
U. S. EPA Superfund Program

Proposed Plan for Record of Decision Amendment

Standard Chlorine of Delaware Superfund Site Operable Unit 2 New Castle County, Delaware



EPA ANNOUNCES PROPOSED PLAN

January 2016

The United States Environmental Protection Agency (EPA) is issuing this Proposed Remedial Action Plan (Proposed Plan) to present EPA's Preferred Alternative to transfer the waste piles that are a component of the remedy selected in the March 9, 1995 Record of Decision (ROD) for the Standard Chlorine of Delaware Superfund Site (Site) to Operable Unit 3. Since issuance of the 1995 ROD, EPA has considered the waste piles to be a component of Operable Unit 2 of the Site, or OU-2. The waste piles referenced in the 1995 ROD are now referred to as the OU-2 Waste Pile Soils.

Dates to Remember

**January 3 to
February 1, 2016**
Public Comment Period on
EPA's Proposed Plan

**Public Meeting
January 12, 2016
6:30 pm to 8:30 pm**
Delaware City Fire Hall

The Site is located on Governor Lea Road in New Castle County, Delaware, approximately three miles northwest of Delaware City, Delaware. Refer to Figure 1 for a map showing the location of the Site. The National Superfund Database Identification Number for the Site is DED141212473.

EPA is proposing to place the OU-2 Waste Pile Soils underneath the multi-layer impermeable cap that is currently being constructed as part of the OU-3 remedial action at the Site. This proposed modification is explained in detail later in this document. EPA is not proposing to modify the existing remedy for the remaining components of the final action for soils and sediments specified in the 1995 ROD, which include the western drainage gully, the eastern ditch, and the unnamed tributary to Red Lion Creek.

EPA is the lead agency for the Site, and the Delaware Department of Natural Resources and Environmental Control (DNREC) is the support agency. This Proposed Plan summarizes information from the 1995 ROD, 2004 Amendment to the 1995 ROD (2004 ROD Amendment), 2008 Explanation of Significant Differences (ESD) to the 2004 ROD Amendment, 2010 ROD for OU-3, and subsequent remedial actions and investigations. All the documents EPA considered for this proposed remedy modification are contained in the Administrative Record for the Site.

This Proposed Plan is being issued as part of EPA's public participation requirements under Section 117 of the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) of 1980, as amended, 42 U.S.C. § 9617, commonly known as Superfund, and Section 300.430(f)(ii) of the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 C.F.R. § 300.430(f)(ii).

After the close of the public comment period, EPA will announce its selection of the remedy modification for the OU-2 Waste Pile Soils in an Amendment to 1995 ROD (ROD Amendment). The public's comments will be considered and presented with discussion in the Responsiveness Summary of the ROD Amendment. EPA encourages the public to review the documents that make up the Administrative Record to gain a more comprehensive understanding of the Site and the Superfund activities that have been conducted at the Site.

The Administrative Record for the Site can be accessed at www.epa.gov/arweb, or at the following locations:

DE Dept. of Natural Resources & Environmental Control
Site Investigation and Restoration Branch
391 Lukens Drive
New Castle, DE 19720-2774
(302) 395-2600

EPA Administrative Records Room
Administrative Coordinator
1650 Arch Street
Philadelphia, PA 19103
Phone: (215) 814-3157
Hours: Monday- Friday 8:30 am to 4:30 pm (by appointment only)

The Proposed Plan includes the following sections:

- Site Background
- Site Characteristics
- Reason for the Proposed Change
- Scope and Role of the Proposed Response Action
- Summary of Site Risks
- Remedial Action Objectives
- Summary of Alternatives
- Evaluation of Alternatives
- EPA's Preferred Alternative
- Community Participation

SITE BACKGROUND

Site Location and Description

The Standard Chlorine of Delaware, Inc. Superfund Site (Site) is located in a heavily industrialized area in New Castle County, Delaware. The Site is located approximately three miles northwest of Delaware City, Delaware, west of Route 9 (River Road) and south of Red Lion Creek. The Site is approximately 65 acres in area, and contains a fenced area that is the former location of a chlorobenzene manufacturing plant (Plant) that was owned and operated by Standard Chlorine of Delaware, Inc. (SCD) until December 1998, and then by Metachem Products, LLC (Metachem) until 2002. Figure 2 shows former and current features of the Site.

History of Contamination

The Plant manufactured chlorobenzenes from 1966 to 2002 by combining chlorine and benzene, reacting and then distilling them at high temperature, and preparing and storing them onsite prior to sale. Some of the chlorobenzenes were stored in heated steel aboveground storage tanks (AST).

Leakage from pipes and ASTs throughout the Plant drained to Catch Basin #1. A crack in the concrete base of Catch Basin #1 was discovered and repaired in March 1976. The crack resulted in chlorobenzenes leaking into the subsurface soil for an unknown period of time.

Bulk liquid chlorobenzenes were often transported offsite by rail for commercial sale. An uncontrolled release of over 5,000 gallons of mono chlorobenzene occurred in September 1981 in the rail car loading area on the west side of the Plant. In 1986, an AST collapsed and the resulting release of chlorobenzenes caused other tanks to fail. The 1986 release totaled over 569,000 gallons of di- and trichlorobenzenes. Together, these two major releases of chlorobenzene compounds and the resulting contamination of soils, sediments and groundwater led to the listing of the Site on the National Priorities List (NPL) in 1987.

Following the 1986 spill, which impacted soil and sediment in adjacent stream valleys and wetlands, SCD used heavy equipment to collect as much of the spilled chlorobenzene as was practicable. Initial recovery efforts included the use of wet dredging and a flexible hose to direct contaminated dredge spoils into a lined sedimentation basin constructed on SCD's property just north of the Plant fence. Contaminated soils were also stockpiled in waste piles (the OU-2 Waste Pile Soils) next to the wetlands. The OU-2 Waste Pile Soils were then covered with high density polyethylene plastic sheeting, and earthen berms were constructed around them. The average concentration of total chlorobenzenes in samples collected from the OU-2 Waste Pile Soils was 50,000 parts per million. The OU-2 Waste Pile Soils remained in place until 2006, at which time EPA relocated the soils to an area just north of the former Plant to accommodate construction

of the subsurface barrier wall required by the OU-1 interim groundwater remedy discussed below.

EPA Response Actions

The 1995 ROD did not reference Operable Units (OU). In the 1995 ROD, EPA selected an interim action for groundwater and a final remedy for soils and sediment that included treatment by bioremediation, or low temperature thermal desorption (LTTD), a contingent remedy, in the event EPA determined bioremediation was not effective.

