FIFTH FIVE-YEAR REVIEW REPORT FOR L.A. CLARKE AND SON SUPERFUND SITE SPOTSYLVANIA COUNTY, VIRGINIA

ORIGINAL

September 2015

Prepared By:
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Date

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LIST OF ABBREVIATIONS

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
CIC	Community Involvement Coordinator
DNAPL	Dense Non-Aqueous Phase Liquid
EPA	United States Environmental Protection Agency
ESD	Explanation of Significant Differences
FYR	Five-Year Review
GPRA	Government Performance and Results Act
IC	Institutional Control
mg/kg	milligrams per kilogram
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbons
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RD/RA	Remedial Design and Remedial Action
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
SWRAU	Sitewide Ready for Anticipated Use
VADEQ	Virginia Department of Environmental Quality

EXECUTIVE SUMMARY

The L.A. Clarke and Son Superfund site (the Site) in Spotsylvania County, Virginia, is a 44-acre former wood treating facility that used creosote to preserve wood from 1937 until 1988. The United States Environmental Protection Agency (EPA) detected soil, sediment, groundwater and surface water contamination at the Site in 1983. The contamination is mostly creosote by-products: polycyclic aromatic hydrocarbons (PAHs), benzene and dense non-aqueous phase liquids (DNAPL). The U.S. Environmental Protection Agency (EPA) added the Site to the National Priorities List (NPL) on June 10, 1986. The triggering action for this five-year review (FYR) was the signing of the previous FYR on September 29, 2010.

EPA issued a Record of Decision (ROD) for the Site on March 31, 1988 to address surface soil contamination and sediments, deferring the investigation of groundwater contamination and selection of a remedy to address groundwater contamination to a future ROD. The cleanup actions taken on the Site include installation of partial fencing and signage to deter trespassers from entering the Site; demolition of all process area buildings and other structures; removal of all of the remaining telephone poles and railroad ties; decommissioning of the former wastewater impoundment, including removal, treatment and off-site disposal of surface water, sludge and underlying soils; and excavation and off-site disposal of sediments from the drainage ditches and flood plain.

The Site consists of five operable units (OUs). This FYR report addresses OU1, OU2, and OU4. OU3 is not addressed in this FYR because EPA determined remedial action was not necessary at OU3, therefore there is no remedy to be assessed. Since EPA has not selected a remedy for OU5, it is not included as part of this FYR.

The Potentially Responsible Party (PRP) is Commonwealth Atlantic-Spotsylvania, Inc. (CASI). They are conducting a comprehensive investigation of the groundwater at the Site, to be followed by a new RI/FS report and issuance of a groundwater ROD for the Site as part of OU5.

The remedy at OU1 currently protects human health and the environment because fencing and signage are in place to deter trespassers. However, in order to be protective in the long-term the proposed changes to the soil remedy need to be recorded and implemented to ensure protectiveness.

The remedy at OU2 is protective of human health and the environment. All site-related buildings and structures have been demolished and disposed of off-site.

The remedy at OU4 is currently underway. Modifications to the soil/ sediment remedy are being considered by EPA. However, currently the remedy is protective of human health and the environment because surface soil contamination has been reduced and there are currently no complete exposure pathways. However, soil cleanup goals defined in the ROD have not been met, the soil cover called for in the ROD has not been added and subsurface soil cleanup has been deferred until OU5 groundwater is addressed. In order to be protective in the long-term, modifications to the selected remedy are necessary and the implementation of the remedy will need to be completed.

Government Performance and Results Act (GPRA) Measure Review

As part of this FYR, the GPRA Measures have also been reviewed. The GPRA Measures and their status are provided as follows:

Environmental Indicators
Human Health: Current Human Exposure Controlled
Groundwater Migration: Groundwater migration is not under control

Sitewide Ready for Anticipated Use (SWRAU)
The Site has not achieved Sitewide Ready for Anticipated Use (SWRAU).

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: L.A. Clarke and Son		
EPA ID: VAD007972482		
Region: 3	**State:** VA	**City/County:** Spotsylvania County
SITE STATUS		
NPL Status: Final		
Multiple OUs? Yes	**Has the site achieved construction completion?** No	
REVIEW STATUS		
Lead agency: EPA **If "Other Federal Agency" selected above, enter Agency name:** Click here to enter text.		
Author name: Christian Matta and Andrew Palestini, with additional support provided by Skeo Solutions		
Author affiliation: EPA Region 3		
Review period: 10/01/2014 – 8/29/2015		
Date of site inspection: 3/19/2015		
Type of review: Statutory		
Review number: 5		
Triggering action date: 9/29/2010		
Due date *(five years after triggering action date)*: 9/29/2015		

FIVE-YEAR REVIEW SUMMARY FORM (CONTINUED)

Issues/Recommendations

OU(s) without Issues/Recommendations Identified in the Five-Year Review:
OU1 and OU3

Issues and Recommendations Identified in the Five-Year Review:

OU(s): OU1	Issue Category: Remedy Performance			
	Issue: Securing the site with fencing and signage was not identified in the 1988 ROD or any subsequent ESD and is required to ensure protectiveness.			
	Recommendation: Issue a decision document identifying the need to address site security with fencing and signage. Click here to enter text.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2016

OU(s): OU4	Issue Category: Institutional Controls			
	Issue: Institutional controls have not been implemented.			
	Recommendation: Define the appropriate Institutional Controls based upon the modified selected remedy and issue a decision document that requires implementation.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA/PRP	EPA	9/30/2016

OU(s): OU4	Issue Category: Remedy Performance			
	Issue: Soil cleanup has not been achieved to the cleanup goals specified in the ROD. In addition, the PRP did not install the protective soil cover.			
	Recommendation: Determine if performance standards in the ROD can be modified and still achieve protectiveness. Issue a decision document recording the changes to the remedy.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Implementing Party**	**Oversight Party**	**Milestone Date**
No	Yes	EPA	EPA	9/30/2016

Protectiveness Statement(s)

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
OU1	Short-term Protective	Click here to enter date.

Protectiveness Statement:
The remedy at OU1 currently protects human health and the environment because fencing and signage are in place to deter trespassers. However, in order to be protective in the long-term the proposed changes to the soil remedy need to be recorded and implemented to ensure protectiveness.

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
OU2	Protective	Click here to enter date.

Protectiveness Statement:
The remedy at OU2 is protective of human health and the environment. All site-related buildings and structures have been demolished and disposed of off-site.

Operable Unit:	*Protectiveness Determination:*	*Addendum Due Date (if applicable):*
OU4	Short-term Protective	Click here to enter date.

