

PROPOSED PLAN
KERR-MCGEE CHEMICAL CORP – NAVASSA SUPERFUND SITE
OPERABLE UNIT 2
NAVASSA, BRUNSWICK COUNTY, NORTH CAROLINA
EPA SITE ID: NCD980557805

PREPARED BY:



REGION 4

MAY 2022

A. INTRODUCTION

The U.S. Environmental Protection Agency seeks public review and comment on the proposed remedy for 15.6 acres of the Kerr-McGee Chemical Corp (Kerr-McGee)–Navassa Superfund site (Site) in the town of Navassa in Brunswick County, North Carolina (Figure 1). The Site’s coordinates are 34°14’50.0” north latitude and 77°59’56.5” west longitude. Kerr-McGee Chemical Corporation (Kerr-McGee) and its predecessors operated a wood-treating facility at the Site for about 38 years. This Proposed Plan applies to Operable Unit 2 (OU-2), which is about 15.6 acres of the former wood storage areas at the Site. The EPA considered the four remedial alternatives evaluated in the Site’s April 2022 OU-2 Feasibility Study (FS) Report. As detailed below, THE EPA’s Preferred Alternative for the OU-2 remedy is Alternative 2: excavation, removal, and off-site disposal of contaminated soils that pose an unacceptable risk to future residents or to ecological receptors. A glossary defining key terms is at the end of this document; key terms appear in bold the first time they are used.

The EPA is the lead agency at the Site. The North Carolina Department of Environmental Quality (NCDEQ) is the support agency. The EPA is issuing this Proposed Plan as part of EPA’s public participation requirements under Section 117 (a) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended, 42 United States Code Section 9617, known as Superfund, and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), as set forth in 40 Code of Federal Regulations Section 300.430(f)(2).

The EPA will issue its final decision on the selected remedial action in a decision document called a Record of Decision (ROD). The public will be notified of the issuance of the ROD in a local newspaper notice and via the EPA’s webpage for the Site: www.epa.gov/superfund/kerr-mcgee-chemical-corp. The ROD will include a responsiveness summary that summarizes the EPA’s responses to any public comments provided on this Proposed Plan.

This Proposed Plan summarizes and identifies key information from the Remedial Investigation (RI) Report, OU-2 risk assessments, the OU-2 FS Report, and other documents in the Site’s Administrative Record file. Administrative records for the Site are available at: semspub.epa.gov/src/collections/04/AR/NCD980557805.

The EPA and NCDEQ encourage the public to review these documents for more details and to gain a more comprehensive understanding of the Site. The EPA established a local Information Repository at two locations where the public may access and review the Site’s Administrative Record online. The locations are:

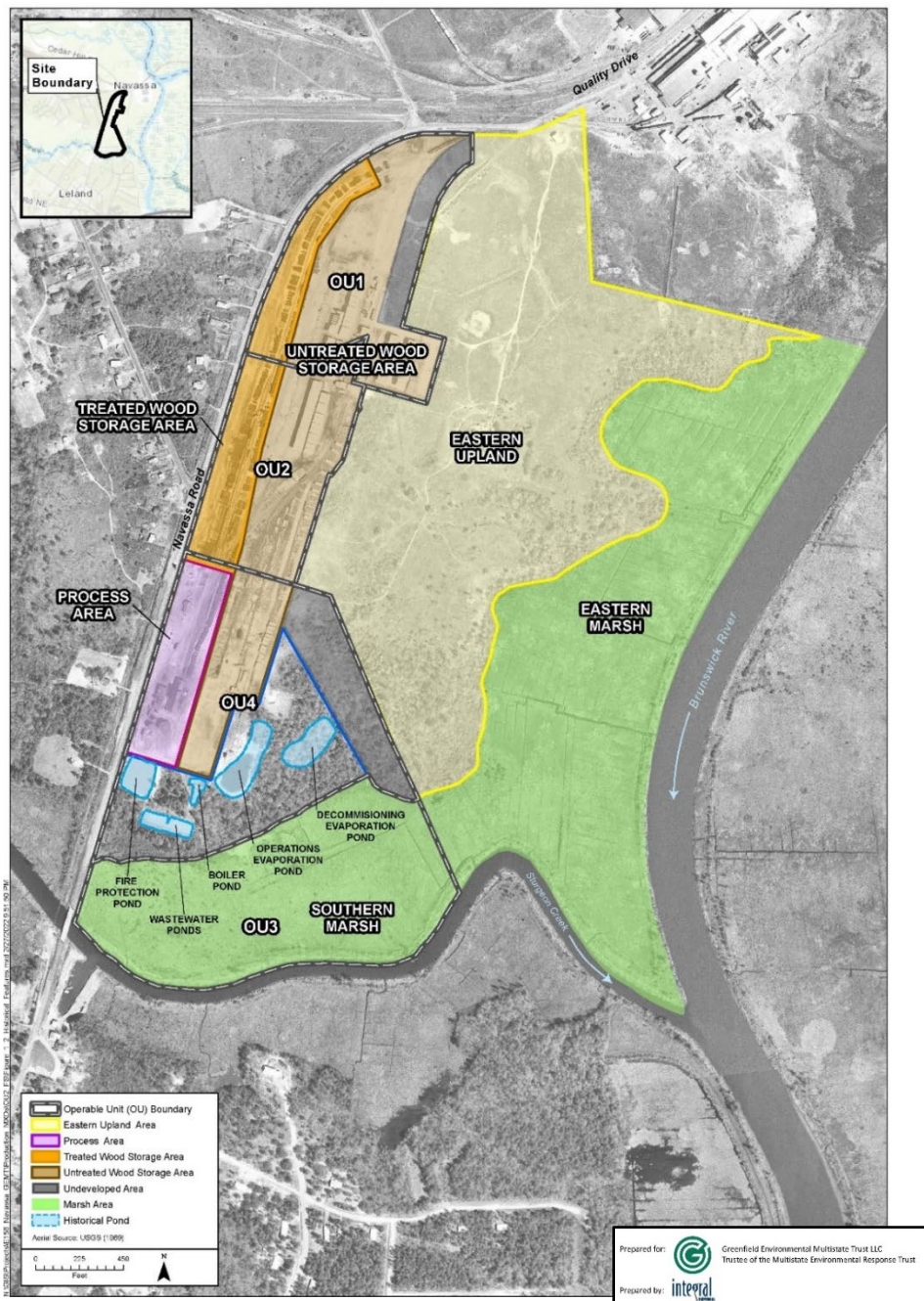
- Navassa Community Center, 338 Main Street, Navassa, North Carolina, 28451.
- Leland Library, 487 Village Road NE, Leland, North Carolina, 28451.

The EPA, in consultation with the NCDEQ, may modify the proposed remedy presented in this proposed plan based on new information or public comments received during the public comment period. Therefore, the public is encouraged to review and comment on the proposed remedy in this proposed plan.

To ensure the community's concerns are being addressed, a public comment period will be held from June 1, 2022 to June 30, 2022. During this time, the public is encouraged to submit comments to the EPA on this proposed plan. Comments can be submitted via mail, email or phone.

The EPA will hold a public meeting on June 14, 2022, from 6:00 p.m. to 7:30 p.m. at the Navassa Community Center, 338 Main Street, Navassa, North Carolina. Join the meeting online at: [this Zoom link](#) or enter tinyurl.com/NavassaMeetings in your browser. You may also join the meeting by phone at (301) 715-8592. Use meeting ID 946 584 8922# and passcode 664564#.

Figure 1: Detailed Site Map with Historical Features



B. SITE BACKGROUND

Site Description and Regional Background

The Site is in the town of Navassa in Brunswick County, North Carolina. From 1936 to 1974, Kerr-McGee and its predecessors operated an industrial wood-treating facility on the property that includes the Site. The Site consists of the 70-acre former wood-treating facility and about 30 acres of the marsh to the south of the former facility. The remainder of the property, which is not part of the Site, is about 82 acres and is called the Eastern Upland Area (Figure 1). The former facility is bounded to the north by Quality Drive and Pacon Manufacturing. Navassa Road borders it to the west. The Eastern Upland Area, Eastern Marsh, and the Brunswick River border the former facility to the east. The Southern Marsh and Sturgeon Creek border it to the south.

Historically, the 100-acre Site provided housing, jobs, and recreation opportunities for the community. Historical aerial photos (Figures 2 and 3) show the facility alongside agricultural areas, homes, a baseball field, and footpaths to the marsh. The property's location along the Brunswick River reflects its history and informs future uses. A rice plantation was located on the property before the Civil War. After the Civil War, a rural-industrial economy developed in the area. A bluff next to the property allowed barges to unload freight and became the location for a rail line connecting Wilmington to the rest of the country. The Navassa Guano Company, which imported guano from the Caribbean Island of Navassa, used the bluff. Eventually, four fertilizer companies operated in the vicinity of the Site. A railyard developed in Navassa, North Carolina, as did other wood-treating company facilities. The community's riverfront consists of three properties: this Site; the Pacon Manufacturing operation; and a former fertilizer plant (Estech), which was cleaned up in 2011 by the responsible party under EPA oversight, with groundwater monitoring ongoing.

Contaminated Media

Facility operations contaminated soil, groundwater, and/or marsh sediments with polycyclic aromatic hydrocarbons (PAHs), pentachlorophenol (PCP), and dioxins. The contaminants that pose the most risk are carcinogenic PAHs and dioxins (a group of chemicals that occur as an impurity associated with PCP). Because the carcinogenic PAHs and dioxins are groups of compounds with varying amounts of toxicity and similar modes of toxicity, the concentrations are expressed as toxicity equivalents (TEQs). To calculate a TEQ, the concentration of each chemical in a group is first adjusted to reflect its toxicity relative to the most toxic member of that group. The TEQ is the sum of these adjusted concentrations. The most toxic carcinogenic PAH is benzo(a)pyrene (BaP), so PAH concentrations are expressed as BaP TEQ. The most toxic of the dioxins is 2,3,7,8-tetrachlorodibenzo-para-dioxin (TCDD), so the concentrations of dioxins and furans are expressed as TCDD TEQ. In this Proposed Plan, the term "dioxins" refers to TCDD plus 17 dioxin/furan congeners.