EPA subsequently designated the following OUs for the Site:

- OU-1. Implementation of the Interim Groundwater Remedy specified in the 1995 ROD.
- OU-2. Spill soils and sediments, as described in the 1995 ROD.
- OU-3. The former Plant area, as described in the 2010 ROD.
- OU-4. Future final remedy for groundwater.

In December of 1998, the Site was sold to Metachem, who resumed the manufacture of chlorobenzenes. Metachem continued remedial design activities for what became known as OU-1 and OU-2. Part of the design activities included conducting a bioremediation pilot test to evaluate the effectiveness of bioremediation to remediate the OU-2 soils and sediments, described in the 1995 ROD. Metachem submitted the results of a bioremediation study in March 2001. EPA evaluated the results of the bioremediation pilot test and determined bioremediation would not be effective at remediating the most highly contaminated OU-2 soils and sediments, and the contingent remedy of LTTD should be implemented.

Metachem filed a bankruptcy petition on May 10, 2002, and abandoned the Site on May 14, 2002 to the custody and control of EPA and DNREC. All remedial response actions from that time until the present have been conducted by EPA and DNREC with the use of Federal and State funds.

From 2002 through 2006, EPA and DNREC conducted a time critical emergency removal action at the Site that included the stabilization of hazardous chemicals; operation of the Plant to return the bulk of hazardous chemicals to the stream of commerce and minimize disposal costs; and decontamination of the Plant equipment. Following decontamination of the equipment; EPA and DNREC oversaw the dismantling and removal of equipment by a third party salvage operation. None of the former Plant equipment remains at the Site.

In 2003, EPA completed a preliminary remedial design to use LTTD to implement the OU-2 contingent remedy at the Site. For comparison purposes, the preliminary remedial design also evaluated off-site LTTD. The volume of soil and sediment requiring remediation was estimated to be 132,000 cubic yards. This estimate included the OU-2 Waste Pile Soils, which were estimated to contain 5,900 cubic yards of contaminated soil.

The estimated cost for conducting LTTD on-site was \$56,500,000, while the estimated cost for the off-site alternative was \$125,400,000.

The remedy for OU-2 has not yet been fully implemented. Currently, EPA is characterizing the nature and extent of contamination to the environment in the adjacent wetlands and water bodies. EPA and DNREC are currently revising the human health and ecological risk assessment based on data from a recent large-scale characterization effort to determine the extent of soil and sediment to be remediated. EPA is working with the U.S. Geological Survey to evaluate various innovative in-situ and ex-situ bioremediation techniques for lesser-contaminated areas of the wetlands.

EPA issued an amendment to the 1995 ROD in 2004 (2004 ROD Amendment). This amendment selected offsite disposal (incineration) for the bulk liquid wastes left onsite following Metachem's bankruptcy in 2002. Removal of the bulk liquid wastes was completed by December 31, 2009.

Physical onsite construction of the OU-1 interim groundwater remedy was initiated in July, 2006 and completed in 2007. Construction of the interim groundwater remedy included a subsurface soil-bentonite barrier wall (barrier wall) and a groundwater extraction and treatment system. The barrier wall, which has an average depth of 65 feet below ground surface, is 5,290 feet long and surrounds a large portion of the Site, including the former Plant area. The barrier wall extends down to a naturally occurring clay layer, called the Merchantville formation, which is about 60 feet beneath ground surface. The Merchantville formation separates the overlying Columbia aquifer from the underlying Potomac aquifer. A network of six extraction wells that were drilled within the area of the barrier wall pump contaminated groundwater from the overlying Columbia aquifer. Contaminants in the groundwater are treated on Site using a combination of technologies, including air stripping, vapor and liquid phase carbon adsorption, bag filters and sand filters. The groundwater is treated to potable standards. The interim groundwater remedy has been effective at containing contaminated Columbia aquifer groundwater within the barrier wall and preventing it from migrating offsite. EPA will continue operating the interim groundwater remedy until a final remedy for groundwater is selected.

From June 2006 through May 2007, EPA constructed the subsurface barrier wall. To construct the subsurface barrier wall, EPA excavated soil from a 3-foot wide by 65-foot deep trench, mixed the excavated soil with bentonite slurry on the surface, and returned the mixture to the trench. This mixture created an impermeable barrier wall to contain contaminated groundwater in the Columbia Aquifer. The OU-2 waste piles were located directly where the subsurface barrier wall was to be constructed, so EPA constructed a lined basin in an area inside of the subsurface barrier wall to temporarily store the OU-2 waste piles. The bottom of the Temporary Soil Storage Area (TSSA) was lined with a coated polyester geomembrane designed for use in hazardous substances applications.

In addition, EPA added approximately 7,000 cubic yards of contaminated soil that was generated during the barrier wall excavation to the TSSA. This soil came from the

former railyard area, which was significantly impacted by historical spills and was contaminated with high concentrations of chlorobenzenes. Concentrations of total chlorobenzenes within this area were as high as 12,000 parts per million.

Once the 5,900 cubic yards of soil contained in the OU-2 waste piles and the 7,000 cubic yards of soil generated during excavation of a portion of the barrier wall were consolidated in the TSSA, the contaminated soils were covered with 12 to 18 inches of imported compacted clay and topsoil. The TSSA was intended as a temporary measure to contain the contaminated soil until the selected remedy was implemented.

EPA issued an Explanation of Significant Differences (ESD) on March 6, 2008 that modified the 2004 ROD Amendment. The 2004 ROD Amendment established off-site incineration as the Selected Remedy for 1.3 million gallons of bulk liquid chemicals, but did not address any other excess bulk materials that remained on-site. The 2008 ESD significantly expanded the volume and associated treatment cost of excess bulk chemicals addressed under the 2004 ROD Amendment to include all excess bulk chemicals remaining on the Site.

The September 2010 ROD for OU-3 addresses the contamination in the vadose zone soils (soils above the water table) (OU-3 Soils) and soil gas in the former Plant area through capping, active soil gas collection and treatment, and institutional controls. EPA modified the 2010 ROD in 2011 to include the sedimentation basin with the OU-3 remedial action. Construction of the OU-3 selected remedy is currently underway. A 23-acre multi-layer soil and geosynthetic material cap (OU-3 Cap) is being constructed over the former Plant area and sedimentation basin. The active soil gas collection and treatment system will capture soil gas volatilizing from the soil and will treat it using granular activated carbon prior to venting it to the atmosphere. The objectives of the OU-3 remedial action are to prevent exposure to contaminated soil and soil gas, through inhalation, ingestion, or dermal contact; prevent risks to ecological communities exposed directly to the contaminated soil and indirectly via bioaccumulation of contaminated soil in plants and animals; and minimize the further spread of contamination to groundwater, surface water, sediment, and air. The impermeable cap and soil gas collection system will prevent vapors from emitting into the atmosphere, and will prevent rain water from infiltrating through the contaminated soil.