Protectiveness Statement:
The remedy at OU4 currently protects human health and the environment because surface soil contamination has been reduced and there are currently no complete exposure pathways. However, soil cleanup goals in the ROD have not been met, the soil cover called for in the ROD has not been added and subsurface soil cleanup has been deferred until OU5 groundwater is addressed. In order to be protective in the long-term, EPA needs to finalize and implement proposed modifications to the soil remedy to ensure protectiveness.

Fifth Five-Year Review Report
for
L.A. Clarke and Son Superfund Site

1.0 Introduction

The purpose of a five-year review (FYR) is to evaluate the implementation and performance of a remedy to determine if it will continue to be protective of human health and the environment. FYR reports document FYR methods, findings and conclusions. In addition, FYR reports identify issues found during the review, if any, and document recommendations to address them.

The United States Environmental Protection Agency (EPA) prepares FYRs pursuant to the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) Section 121 and the National Oil and Hazardous Substances Pollution Contingency Plan (NCP). CERCLA Section 121 states:

> If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at the site, the President shall review such remedial action no less often than each 5 years after the initiation of such remedial action to assure that human health and the environment are being protected by the remedial action being implemented. In addition, if upon such review it is the judgment of the President that action is appropriate at such site in accordance with section [104] or [106], the President shall take or require such action. The President shall report to the Congress a list of facilities for which such review is required, the results of all such reviews, and any actions taken as a result of such reviews.

EPA interpreted this requirement further in the NCP, 40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii), which states:

> If a remedial action is selected that results in hazardous substances, pollutants, or contaminants remaining at the site above levels that allow for unlimited use and unrestricted exposure, the lead agency shall review such action no less often than every five years after initiation of the selected remedial action.

EPA Region 3, with contractor support from Skeo Solutions, conducted the FYR from October 2014 to August 2015 and prepared this report regarding the remedy implemented at the L.A. Clarke and Son Superfund site (the Site) in Spotsylvania County, Virginia. EPA is the lead agency for developing and implementing the remedy for the potentially responsible party (PRP)-financed cleanup at the Site. Virginia Department of Environmental Quality (VADEQ), as the support agency representing the Commonwealth of Virginia, has reviewed all supporting documentation and provided input to EPA during the FYR process.

This is the fifth FYR for the Site. The triggering action for this statutory review is the signing of the previous FYR. The FYR is required because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted

exposure. The Site consists of five operable units (OUs). This FYR report addresses OU1, OU2, and OU4. OU3 is not addressed in this FYR because EPA determined remedial action was not necessary at OU3. Since EPA has not selected a remedy for OU5, it is not included as part of this FYR.

2.0 Site Chronology

Table 1 lists the dates of important events for the Site.

Table 1: Chronology of Site Events

Event	Date
Wood preserving operations took place at the Site	June 1937 – 1988
Inactive period at the Site	April 1979 – June 1980
EPA conducted a site inspection and discovered contamination	April 1, 1983
EPA listed the Site on the National Priorities List (NPL)	July 10, 1986
EPA completed remedial investigation and feasibility study (RI/FS)	February 1988
EPA signed Record of Decision (ROD) for OU1, OU2, OU3 and OU4	March 31, 1988
PRPs began remedial design for OU1	March 1989
EPA and PRP entered into a Consent Decree for remedial design and remedial action (RD/RA)	July 17, 1989
EPA issued Administrative Order on Consent (AOC)	September 6, 1989
PRP began RD for OU2	September 1989
EPA issued first Explanation of Significant Differences (ESD) for OU2	December 29, 1989
PRP began RD for OU4	March 1990
PRP completed RD and began RA for OU2	August 1990
PRP completed first ESD work	January 13, 1993
PRP completed RD/RA for OU1	September 1993
EPA issued second ESD for OU2	March 31, 1994
EPA signed first FYR	September 30, 1994
EPA issued AOC for removal order	September 29, 1995
PRP completed second ESD work	February 28, 1997
PRP completed RA for OU2	May 1997
EPA signed ESD for OU4	June 14, 1999
EPA signed second FYR	September 30, 1999
PRP completed RD for a portion of OU4	September 2000
PRP began RA for a portion of OU4	July 2001
PRP completed third ESD work	October 2001
PRP submitted supplemental site characterization report	April 2005
EPA signed third FYR	September 29, 2005
EPA signed fourth FYR	September 29, 2010
PRP conducted supplemental sampling of subsurface soils, sediments and surface water	October 2012
PRP submitted draft RI/FS for groundwater	March 2015

3.0 Background

3.1 Physical Characteristics

The Site is located in Spotsylvania County, Virginia, about 4.5 miles southeast of Fredericksburg. It is a quarter mile east of state Route 608, north of Massaponax Creek (Figure 1). The Site consists of about 40 acres owned by the Commonwealth Atlantic-Spotsylvania, Inc. (CASI) and a related entity. It encompasses three tracts of property. The North Terrace and South Terrace areas are the former L.A. Clarke and Son property and are separated by a railroad right-of-way that includes an active spur. The third area comprises Massaponax Creek and its floodplain. There is fencing along the North Terrace. The floodplain area and the railroad are not fenced. Figure 2 includes the approximate boundaries of the Site, current features and location of historic source areas.

Surface topography is relatively flat due to extensive fill and grading operations. Surface runoff from the Site flows into drainage ditches that discharge into the Massaponax Creek floodplain south of the Site. Water from the floodplain flows through several tributaries to Massaponax Creek. Westvaco Pond lies to the west of the former L.A. Clarke and Son property.

Groundwater at the Site flows in a southwesterly direction within two water-bearing zones. The shallow aquifer flows beneath the former operations area and surfaces at the southern property boundary in the floodplain area. Groundwater from the Site sometimes enters the drainage ditches, with outfalls in the floodplain. A deeper aquifer flows under the Site and the floodplain.

3.2 Land and Resource Use

The property currently consists of undeveloped land. All of the process buildings, structures and tanks have been removed. The Site is near a secondary road in a mostly rural area. An active rail line passes through the property.

Residential homes are located about 1,000 feet upgradient of Site. These homes are on public water service provided by Spotsylvania County. The PRP-owned parcels 37-A-17C (See Figure 2) and the majority of the floodplain area are zoned industrial. A portion of the floodplain is zoned rural use, which can include residential use. That property is operated as a firing range.

Massaponax Creek eventually discharges into Ruffins Pond about two miles downstream. Ruffins Pond is used for recreational fishing. Westvaco Pond is not known to be a swimming or fishing location.

3.3 History of Contamination

Wood preserving operations began at the Site in 1937 and continued until 1988, with the exception of one inactive period between April 1979 and June 1980. Operators preserved railroad ties, telephone poles and fence posts by injecting the lumber with a mixture of creosote and coal tar under high temperature and pressure in a sealed compartment.

Contamination at the Site resulted from facility operations, spills, waste streams entering drainage ditches, and on-site disposal of waste products.