Figure 2. Historical Aerial Photographs (1938 and 1951)

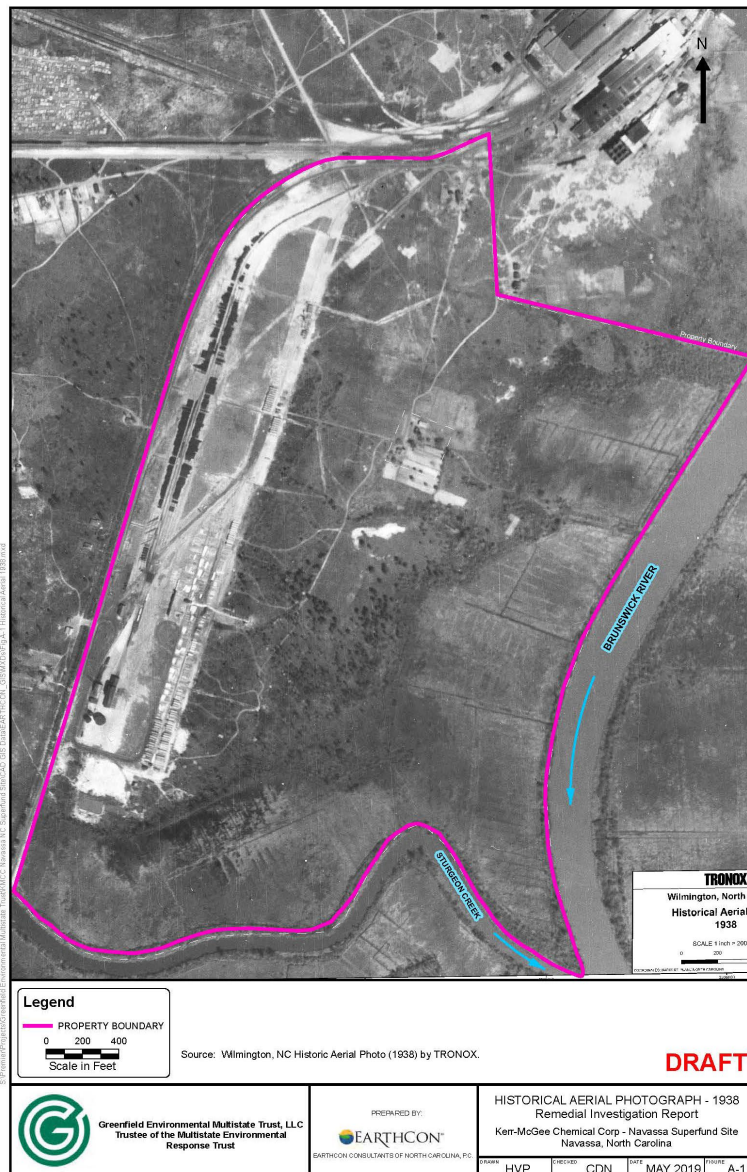
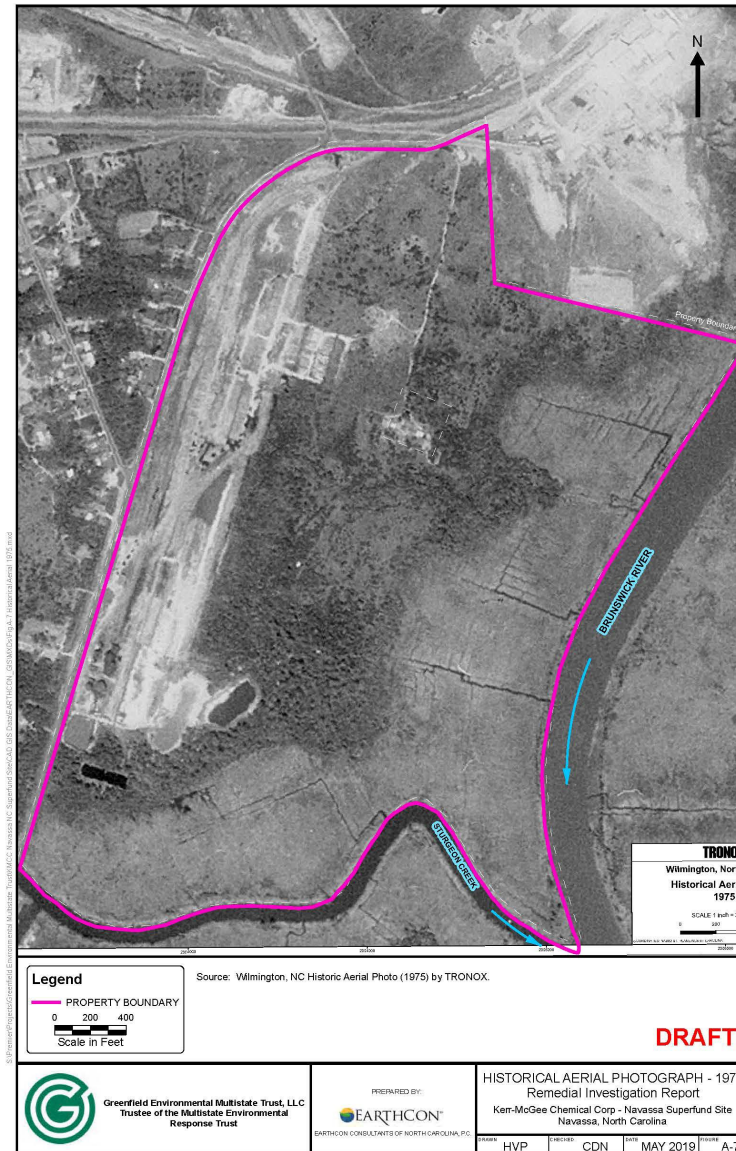
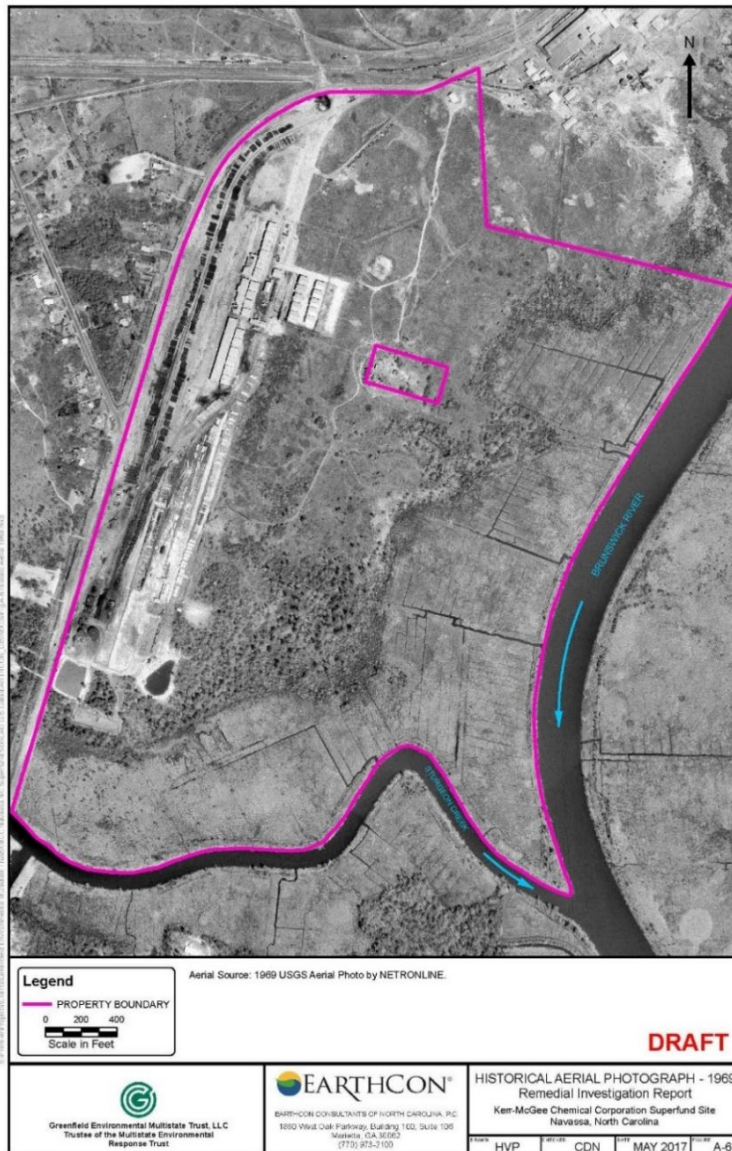


Figure 3. Historical Aerial Photographs (1969 and 1975)



History of Site Operations

From 1936 to 1974, Kerr-McGee's facility treated wood for railroad ties, utility poles, and pilings. Kerr-McGee reported that the facility used only creosote as a preservative. However, PCP and dioxins have also been detected in samples collected from the Site, which suggests wood-treating processes could have used PCP as well as creosote wood preservatives. Kerr-McGee discontinued site operations in 1974 and decommissioned and dismantled the plant in 1980. The EPA has limited information about the wood-treating operations at the facility, and no records related to releases (including spills) of spent preservative, process residuals, preservative drippage, and other materials. Most information about plant operations comes from a six-page Kerr-McGee letter dated August 14, 1984. It describes plant operations from 1965 to 1974, when operations were discontinued.

Aerial photos provide the only information about the Site prior to 1965. Figures 2 and 3 show selected historical aerial photographs (1938, 1951, 1969, and 1975) reviewed during the investigation. As a result of the lack of documentation, the lack of process knowledge, and the inconclusive distribution of the low-level soil contamination across the OU, the EPA is not able to determine whether site contamination in any particular part of OU-2 originated from releases of listed hazardous wastes F032 and F034 under 40 CFR 261.31 Hazardous Wastes from Non-specific Sources, per the Resource Conservation and Recovery Act (RCRA) of 1980, as amended.

History of Site Ownership and Responsible Parties

Gulf States Creosoting Company built the original wood-treating operation at the Site in 1936. American Creosoting purchased the facility in 1958 and sold it to Kerr-McGee in 1965. Kerr-McGee discontinued site operations in 1974. Kerr-McGee owned the property as a 244-acre parcel until 1991, when it transferred 92 acres of marsh to the state of North Carolina, after which Kerr-McGee's property totaled about 152 acres. In March 2006, Kerr-McGee created Tronox, LLC (Tronox) as a spin-off corporation, and transferred responsibility for the Site (and many other sites across the country) to Tronox without sufficient funding to address its environmental liabilities. Anadarko Petroleum acquired Kerr-McGee in August 2006. In January 2009, Tronox filed for Chapter 11 bankruptcy protection in federal court.

In February 2011, the Multistate Environmental Response Trust (and several other trusts) was established as part of the Tronox bankruptcy settlement and given responsibility for owning and remediating hundreds of former Tronox-owned sites, including the Site. Greenfield Environmental Multistate Trust LLC (Multistate Trust) is the Trustee of the Multistate Environmental Response Trust. The Multistate Trust operates pursuant to the February 14, 2011 Tronox Bankruptcy Consent Decree and Environmental Settlement Agreement and Multistate Environmental Response Trust Agreement. Among other responsibilities, the purpose of the Multistate Trust is to remediate the Multistate Trust sites using funds earmarked for each site and to facilitate the sites' safe redevelopment and long-term stewardship.

The Multistate Trust is responsible for implementing all environmental actions at the Site, consistent with its obligations to the beneficiaries of the Multistate Trust. The beneficiaries are the United States and the Navassa Trustee Council, consisting of the U.S. Department of the Interior, the National Oceanic and Atmospheric Administration, and NCDEQ. In 2016, the Multistate Trust purchased two 1-acre residential properties in the interior of the Eastern Upland Area that were not contaminated to ensure that future remedial construction would not affect residents. This purchase increased the size of the property owned by the Multistate Trust to 154 acres. The Multistate Trust will eventually sell or transfer property for reuse.

Previous Response Actions

Response Actions Conducted Under Other Authorities

Kerr-McGee decommissioned and dismantled the plant in 1980. Kerr-McGee reported that it dismantled and sold all plant equipment, treatment cylinders, buildings, and tanks as scrap. Kerr-McGee reforested the area by planting pine trees. A 1984 letter from Kerr-McGee is the only documentation of the decommissioning of the former wood-treating facility; there are no work plans, reports, photos, surveys, analytical results, or construction reports. At present, there are building foundations present at the Site. The only intact railroad tracks are a 10-to-15-foot-long segment that is set into a concrete slab in OU-2. Kerr McGee did not coordinate with any state or federal cleanup programs when decommissioning the facility and disposing of the waste.

Beginning in the 1980s, several parties led environmental investigations at the Site, including Kerr-McGee, the North Carolina Department of Environment, Health and Natural Resources (subsequently the North Carolina Department of Environment and Natural Resources [NCDENR], now NCDEQ), the North Carolina Department of Transportation (NCDOT), the EPA, and the Multistate Trust. In March 2003, NCDENR recommended the Site for further evaluation by the EPA.