The final remedy for groundwater will be selected in the future as part of OU-4. EPA is currently completing a Remedial Investigation (RI) and Feasibility Study (FS) for the final remedy for groundwater. Once the RI/FS is completed, EPA will issue a Proposed Plan describing EPA's preferred alternative for groundwater.

SITE CHARACTERISTICS

The OU-2 Waste Pile Soils, which are now part of the TSSA, are the subject of this Proposed Plan. The TSSA is located north of the former Plant fence line, and lies to the north of the OU-3 Cap that is currently being constructed as part of the OU-3 remedial action. The TSSA contains approximately 13,000 cubic yards of soil contaminated with

total chlorobenzenes, and approximately 4,000 cubic yards of clay and topsoil. The concentration of total chlorobenzenes are up to 50,000 parts per million. The OU-2 Waste Pile Soils contaminants and their respective concentrations are similar to the contaminants and contaminant concentrations found in the OU-3 Soils that are being placed under the OU-3 Cap as selected in the 2010 ROD.

REASON FOR THE PROPOSED CHANGE

The TSSA was constructed as a temporary measure to contain the OU-2 Waste Pile Soils and the soil generated during the excavation of a small portion of the barrier wall. EPA has determined the most expeditious and cost-effective way to permanently address the soils within the TSSA is to place them under the OU-3 Cap. Construction of the OU-3 Cap is currently taking place, so the additional cost of placing the soils that are in the TSSA will be minimal. Furthermore, because the contamination present in the OU-2 Waste Pile Soils is similar to the contamination in the OU-3 Soils, consolidating them does not significantly alter the OU-3 remedial action with respect to scope, performance, or cost.

The remedy selected in the 1995 ROD for the OU-2 Waste Pile Soils was bioremediation, or, if it was determined that bioremediation was not feasible, a contingent remedy of low temperature thermal desorption was selected. EPA evaluated a bioremediation study completed by Metachem in 2001, determined bioremediation was not a feasible treatment option for the most highly contaminated soil and sediments present in OU-2 soils and sediments, and initiated a remedial design for LTTD. EPA is continuing to evaluate the use of bioremediation for some of the lesser contaminated soil and sediment within OU-2. The cost of placing the OU-2 Waste Pile Soils under the OU-3 Cap is a more cost effective approach than LTTD. Additionally, under EPA's proposal to place the OU-2 Waste Pile Soils under the OU-3 Cap that is currently under construction, the OU-2 Waste Pile Soils can be addressed within the coming months.

SCOPE AND ROLE OF THE PROPOSED RESPONSE ACTION

The scope and role of the Preferred Alternative is to modify the remedy selected for the OU-2 Waste Pile Soils described in the 1995 ROD. EPA is not proposing to modify the remedy selected for any of the other remaining features described in the 1995 ROD, which include the contaminated soils and sediment in the eastern drainage ditch, western drainage gully, or the unnamed tributary to Red Lion Creek.

The Preferred Alternative will provide for a cost effective and permanent solution for the OU-2 Waste Pile Soils by placing them underneath the OU-3 Cap that is currently being constructed. The TSSA will be excavated and the soils will be moved to within the bounds of the OU-3 Cap, where they will be covered by a 12-inch gas collection layer; a geosynthetic clay liner; an impermeable geomembrane; 18 inches of imported soil; 6 inches of topsoil; and seeded with grass. Through the use of an impermeable, multi-layer soil and geosynthetic material cap and the capture and treatment of contaminated soil gas,

this proposed remedy would permanently eliminate the potential for exposure to contaminated soil and related soil gas.

The remedy modification described in this Proposed Plan will modify the following component of the 1995 ROD with respect to the OU-2 Waste Pile Soils:

1995 ROD Component	Proposed Remedy Modification
<ul style="list-style-type: none"> • Bioremediate the soils/sediments in the waste piles using in situ (in place) or ex situ (excavated) treatment; <p><u>(with a Contingency Remedy of)</u></p> <ul style="list-style-type: none"> • Excavate and treat the soils/sediments in the waste piles using low temperature thermal desorption. 	<p>Place OU-2 Waste Pile Soils underneath the multi-layer soil and geosynthetic material cap currently being constructed as part of the OU-3 remedial action; collect and treat contaminant vapors that accumulate underneath cap.</p>

SUMMARY OF SITE RISKS

Limited risks are currently posed by the OU-2 Waste Pile Soils because they are located within the TSSA and within the boundaries of the barrier wall. However, the TSSA was not constructed to provide permanent containment of the contaminated soil. It was intended to provide temporary containment. While it does have an underlying coated polyester geomembrane that is designed for use with hazardous materials, there are only 12 to 18 inches of clay and 6 inches of topsoil covering the contaminated soil, and soil gas vapors are passively vented to the atmosphere without treatment. In the event the TSSA erodes, or is subject to damage, migration of contaminants to the environment may occur. If contaminated soil becomes exposed and subject to surface runoff, it may migrate to a nearby stormwater detention pond and drain offsite. The levels of total chlorobenzenes in the OU-2 Waste Pile Soils are as high as 50,000 parts per million, and would pose a risk to human health and the environment.

EPA characterizes waste on site as either principal threat waste or low-level threat waste. The concept of principal threat waste and low-level threat waste, as developed by EPA in the NCP, is applied on a site-specific basis when characterizing source material. "Source material" is defined as material that includes or contains hazardous substances, pollutants, or contaminants that act as a reservoir for migration of contamination to groundwater, to surface water, to air, or that act as a source for direct exposure. Principal threat wastes are those source materials considered to be highly toxic or highly mobile, which would present a significant risk to human health or the environment should exposure occur. The soils in the TSSA, with levels of chlorobenzenes as high as 50,000 parts per million are considered Principal Threat Waste at the Site.

REMEDIAL ACTION OBJECTIVES

The 1995 ROD identified Remedial Action Objectives (RAOs) to protect the public from potential current and potential future health risks, and to protect the environment from contaminants present in the soils and sediment. The 1995 ROD RAOs with respect to the OU-2 Waste Pile Soils included:

- Remediate soils and sediments to levels that are protective of human health and the environment.
- Minimize infiltration, run-on, and run-off of precipitation to areas containing subsurface contaminated soils and sediments.
- Reduce bioaccumulation of contaminants.

