you very much for taking the time to address these questions.

Very truly yours,

/s/ Linda Sikora

Linda Sikora
lsikora@optonline.net
908.231.1710

Austin, Mark

From: Kristen Schiro <kschiro@bridgewaternj.gov>
Sent: Monday, June 18, 2018 3:15 PM
To: Austin, Mark
Subject: FW: EPA Proposed Plan for American Cyanamid Superfund Site Impoundments 1 and 2

Hi Mark,

Below are comments forwarded to me by Tom Francis, Bridgewater resident and one of the members of the Bridgewater Environmental Commission. Please include these in the public comment. Thank you.

Best regards,

Kristen

From: tfrancis@cardinallsrp.com [mailto:tfrancis@cardinallsrp.com]
Sent: Thursday, June 07, 2018 9:12 AM
To: Kristen Schiro
Cc: 'linda sikora'; 'James Rokosny'; 'Debbie Rokosny'; 'Susan Dorward'; rchaz@optonline.net; 'Aimee Alonso'; 'Alex Mycio'; pushpaamin@gmail.com
Subject: FW: EPA Proposed Plan for American Cyanamid Superfund Site Impoundments 1 and 2

Kristen,
I'll look at this further (and may submit questions to region 2 later) but overall, excavation and off-site disposal are the preferred method here. It'll cost almost $10MM more than the next alternative (Alt. 6); however, the long-term benefits are greater. Despite the reported effectiveness of the other alternatives (excluding alternative 1-"No Action"), there are always varying degrees of uncertainty associated with innovative / remedial technologies, so if there is adequate funding to physically remove the material it's best to just proceed with the removal. The additional hydraulic controls to minimize contaminated groundwater reaching the river are in-place, which are extremely beneficial, and should meet the long-term objectives.

The remedial design following the selection of this alternative will happen later, but with excavations of this size there are always concerns:

- What is the traffic plan / truck plan for the transportation of contaminated materials?
    - They estimated 415 tons material/week, which = +/- 4-5 trucks per day (soils/sludge/etc.)
    - Truck washing/tire washing stations should be set up prior to any vehicle leaving the site and entering public roadways. (This would be a concern to the community, but I would expect the amount of mud/dirt being tracked off-site to be minimal).
- Was rail considered as a transportation method?
- 38 months of excavation work/trucking, etc. will produce a large amount of vehicle emissions to the community. Although the short-term effects may be an issue, the long-term benefits would off-set this concern. However (and I don't do green remediation projects) was there any consideration given to the expected level of "diesel" emissions...not included the VOCs arising from the actual excavation (which are to be suppressed using foams, etc.)? You'd think that Bound Brook & South Bound Brook are going to get most of the downwind odors, emissions.
- Strict adherence to the site health and safety plan is going to be key: Air & dust monitoring, erosion & sedimentation controls, etc. With EPA and NJDEP involvement I would expect these items to be prioritized but the Township should be kept in the loop on these efforts.
- They've mentioned that they are preparing for catastrophic flooding to the area.

- Long-term Operation & Maintenance. They've allotted $1.7MM, so I would expect the Township to be made aware of annual / biennial inspections, repairs/maintenance, and overall progress, for the foreseeable future.

Linda-I took a quick look at the Baseline Site-Wide Endangerment Assessment (1990) but didn't see of any specific health assessments regarding fish. They did mention (by contaminant) what to expect by the local fish species, which included bioaccumulation potential, bioconcentration, etc. Ingestion exposure would be an issue if you're looking to eat anything out of the river. They also mentioned human exposure (dermal contact) or accidental ingestion. No aquatic vertebrate species were identified in Lower Cuckolds Brook at that time, but other parts of the River were in better shape. I'm also not certain that Fish & Wildlife stock this part of the river...but I could be wrong.

I'd like to go to the public meeting, but I'll be at a soccer practice that night!

Tom

From: Tom Francis <tomfrancis8997@yahoo.com>
Sent: Thursday, June 7, 2018 8:06 AM
To: Tom Francis <tfrancis@cardinallsrp.com>
Subject: Fw: EPA Proposed Plan for American Cyanamid Superfund Site Impoundments 1 and 2

Sent from Yahoo Mail for iPhone

Begin forwarded message:

On Wednesday, June 6, 2018, 10:06 PM, linda sikora <lsikora@optonline.net> wrote:

Kristen:

Question re: Impoundments 1 and 2:

- Since the human health assessments showed the cancer risks did not exceed the acceptable range, except for unlikely scenario of future resident using Cuckel's Brook for portable water, (P. 7 of report), did any of the health assessments find any contaminated fish in Cuckel's Brook, etc. and/or Raritan River? As sometimes parts of the River are stocked with fish in the spring as fishing is a popular sport.

Meanwhile, currently I agree with EPA that Alternative 6, excavation, dewatering, etc.is the preferred alternative, based upon the written report (p.18), and without the benefit of the presentation and public debate..