3.4 Initial Response

In 1980, L.A. Clarke and Sons, Inc. (L.A. Clarke) was classified under RCRA as a treater of hazardous wastes because of its use of an on-site wastewater impoundment (Figure 2). In 1982, L.A. Clarke submitted a RCRA Part B Permit Application, which addressed the impoundment and a contaminated soil pile south of the process area.

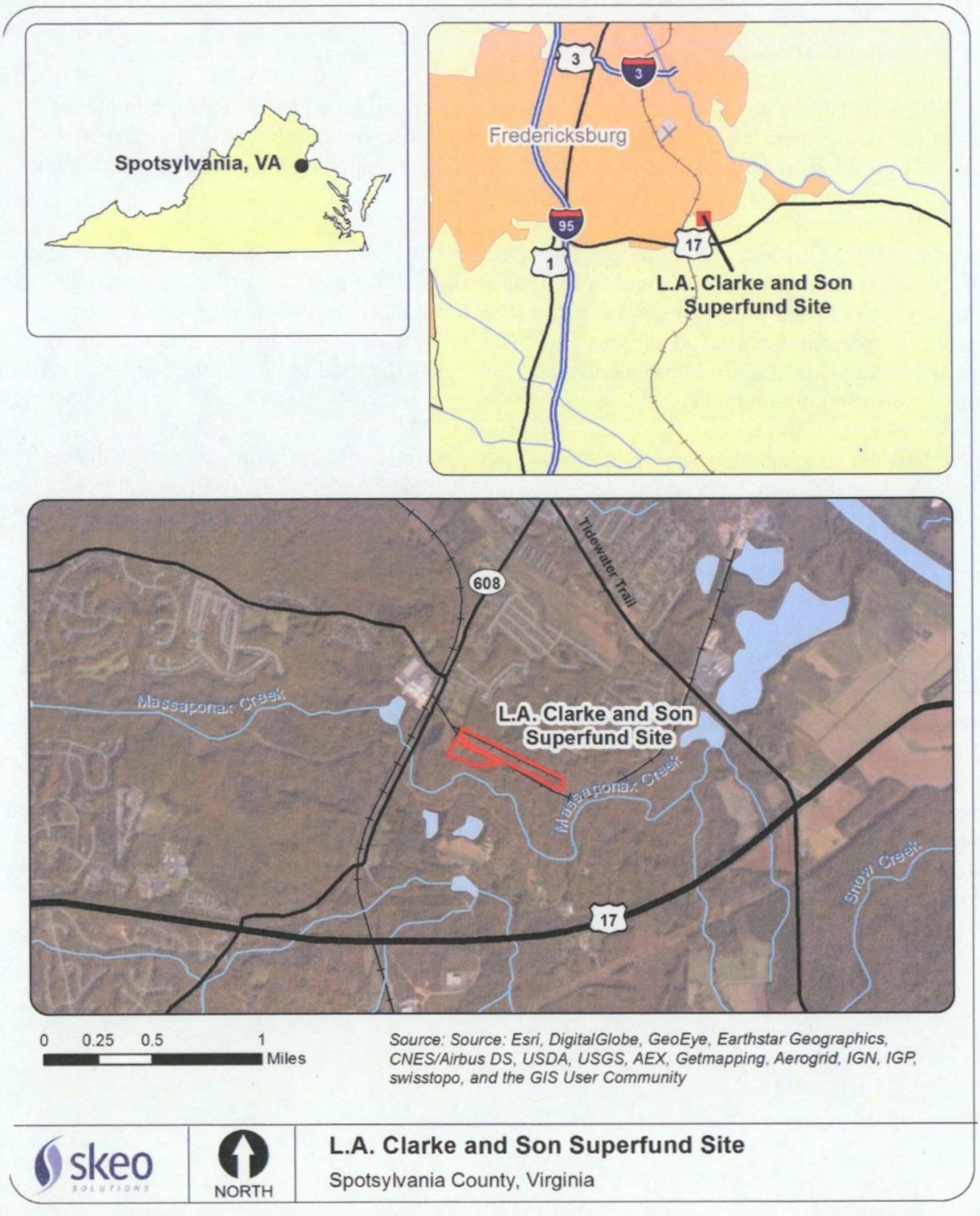
As part of the RCRA-permitting process, a state-mandated remedial action required excavation of soils from the processing area and from drainage ditch # 2 along the northern property line. The work, conducted prior to 1984, created a RCRA-regulated soil waste pile. The waste pile contained approximately 1,400 cubic yards of soil, and was underlain by two synthetic liners of 10 mils each. This pile was subsequently sent for off site disposal as part of the Remedial Action activities carried out under OU2.

EPA detected soil, sediment, groundwater and surface water contamination at the Site during a 1983 site investigation. EPA added the Site to the National Priorities List (NPL) on July 10, 1986.