With regard to the proposed remedy, EPA would modify one RAO, as follows:

1995 ROD RAO	Modified RAO
Remediate soils and sediments to levels that are protective of human health and the environment.	Minimize the spread of contamination via any of the following major migration pathways: <ul style="list-style-type: none"> • Soil to groundwater • Soil to surface water • Soil to sediment • Soil to air

The following RAOs from the 1995 ROD would be met by the Preferred Alternative for the OU-2 Waste Pile Soils:

- Minimize infiltration, run-on, and run-off of precipitation to areas containing subsurface contaminated soils and sediments.
- Reduce bioaccumulation of contaminants (the accumulation of contaminants in organisms).

Additionally, the following RAO would be met by the Preferred Alternative for the OU-2 Waste Pile Soils:

- Prevent exposure to contaminants in the soil and soil gas via the potential exposure routes of inhalation, ingestion, and dermal contact.

SUMMARY OF ALTERNATIVES

Remedial alternatives for addressing the OU-2 Waste Pile Soils are presented below. Alternatives include the current selected remedy (LTTD) along with EPA’s Preferred Remedy. During the upcoming public comment period, EPA welcomes and encourages

public comment on the Preferred Alternative, the other evaluated alternatives, or any other ideas or approaches.

Contingent Remedy, per the 1995 ROD: Low Temperature Thermal Desorption.

Under this alternative, the OU-2 Waste Pile Soils would be remediated using LTTD to a level safe enough to allow the soil to be returned to the wetlands. LTTD is a technology in which the contaminated soil and sediment would be excavated and heated at temperatures ranging from 200 degrees to 1,000 degrees Fahrenheit, driving off water and volatile contaminants. The recovered liquid would be treated, and the recovery vapors would be either further heated in an afterburner to destroy the contaminants, or captured by carbon filtration units. The OU-2 Waste Pile Soils currently being stored in the TSSA would be remediated at the same time as the rest of the contaminated soil and sediment that are part of OU-2, and remediation would not occur until a final remedial design is completed and sufficient funding is received. The cost figures shown below apply only to remediation of the estimated 16,000 cubic yards comprising the TSSA. Costs are based on determinations made in the 2003 Preliminary Design, and have been adjusted for 2015 dollars. Under the current alternative, the soil would be remediated to unrestricted use so there would be no operation and maintenance (O&M) costs.

<i>Estimated Capital Cost:</i>	<i>\$5,800,000</i>
<i>Estimated Annual O&M Cost:</i>	<i>\$0</i>
<i>Estimated Present Worth Cost:</i>	<i>\$5,800,000</i>

Preferred Alternative: Containment. Under this alternative, the OU-2 Waste Pile Soils would be placed underneath the cap during construction of the remedy for OU-3. Vapors from beneath the OU-3 Cap will be collected and treated with granular activated carbon prior to venting to the atmosphere. Potential exposure pathways to human health and the environment would be eliminated via capping and the collection and treatment of gas vapors. Because the OU-3 Cap is currently under construction, this alternative could be completed within the coming months. The addition of the estimated 16,000 cubic yards of soil from the TSSA (12,000 cubic yards of contaminated soil and 4,000 cubic yards of cover soil) would not have a significant impact on the scope, performance, or cost of the OU-3 remedy, because:

- The total volume of soils in the TSSA is low compared to the total volume of soil already being capped within OU-3 (approximately 900,000 cubic yards);
- Contaminants present in the OU-2 Waste Pile Soils are consistent with the contaminants present in OU-3 Soils; and
- The cost of placing the OU-2 Waste Pile Soils under the OU-3 Cap (\$300,000) is low compared to the estimated total cost for the OU-3 remedy (\$17.1 Million).
- Placement of the OU-2 Waste Pile Soils under the OU-3 Cap would not have a significant increase O&M labor or material costs because O&M will be conducted regardless of whether the OU-2 Waste Pile Soils are placed under the OU-3 Cap or not.

<i>Estimated Capital Cost:</i>	<i>\$300,000</i>
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Estimated Annual O&M Cost: \$0
Estimated Present Worth Cost: \$300,000

EVAUATION OF ALTERNATIVES

Nine criteria are used to evaluate the different remediation alternatives individually and against each other in order to select a remedy. This section of the Proposed Plan profiles the relative performance of each alternative against the nine criteria, noting how it compares to the other options under consideration. The nine criteria are discussed below.

Evaluation Criteria for Superfund Remedial Alternatives
1. 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.
2. Compliance with ARARs evaluates whether the alternative meets Federal and State environmental statutes, regulations, and other requirements that pertain to the site, or whether a waiver is justified.
3. Long-term Effectiveness and Permanence considers the ability of an alternative to maintain protection of human health and the environment over time.
4. 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.
5. 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.
6. Implementability considers the technical and administrative feasibility of implementing the alternative, including factors such as the relative availability of goods and services.
7. Cost includes estimated capital and annual operations and maintenance costs, as well as present worth cost. Present worth cost is the total of an alternative over time in today's dollar value. Cost estimates are expected to be accurate within a range of +50 to -30 percent.
8. State/ Support Agency Acceptance considers whether the State agrees with EPA's analyses and recommendations, as described in the RI/FS and Proposed Plan.
9. 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.

Detailed Analysis of Proposed Remedial Alternative Compared to Current Selected Remedy

1. Overall Protection of Human Health and the Environment

The Preferred Alternative will protect human health and the environment by eliminating or mitigating exposure or the potential for exposure to Site-related contaminants by placing the OU-2 Waste Pile Soils underneath the OU-3 Cap which will include a soil gas collection and treatment system. The Preferred Alternative will provide protection of the

environment for all areas of ecological concern within OU-3 by eliminating the exposure pathway.

The LTTD remedy would also protect human health and the environment by remediating the OU-2 Waste Pile Soils to the performance standards listed in the 1995 ROD so they can be returned to the wetlands.