History of CERCLA Site Investigations and Enforcement Activity

In 2004, the EPA and Kerr-McGee entered an Administrative Order on Consent for the performance of an Expanded Site Inspection, which is a step in the Superfund site evaluation process. The August 2005 Expanded Site Inspection Report documented creosote contamination at the Site and recommended more site assessment under CERCLA. In July 2006, the EPA and Tronox entered into an Administrative Order on Consent to conduct the Site's RI under the Superfund Alternative Approach. This approach complies with all the steps of the Superfund process without listing the Site on the Superfund program's National Priorities List (NPL). Tronox conducted several investigations but did not finalize the risk assessments or an RI Report. In January 2009, Tronox filed for Chapter 11 bankruptcy protection in federal court. Tronox was no longer able to conduct the RI.

In March 2010, the EPA formally took over marsh and groundwater sampling activities from Tronox. In April 2010, the EPA placed the Site on the NPL. The EPA's NPL listing package identified about

100 acres along Navassa Road and Sturgeon Creek as the area used or contaminated by the former wood-treating process. This corresponds to the 70-acre former facility and the 30-acre Southern Marsh.

Creation of Multistate Environmental Response Trust (2011)

Since 2011, the Multistate Trust has been performing environmental actions at the Site. Because Kerr-McGee and Tronox did not fully investigate the nature and extent of contamination or complete a final RI Report, the Multistate Trust completed a sitewide RI Report in 2019. It details all site investigations undertaken up to March 2017, including:

- ENSR/AECOM Phase 1 RI in 2006.
- ENSR/AECOM Phase 2 RI in 2008.
- EPA residential sampling in 2010.
- AECOM supplemental RI (SRI) in 2012.
- CH2M Hill SRI in 2015 and 2016.
- EarthCon SRI in 2016 and 2017.

The 2019 RI Report documented contamination in surface soils, subsurface soils, groundwater, and marsh sediment, as well as the presence of free-phase creosote in the subsurface and in marsh sediments. The 2019 RI Report also documented low levels of PAH and PCP contamination in soils in the northern parts of the treated and untreated wood storage areas. It also concluded that groundwater contamination is limited to the former process and pond areas in the southern part of the Site, and to an off-site area southwest of the process and pond areas.

The Multistate Trust conducted studies from 2017 to 2021 in the northern parts of the treated and untreated wood storage areas:

- EarthCon trench evaluation in 2018.
- EarthCon surface soil study in August and December 2020.
- Ramboll ecological uptake study in June 2020.
- EarthCon and Integral 2021 subsurface soil sampling in May 2021.
- EarthCon and Integral OU-2 pre-design investigation in September 2021.
- EarthCon and Integral OU-2 Eastern Upland Area soil sampling in September 2021.

In 2018, the Multistate Trust conducted a trenching study to explore subsurface or buried contamination in the wood storage areas based on visual observations and screening with a photoionization detector (PID). The study informed more soil sampling targeting worst-case locations and updated risk assessments completed in 2019. Based on the 2019 risk assessments, the EPA issued a Proposed Plan for OU-1 in 2019 that proposed a “no action” decision for the northernmost 21.6 acres of the Site, assuming future commercial, industrial, and recreational land uses. However, during the public comment period, the public

and the local government expressed interest in residential land uses. As a result, in August and December 2020, the Multistate Trust conducted more sampling across OU-1 and OU-2 to evaluate potential residential risks from potential exposure to PAHs and PCP in surface soils. In addition, the 2020 sampling included evaluation of dioxins, which had not been evaluated previously in OU-1 and OU-2 soils.

The sampling design for the August and December 2020 soil sampling effort divided OU-1 and OU-2 into exposure units or “parcels” of 0.25 acres or less – the size of a potential future residential parcel, as specified by NCDEQ. As a result, the OU-1 and OU-2 risk assessments evaluate potential risks for a range of land uses suggested by the town (including residential land use without restrictions). Based on the findings of the 2020 sampling, the OU-1 and OU-2 boundary was redefined so the revised OU-1 and OU-2 areas encompass 20.2 acres and 15.6 acres, respectively. The EPA selected a “no action” remedy in an April 2021 ROD for OU-1 based on unrestricted use and no land use controls. The EPA deleted OU-1 from the NPL in September 2021.

Based on the 2018 trenching study and supported by soil sampling and risk assessments completed in 2019, the EPA and NCDEQ concluded that PAHs and PCP are not present in OU-2 subsurface soils at concentrations that would pose an unacceptable risk to future residents. However, because dioxins were not evaluated in OU-2 soils prior to the 2020 sampling events, subsurface soil samples were collected from OU-2 for analysis of dioxins at any 2020 surface soil sampling location where TCDD TEQ was present at a concentration that represents a potential unacceptable risk to a future resident. This effort includes subsurface sampling in 2021 to determine the vertical extent of dioxins contamination to evaluate remedies that meet NCDEQ guidelines for unrestricted use.

To evaluate ecological risks in OU-2, the Multistate Trust conducted an uptake study in June 2020 to calculate how much contamination was moving from the soil into invertebrates, which form the bottom of the ecological food chain. The uptake study provides site-specific data to estimate potential ecological risk more accurately.

Public Participation Activities Prior to Issuance of the Proposed Plan

The EPA, NCDEQ, and the Multistate Trust have held more than 20 community meetings in Navassa since late 2016. The EPA, NCDEQ, and the Multistate Trust held the most recent joint public quarterly updates on March 15, 2022. The two meetings were held at the town of Navassa’s community center and included the opportunity for stakeholders to attend in person or online. More than 50 stakeholders were in attendance (in person or online). On January 28, 2022, the Multistate Trust distributed three recent memoranda directly to community stakeholders and the community’s technical advisor prior to the beginning of the public comment period:

- Operable Unit 2 Human Health Risk Assessment (HHRA) Addendum.
- Operable Unit 2 Pre-Design Investigation and Eastern Upland 2021 Soil Sampling Report.

- Operable Unit 2 Ecological Risk Reduction Technical Memorandum.

The Multistate Trust, the EPA, and NCDEQ held a virtual meeting with the town and community leaders on February 2, 2022, to provide an update on these OU-2 technical documents. The Multistate Trust posts the meeting presentations and fact sheets on navassa.greenfieldenvironmental.com. The EPA and the Multistate Trust maintain websites with more information at www.epa.gov/superfund/kerr-mcgee-chemical-corp and navassa.greenfieldenvironmental.com.

C. SITE CHARACTERISTICS

Physical Characteristics

The Site's main topographic and geographic feature is its location along the marshes of the Brunswick River and Sturgeon Creek.

Site Hydrogeology

As documented in the 2019 RI Report, groundwater underlying OU-2 is not contaminated, suggesting that surface water leaching/infiltration does not pose a risk of groundwater contamination. The Multistate Trust included a detailed analysis of stormwater runoff in the FS. OU-2 is heavily vegetated and there is minimal stormwater runoff or transport of soils with stormwater. The OU-2 remedial action will be conducted using best management practices to ensure stormwater runoff is controlled and that no contaminated soils leave the Site.

Nature and Extent of OU-2 Contamination

This discussion of the nature and extent of soil contamination focuses on the 15.6-acre OU-2 that is the subject of this Proposed Plan. Figure 4 shows the division of OU-2 into 91 parcels of 0.25 acres or less. More than 400 samples have been analyzed in OU-2. Figure 5 and Figure 6 provide summaries the BaP and dioxin results, respectively. About 1.6 acres of OU-2 pose unacceptable risk to a potential future resident (Figure 7). As discussed below, the cleanup of this 1.6 acres will also address unacceptable ecological risks. About 14 acres of OU-2 do not pose an unacceptable risk to human health under CERCLA, assuming residential land use, and meet unrestricted use criteria under the North Carolina General Statutes § 143B-279.9(b)(1). A "no action" ROD addressed OU-1 in April 2021. A copy of the ROD is in the Site's Administrative Record file. Remaining parts of the Site will be addressed by future CERCLA remedy selection documents, including Proposed Plans and RODs.

Based on observations from about 1,800 linear feet of trenches in OU-2 and more than 100 subsurface soil samples on OU-2, the EPA concluded that contamination in OU-2 is limited to the top 1 or 2 feet of soil. The Multistate Trust collected 77 subsurface soil samples for PAHs and PCP and 62 subsurface samples for dioxins. Subsurface soil sampling for dioxins was conducted under every surface soil sample location

where dioxin concentrations exceeded the preliminary remediation goal (PRG) for TCDD TEQ of 50 picograms per gram (pg/g).

Contamination in OU-2 poses a relatively low long-term threat and there is no principal threat waste in OU-2. Contamination is not clustered in any specific part of OU-2. Contamination in OU-2 likely originated from some combination of finished treated wood products stored prior to sale, decommissioned rail line timbers, buried creosote timbers, and/or transport from other portions of the Site by movement of personnel and vehicles. Because facility decommissioning removed most of the surface features (e.g., buildings, rail lines, railroad timbers) and possibly moved or removed soil, it is not possible to confirm the original source of contamination.

The Site's FS estimated the area and volume of OU-2 soils requiring remedial action based on the results of the 2021 OU-2 HHRA Addendum, the 2021 OU-2 ecological risk assessment (ERA), the remedial action objectives (RAOs), and exceedance of the PRGs for surface soil. About 2,526 cubic yards of surface soil (0-1 foot below ground surface) pose an unacceptable risk to human health and/or ecological receptors. In addition, about 295 cubic yards of subsurface soils (1-2 feet below ground surface) would pose an unacceptable risk to human health and/or ecological receptors if these soils were brought to the surface.

Figure 4: OU-1 and OU-2 – Divided into 91 Exposure Units or Parcels of 0.25 Acres or Less

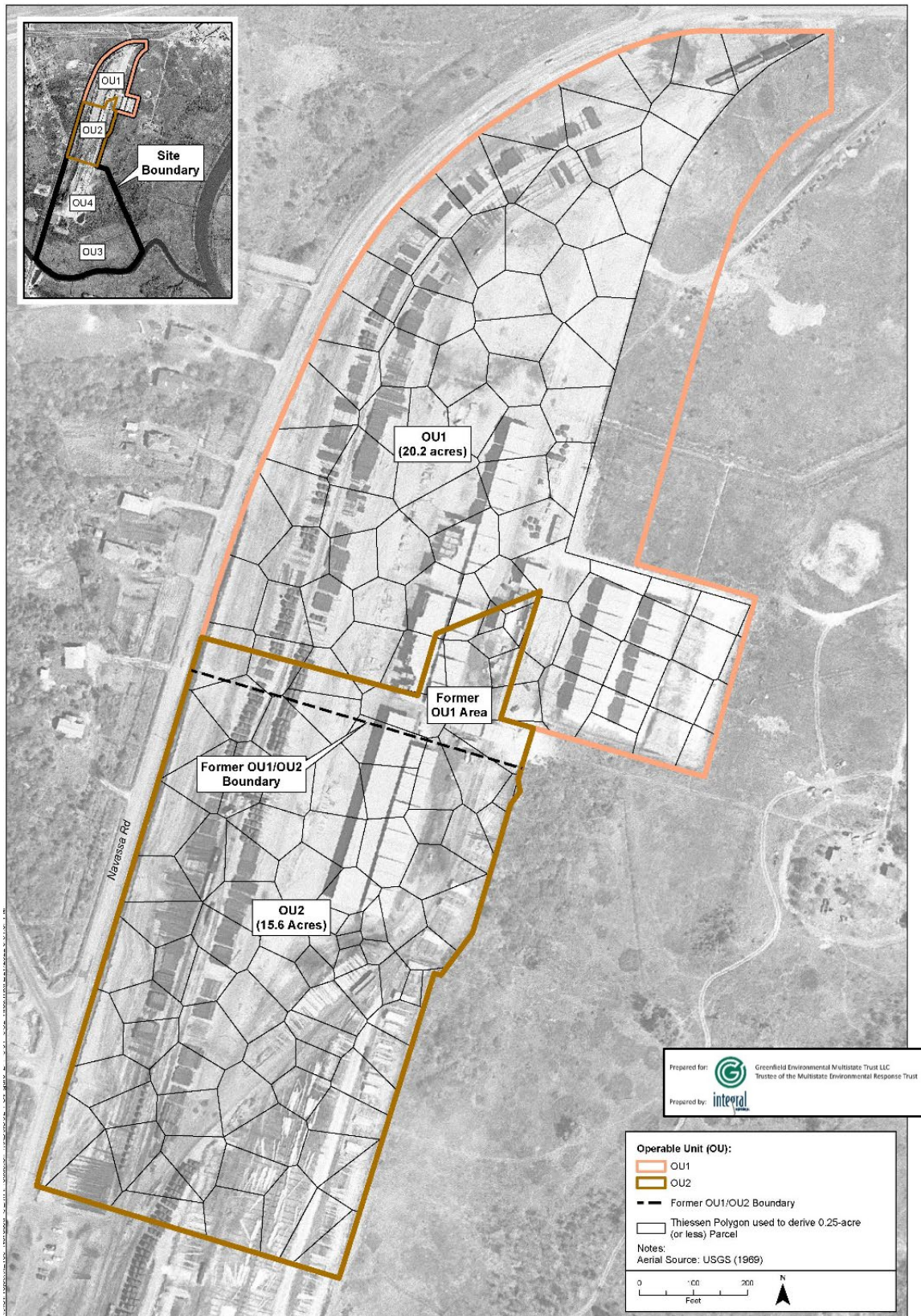


Figure 5: OU-2 Surface Soil BaP TEQ Concentrations (2022 OU-2 FS Report)