3.5 Basis for Taking Action

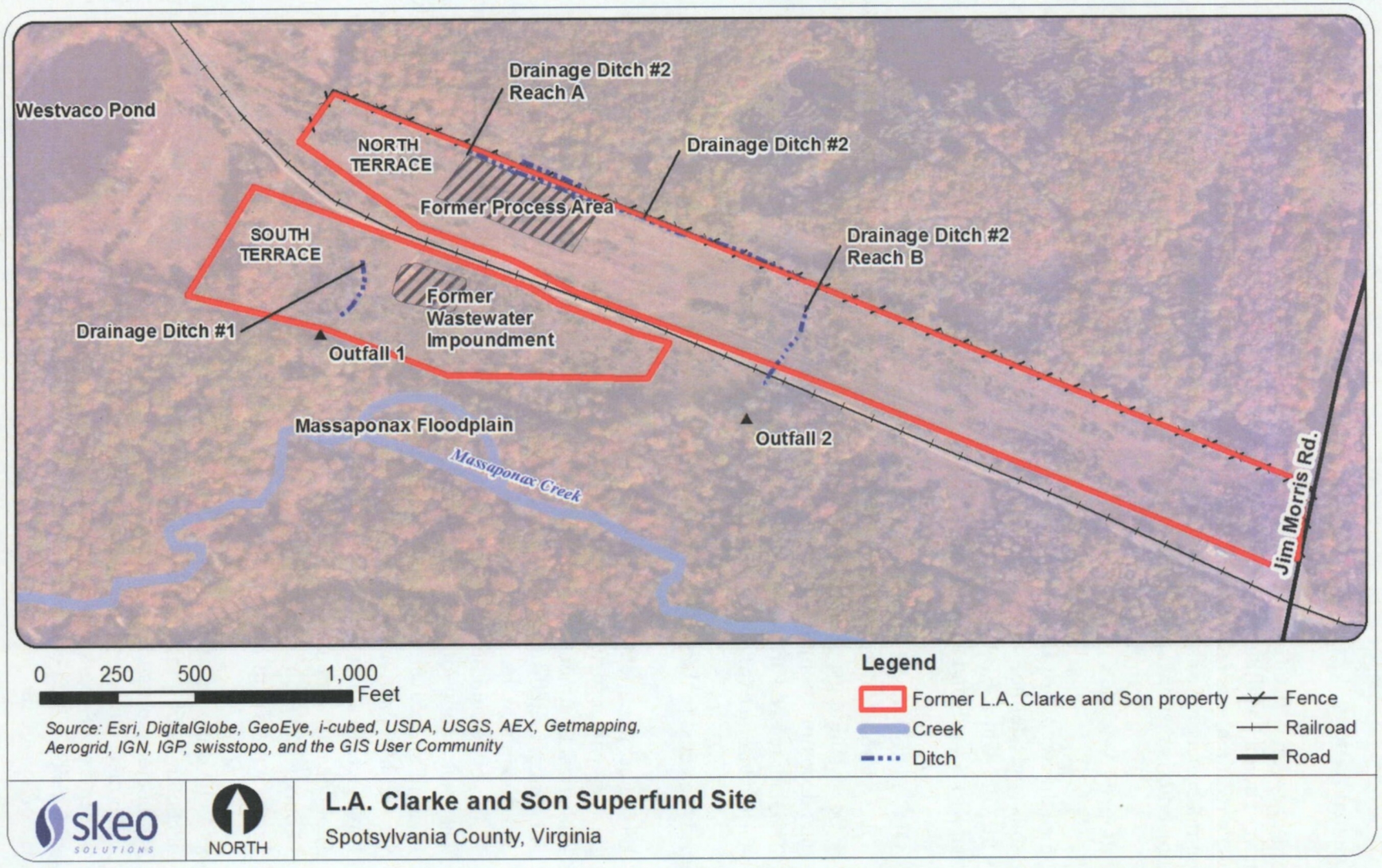
EPA completed the remedial investigation and feasibility study (RI/FS) in February 1988. EPA determined that the Site contained contaminated soils and sediments that may present an imminent and substantial endangerment to public health, welfare or the environment. The contamination consists of the by-products of creosote: polycyclic aromatic hydrocarbons (PAHs), benzene and dense non-aqueous phase liquids (DNAPLs). Sample results showed free product creosote five or more feet below the surface both next to the facility and along the southern site boundary. Other subsequent investigations confirmed that contamination was either transported off site via surface flow or migrated along thin alluvial planes to the floodplain area of Massaponax Creek. The RI/FS also included a survey of bottom feeding fish from Westvaco Pond, which revealed carcinogenic lesions around the gills and mouth of several specimens.

Figure 1: Site Location Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

Figure 2: Detailed Site Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

4.0 Remedial Actions

In accordance with CERCLA and the NCP, the overriding goals for any remedial action are protection of human health and the environment and compliance with applicable or relevant and appropriate requirements (ARARs). A number of remedial alternatives were considered for the Site, and final selection was made based on an evaluation of each alternative against nine evaluation criteria that are specified in Section 300.430(e)(9)(iii) of the NCP.

4.1 Remedy Selection

EPA signed the Record of Decision (ROD) on March 31, 1988, to address the contaminated surface soils (soils defined at a depth of less than 18 inches) and sediments. The ROD selected a remedy for OU1 which EPA subsequently divided into four OUs as shown below. EPA deferred additional RI/FS work and selection of a remedy for groundwater to OU5.

- OU1 addressed site security with fencing and signage.
- OU2 addressed decontamination and demolition at the Site, including demolition of the process buildings; disposal of railroad ties, telephone poles and unused treated wood; and decommissioning of the wastewater impoundment.
- OU3 addressed surface water controls.
- OU4 addressed treatment and disposal of contaminated surface soil and sediments.

The remedy selected in the 1988 ROD included the following:

- Biological treatment of contaminated soil under the process buildings via in-situ soil flushing with a surfactant solution followed by in-situ bioreclamation.
- Biological treatment of all other contaminated soil and sediment via on-site landfarming. All contaminated surface soil that could not be treated in-situ, sediments (ditches 1, 2, 3 and floodplain), buried pit materials and subsurface floodplain soils (at depth greater than 12 inches) would be excavated and consolidated for treatment in the landfarming unit. The total amount of soil and sediments to be treated was about 119,000 cubic yards.
- Backfill of excavated areas with treated soil and sediment. Cover backfilled areas with 1.5 feet of topsoil and revegetate.
- Biological treatment of the RCRA-regulated soil pile via land treatment in place.
- Biological treatment of the former wastewater impoundment sludge.
- Groundwater monitoring during and after treatment (deferred to OU5).
- Implementation of institutional controls.

The 1988 ROD states that the primary remedial action objective (RAO) is to eliminate soil and sediment contamination that presents an unacceptable risk to human health and the environment. The ROD set cleanup standards for carcinogenic PAH-contaminated surface soils and sediments that would protect current workers (0.22 milligrams per kilogram (mg/kg)) and on-site potential future residents (0.08 mg/kg) for incidental ingestion and dermal contact. The ROD also specified that site-related contaminants in soils and sediments should not exceed criteria protective of aquatic life in surface water bodies such as Massaponax Creek. As a result the ROD

specifies a Total PAH cleanup standard of 352 mg/kg for soils and sediments to protect aquatic receptors. In order to ensure subsurface soils would not be a continued source of contamination to the shallow aquifer a target cleanup level for carcinogenic PAHs was set at 10.3 mg/kg and a target cleanup level of 94.03 mg/kg was set for Benzene.

Explanations of Significant Differences (ESDs) in 1989, 1994 and 1999 modified the remedy. On December 29, 1989, EPA issued the first ESD, which provided for the removal of the onsite process buildings and associated appurtenances. With respect to soils beneath the process buildings, in the 1988 ROD EPA had selected in-situ soil flushing followed by bioremediation. The ROD further provided that should the on-site process buildings be removed, Alternative 4 would be selected. Alternative 4 is identical to Alternative 3 except that, with absence of the buildings, contaminated soils beneath the former process buildings were to be subject to the same remedy selected for other site soils and sediments at the Site.

The 1994 ESD modified the remedy for the wastewater impoundment sludge. Because the sludge was a listed waste under RCRA with the designation K001, it had to meet the Land Disposal Restrictions prior to disposal. Since the Land Disposal Restrictions became effective August 8, 1988, it was not known at the time of the March 31, 1988 ROD that biological treatment of the sludge could not meet the restrictions. As a result, EPA selected off-site incineration as the selected remedy for the wastewater impoundment sludge.