With regard to the Cleanup Plan already in progress for the overall site:

- Ecological assessment for overall site said the onsite habitat did not support threatened or endangered species, with exception of the great blue heron (p.7 of report). Any protections being made for the great blue heron as did not see any in report?

- EPA fact sheet said the 2012 plan provided for an ecological risk assessment to determine if 3 add'l impoundments needed excavation and relocation (p.2). Have these add'l assessments been done?

- Did the dike, constructed around the entire North Area which is also in the Raritan River floodplain, ever need reinforcements to hold back the water in times of unprecedented rain, or can these reinforcements be brought in if necessary? (p. 2 of report).

I'm planning to go to the 6:00 info session and 7:00 pm meeting on Tuesday. Will others from our committee be there also? Thanks for sending this material.

Linda

From: Kristen Schiro <kschiro@bridgewaternj.gov>
Sent: Thursday, May 31, 2018 12:13 PM
To: James Rokosny <jhrokosny@yahoo.com>; pushpaamin@gmail.com; tfrancis@cardinallsrp.com; linda sikora <lsikora@optonline.net>; Alex Mycio <alexander.mycio@gmail.com>; Susan Dorward <susandorward@gmail.com>; Debbie Rokosny <drokosny@yahoo.com>; rchaz@optonline.net
Subject: EPA Proposed Plan for American Cyanamid Superfund Site Impoundments 1 and 2

Hello All,

I have attached the EPA's full report, fact sheet, and press release for their proposed clean-up plan for the American Cyanamid Superfund Site Impoundments 1 & 2 for you review. I attended the EPA's press event last week and the public meeting is on June 12, 2018, 6:00 pm information session, 7:00 pm formal public meeting in the courtroom at the municipal building. Please let me know if you have any comments on the proposed plan. Thank you so much!

Kristen

Kristen Schiro, MS

Director of Human Services

Township of Bridgewater

100 Commons Way, Bridgewater, NJ

908-725-6300 ext. 5210

kschiro@bridgewaternj.gov

www.bridgewaternj.gov

Austin, Mark

From: Jack King <kingfamily306@msn.com>
Sent: Tuesday, June 12, 2018 4:30 PM
To: Austin, Mark
Subject: American Cyanamide Site

Mr. Mark,
Our home is about 2,500 feet east of the site across the river/canal at 306 Samuel Place, SOMERSET, NJ 08873. We are concerned that the contamination may have or could leak or have crossed over during flooding and may or could have contaminated our well water.
Could the EPA include testing of our well as part of this clean up project to assure this contamination has not migrated to the wells in our neighborhood?
Thank you, Jack King

Sent from my iPhone

Austin, Mark

From: Patricia Manfredi <pattiman@verizon.net>
Sent: Wednesday, June 20, 2018 5:16 PM
To: Austin, Mark
Subject: Cleanup

I am a supporter of the EPA and CRISIS suggested answer to the clean-up of the present Pfizer property. I believe that the taxpaper will NOT pay for this. Thank you for your help in this matter.

Patricia Manfredi
pattiman@verizon.net

Austin, Mark

From: Andy Zaayenga <andy.zaayenga@gmail.com>
Sent: Tuesday, June 19, 2018 2:03 PM
To: Austin, Mark
Subject: American Cyanamid Superfund Site in Bridgewater Township NJ

Mark Austin
EPA Project Manager
US EPA, 290 Broadway, 19th floor
New York, NY 10007-1866
austin.mark@epa.gov

Dear Mark,

With regards to the American Cyanamid Superfund Site in Bridgewater Township NJ, we are in favor of the option for cleanup that has been selected by the EPA. It is the safest option. There are alternatives that are cheaper, but they don't result in the destruction of the dangerous contents of the impoundments in question. Moreover, Pfizer (the current owner of the property) has committed to paying the cost of the cleanup.

We appreciate your work at the EPA in this site remediation.

Thank you.

Andrew & Helen Zaayenga & family
1730 W Circle Dr
Martinsville, NJ 08836-2147
(732) 672-4452
andy.zaayenga@gmail.com


Think before you print.

Austin, Mark

From: Penny Hamerslag <phamerslag@gmail.com>
Sent: Thursday, June 21, 2018 3:03 PM
To: Austin, Mark
Subject: EPA /American-Cyanamid Superfund Site

I have followed the meetings and information available about the EPA choice for this superfund site and am in agreement with CRISIS that this is the best proposal and approve the option selected by the EPA.

Thank you.

Penny Hamerslag

Austin, Mark

From: alan nacht <adnacht@gmail.com>
Sent: Tuesday, June 19, 2018 5:20 PM
To: Austin, Mark
Subject: American Cyanamid Cleanup Plan

Agree with EPA plan for Cyanamid cleanup

Alan Nacht

Austin, Mark

From: Deborah Hercky <deborah.hercky@gmail.com>
Sent: Tuesday, June 19, 2018 1:52 PM
To: Austin, Mark
Subject: American Cyanamid Superfund Site

Dear Mr. Austin,

My husband and I are longtime residents of Martinsville, NJ, Bridgewater Township. We've lived here for 34 years. We are reaching out to express our support of the option that the EPA has selected for the cleanup of the American Cyanamid site. We feel this option, chosen by both the EPA and CRISIS, is the safest one.