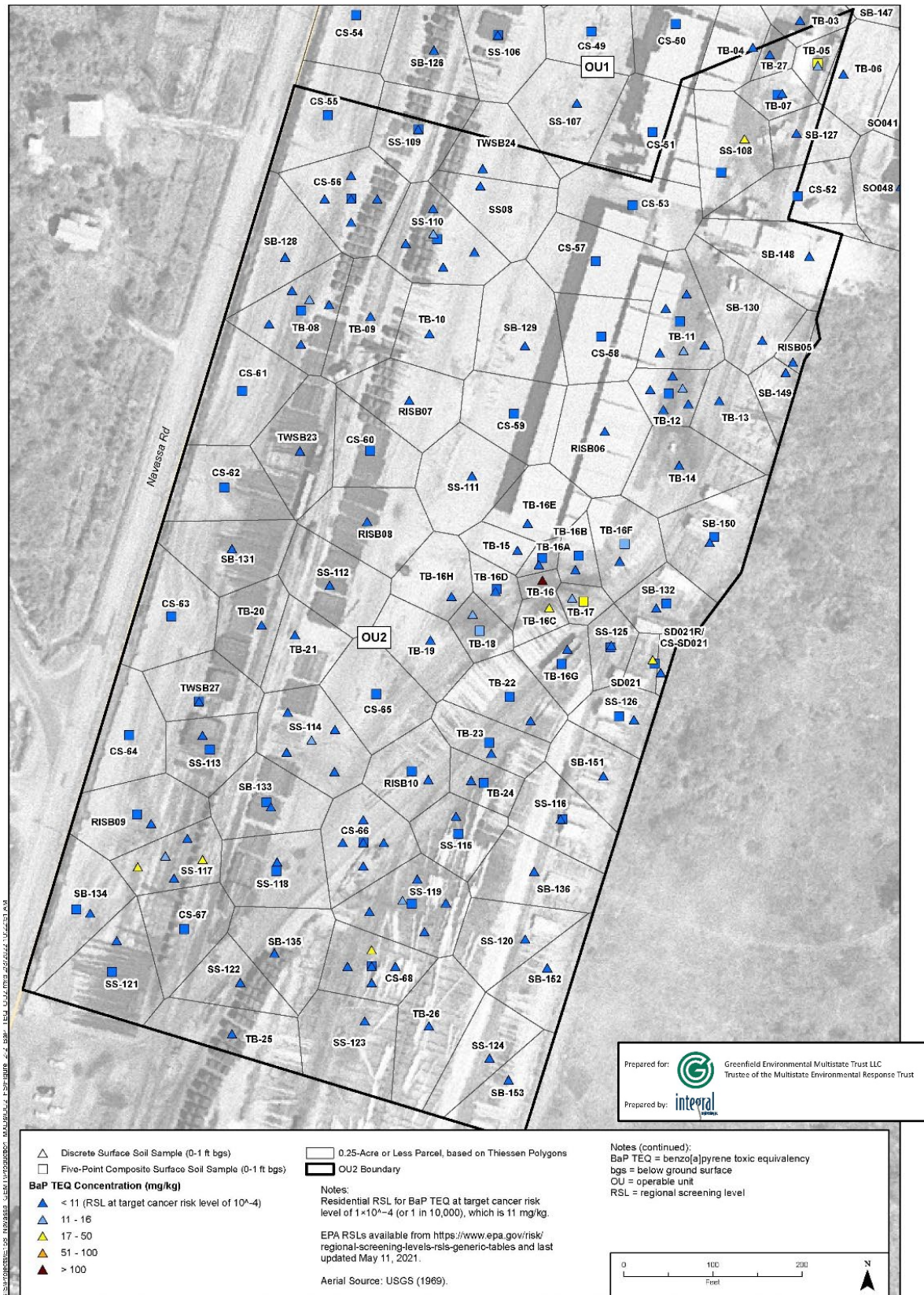


Figure 6: OU-2 – Surface and Subsurface Soil TCDD TEQ Concentrations (2022 OU-2 FS Report)

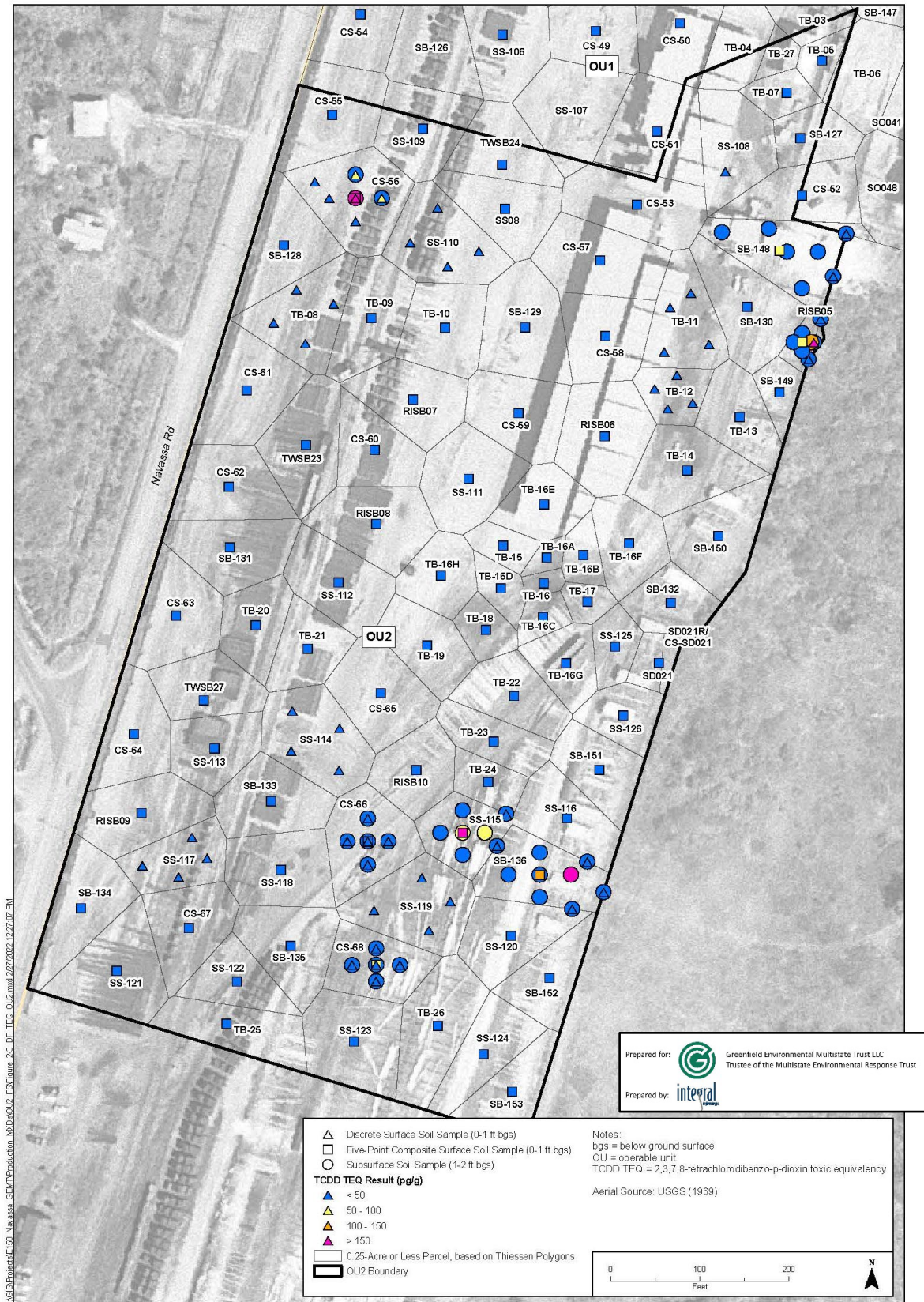
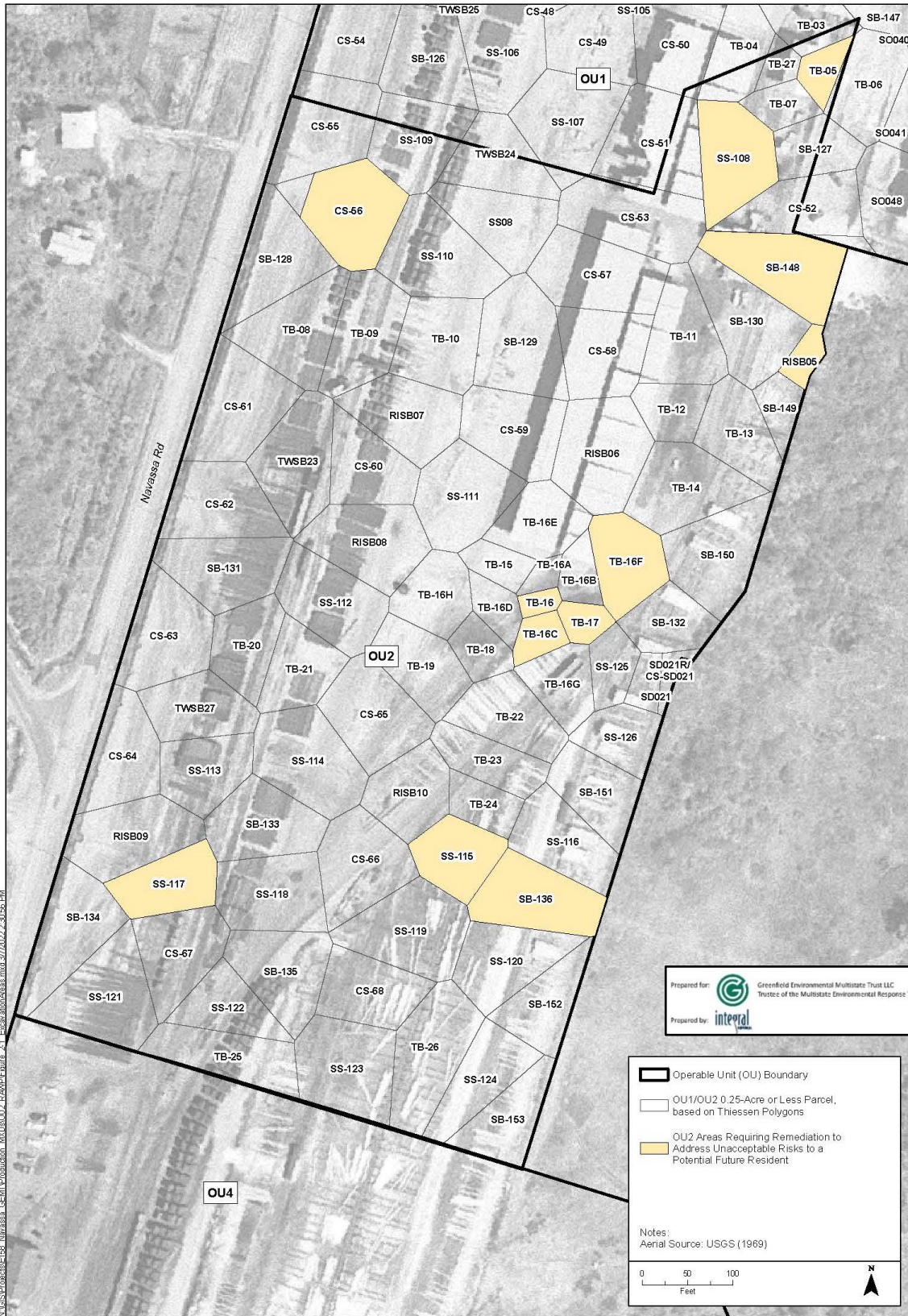