The 1999 ESD modified the remedy for floodplain and drainage ditch sediments to be off-site disposal of the top 6 inches of sediment from areas exceeding the ROD sediment cleanup criteria instead of on-site biological treatment of the sediments along with surface soils.

4.2 Remedy Implementation

The PRPs entered into a Consent Decree with EPA on July 17, 1989, to conduct the remedial design and remedial action (RD/RA) of the remedy selected in the 1988 ROD. The CD defined the remedy selected in the ROD as OU1 and the additional work to be completed as OU2. OU1 was later broken out into four OUs as listed below:

OU1 – Site security
The OU1 remedial design took place in March 1989. Remedial action began in September 1989 and was completed in September 1993. The north terrace of the property is fenced along the northern, western and eastern boundaries. The presence of a railroad spur prevents complete fencing of the property. Site security was not explicitly identified as part of the selected remedy identified in the 1988 ROD. Therefore, EPA will identify the need for the fencing and document its implementation in a pending decision document.

OU2 – Building demolition
OU2 covered decontamination, demolition and removal of the process buildings, railroad ties, scrap metal, drums and the wastewater impoundment. Remedial design started in September 1989 and was completed August 1990. Remedial action began in August 1990 and was completed in May 1997, with completion of the impoundment removal. This included removal and off-site disposal of wastewater, emulsion, sludge, liner material and contaminated soil.

OU3 – Water control

OU3 encompassed control of water in on-site ditches. The purpose of OU3 was to determine whether it was feasible to prevent clean water from becoming contaminated by entering the drainage ditches on the site. However, the results of a study indicated that it was not feasible to prevent the clean water from entering the drainage ditches and no further work was performed under this OU.

OU4 – Soil and sediment

OU4 encompasses biological treatment via landfarming of shallow soils and sediments on site. Remedial design was started in March 1990 and completed in September 2000. Shallow soils that were formerly located under the buildings and process area soils were treated by landfarming pursuant to the 1989 ESD. Remedial action began in July 2001. By fall 2001, sediments were removed from the drainage ditches and at the discharge point of the ditches in the floodplain and disposed of off site pursuant to the 1999 ESD. The soil waste pile and soil and sludge from the wastewater impoundment were removed and disposed of off site pursuant to the 1994 ESD. However, it should be noted that off site disposal of the soil piles was omitted from the 1994 ESD and will be documented in a future decision document.

The wastewater impoundment was decommissioned in March 1997. This effort included removal and off-site disposal of approximately 240,000 gallons of wastewater, approximately 153,000 gallons of emulsion and sludge, 172 tons of liner material, and 96 cubic yards of contaminated soil from underneath the impoundment liner. Approximately 770 cubic yards of contaminated sediments were removed and disposed off-site.

In 1999, the PRP petitioned EPA to change the surface soil cleanup level based on a risk-based industrial land use rather than residential land use which was the requirement of the ROD. The petition states that the PRP anticipates industrial, rather than residential, use of the property. The petition requests that EPA change the surface soil cleanup to risk-based levels for the Operator, Fabricator, and Laborer worker receptors. EPA has evaluated the petition to determine if the surface soil cleanup numbers are protective of the intended future use of the property. The proposed cleanup level of 60 mg/kg Benzo (a) Pyrene equivalents in soil is expected to be protective of future workers at the site given that the probabilistic Reasonable Maximum Exposure (RME) risk is 1E-04 and the point Central Tendency Estimate (CTE) risk is 3E-05. EPA has provisionally accepted the proposed cleanup level and has not enforced soil cleanup to the extent required in the ROD while the necessary decision document is prepared by EPA which among other things will modify the surface soil cleanup level. Currently, no activities are occurring that could result in soil contact. The PRP has indicated that it does not intend to use the Site for residential development. Future residential use is also unlikely given current land uses, the presence of the floodplain south of the Site, and the presence of an active rail spur through the Site. Institutional Controls will also be required to prohibit residential use of the property.

Phase 1 of a landfarming pilot study began in 2013 to determine if total PAH concentrations could be reduced to the ecological cleanup goals. Phase 2 occurred during the summer and fall of 2014 when amendments were added to determine the optimal rates of biological activity to degrade the PAHs. Based on the results of Phase 2, Phase 3 started in May 2015 using Soygold,

a commercial grade oil product, as an amendment. In the summer and late fall of 2015, the PRP will conduct sampling to determine the efficacy of Soygold.

OU5 Ongoing Investigations

The ROD indicated that groundwater would be addressed in a separate operable unit. EPA determined that a new RI/FS was needed followed by issuance of a ROD to select the remedy for subsurface soils and groundwater. The RI/FS is underway. The purpose of this RI/FS is to:

- Provide a summary of the scope, findings and conclusions of the various investigations that have been completed at the Site.
- Define the nature and extent of contamination, including DNAPL (residuals and free-phase) and COPCs in the subsoils (vadose zone and saturated zone), sediment, groundwater and surface water.
- Develop a conceptual site model and RAOs.
- Present a human health risk assessment that includes potential exposure to impacted groundwater.
- Evaluate potential risk to ecological receptors.
- Develop, screen and evaluate remedial action technologies and alternatives.

Following completion of the RI/FS, EPA will issue a decision document selecting the final remedy.

4.3 Operation and Maintenance (O&M)

The PRP performs general site maintenance, including security fencing and signage. The PRP also conducts quarterly site inspections, except during June, July and August, when site inspections are conducted monthly. Periodic maintenance to remove beaver dams and debris is performed to maintain the functionality of the ditches. No costs associated with O&M were reviewed.

5.0 Progress since the Last Five-Year Review

The protectiveness statement from the 2010 FYR for the Site stated the following:

A protectiveness statement cannot be made at this time for the remedy at OUI. Although the fencing and signage help to deter trespassers from entering the upland portion of the site and past sampling has indicated that the surface soil at the upland portion of the site meets the to-be-proposed revised cleanup level of 60 milligrams per kilogram for polynuclear aromatic hydrocarbons (cPNAs), confirmatory sampling of the flood plain must be performed to assure the sediments have not been re-contaminated and, possibly exposing trespassers to unacceptable levels of contaminants. It is expected that the confirmatory sampling will take approximately 15 months to complete, at which time a protectiveness determination will be made.

The remedy at OU 2 is protective of human health and the environment. The demolition of process area buildings and structures; removal and off-site disposal of debris; removal and off-

site treatment and disposal of the surface water, emulsion, and sediments in the surface impoundment; and the excavation and off-site disposal of the contaminated soil underlying the surface impoundment have removed these elements from possibly exposing trespassers at the site to contaminant levels exceeding site cleanup levels.