2. Compliance with ARARs

The Preferred Alternative will attain all ARARs, with the exception of the requirement to construct a liner system beneath the waste. The ARAR to be waived is Delaware Regulations Governing Hazardous Waste (DRGHW) Part 264 Subpart N (§§264.300 through 264.317) and 40 CFR Part 264 Subpart N (§§264.300 through 264.317). The method of construction will attain a standard of performance equivalent to what would be attained through the construction of a liner system. The standard of performance equivalent is based on the presence of the Merchantville clay formation underlying the OU-3 area, as well as the thick clays of the upper part of the Potomac formation, which separate the overlying Columbia aquifer from the underlying Potomac aquifer. These naturally occurring clays serve as an impermeable barrier separating the contaminated groundwater in the upper aquifer from the deeper parts of the Potomac aquifer. The bottom of the barrier wall is keyed into these clays, which therefore allows for containment of the groundwater within the barrier wall. Because the Preferred Alternative will attain a standard of performance that is equivalent to that which would be attained with the construction of a liner system, this ARAR is waived pursuant to 40 CFR §300.430(f)(1)(ii)(C)(4).

The LTTD remedy would attain ARARs by treating the OU-2 Waste Pile Soils to health-based clean-up levels.

3. Long-Term Effectiveness and Permanence

The Preferred Alternative would provide effective containment of all contaminants present in the OU-2 Waste Pile Soils by placing them underneath the OU-3 Cap. The soils will be covered by a 12-inch gas collection layer; a geosynthetic clay liner; an impermeable geomembrane; 18 inches of imported soil; 6 inches of topsoil; and seeded with grass. The soil gas capture system that is part of the OU-3 remedial action, along with the institutional control prohibiting the construction of any building on Site without prior written approval from EPA, are together expected to satisfactorily address the long-term effectiveness concerns associated with soil gas. Hydraulic containment will be achieved because the subsurface barrier wall surrounds OU-3, and extraction and treatment of contaminated groundwater within the barrier wall will continue. Containment would substantially reduce the risks related to, and the potential spread of, Site contaminants. To remain effective over the long term, operations and maintenance activities, including management of vegetation and burrowing animals and repairs of cracks and erosional features, are a long-term component of the OU-3 remedial action and this Preferred Alternative. Because

wastes would be left in place, reassessment of the effectiveness of the Preferred Alternative would be necessary at five-year intervals as required by CERCLA §121(c).

The LTTD remedy would result in the near-complete removal of contaminants from the OU-2 Waste Pile Soils and allow the soil to be re-used on the Site. The remedy would effectively and permanently remove the contamination once all of the soil is remediated.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

High concentrations of chlorobenzenes (up to 50,000 parts per million) are present in the OU-2 Waste Pile Soils that are within the TSSA, and are considered to be Principal Threat Waste. The chlorobenzenes present in the OU-2 Waste Pile Soils are not liquid, and therefore are not highly mobile, but are considered highly toxic due to the high concentrations of the contaminants. The Preferred Alternative will use a combination of permanent containment and soil gas collection and treatment within OU-3 to prevent the OU-2 Waste Pile Soils from impacting human health or the environment. This gas collection and treatment system will satisfy the preference for treatment of the soil gas.

The Preferred Alternative will reduce the mobility of the contaminants through the use of a surface cap to reduce infiltration (reducing the soil to groundwater pathway), eliminate contact of contaminated materials with stormwater (eliminating the soil to sediment pathway), and capture and treat soil gas (eliminating the soil to air pathway). The OU-3 remedial action that is being constructed includes a gas collection and treatment system to meet the substantive provisions of air discharge permit requirements for off-gas from the cap's soil gas collection system because of the expected rate of discharge of contamination in soil gas that would be emitted if such gasses were directly vented. EPA expects that the soil gas capture and treatment component of the OU-3 remedial action will also reduce the toxicity or volume of the OU-3 organic contaminants, including the OU-2 Waste Pile Soils that are the subject of this Proposed Plan, to some degree, but it will not reduce the toxicity or volume of inorganic or semivolatile organic compounds.

The LTTD remedy uses treatment to address the threats posed by contaminants present in the OU-2 Waste Pile Soils. The preference for treatment as a principal element is satisfied since treatment of contaminants using LTTD is the principal element of the contingent remedy.

5. Short-term Effectiveness

Short-term risks to construction workers and the environment are expected to occur from the implementation of the Preferred Alternative. These risks include exposure to dust and vapors during construction activities, as well as continued risks from the current Site conditions before the alternatives are fully implemented. Short-term risks associated with the Preferred Alternative can be managed by a combination of Personal Protective Equipment (PPE), and vapor and dust suppression measures to be employed during construction activities. Conducting the work in the winter months when ambient temperatures are low would reduce the vapors present. When the OU-2 Waste Pile Soils

are being uncovered and the soils relocated, additional measures can be taken to address potential organic vapors including temporarily covering contaminated soil with foam and ensuring cover soil is placed over the material as soon as practicable once it is staged within the OU-3 area to be capped.

The same short-term risks to construction workers and the environment can be expected to occur during implementation of the LTTD remedy. The same risks to workers that are described above would apply to the LTTD remedy. However, the time taken to batch-treat the OU-2 Waste Pile Soils would be longer than the relatively short length of time to move and place the OU-2 Waste Pile Soils under the Preferred Alternative.

6. Implementability

The Preferred Alternative would be straightforward to implement. Since it does not significantly impact the scope, performance, or cost of the OU-3 remedial action, relocation of the OU-2 Waste Pile Soils and remainder of soils within the TSSA to within the OU-3 area to be capped could be completed within 3 months of issuing a ROD Amendment. Construction crews are already onsite for the OU-3 cap construction. No significant changes are necessary to the overall design of the OU-3 Cap because the volume of soil comprising the TSSA (approximately 16,000 cubic yards) will not impact the overall design.

Implementation of the LTTD remedy will require completing a remedial design and securing adequate funding. As stated earlier, remediation of the OU-2 Waste Pile Soils would be conducted at the same time as remediation of the remainder of OU-2, which includes sediment in the contaminated wetlands. It would likely be several more years before the OU-2 Waste Pile Soils could be addressed, because of the complexity of the remedial design and availability of remedial funding. Commercial LTTD units are available and therefore implementation of the LTTD remedy is technically practicable with respect to treating the OU-2 Waste Pile Soils.

7. Cost

The estimated present worth cost for the Preferred Alternative is \$300,000. These costs include to the labor and equipment costs to transport the OU-2 Waste Pile Soils and remainder of soils within the TSSA to the OU-3 Cap area. Placement of these soils within the OU-3 Cap area would not increase the area to be capped, so there are no additional costs. Since the Preferred Alternative would not have a significant impact on the OU-3 remedial action, O&M costs are not being considered. O&M costs and efforts related to the Preferred Alternative will be absorbed by the O&M that will be conducted as part of the OU-3 remedial action.