Figure 7: Map Summarizing OU-2 Areas Requiring Remedial Action to Achieve RAOs (2022 OU-2 FS)



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D. SCOPE AND ROLE OF OU-2

The EPA's site strategy is to expedite acreage becoming available for reuse, and to support partial deletions from the NPL as OUs are completed. The proposed cleanup of soil contamination in OU-2 will allow the Multistate Trust to conduct the cleanup and should allow the EPA to propose partial deletion of OU-2 from the NPL in calendar year 2023.

Due to the Site's size and complexity, the EPA manages the Site as five OUs:

- OU-1: The northernmost 20.2 acres of the Site, formerly used for treated and untreated wood storage. The boundary of OU-1 was selected to only include areas requiring no action and no land use controls. The EPA issued a "no action" ROD in April 2021 and deleted OU-1 from the NPL in September 2021.
- OU-2: The 15.6-acre area south of OU-1 and north of the process area. OU-2 was used for treated and untreated wood storage. The extent of OU-2 is drawn to include soils that require cleanup under CERCLA, but to exclude the former process area and groundwater contamination. OU-2 is the subject of this Proposed Plan.
- OU-3: The Southern Marsh, which consists of an about 30-acre area of tidally influenced marsh that borders the former facility boundary. OU-3 will be addressed in a future Proposed Plan.
- OU-4: The pond and process area, a 36-acre area at the southern end of the former facility that includes the former facility pond area, the process area, and an area used for treated wood storage. OU-4 will be addressed in a future Proposed Plan.
- OU-5: The groundwater affected by former facility operations, including groundwater underlying the southern end of OU-4, the northernmost edge of OU-3, and the area immediately southwest of OU-4. OU-5 will be addressed in a future Proposed Plan.

Waste Characterization and Management

The off-site transfer of contaminated soils from OU-2 must be disposed of in environmentally sound management units according to Section 121(d)(3) of CERCLA and 40 CFR 300.440 of the NCP, known as the "CERCLA Off-Site Rule." The purpose of the CERCLA Off-Site Rule is to prevent CERCLA wastes from creating future environmental problems after disposal. The CERCLA Off-Site Rule requires that wastes from a CERCLA cleanup may be placed only in a facility operating in compliance with federal and state requirements, including RCRA (www.epa.gov/superfund/site-rule-fact-sheet).

The soils to be excavated from OU-2 are contaminated environmental media. As with any other solid waste set for disposal, the generator must determine if remediation wastes, such as contaminated soils, are subject to RCRA Subtitle C. Specifically, the generator must determine if the originating source of contamination is a listed hazardous waste and whether the environmental media exhibits a hazardous waste characteristic. In the case of OU-2 soils, the EPA determined that there is insufficient information on the

releases of wood-treating chemicals to consider the source of OU-2 contamination to be from a RCRA listed hazardous waste (F032 or F034). This decision is consistent with EPA guidance (Management of Remediation Waste Under RCRA) and with 53 FR 51444, December 21, 1988; 55 FR 8758, March 13, 1990; and 61 FR 18805, April 29, 1996. OU-2 soils should be managed for disposal as a non-hazardous or a hazardous waste based solely on whether the soils exhibit a hazardous waste characteristic (such as the Toxicity Characteristic). Based on analytical results to date, the the EPA does not anticipate OU-2 soils will exhibit a characteristic of hazardous waste. If the remedial action encounters unexpected wastes, the EPA, NCDEQ, and the Multistate Trust will make waste management decisions in accordance with federal and state laws and regulations that are identified as applicable or relevant and appropriate requirements (ARARs), as required by CERCLA 121(d)(2) and certain provisions of the NCP.

Principal Threat Waste

The NCP establishes an expectation that the EPA will use treatment to address the principal threats posed by a site wherever practicable (NCP Section 300.430(a)(1)(iii)(A)) and to use engineering controls for waste that poses a relatively low long-term threat (NCP Section 300.430(a)(1)(iii)(B)). The “principal threat waste” concept is applied to the characterization of "source materials" at a Superfund site. Source material is material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, surface water, or air, or acts as a source for direct exposure. There are no principal threat wastes known to be present in OU-2 soils. The contaminated soils in OU-2 are a relatively low long-term threat and off-site disposal at a RCRA Subtitle D landfill approved by the EPA under the CERCLA Off-Site Rule is consistent with EPA’s expectation to use engineering controls for such wastes.

E. SUMMARY OF OU-2 RISKS

The Multistate Trust conducted risk assessments to evaluate the potential human health and ecological risks from exposure to chemicals detected at the Site. Human health risk assessments evaluated potential exposure to: Residents, Commercial/industrial workers, Construction workers, Trespassers, Youth sports players, and Site visitors/trail walkers. Ecological risk assessment evaluated exposure to birds, mammals, and soil invertebrates. The results of these assessments and site-specific characteristics serve as the baseline for determining whether remedial action is necessary. The findings of the risk assessments are summarized in the following subsections. Details of the risk assessments conducted for OU-2 are presented in the following human health and ecological risk reports:

- The 2019 HHRA.
- The 2019 HHRA Addendum.
- The 2021 OU-2 Soil Sampling Results and HHRA (2021 OU-2 HHRA).
- The 2021 OU-2 HHRA Addendum.
- The 2021 OU-2 ERA Technical Memorandum (2021 OU-2 ERA).

- The 2021 Ecological Risk Reduction as a Result of Remediating OU-2 Parcels Memorandum (Eco Risk Reduction Memo).

Chemicals of Concern for OU-2

The risk assessments for OU-2 estimated risks to humans and the environment from soil containing wood-treating chemicals of concern (COCs), including PAHs, PCP, and dioxins. Groundwater beneath OU-2 is not contaminated above detection limits.

Reasonably Anticipated Future Land Use in OU-2

Land use in the Navassa area of Brunswick County is both rural residential and industrial. The residential areas are west of the Site, across Navassa Road. The Pacon Manufacturing facility is immediately northeast of the Site. Most of the area further north consists of undeveloped industrial land and undeveloped coastal forest or low-lying marsh. South of Sturgeon Creek, the waterfront land uses are single-family residential and recreational.

The majority of the former wood-treating facility property is zoned for heavy industrial use, except for two former residential properties in the Eastern Upland Area that are zoned R-10 (Moderate Density Single Family Residential) (Figure 1). However, the current zoning does not reflect the town's desired land uses for the area, which are a mixture of land uses. The town's rezoning process will determine the area's future zoning designation.

Land use around OU-2 is not restricted due to site-related contamination to the west, north, or east (Navassa Road, the now-deleted OU-1, and the Eastern Upland Area, respectively). The former process and pond areas (OU-4) are south of OU-2. They are vacant and under investigation by the Multistate Trust. After the remedial action, the Multistate Trust intends to make OU-2 available for community-supported redevelopment by selling the property to a developer. The sale will be contingent on the developer following the town's zoning process to secure a rezoning of the property.

2022 Summary of Human Health Risks in OU-2

The HHRA evaluated both cancer risk and noncancer risk for the COCs identified at the Site. The likelihood of cancer resulting from a Superfund site exposure is generally expressed as an upper bound probability, for example, a "1 in 10,000 chance," also expressed as 1×10^{-4} . For noncancer health effects, a hazard index (HI) – a ratio of estimated exposure to an exposure unlikely to cause harm – is calculated. Under CERCLA, potential risk to human health is considered unacceptable if the excess lifetime cancer risk (ELCR) is greater than 1×10^{-4} or if the noncancer HI is greater than 1.0.

The 2019 HHRA used data collected between 2003 and 2017. The 2019 HHRA defined exposure areas based on historical site uses and did not evaluate risks specific to OU-2, though OU-2 includes portions of the treated and untreated wood storage areas. Findings from the 2019 HHRA that form the basis for this Proposed Plan include:

- No unacceptable risk to construction workers exists due to exposure to PAHs and PCP in the surface and subsurface soils in the treated and untreated storage areas, including in OU-2.
- No site-related contaminants were detected in groundwater samples from OU-2.
- Sediment and surface water are not present in OU-2. Therefore, potential exposures to these media were not evaluated for OU-2.

The 2021 OU-2 HHRA and the 2021 OU-2 HHRA Addendum evaluated risks due to potential exposure to site related chemicals under residential and non-residential exposure scenarios. The following potential human receptors were evaluated based on input from the town of Navassa:

- Residents.
- Commercial/industrial workers.
- Construction workers.
- Trespassers.
- Youth sports players.
- Site visitors/trail walkers.

2021 OU-2 HHRA and 2021 OU-2 HHRA Addendum Summary

As described further in the 2021 OU2 HHRA, the 15.6-acre OU-2 was divided into exposure areas of different sizes for different exposure scenarios: As described further in the 2021 OU-2 HHRA, the 15.6-acre OU-2 was divided into exposure areas of different sizes for different exposure scenarios:

- Exposure areas (called parcels) no greater than 0.25 acres for residential exposure.
- Exposure areas no greater than 2 acres for evaluating potential exposure to commercial/industrial workers, construction workers, trespassers, and recreational youth sports players.
- Exposure areas no greater than 6 acres for evaluating potential exposure to site visitors/trail walkers.

The 2021 OU-2 HHRA identified additional data needs for nine parcels. These data needs led to the Multistate Trust's September/October 2021 sampling and to the 2021 OU2 HHRA Addendum. The 2021 OU-2 HHRA and 2012 OU-2 HHRA Addendum identified a total of 12 of the 91 parcels with chemicals present in surface soils (0 to 1 foot below ground surface) that represent a potential unacceptable risk to future residents. The public may find all residential risk estimates for OU-2 in Table 3-2 of the 2021 OU2

HHRA Addendum. The public may find all residential risk estimates for OU-2 in Table 3-2 of the 2021 OU-2 HHRA Addendum.