The remedy at OU 4 is broken into four phases: surface soils, subsurface soils, flood plain and drainage ditch sediments, and Westvaco Pond sediments. A protectiveness determination cannot be made on subsurface soils since EPA has deferred action on subsurface soils to a remedy to be selected for ground water. The remedy for surface soils is expected to be protective of human health and the environment and will be documented in the decision document EPA expects to propose changing the cleanup level for cPNAs to 60 mg/kg. A protectiveness determination on flood plain and Westvaco Pond sediments cannot be made at this time until further information is obtained, which will include confirmatory samples of the flood plain and drainage ditch sediments to determine whether the flood plain and/or drainage ditches have become recontaminated and to sample Westvaco Pond sediments to determine whether they exceed the cleanup level. It is expected that the confirmatory sampling will take approximately 15 months to complete, at which time a protectiveness determination will be made.

The 2010 FYR included six issues and recommendations. This report summarizes each recommendation and its current status below.

Table 2: Progress on Recommendations from the 2010 FYR

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
EPA needs to issue another decision document based on current and reasonably anticipated future land use, which includes institutional controls.	EPA	11/30/2011	Ongoing. EPA intends to issue a decision document in 2015.	NA
Remove beaver dams prior to the fall/early winter when historically heavier precipitation may cause flooding of the railroad siding.	PRP	12/30/2010	Completed. Beaver dams continue to be removed as needed.	12/30/2010
EPA will work with PRPs to develop institutional controls.	PRP	9/30/2011	Ongoing. EPA intends to issue a decision document in 2015 which require ICs	NA
Provide 1.5 feet of cover over areas where treatment is required.	PRP	11/30/2012	Ongoing. EPA intends to issue a decision document in 2015.	NA
Evaluate sediments in Westvaco Pond.	PRP	11/30/2011	Completed. Sampling in 2012.Determined the pond has not been contaminated by the Site. No remediation is required.	7/31/2012

Recommendations	Party Responsible	Milestone Date	Action Taken and Outcome	Date of Action
The floodplain area will be sampled to determine whether sediments have been re-contaminated.	PRP	11/30/2011	Completed. Those areas re-contaminated since the 2001 sediment removal will be remediated to the cleanup standard previously established by EPA for sediments.	7/31/2012

6.0 Five-Year Review Process

6.1 Administrative Components

EPA Region 3 initiated the FYR in October 2014 and scheduled its completion by September 2015. EPA remedial project manager (RPM) Andrew Palestini led the EPA site review team, with contractor support provided to EPA by Skeo Solutions. In April 2015, EPA held a scoping call with the review team to discuss the Site and items of interest as they related to the protectiveness of the remedy currently in place. The review schedule established consisted of the following activities:

- Community notification.
- Document review.
- Data collection and review.
- Site inspection.
- Local interviews.
- FYR Report development and review.

6.2 Community Involvement

On June 26, 2015, EPA published a public notice in the Fredericksburg Freelance Star newspaper announcing the commencement of the FYR process for the Site. The press notice is available in Appendix B. No one contacted EPA as a result of the advertisement.

EPA will make the final FYR Report available to the public. EPA will place copies of the document in the designated site repository: Central Rappahannock Regional Library Snow Branch 8740 Courthouse Rd, Spotsylvania, VA 22551. Upon completion of the FYR, EPA will place a public notice in the Fredericksburg Freelance Star newspaper to announce the availability of the final FYR Report in the Site's document repository.

6.3 Document Review

ARARs Review

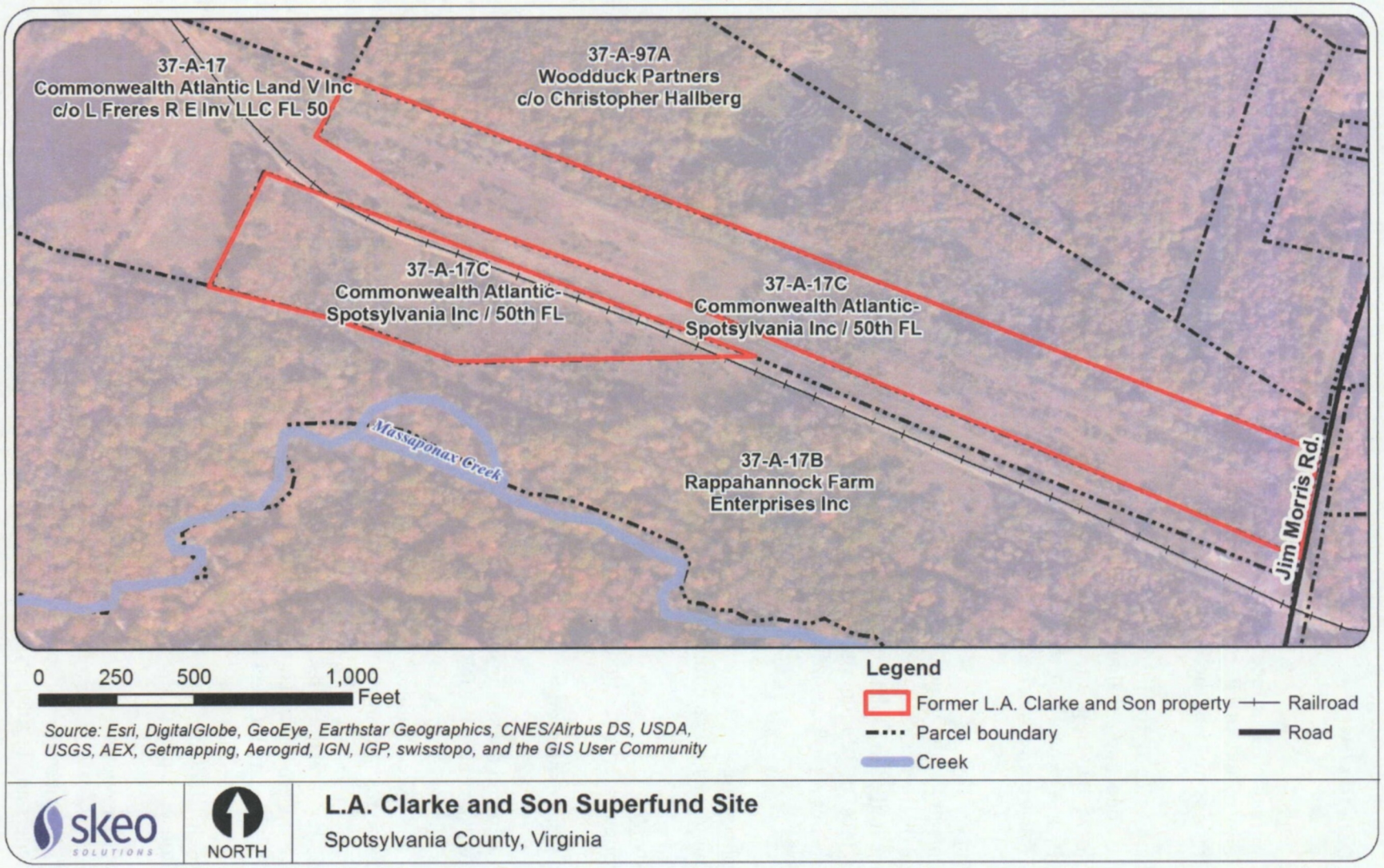
CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substances, pollutants, and contaminants released into the environment and of control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate.