Thank you for your efforts,

Deborah and Peter Hercky
1822 Middle Road
Martinsville, NJ 08836

Austin, Mark

From: Al Beronio <aberonio@verizon.net>
Sent: Tuesday, June 19, 2018 7:01 PM
To: Austin, Mark
Subject: American Cyanamid Cleanup...Bridgewater, NJ

We wish to be on record as supporting the recommendations of the EPA with regard to the cleanup of the American Cyanamid SuperFund site in Bridgewater, NJ.

Mr. & Mrs. A, Beronio

Austin, Mark

From: frank ostroman <frank.ostroman@gmail.com>
Sent: Tuesday, June 26, 2018 5:43 AM
To: Austin, Mark
Subject: American-Cyanamid Super Fund Site cleanup

Mr. Austin,
I have lived in Bridgewater, NJ for the last 27 years. I am writing to state that I support the chosen option for the cleanup of the American-Cyanamid Super Fund site.

Frank Ostroman
1851 Ridge Road
Martinsville, NJ 08836

Austin, Mark

From: Karen B Kane <chairbabe1@gmail.com>
Sent: Tuesday, June 19, 2018 12:17 PM
To: Austin, Mark
Subject: American Cyanamid Site clean up

Dear Austin - I am in favor of the clean up option requested by CRISIS.
I have lived in the area for 32 years, and have been following this for many years.
Let's make this happen.
Best,
Karen B Kane

Austin, Mark

From: Pete Hamerslag <pete.hamerslag@gmail.com>
Sent: Tuesday, June 19, 2018 12:04 PM
To: Austin, Mark
Subject: Comment on American Cyanamid Superfund cleanup plan

Dear Mr. Austin,

I have been a member of CRISIS since its inception in the early 1990's, and have been a board member as long as I can remember. I was unable to attend the public meeting on June 12, 2018 due to a previously planned vacation out of state.

I am very much in favor of the cleanup alternative selected by the EPA, and, as you know, preferred by CRISIS. I have personally favored destruction in a cement kiln (or similar facility) ever since I learned of it as a possibility during a meeting a year or two ago. I can think of no better option.

If the contents of Impoundments 1 and 2 are not destroyed, there is always the possibility that sometime in the future it will leach from wherever it is stored, no matter how diligently its resting place is designed and maintained. Destruction is the only certain solution.

The expected truck traffic created by the movement of the substance is not great, especially since the site is near a major interstate and not in a residential area.

In short, the EPA has made the right choice, as has CRISIS.

Peter S. Hamerslag

1810 Middle Road
Martinsville, NJ 08836
(Martinsville is a section of Bridgewater)

Austin, Mark

From: Loren Martin <LMartin@geo-solutions.com>
Sent: Friday, June 22, 2018 7:20 AM
To: Austin, Mark
Subject: [WARNING: SPF validation failed] RE: Pfizer Bridgewater OU-8 Alternative # 6 Remedy
Attachments: ATT00001.txt

Mark,

Thank you for your note. I look forward to speaking with you after the ROD is approved. It certainly will be good for everyone involved once OU-8 gets moving in a positive direction toward completion.

Have a great weekend.

Best regards,

Loren

Loren A. Martin
Mobile: (610) 247-6069 | Office: (610) 399-9783
lmartin@geo-solutions.com

From: Austin, Mark [mailto:Austin.Mark@epa.gov]
Sent: Thursday, June 21, 2018 9:30 AM
To: Loren Martin <LMartin@geo-solutions.com>
Subject: RE: Pfizer Bridgewater OU-8 Alternative # 6 Remedy

Loren,

Sorry for the late response. Since we are within the comment period ending June 28, a full response to your questions will be provided in the Responsiveness Summary when the Record of Decision is approved and released. I will reach out to you when this is available and where you can find the official response. Alternatively, once I have reviewed the public's comments and we have a more definitive direction post June 28, I should be able to provide you with a more accurate schedule and the additional information as requested. If you wish to discuss this further, I can be available at some point in early July.

Thanks for your questions.

Have a great day!
Mark

Mark Austin, RPM
US EPA Region II

From: Loren Martin [mailto:LMartin@geo-solutions.com]
Sent: Wednesday, June 13, 2018 10:08 AM
To: Austin, Mark <Austin.Mark@epa.gov>
Subject: Pfizer Bridgewater OU-8 Alternative # 6 Remedy

Mark,

It was a pleasure meeting you last night at the meeting. The presentation was very good and well presented. Though the most expensive of the remedies, it sounds like the most effective in meeting the cleanup goals and community concerns.

I have a few questions:

1. What is the planned date to start the Project?
2. What is the estimated ISS volume in cubic yards at the end of the process for stabilizing the soil and clay impacted by acid tar?
3. What company is doing the project in Syracuse, NY?

Thank you,

Best regards,

Loren Martin

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