The 2021 OU-2 HHRA did not find unacceptable risks for humans under any of the non-residential exposure scenarios considered, including potential exposure to: commercial/industrial workers, construction workers, trespassers, recreational youth sports players, or site visitor/trail walkers. Table 4-2 and Table 4-3 of the 2021 OU-2 HHRA summarize these results. The 2021 OU2 HHRA also estimated potential risks to construction workers from exposure to dioxins (as TCDD TEQ) in subsurface soils using the maximum dioxin concentration detected in OU-2 subsurface soils (0.18 parts per billion [ppb] at location SB-136-C). The 2021 OU-2 HHRA also estimated potential risks to construction workers from exposure to dioxins (as TCDD TEQ) in subsurface soils using the maximum dioxin concentration detected in OU-2 subsurface soils (0.18 parts per billion [ppb] at location SB-136-C). This conservative analysis found no unacceptable risk to construction workers from exposure to dioxins in subsurface soils.

HHRA Conclusions

The risk assessments concluded that, in OU-2, 12 parcels pose a potential unacceptable risk for future residential uses and 79 parcels do not pose an unacceptable risk. The OU-2 risk assessments estimated ELCR from 1.1×10^{-6} at parcel TB-10 to 9.5×10^{-4} at parcel TB-16. Eight parcels in OU-2 had a cancer risk greater than 1.0×10^{-4} (the EPA's unacceptable risk threshold), as shown in Table 1, which is Table 3-3 from the 2021 OU-2 HHRA Addendum. The total noncancer child HI ranged from 0.023 at parcels CS-61 and TB-10 to 5.7 at parcel SS-115. Seven parcels had an HI that exceeded 1 (the EPA's threshold of unacceptable noncancer risk).

Table 1: Summary of OU-2 Parcels with ELCR Greater than 1.0×10^{-4} and/or HIs Greater than 1.0 under a Residential Use Scenario

Parcel	Total Excess Lifetime		Notes
	Cancer Risk	Total Noncancer HI (child)	
CS-56	7.5x10 ⁻⁵	4.1	
RISB05	1.8x10 ⁻⁵	1.7	
SB-136	3.5x10 ⁻⁵	2.6	
SB-148	1.8x10 ⁻⁵	1.4	
SS-108	1.5x10 ⁻⁴	0.64	
SS-115	1.3x10 ⁻⁴	5.7	
SS-117	2.9x10 ⁻⁴	1.4	
TB-05	2.5x10 ⁻⁴	1.2	Parcel evaluated in OU2 HHRA Addendum; endpoint-specific HIs are less than 1.0
TB-16	9.5x10 ⁻⁴	4.7	
TB-16C	1.7x10 ⁻⁴	1.0	
TB-16F	1.3x10 ⁻⁴	0.88	
TB-17	1.6x10 ⁻⁴	0.77	Parcel evaluated in OU2 HHRA Addendum

Notes:

ELCR = excess lifetime cancer risk

HI = hazard index

NCDEQ = North Carolina Department of Environmental Quality

At the direction of NCDEQ, ELCRs and HIs are presented to two significant figures. Total ELCR greater than 1.0×10^{-4} and/or total HI greater than 1.0 are shaded.

Risk calculations for parcels evaluated as part of this OU2 HHRA addendum are presented in Table 3-1. Table 3-10 of the 2021 OU2 HHRA presents the risk calculations for those parcels not evaluated as part of the OU2 HHRA Addendum.

2022 Summary of Ecological Risks in OU-2

The 2021 OU-2 ERA Report presents the results of the June 2020 field event and estimates the potential for ecological risk for different ecological receptor groups. The 2021 OU-2 ERA evaluated two different land use scenarios. In the first scenario, the entire land surface is developed for residential, commercial/industrial and/or recreational (sports field) use. In the second scenario, the land is used for recreational nature trails and remains largely undisturbed. The 2021 OU-2 ERA estimated lowest-observed-adverse-effect level (LOAEL) hazard quotients (HQs), which represent the ratio of potential exposure to the level where minimal adverse effects are expected. A LOAEL HQ greater than 1 indicates a potential for ecological risk. The 2021 OU-2 ERA estimated the following LOAEL HQs for bird and mammal receptors based on four diet scenarios.

- Low molecular weight (LMW) PAHs: LOAEL HQs less than 1 for exposure of bird and mammal receptors for all on diet scenarios.
- High molecular weight (HMW) PAHs: LOAEL HQs varied based on diet scenarios.
 - American robin: the LOAEL HQs varied between 7 and 20.
 - American woodcock: the LOAEL HQs varied between 2 and 6.

- Raccoon: the LOAEL HQs varied between 0.2 and 0.3.
- Short-tailed shrew: the LOAEL HQs varied between 1 and 3.

The risk characterization for soil invertebrates in OU-2 yielded the following results:

- LMW PAHs: HQs were below 1 at 85 parcels and were 2, 8 and 20 at three parcels (TB-12, TB16-F, and TB-16, respectively).
- HMW PAHs: HQs were below 1 at 56 parcels, between 2 and 10 at 29 parcels, and equal to or exceeding 20 at 3 parcels (SS-117, TB-12, and TB-16).

The December 2021 OU-2 Eco Risk Reduction Memo estimates the range of ecological risks that would remain after a cleanup to make OU-2 acceptable for residential use. The memo estimates that the resulting range of HQs for the American robin would be reduced from 20 to less than 4.3 under diet scenario 1 and reduced from 7 to less than 2.4 under diet scenario 3. This estimate of HQs is consistent with the diet scenarios and HQs in OU-1, where the EPA's risk management decision was no action for ecological risks. As a result, a cleanup to make OU-2 acceptable for residential use would also reduce the unacceptable ecological risks to a range that would be protective for ecological receptors.

Basis for Taking Action

It is the EPA'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.

F. REMEDIAL ACTION OBJECTIVES (RAOs)

Remedial Action Objectives (RAOs)

Before developing cleanup alternatives for a Superfund site, the EPA establishes RAOs to protect human health and the environment. RAOs are specific goals to protect human health and the environment. These objectives address contaminated media, exposure pathways and are based on available information and standards, such as applicable or relevant and appropriate requirements (ARARs), to-be-considered (TBC) guidance, and site-specific, risk-based levels.

The 2022 OU2 FS Report identified the following RAOs:

- Prevent potential unacceptable risk to future child and adult residents from long-term exposure through incidental ingestion of, dermal contact with, and/or inhalation of surface soils (up to 1 foot below ground surface) with COC concentrations above the residential PRGs for BaP TEQ, TCDD TEQ, benzo[a]pyrene, naphthalene, and PCP.

- Prevent potential unacceptable risk to future child and adult residents from long-term exposure through incidental ingestion of, dermal contact with, and/or inhalation of subsurface soils, with dioxin/furan concentrations above the residential PRG for TCDD TEQ should the subsurface soils be brought to the surface in the future.
- Prevent potential unacceptable risks to songbirds and small mammals due to exposure through the food chain, incidental ingestion of, or direct contact with surface soils (up to 1 foot below ground surface), with a surface-weighted average concentration (SWAC) of the sum of HMW PAHs above the ecological risk PRG across a 2-acre area.

Preliminary Response Goals (PRGs)

As part of the FS, PRGs are developed and may be based on chemical-specific ARARs when available (Table 2). For contaminated soil, the PRGs are typically risk-based concentrations since there are not many federal- or state-promulgated cleanup levels. PRGs are established for each COC that will achieve the RAOs for each medium and receptor. A range of PRGs were developed during the risk assessments and FS and are presented below for public comment. The EPA proposes concentrations that are within the risk range and consistent with the residual contamination in the “no action” OU-1 area. The EPA will select the site-specific cleanup levels in the ROD.

Table 2: PRGs

PRGs				
Receptor	COC	PRG	Units	Basis
Future residents	BaP TEQ	1.1	mg/kg	Cancer (ELCR) = 1×10^{-5}
Future residents	BaP	18	mg/kg	Noncancer (HI) = 1
Future residents	Naphthalene	17	mg/kg	Cancer (ELCR) = 1×10^{-5}
Future residents	PCP	10	mg/kg	Cancer (ELCR) = 1×10^{-5}
Future residents	TCDD TEQ	50	pg/g	Noncancer, HI = 1
Ecological receptors	HMW PAHs	22	mg/kg	2-acre surface-weighted average concentration (SWAC)

Applicable or Relevant and Appropriate Requirements (ARARs)

CERCLA remedial actions must comply with substantive requirements and standards under the federal or the more stringent state environmental laws and regulations that are identified as ARARs or justify a waiver under CERCLA section 121(d)(4). Potential chemical-, location-, and action-specific ARARs and TBC criteria identified to address the contamination and potential exposure pathways for OU-2 are summarized below.

Potential Chemical-Specific ARARs

Chemical-specific ARARs usually are either health- or risk-based numerical values or methodologies that establish the acceptable amount or concentration of a chemical that may remain in or be discharged to the environment. There are no chemical-specific ARARs for OU-2 soil.

Potential Action-Specific ARARs

Action-specific ARARs usually are restrictions on the conduct of certain activities or operation of certain technologies at a particular site. Regulations that dictate design, construction, and operating characteristics of incinerators, air stripping units, and landfill construction are examples of action-specific ARARs.

Action-specific ARARs for OU-2 address general construction standards, waste characterization, waste storage, treatment/disposal of waste, capping soil in place, and transportation of wastes. These ARARs include state requirements such as North Carolina General Statutes (NCGS) Chapter 113 and North Carolina Administrative Code (NCAC) Title 15A, as well as federal requirements such as 40 CFR Parts 262, 264, 265, and 268, and 49 CFR Part 171. Action-specific ARARs and TBCs for the remedial alternatives evaluated are included in Table 3-1 of the 2022 OU2 FS Report.

Potential Location-Specific ARARs

Location-specific ARARs generally restrict certain activities or limit concentrations of hazardous substances solely because of geographical or land use concerns. Requirements addressing wetlands, historic places, floodplains, or sensitive ecosystems and habitats are potential location-specific ARARs. There are no location-specific ARARs for OU-2 soil.

Potential “To Be Considered” (TBC)

In addition to applicable or relevant and appropriate requirements, pursuant to the NCP at 40 CFR 300.400(g)(3), the lead and support agencies may, as appropriate, identify other advisories, criteria, or guidance to be considered for a particular release. The TBC category consists of advisories, criteria, or guidance developed by the EPA, other federal agencies, or states that may be useful in developing CERCLA remedies. Examples include health advisories, reference doses, and the EPA and state technical guidance on how to perform specific response activities. There are no TBC for remediation of OU-2 soil.

G. SUMMARY OF REMEDIAL ALTERNATIVES

The 2022 OU-2 FS Report evaluated four remedial action alternatives:

- Alternative 1: No Action.
- Alternative 2: Removal and Off-site Disposal.
- Alternative 3: Removal, On-site Reuse/Consolidation, and Off-site Disposal.
- Alternative 4: Cover and Institutional Controls.

Alternatives 2 and 3 both involve excavating OU-2 surface soils, with dioxin concentrations and/or PAH concentrations exceeding the residential PRGs and importing clean backfill to bring excavated areas back to grade. The alternatives differ in terms of disposal of the contaminated soil excavated from OU-2. Alternative 2 sends all contaminated soil to an appropriate off-site landfill. Alternative 3 sends the excavated soil with highest contaminant concentrations to an appropriate off-site landfill and soil with contaminant concentrations below certain, to-be-determined thresholds for future incorporation as cover or backfill material for OU-4. Under both Alternative 2 and Alternative 3, off-site disposal must be at a facility approved by the EPA to accept CERCLA waste per the Off-Site Rule, a provision of the Superfund law to ensure CERCLA wastes do not create environmental problems at disposal locations. Alternative 4 leaves waste in place and isolates contaminated soil with placement of a 1-foot-thick soil cover.