Remedial actions are required to comply with the ARARs identified in the ROD. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed. The OUs addressed under this FYR do not include chemical-specific ARARs. Cleanup goals for soil are risk-based and are discussed in section 7.2 of this report. ARARs for groundwater will be included in the OU5 decision document.

Institutional Control Review

No institutional controls have been implemented at the Site. The proposed modified soil cleanup goals are based on specific worker classes. Therefore, the affected properties will require specific institutional controls to prohibit unacceptable exposures. The properties and current owners are depicted in Figure 3. EPA is addressing groundwater under OU5, and any necessary ICs will be included in the decision document addressing that OU.

Figure 3: Institutional Control Base Map



Disclaimer: This map and any boundary lines within the map are approximate and subject to change. The map is not a survey. The map is for informational purposes only regarding EPA's response actions at the Site.

6.4 Data Review

Surface Soils
The PRP conducted surface soil sampling in July 2012. Forty-three samples were collected in the North Terrace, and 48 samples were collected in the South Terrace. The total PAH concentrations in 15 of the 91 samples were greater than 100 mg/kg.

In September 2013, total PAH concentrations remained above 100 mg/kg at 14 of 20 locations. Pilot study data suggest that the target cleanup goal of 100 mg/kg total PAH in a single sample and a site-wide average of 50 mg/kg total PAH will likely be attainable under the pilot project. The PRP have expanded the study to a larger area in 2015, when it is anticipated that the cleanup level will largely be reached in the pilot area.

Sediment
Sediments in the drainage ditches and floodplain were re-sampled in 2012. Two locations in the drainage ditches exceed the cleanup level for aquatic exposure of 352 mg/kg and five sampling locations in the floodplain exceed the cleanup standard being considered for use as the terrestrial cleanup level of 100 mg/kg. An ESD is expected to be issued in September 2015 which will establish a new surface soil cleanup level of 100 mg/kg for the protection of terrestrial ecological receptors.

Subsurface Soils
Remaining subsurface contamination is being assessed under the ongoing RI/FS under OU5.

Groundwater
The groundwater investigation is continuing as part of OU5, which is not included in this FYR.

6.5 Site Inspection

EPA conducted the site inspection on March 19, 2015. Site inspection participants included Andrew Palestini, EPA RPM; Channing Martin, PRP attorney; James Zubrow, PRP contractor; Angela McGarvey and Kevin Greene, VADEQ, and Ryan Burdge and Melissa Oakley, EPA contractors (Skeo Solutions). Site inspection participants walked the Site, beginning at the locked gate on the eastern access point. All remedial features were inspected and found to be in good condition. No issues with access or trespassing were noted during the inspection or reported by the O&M contractor. Observed monitoring wells were labelled and locked. The landfarming pilot areas were observed and their status discussed. No issues were noted during the inspection. The Site Inspection Checklist is in Appendix D and the site photographs are in Appendix E.

On March 19, 2015, Skeo Solutions staff visited the designated site repository, Spotsylvania Courthouse, as part of the site inspection, but did not find any site documents.

6.6 Interviews

The FYR process included interviews with parties affected by the Site, including the current landowners and regulatory agencies involved in site activities or aware of the Site. The purpose

was to document the perceived status of the Site and any perceived problems or successes with the phases of the remedy implemented to date. The interviews are summarized below and the complete interviews are included in Appendix C.

Interviewee #1 stated that there is frustration with the lack of information being provided by EPA as to the status of the cleanup of the Site and progress towards completion of the cleanup.

Interviewee #2 identified the need for long term institutional controls to be put in place to ensure the site is protective as well as the need for an interim measure to be taken to address contaminant migration.

Interviewee #3 noted that there has been a great deal of investigative work done on the site since the last five year review and that the site owner is working with the EPA and VADEQ to finalize a groundwater remedy. Overall the interviewee felt the cleanup is going well however EPA and VADEQ could improve on reviewing documents in a shorter period of time.

7.0 Technical Assessment

7.1 Question A: Is the remedy functioning as intended by the decision documents?

No. The remedy is not functioning as intended. Remediation is complete for OUs 1, 2 and 3 according to the ROD and ESDs. However, the OU4 remedy is not completed as intended by the ROD. Soil cleanup goals in the ROD have not been met and the 1.5 foot soil cover called for in the ROD has not been added. EPA is evaluating a modification to the soil remedy to include soil cleanup goals protective of future workers and to remove the requirement for 1.5 feet of soil cover that in conjunction with the implementation of institutional controls will be protective.

Based on the remedy called for in the 1988 ROD and ESDs, the PRP conducted the following actions: installation of site fencing; demolition of process area buildings and structures; excavation, incineration and off-site disposal of the sediments from the wastewater impoundment; excavation and off-site disposal of drainage ditch and flood plain sediments; and landfarming of surface soils.

EPA has not yet selected a remedy for subsurface soils contamination and groundwater contamination. The PRP is performing a comprehensive investigation of the groundwater at the Site, to be followed by a new RI/FS report and issuance of a groundwater ROD for the Site.

7.2 Question B: Are the exposure assumptions, toxicity data, cleanup levels and remedial action objectives (RAOs) used at the time of remedy selection still valid?

No. The exposure assumptions and cleanup levels are no longer valid. The ROD set cleanup standards for PAH-contaminated surface soils that would protect current workers (0.22 mg/kg) and on-site potential future residents (0.08 mg/kg) for incidental ingestion and dermal contact. These cleanup goals were set assuming all PAHs having the same toxicity as benzo(a)pyrene, the most toxic PAH. Since the time the ROD was issued, toxicity equivalency factors have been developed to compare each carcinogenic PAH to the toxicity of benzo(a)pyrene. The revised

human health cleanup level for the site will be based on these toxicity equivalency factors. Currently, no activities are occurring that could result in soil contact. The current owner has indicated that it does not intend to use the Site for residential development. EPA is considering a remedy revision to modify the soil cleanup level based on a new understanding of future Site use, document this change in a decision document, and implement appropriate remedial actions and institutional controls to ensure protectiveness.

7.3 Question C: Has any other information come to light that could call into question the protectiveness of the remedy?

No other information has come to light that could call into question the protectiveness of the remedy.

7.4 Technical Assessment Summary

The remedy is not functioning as intended. The OU4 remedy is not complete, as soil cleanup goals selected in the ROD have not been met. EPA intends to modify the remedy to include less stringent soil cleanup goals and the appropriate institutional controls. In the interim, no unacceptable exposures are occurring.