As a point of comparison, EPA completed a 15% Preliminary Design in 2003 to use LTTD to remediate all contaminated soil and sediment associated with OU-2, including the OU-2 Waste Pile Soils, which at that time had not yet been placed in the TSSA. The total volume of soil to be remediated was estimated at 130,000 cubic yards. The cost estimate for thermal oxidation was \$32.6 million, or \$251 per cubic yard. This estimate

does not include site work, sampling, or restoration, which would be minimal when considering just the TSSA. Adjusted for inflation, the estimate is \$48.0 million, or \$369 per cubic yard. Therefore, the cost to remediate the OU-2 Waste Pile Soils and remaining soils within the TSSA using LTTD is estimated to be \$5.9 million.

8. State Acceptance

The State of Delaware has indicated their support of the Preferred Alternative. Any comments received from the State will be reviewed and addressed in the Responsiveness Summary.

9. Community Acceptance

Community acceptance of the Preferred Alternative will be evaluated after the public comment period ends and EPA will address questions and comments in the Responsiveness Summary of the ROD Amendment.

EPA'S PREFERRED ALTERNATIVE

EPA's Preferred Alternative to modify the remedy selected in the 1995 ROD is to contain the OU-2 Waste Pile Soils by placing them underneath the OU-3 Cap and treat contaminated vapors. EPA is not proposing to modify any other component of the remedy selected in the 1995 ROD. The Preferred Alternative will modify the currently selected remedy with respect to the former waste piles as follows:

Current Remedy	Proposed Remedy
Bioremediate the soils/sediments in the waste piles using in situ (in place) or ex situ (excavated) treatment; Or Excavate and treat the soils/sediments in the waste piles using low temperature thermal desorption.	Place OU-2 Waste Pile Soils underneath the multi-layer soil and geosynthetic material cap currently being constructed as part of the OU-3 remedial action; collect and treat contaminant vapors that accumulate underneath cap.

The Preferred Alternative consists of the following:

EPA will excavate and move the OU-2 Waste Pile Soils currently within the TSSA to the area just to the south that is being covered in the OU-3 Cap. The OU-3 Cap cover system will consist of the following elements:

- 12-inch gas collection layer connected to two granular activated carbon treatment units for capture and treatment of VOCs in soil gas;
- 1-inch thick geosynthetic clay liner;
- Impermeable geomembrane;

- 18 inches of imported soil;
- 6 inches of topsoil; and
- Vegetated surface.

EPA is prepared to complete construction of the Preferred Alternative within six months of issuance of the ROD Amendment.

Statutory Determination

Based on the information currently available, EPA has determined that the Preferred Alternative would be protective of human health and the environment, would comply with ARARs with the exception of the ARAR being waived, and would be a timely and a cost effective solution for permanently addressing the OU-2 Waste Pile Soils. The Preferred Alternative does not satisfy the statutory preference for treatment as a principle element of the remedy. However, protection of human health and the environment will be achieved through the combined use of soil gas collection and treatment and containment as engineering controls. Placement of the OU-2 Waste Pile Soils within OU-3 will not significantly affect the scope, performance, or cost of the OU-3 remedy. The modified remedy selected by EPA for the OU-2 Waste Pile Soils may differ from the Preferred Alternative described in this Proposed Plan based on public comments or new information.

COMMUNITY PARTICIPATION

EPA relies on public input so that the remedy selected for each Superfund site meets the concerns of the local community.

Public Comment Period – To allow for community involvement, a public comment period will open January 3, 2016 and extend through February 1, 2016. During this time the public is encouraged to submit to EPA any comments on the Proposed Plan.

Public Meeting – A public meeting will be held to discuss the Proposed Plan on January 12, 2016, from 6:30 pm to 8:30 pm. The public meeting will be held at the Delaware City Fire Hall.

It is important to note that although EPA has proposed a Preferred Alternative, no changes to the remedy selected in the 1995 ROD will be implemented until the community participation component of this Proposed Plan is completed. All relevant comments received will be considered and addressed by EPA before any changes are made to the remedy selected in the 1995 ROD.

Detailed information on the material discussed herein may be found in the Administrative Record for the Site, which includes the OU-1 and OU-2 Remedial Investigation, Human Health Risk Assessment, Feasibility Study, Pre-Design Investigation, Focused Feasibility Study and other information used by EPA in the decision making process. The Administrative Record also includes relevant information related to OU-3, including the

*Proposed Plan
Standard Chlorine of Delaware Superfund Site*

Record of Decision and Final Remedial Design. EPA encourages the public to review the Administrative Record in order to gain a more comprehensive understanding of the Site and the Superfund activities that have taken place there. Copies of the Administrative Record are available for review at www.epa.gov/arweb, or at the following locations:

EPA Administrative Records Room,
Attention: Administrative Coordinator
1650 Arch Street
Philadelphia, PA
(215) 814-3157

Hours: Monday through Friday, 8:00 am to 4:30 pm; by appointment only.

DE Dept. of Natural Resources & Environmental Control
Site Investigation and Restoration Section
391 Lukens Drive
New Castle, DE 19720-2774
302-395-2600

The deadline to submit comments is February 1, 2016. Written comments, questions about the Proposed Plan or public meeting, and requests for information can be sent to either representative below:

Brad White (3HS22)
Remedial Project Manager
Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103
(215) 814-3217
White.Brad@epa.gov

Trish Taylor (3HS52)
Community Involvement Coordinator
Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103
(215) 814-5539
Taylor.Trish@epa.gov

Following the conclusion of the public comment period on this Proposed Plan, EPA will prepare a Responsiveness Summary. The Responsiveness Summary will summarize and respond to comments on EPA's Preferred Alternative for the OU-2 Waste Pile Soils. EPA will also prepare a formal decision document, ROD Amendment, which summarizes the decision and the remedy modification for the OU-2 Waste Pile Soils. The ROD Amendment will include the Responsiveness Summary. Copies of the ROD Amendment will be available for public review in the designated repositories, described above.