Implementation of Alternative 2 allows for unlimited use and unrestricted exposure with no long-term O&M requirements. Alternative 3 requires regular inspections and five-year reviews for stockpiled soil until a final remedy is selected for OU-4 that incorporates this stockpiled soil. Long-term O&M activities as well as determination of appropriate land use for Alternative 3 is dependent on the OU-4 remedy. With waste left in place under a soil cover, Alternative 4 would require long-term monitoring and maintenance, five-year reviews, and institutional controls to prevent exposure to contaminated soil. The EPA prefers Alternative 2 because it is highly effective in the short term, allows OU-2 to support unlimited use and unrestricted exposure, and does not require long-term monitoring and maintenance and associated costs.

Alternative 1: No Action

The “no action” alternative must be evaluated under the NCP as a baseline against which all other alternatives are compared. Under this alternative, no remedial actions would take place. There are no capital costs associated with Alternative 1, though the comparative analysis includes a cost estimate for five-year reviews.

Alternative 2: Removal and Off-site Disposal

Alternative 2 consists of excavating OU-2 surface soils, with dioxin concentrations and/or PAH concentrations exceeding the residential PRGs. Sampling indicates that contamination does not extend

deeper than 2 feet below ground surface, but excavations could go deeper than 2 feet if needed to achieve the RAOs. Excavated material will be disposed of in an off-site, EPA-approved (per the CERCLA Off-Site Rule), RCRA Subtitle C or D landfill, depending on waste characterization. Clean backfill material suitable for residential use will be placed in excavated areas, graded, and vegetated. Because this alternative involves removal of contaminated soils from OU-2 to allow for unlimited use and unrestricted exposure, there are no long-term O&M or post-remedy monitoring requirements.

The estimated timeframe for construction completion is one to three months. The estimated capital cost associated with Alternative 2 is \$1,587,000; no O&M activities are required. The total present worth cost of Alternative 2 is \$1,587,000.

Alternative 3: Removal, On-site Reuse/Consolidation, and Off-site Disposal

Alternative 3 consists of excavating OU-2 surface soils with dioxin/furan concentrations and/or PAH concentrations exceeding the residential PRGs. Sampling indicates that contamination does not extend deeper than 2 feet below ground surface, but excavations could go deeper than 2 feet if needed to achieve the RAOs. The EPA and NCDEQ will establish contaminant criteria concentrations to determine whether the excavated soils may be stockpiled on OU-4 and eventually used, as needed and appropriate, as backfill or cover material for the OU-4 remedy. Soils that do not meet these reuse criteria will be disposed of in an off-site, EPA-approved (per the CERCLA Off-Site Rule), RCRA Subtitle C or D landfill, depending on waste characterization. Clean backfill material suitable for residential use will be placed in excavated areas and graded. Stockpiled soil would be managed in accordance with identified ARARs such the RCRA staging pile regulations to prevent cross-media contamination. Regular inspections and five-year reviews would be required for OU-2 soils stockpiled on OU-4 until the selection of a final remedy for OU-4 that includes the stockpiled soils.

The estimated timeframe for construction completion is one to three months. The estimated capital cost associated with Alternative 3 is \$1,424,000 and the 30-year O&M cost is \$40,000. The total present worth cost of Alternative 3 is \$1,455,000.

Alternative 4: Cover and Institutional Controls

Alternative 4 consists of covering the soil contamination with 1 foot of clean fill material suitable for residential use and planting of appropriate ground cover, such as local grasses, to prevent erosion. This alternative requires routine monitoring of the vegetated soil cover's integrity and maintenance, as needed, as well as implementation of institutional controls to limit site activity or use that could disturb the soil cover. Five-year reviews would be required indefinitely since waste would remain in place with contaminant concentrations exceeding levels suitable for unlimited use and unrestricted exposure.

The estimated timeframe for construction completion is one to two months. The estimated capital cost associated with Alternative 4 is \$907,000 and the 30-year O&M cost is \$510,000. The total present worth cost of Alternative 4 is \$1,107,000.

H. EVALUATION OF REMEDIAL ALTERNATIVES

The EPA uses nine CERCLA criteria to evaluate the alternatives and select remedial actions. This section summarizes the relative performance of each alternative against the nine criteria and each other. A detailed analysis of alternatives is provided in the 2022 OU-2 FS Report.

The nine criteria consist of two threshold criteria, five balancing criteria, and two modifying criteria. The threshold criteria are overall protectiveness of human health and the environment and compliance with ARARs. These two criteria must be met by any remedial alternative for it to be considered a viable remedial action. The five balancing criteria are long-term effectiveness and permanence; short-term effectiveness; reduction of toxicity, mobility, and volume through treatment; implementability; and cost. These are the primary criteria on which the detailed analysis was based. The remaining two criteria are state acceptance and community acceptance. These modifying criteria are typically evaluated following a public comment period on the Proposed Plan and will be documented in the ROD.

EVALUATION CRITERIA FOR SUPERFUND REMEDIAL ALTERNATIVES
<u>THRESHOLD CRITERIA</u>
<i>Overall Protection of Human Health and the Environment</i> determines whether an alternative eliminates, reduces, or controls threats to public health and the environment through institutional controls, engineering controls, or treatment.
<i>Compliance with ARARs</i> evaluates whether the alternative meets federal and state environmental statutes, regulations, and other requirements that pertain to a site, or whether a waiver is justified.
<u>EVALUATION CRITERIA</u>
<i>Long-term Effectiveness and Permanence</i> considers the ability of an alternative to maintain protection of human health and the environment over time.
<i>Reduction of Toxicity, Mobility, or Volume of Contaminants through Treatment</i> 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.
<i>Short-term Effectiveness</i> considers the length of time needed to implement an alternative and the risks the alternative poses to workers, residents, and the environment during implementation.
<i>Implementability</i> considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
<i>Cost</i> includes estimated capital and annual O&M 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%.
<u>MODIFYING CRITERIA</u>
<i>State/Support Agency Acceptance</i> considers whether the state agrees with the EPA's analyses and recommendations, as described in the RI and FS reports and the Proposed Plan.
<i>Community Acceptance</i> considers whether the local community agrees with the EPA's analyses and preferred alternative. Comments received on this Proposed Plan are an important indicator of community

Comparison of Remedial Alternatives

1. Overall Protection of Human Health and the Environment

During every FS, a “no action” alternative is developed as a baseline for comparative analysis purposes. The current condition of surface soils for a portion of OU-2 represents a potentially unacceptable risk and does not meet the RAOs. Without engineering controls and/or institutional controls, there is a potential for exposure to PAHs and dioxins/furans in OU-2 soils for current and future site users. Therefore, Alternative 1 (No Action) does not meet the threshold criteria and will not be assessed further in these comparative analyses.

Alternatives 2 and 3 will meet the threshold criteria by removing OU-2 soils with COC concentrations above PRGs and replacing those soils with clean backfill. Under these alternatives, the excavated soils would be transported off site to a RCRA-permitted landfill that is approved by the EPA per the CERCLA Off-Site Rule for disposal or stockpiled in OU-4 for reuse/on-site consolidation as part of the final OU-4 remedy.

Alternative 4 will meet the threshold criteria by isolating OU-2 soils with COC concentrations above PRGs beneath a soil cover, thereby eliminating/limiting potential exposure. However, land use controls in the form of deed restrictions and long-term monitoring would be required to ensure the cover integrity is maintained.

2. Compliance with ARARs

Alternatives 2, 3, and 4 can meet the action specific ARARs identified in the 2022 OU-2 FS Report.

3. Long-Term Effectiveness and Permanence

Alternatives 2 and 3 would meet the criteria of long-term effectiveness and permanence (Table 6-1 of the 2022 OU-2 FS Report) through removal of OU-2 surface soils with COC concentrations above PRGs, followed by backfilling of the excavated areas with clean fill. By removing soils containing COCs above PRGs from OU-2, Alternative 2 and Alternative 3 will prevent potential migration or exposure. As a result, both alternatives were assigned a high ranking with respect to long-term effectiveness and permanence.

Alternative 2 and Alternative 3 differ in the dispensation of the excavated OU-2 soils. Under Alternative 2, all excavated soils would be transported off site for disposal in an appropriately permitted RCRA landfill. This approach would be highly effective and permanent with a high degree of confidence because all OU-2 soils exceeding the PRGs would be removed from the Site. No long-term management is required for OU-2 under Alternative 2, and there is almost no likelihood of needing to adjust the OU-2 remedy in the future.

Alternative 3 would involve the eventual reuse/consolidation of OU-2 soils that are suitable for use as backfill or cover on the southern end of the process area in OU-4. OU-2 soils that are unsuitable for reuse/consolidation in OU-4 would be transported off site for disposal in an appropriately permitted RCRA landfill.

Alternative 3 has somewhat lower long-term effectiveness and permanence than Alternative 2 because it would leave some OU-2 contamination in OU-4. While OU-2 soils would be managed in a protective manner and would not lead to an unacceptable risk to human health or the environment, the stockpiled OU-2 soils would require inspection and/or maintenance until the soils are reused in OU-4. Because the OU-4 RI is underway and the OU-4 remedy has not yet been selected, there is uncertainty about how the

OU-2 soils will be integrated into the OU-4 remedy. If reuse/consolidation in OU-4 is incompatible with the OU-4 remedy, then the OU-2 soils would require off-site disposal.

Alternative 4 would meet the criterion of long-term effectiveness and permanence through isolation of OU-2 soils with COC concentrations above PRGs but would require inspection and maintenance of the soil cover and monitoring of restrictive covenants. As a result, Alternative 4 is considered less effective in the long term and less permanent than Alternative 2 and Alternative 3.

Sustainability was included as a secondary consideration in the comparative analysis alternatives. Physical impacts of sea level rise are not a factor in the long-term effectiveness and permanence for the OU-2 remedial alternatives because of the distance of OU-2 from the 100-year floodplain and the elevation of OU-2 (being about 20 feet above sea level). The main considerations regarding sustainability are the use of fuel, emission of greenhouse gases, use of landfill space, and limitations on future use of OU-2.

Alternative 2 ranks lowest of the four alternatives with respect to long-term sustainability considerations, due to the transport of soils to an off-site landfill and the use of landfill space. Alternative 3 is more sustainable than Alternative 2 because less soil is transported to a landfill, less soil would be imported for the OU-4 remedy, less fuel would be used, and there would be fewer emissions. However, there is some uncertainty about the number of times soil would be moved on site, and the OU-2 remedy may need to be adjusted, depending on the OU-4 remedy. Alternative 4 has the lowest impacts related to fuel and emissions but would place limitations on use of parts of OU-2 that offset the benefit of not consuming landfill space.

4. Reduction of Toxicity, Mobility and/or Volume Through Treatment

This criterion addresses the preference under CERCLA for remedial alternatives that permanently and significantly reduce the mobility, toxicity, or volume of hazardous substances through treatment. This preference is satisfied when treatment is used to reduce the principal threats at a site through destruction of toxic contaminants, reduction of the total mass of toxic contaminants, irreversible reduction in contaminant mobility, or reduction of total volume of contaminated media. There are no principal threat wastes in OU-2. However, the removal of contaminated soil for off-site disposal will reduce the volume of soil located at the Site and prevents mobility of COCs that could occur through erosion from stormwater events.

5. Short-Term Effectiveness

Alternatives 2, 3, and 4 use conventional construction techniques and would be effective immediately upon completion. The potential for short-term exposures to workers and the community will be addressed through proper design and execution of the remedial action, including the use of well-established best management practices. Many of the potential short-term exposures associated with the remedial actions are related to the transport of contaminated soils and clean backfill materials.