Standard Chlorine of Delaware – Proposed Plan

General Location

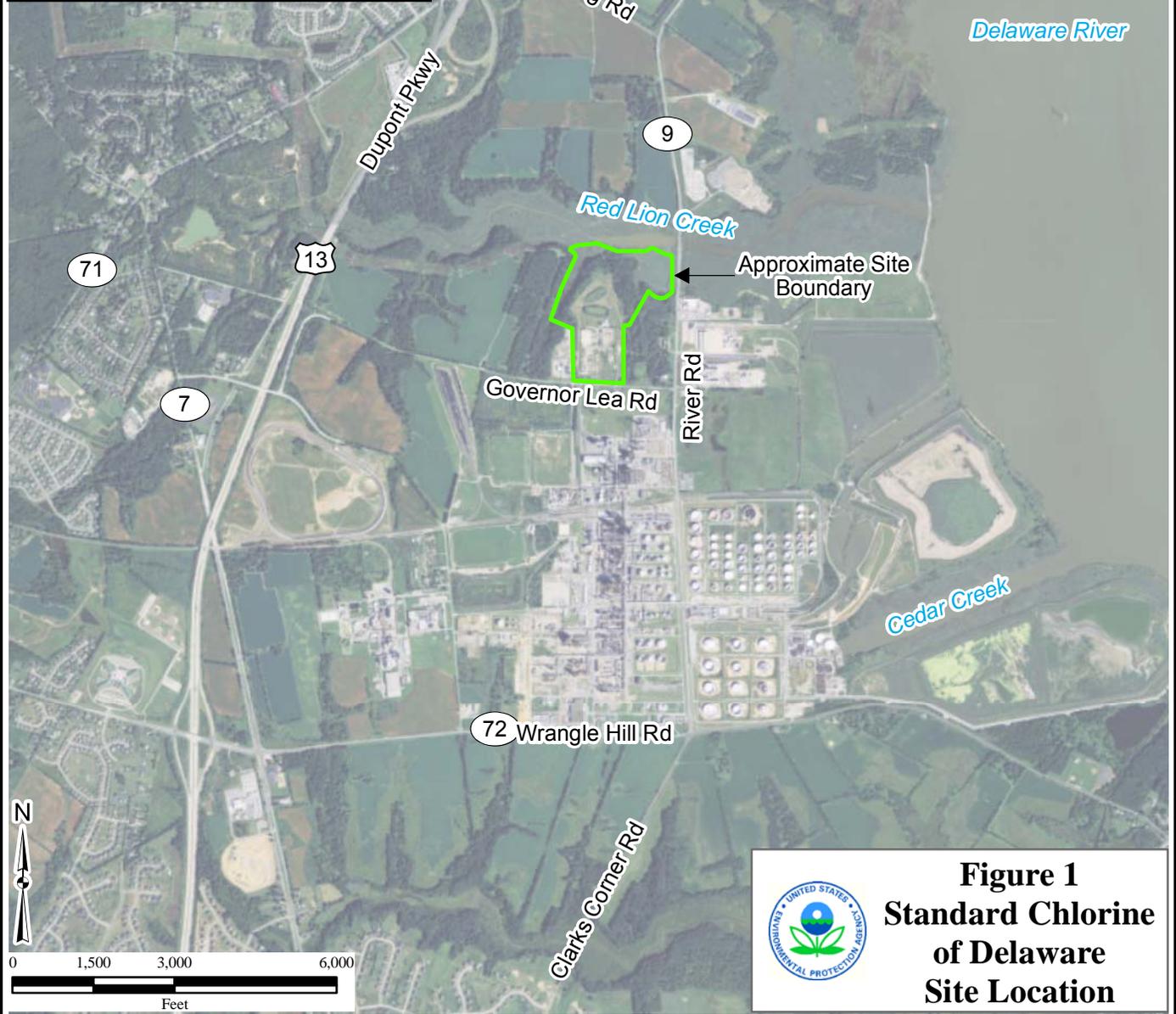
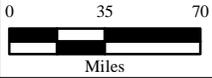