Alternative 4 (cover and institutional controls) poses the least short-term risks of alternatives 2 through 4 because there is no excavation of contaminated soils. Alternative 2 was assigned the lowest relative ranking of these three alternatives because this alternative would involve considerably more off-site truck traffic and thus represents a higher risk to workers and the community and would be a greater nuisance to the community.

6. Implementability

Alternatives 2 through 4 are straightforward to implement using readily available and highly reliable technologies and equipment, and specialists are not required. Alternative 3 requires stockpiling to meet ARARs and coordination with the OU-4 remedy, and thus poses some challenges to implementation. Alternative 4 would require institutional controls that prevent disturbance of the cover, including legally binding restrictions that apply in the event the property is transferred or sold. As a result, Alternative 4 is more difficult to implement than Alternative 2 and Alternative 3.

7. Cost

The breakdown of the estimated costs for the four alternatives is provided below, in Table 3. These costs are estimates based on the best available information and have an expected accuracy of +50% to -30%. Alternative 2 has the highest net present value estimate. However, Alternative 2 will leave OU-2 ready for unlimited use and unrestricted exposure and has no long-term O&M or post-remedy monitoring costs. Alternative 4 had the lowest capital costs, but high administrative costs associated with establishing institutional controls, as well as long-term costs for routine inspection and maintenance of the cap and maintenance of institutional controls. Alternative 3 falls between Alternative 2 and Alternative 4 in terms of intermediate capital costs and the need for short-term costs associated with the inspection of stockpiles and maintenance of best management practices until the completion of the OU-4 remedy.

Table 3: Summary of Estimated Costs for Each Alternative

Summary of Estimated Costs				
Cost Category	Alternative 1	Alternative 2	Alternative 3	Alternative 4
	No Action	Removal and Off-site Disposal	Removal, On-site Reuse/Consolidation, and Off-site Disposal	Cover and Institutional Controls
Direct Capital Costs	\$0	\$1,318,000	\$1,166,000	\$591,000
Indirect Capital Costs	\$0	\$269,000	\$258,000	\$316,000
Total O&M Costs	\$90,000	\$0	\$40,000	\$510,000
Totals (net present value)	\$32,000	\$1,587,000	\$1,455,000	\$1,107,000

8. Support Agency Acceptance

Support agency acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the ROD.

9. Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends and will be described in the ROD.

Summary of the Detailed Evaluation of Remedial Alternatives

The following diagram summarizes the results of the detailed evaluation of remedial alternatives presented in this Proposed Plan.

		EVALUATION CRITERIA							OVERALL RATING
		Threshold		Balancing					
		Protectiveness	Compliance with ARARs	Long-Term Effectiveness	Short-Term Effectiveness	Reduction of Toxicity, Mobility, or Volume through Treatment	Implementability	Estimated Cost (millions)	
Alternative 1	No Action	○	○	○	○	NA	●	\$0.03	○
Alternative 2	Removal and Offsite Disposal	●	●	●	◐	NA	●	\$1.59	●
Alternative 3	Removal, Onsite Reuse/ Consolidation, and Offsite Disposal	●	●	◐	◐	NA	◐	\$1.46	◐
Alternative 4	Cover and Institutional Controls	●	●	◐	●	NA	◐	\$1.11	◐

LEGEND

- Excellent
- ◐ Good
- ◑ Fair
- Poor
- Very Poor

I. PREFERRED ALTERNATIVE

Considering the detailed analysis information in the 2022 OU-2 FS Report as summarized above, the EPA's Preferred Alternative for OU-2 is Alternative 2: Removal and Off-site Disposal. Alternative 2 consists of the following remedial activities:

- Excavation and removal of contaminated surface soils that exceed PRGs (cleanup levels identified in the ROD).
- Characterization of the excavated soil to determine if is considered RCRA characteristic waste.
- Off-site disposal of the soil at an EPA-approved RCRA Subtitle C or D permitted landfill (depending on waste characterization).
- Placement of clean backfill materials suitable for residential use in the excavated areas.
- Grading of backfilled material followed by vegetation to prevent erosion.

The EPA recommends this alternative because it achieves the RAOs in the shortest timeframe while also supporting unlimited use and unrestricted exposure in OU-2 after cleanup. Alternative 2 would not require long-term monitoring and maintenance or five-year reviews under CERCLA.

Based on the information available now, the EPA believes the Preferred Alternative meets the threshold criteria and provides the best balance of tradeoffs among the alternatives evaluated with respect to the balancing and modifying criteria. The EPA expects the preferred alternative to satisfy the following statutory requirements of CERCLA §121(b): (1) to be protective of human health and the environment; (2) to comply with ARARs; (3) to be cost effective; and (4) to use permanent solutions and alternative treatment technologies or resource recovery technologies to the maximum extent practicable.

The Preferred Alternative does not satisfy the statutory preference to use treatment to address principal threats as a principal element of the remedy because there are no principal threat wastes known to be present. During the FS, treatment options were considered. However, none was identified as viable alternatives because they would either be ineffective for the COCs at the Site or would limit future land use, including construction options. Consequently, treatment options were eliminated from further consideration. This approach is consistent with the EPA's expectation to use engineering controls for waste that poses a relatively low long-term threat (NCP Section 300.430(a)(1)(iii)(B)). The Preferred Alternative can change in response to public comment or new information.

Support Agency Coordination

NCDEQ reviewed the 2022 OU-2 FS Report, concurred with the alternatives evaluated, and concurred with how the alternatives were screened and analyzed. NCDEQ will have an opportunity to review this Proposed Plan and provide its feedback indicating concurrence, or lack thereof, with the Preferred Alternative. NCDEQ's response will be documented in a Responsiveness Summary, which will be included in the ROD.

J. COMMUNITY PARTICIPATION

The RI Report, risk assessment documents, the 2022 OU-2 FS Report, this Proposed Plan, and all supporting documents are available online at www.epa.gov/superfund/kerr-mcgee-chemical-corp and have been placed in the Site's Administrative Record. The public is encouraged to review and comment on all the alternatives presented in the Proposed Plan. The public comment period for the Proposed Plan begins June 1, 2022 and ends June 30, 2022.

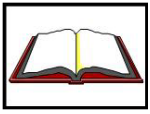
The EPA will hold a public meeting on June 14, 2022, from 6:00 p.m. to 7:30 p.m. at the Navassa Community Center, 338 Main Street, Navassa, North Carolina. Join the meeting online at: [this Zoom link](#) or enter tinyurl.com/NavassaMeetings in your browser. You may also join the meeting by phone at (301) 715-8592. Use meeting ID 946 584 8922# and passcode 664564#. A court recorder will be available to record verbal comments. Written comments may be provided that evening or mailed before the close of the comment period to the address below:

Erik Spalvins
EPA Remedial Project Manager
Phone: (404) 562-8938
Email: spalvins.erik@epa.gov

L'Tonya Spencer-Harvey
EPA Community Involvement Coordinator
Phone: (404) 562-8463
Email: spencer.latonya@epa.gov

Mailing Address: U.S. EPA Region 4, 61 Forsyth Street, S.W., 11th Floor, Atlanta, Georgia 30303-8960

The Preferred Alternative may change in response to public comment or new information acquired during the designated public comment period. Responses to comments received will be provided in the ROD, which will identify the selected interim remedial action to be implemented.



Glossary

Administrative Record: Materials, information, and documents that provide the basis and support EPA's selection of a remedial action at Superfund Sites usually placed in the information repository near the Site.

Applicable or Relevant and Appropriate Requirements (ARARs): Refers to federal and more stringent state environmental requirements that a selected remedy must attain (unless a waiver is justified in accordance with CERCLA Section 121(d)(4)) that vary from site to site. Reference 40 CFR 300.5 definitions of “applicable requirements” and “relevant and appropriate requirements”.

Chemicals of Concern (COCs): Chemical constituents associated with a Superfund site that have been released into the environment and pose an unacceptable risk to human health.

Cleanup: Actions taken to deal with a release or threat of release of a hazardous substance that could affect humans and/or the environment. The term "cleanup" is sometimes used interchangeably with the terms remedial action, removal action, response action, and corrective action.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA): Also known as Superfund, this federal law was passed in 1980 and modified in 1986 by the Superfund Amendment and Reauthorization Act (SARA). The act created a trust fund to investigate and clean up abandoned or uncontrolled hazardous waste sites.

Ecological Risk Assessment (ERA): A qualitative and quantitative evaluation that defines the risk posed to ecological receptors by the presence or potential presence of specific contaminants.

Feasibility Study (FS): Study conducted during or after the remedial investigation to identify alternatives or technologies that could be applicable to site-specific COCs.

Groundwater: Water located beneath the ground surface in soil pore spaces and in the fractures of lithologic formations.

Human Health Risk Assessment (HHRA). The process used to estimate the nature and probability of adverse health effects in humans who may be exposed to hazards in contaminated environmental media, now or in the future.

Information Repository: A library or other location where documents and data related to a Superfund project are placed to allow public access to the material.

Institutional Controls: Administrative non-engineering controls that inform and prevent exposures to human receptors.

Monitoring: The periodic or continuous surveillance or testing to determine the level of pollutants in various media.

National Oil and Hazardous Substances Pollution Contingency Plan (NCP): The federal regulation that guides the Superfund program. More commonly called the National Contingency Plan or NCP, the regulation is the federal government's blueprint for responding to oil spills and hazardous substance releases.

National Priorities List (NPL): The Superfund program's list of sites of national priority among the known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL guides the EPA in determining which sites warrant further investigation.

Operable Unit (OU): Distinct areas of a site, defined by geographic areas, specific problems, or medium (e.g., groundwater, soil) where a specific action is required.

Preliminary Remedial Goal (PRG): The average concentration of a chemical in an exposure area that will yield the specified target risk in an individual who is exposed at random within the exposure area.

Proposed Plan: Document that summarizes a site's remedial investigation and feasibility study, the alternatives developed, and the proposed Preferred Remedial Alternative and the rationale for its proposal.

Public Comment Period: The time allowed for the public to express its views and concerns on the information provided in the **Proposed Plan** and the EPA's proposed Preferred Remedial Alternative.

Record of Decision (ROD): An EPA decision document that selects and describes the remedy that will be implemented at a Site. The ROD is based on information and technical analysis generated during the remedial investigation and feasibility study and consideration of public comments.

Regional Screening Levels (RSLs): Risk-based screening levels below which health effects are not expected to occur. RSLs are used to identify contaminants that should be evaluated further in the risk assessment process. Exceedance of an RSL does not necessarily mean that a health impact is expected to occur.

Remedial Action: The actual construction or implementation phase of a Superfund site cleanup that follows the remedial design.

Remedial Action Objectives (RAOs): Cleanup goals that provide a general description of what a cleanup will accomplish (e.g., restoration of groundwater to drinking water levels). RAOs typically serve as the basis for developing remedial alternatives.

Remedial Design (RD): The phase in a Superfund site cleanup where the technical specifications for cleanup remedies and technologies are designed.

Remedial Investigation (RI): An investigation conducted to fully characterize the nature and extent of contamination of a release, or threat of release, of hazardous substances, pollutants, or contaminants. In addition, the RI also evaluates risks posed to human health and the environment. The RI gathers the necessary data to support the corresponding feasibility study.

Response Action: A CERCLA-authorized action involving either a short-term removal action or a long-term removal response. This may include, but is not limited to, removing hazardous materials from a site to an EPA-approved hazardous waste facility for treatment or containment, treating waste on site, identifying and removing sources of groundwater contamination, and halting further migration of contaminants.

Superfund: The common name used for the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), as amended in 1986.

To Be Considered (TBC): Advisories, criteria, and guidance developed by the EPA, other federal agencies, and states that may be useful in developing CERCLA remedies. See 40 C.F.R. § 300.400(g)(3).