Figure 1
Standard Chlorine
of Delaware
Site Location

Standard Chlorine of Delaware – Proposed Plan

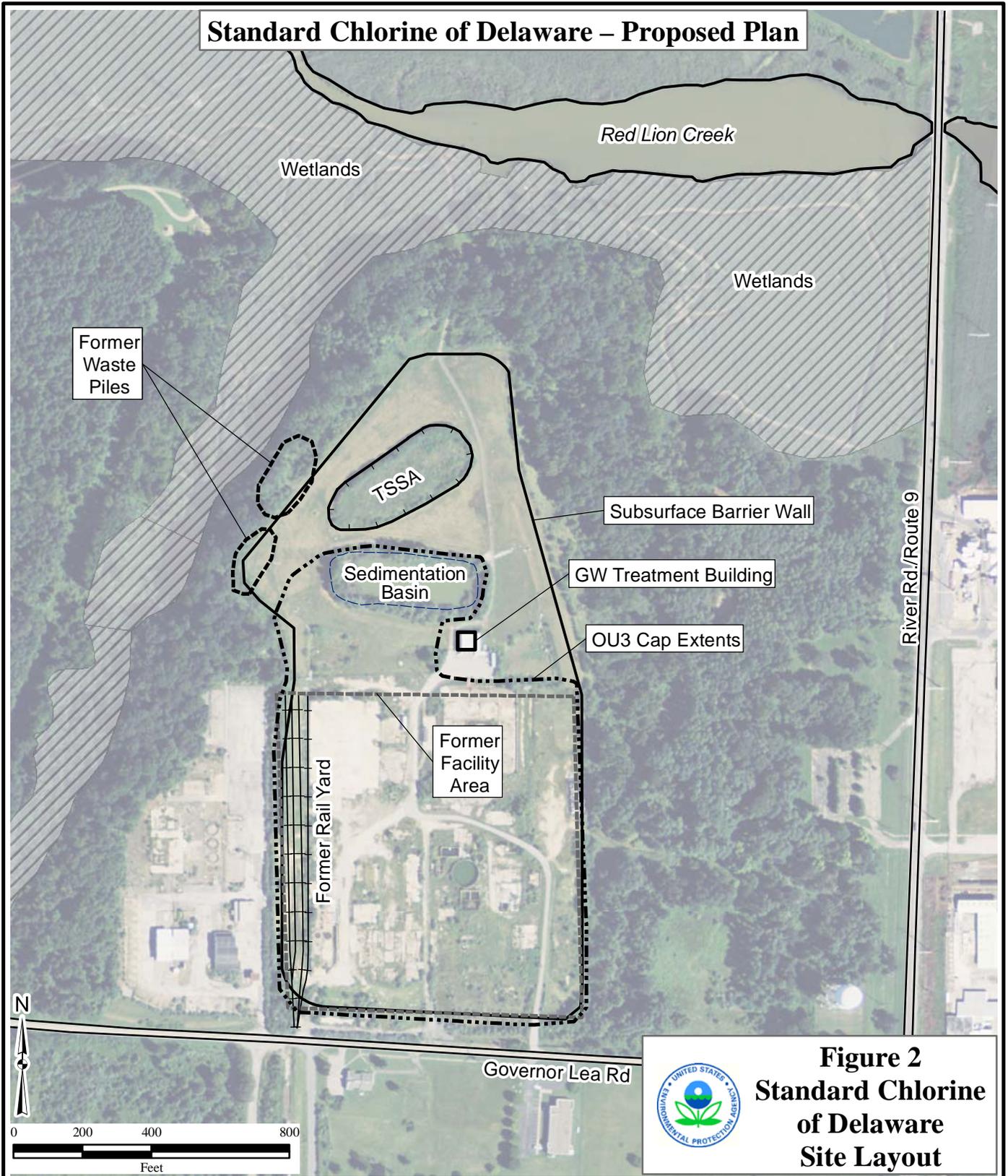


Figure 2
Standard Chlorine
of Delaware
Site Layout



Attachment 1
Applicable or Relevant and Appropriate Requirements (ARARs)
for the Preferred Remedy for OU-2 Waste Pile Soils
(Page 1 of 4)

ARAR	Legal Citation	ARAR Class	Requirement Synopsis	Applicability to Proposed Alternative
Coastal Zone Management Act of 1972; Coastal Zone Act Reauthorization Amendments of 1990.	16 USC 1451, 1452, 1453, 1456	Applicable	Requires that Federal agencies conducting activities in or affecting the coastal zone, conduct those activities in a manner that, to the maximum extent practicable, is consistent with the enforceable policies of the appropriate approved State coastal zone management program.	The substantive requirements are applicable to this remedial action, which is being conducted by EPA at a facility that is located in the Delaware coastal zone.
Delaware Coastal Zone Act; Delaware Regulations Governing the Coastal Zone	7 Delaware Code, Chapter 70, at Sections 7002-7003; Delaware Coastal Zone Act Regulations of May 11, 1999, amended on October 1, 2001, Sections A-E	Applicable	Govern permissible activities and land uses for properties located in Delaware's Coastal Zone. Section 7003 of the Act sets forth the uses that are absolutely prohibited in the Coastal Zone. Section E of the regulations specifically allows the, "installation and modification of pollution control and safety equipment for nonconforming uses within their designated footprint providing such installation and modification does not result in any negative environmental impact over and above impacts associated with the present use."	The Site is located in the Coastal Zone. As a result, the substantive standards of the statute and regulations apply to this remedy.

Attachment 1
Applicable or Relevant and Appropriate Requirements (ARARs)
for the Preferred Remedy for OU-2 Waste Pile Soils
(Page 2 of 4)

ARAR	Legal Citation	ARAR Class	Requirement Synopsis	Applicability to Proposed Remedies
Delaware Regulations Governing Hazardous Waste (DRGHW)	SEE ITEMS 1 AND 2 BELOW The DRGHW provisions that are a part of Delaware's Federally authorized program would apply instead of the Federal RCRA regulations. Additionally, any provision that is not a part of the authorized program, but that is more stringent than the Federal requirement, would also be applicable.	Applicable	Regulate the transportation, management, treatment, and disposal of hazardous wastes.	SEE ITEMS 1 AND 2 BELOW
Regulations promulgated pursuant to the Resource Conservation and Recovery Act of 1976; Hazardous and Solid Waste Amendments of 1984	SEE ITEMS 1 AND 2 BELOW Federal RCRA regulations would not apply for those regulations where Delaware has the authority from EPA to administer. Federal citations are also included in items 2 through 6 below because any Federal regulations that are imposed under the Hazardous and Solid Waste Amendments of 1984, which are not a part of Delaware's authorized program, and which are immediately effective, would apply.	Applicable	Regulates the management of hazardous waste, to ensure the safe disposal of wastes, and to provide for resource recovery from the environment by controlling hazardous wastes "from cradle to grave."	SEE ITEMS 1 AND 2 BELOW

Attachment 1
Applicable or Relevant and Appropriate Requirements (ARARs)
for the Preferred Remedy for OU-2 Waste Pile Soils
(Page 3 of 4)

ARAR	Legal Citation	ARAR Class	Requirement Synopsis	Applicability to Proposed Remedies
1. Identification and Listing of Hazardous Wastes	DRGHW Part 261	Applicable	Identifies solid wastes which are regulated as hazardous wastes.	This part of the regulations will be used to determine which materials must be managed as hazardous wastes.
2. Standards Applicable to Generators of Hazardous Waste	DRGHW Part 262 subpart A (sections 262.10-262.12) and § 262.34; 40 CFR Part 262. subpart A (§§ 262.10-262.12 and § 262.34)	Applicable	Establishes standards for generators of hazardous wastes including waste determination and requirements regarding accumulation time.	The substantive standards of the listed sections would be applicable to excavated soils placed under the OU03 cap.
Delaware Regulations Governing Hazardous Substance Cleanup, 9/96, as amended 02/2002	Subsections 1.1 and 9.3	Applicable	Establishes surface water cleanup levels.	Applicable to the cleanup of soils, groundwater that discharges to water bodies, and surface water at the Site.
Delaware Sediment and Stormwater Regulations, 01/23/91, as amended April 11, 2005	Sections 1-3, 10-13, 15	Applicable	Establishes a statewide sediment and stormwater management program.	The substantive provisions of this regulation are applicable to stormwater from the construction area. No permits or plans will be obtained or prepared.

Attachment 1
Applicable or Relevant and Appropriate Requirements (ARARs)
for the Preferred Remedy for OU-2 Waste Pile Soils
(Page 4 of 4)

Delaware Air Quality Management Regulations	Air Quality Management Regulations Number 1102 (Section 11.6), 1103 (Sections 3 and 11), 1106, 1119, 1124	Applicable	Regulation No. 1102 sets forth the permitting requirements for equipment and construction activities that may discharge air contaminants into the atmosphere. Regulation No. 1103, sections 3 and 11, establish ambient air quality standards for particulates. Regulation No. 1106 limits particulate emissions from excavation/ construction operations. Regulation No. 1119 requires that odorous air contaminants be controlled. Regulation No. 1124 requires the control of emissions of the volatile organic compounds.	Applicable to potential releases from soil gas capture systems, excavation work, or other remedial actions. If soil gas system emissions exceed the appropriate regulatory limit, the substantive requirements of regulation No. 1124 must be met. In addition, the emissions must meet the Ambient Air Quality Standards set forth in Regulation No. 1103. Dust suppression measures must also be in place to ensure that excavation and construction activities meet the regulation requirements. Furthermore, the substantive requirements of Regulation No. 1102 must be met.
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