EPA has not yet selected a remedy for groundwater contamination. The PRP is performing a comprehensive site investigation which will be followed by a new RI/FS report and issuance of a ground water ROD for the Site.

8.0 Issues

Table 3 summarizes the current site issues.

Table 3: Current Site Issues

Issue	Affects Current Protectiveness?	Affects Future Protectiveness?
Soil cleanup has not achieved the cleanup goals specified in the ROD. In addition, the PRP did not install the protective soil cover.	No	Yes
Institutional controls have not been implemented.	No	Yes
Securing the site with fencing and signage was not identified as part of the 1988 ROD or any subsequent ESD.	No	Yes

9.0 Recommendations and Follow-up Actions

Table 4 provides recommendations to address the current site issues.

Table 4: Recommendations to Address Current Site Issues

Issue	Recommendation / Follow-Up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness?	
					Current	Future
Soil cleanup have not achieved the cleanup goals specified in the ROD. In addition, the PRP did not install the protective soils cover.	Determine if the performance standards in the ROD can be modified and still achieve protectiveness. Issue a decision document recording the changes to the remedy.	EPA	EPA	9/30/2016	No	Yes
Institutional controls have not been implemented.	Determine the most appropriate land use for the Site, taking into account the revisions to the selected remedy. Issue a decision document and implement institutional controls.	EPA/PRP	EPA	9/30/2017	No	Yes
Securing the site with fencing and signage was not identified in the 1988 ROD or any subsequent ESD.	Issue a decision document identifying that addressing site security with fencing and signage is a component of the 1988 selected remedy.	EPA	EPA	9/30/2016	No	Yes

Additional Issues Not Affecting protectiveness:

- Site documents could not be located in the specified repository. EPA will provide appropriate documents to the site repository.

10.0 Protectiveness Statements

The remedy at OU1 currently protects human health and the environment because fencing and signage are in place to deter trespassers. However, in order to be protective in the long-term the proposed changes to the soil remedy need to be recorded and implemented to ensure protectiveness.

The remedy at OU2 is protective of human health and the environment. All site-related buildings and structures have been demolished and disposed of off-site.

The remedy at OU4 currently protects human health and the environment because surface soil contamination has been reduced and there are currently no complete exposure pathways.

However, soil cleanup goals in the ROD have not been met, the soil cover called for in the ROD has not been added and subsurface soil cleanup has been deferred until OU5 groundwater is addressed. In order to be protective in the long-term, EPA needs to finalize and implement proposed modifications to the soil remedy to ensure protectiveness.

11.0 Next Review

The next FYR will be due within five years of the signature/approval date of this FYR.

Appendix A:
List of Documents Reviewed

Appendix A: List of Documents Reviewed

CPF Associates, Phase III Landfarming Pilot Study Worklplan, March 19, 2005.

Key Environmental, Draft Remedial Investigation and Feasibility Study Report, L.A. Clarke and Son Superfund Site. January 27, 2015.

U.S. Environmental Protection Agency, Record of Decision, L.A. Clarke and Son Superfund Site. EPA Region 3. March 31, 1988.

U.S. Environmental Protection Agency, Explanation of Significant Differences, L.A. Clarke and Son Superfund Site. EPA Region 3. December 29, 1989.

U.S. Environmental Protection Agency, Explanation of Significant Differences, L.A. Clarke and Son Superfund Site. EPA Region 3. March 31, 1994.

U.S. Environmental Protection Agency, Explanation of Significant Differences, L.A. Clarke and Son Superfund Site. EPA Region 3. July 14, 1999.

U.S. Environmental Protection Agency Five-year Review, L.A. Clarke and Son Superfund Site. EPA Region 3. September 30, 1999.

U.S. Environmental Protection Agency, Five-year Review, L.A. Clarke and Son Superfund Site. EPA Region 3. September 30, 205.

U.S. Environmental Protection Agency, Five-year Review, L.A. Clarke and Son Superfund Site. EPA Region 3. September 30, 2010.

Appendix B: Press Notice

EPA Reviews Cleanup
L.A. Clarke & Son Superfund Site

The U.S. Environmental Protection Agency (EPA) is conducting a fifth Five-Year Review of the L.A. Clarke & Son Superfund Site located in Spotsylvania County. EPA inspects sites regularly to ensure that cleanups conducted remain fully protective of public health and the environment. EPA's last review concluded that additional information was required before making a protectiveness determination. EPA is currently working on a groundwater remedy that will ensure the cleanup is protective in the long-term. The results of this review will be available by September 2015.

To access results of the review (starting Sept 2015):
http://epa.gov/5yr

To learn detailed site and contact information:
http://go.usa.gov/3PyVW

To listen to a podcast about EPA Five-Year Reviews:
http://go.usa.gov/9rkW

To ask questions or provide site information:
Contact: Vance Evans **Phone**: 215-814-5526
Email: evans.vance@epa.gov

Appendix C: Interview Forms

L.A. Clarke and Sons Superfund Site **Five-Year Review Interview Form**

Site Name:	**L.A. Clarke and Sons Site**	**EPA ID No.:**	
Interviewer Name:	**Vance Evans**	**Affiliation:**	**N/A**
Subject Name:	**James Hansford**	**Affiliation:**	**N/A**
Subject Contact Information:			
Time:		**Date:**	**8/4/15**
Interview Location:	**Via email**		

Interview Format (circle one): In Person Phone X Mail Other:

Interview Category: Interviewee #3 Site Owner Representative

1. What is your overall impression of the remedial activities at the Site?

A great deal of investigation has been performed at the site since the last Five-Year Review. Commonwealth Atlantic-Spotsylvania Inc. (CASI) has been working with EPA and Virginia DEQ to complete a new RI/FS for the site. It is believed that the RI/FS should be completed soon.

2. What have been the effects of this Site on the surrounding community, if any?

CASI is not aware of any effects of the Site on the surrounding community.

3. What is your assessment of the current performance of the remedy in place at the Site?

There is a remedy in place only for soil and sediment. That remedy appears to be performing well. A remedy has not yet been selected for groundwater.

4. Are you aware of any complaints or inquiries regarding environmental issues or the remedial action from residents since implementation of the cleanup?

No.

5. Do you feel well-informed regarding the Site's activities and remedial progress? If not, how might EPA convey site-related information in the future?

Yes, although CASI would like EPA and DEQ to accelerate their review of documents and reports submitted by CASI.

6. Do you have any comments, suggestions or recommendations regarding the management or operation of the Site's remedy?

No.

L.A. Clarke and Sons Superfund Site **Five-Year Review Interview Form**

Site Name:	L.A. Clarke Superfund Site	**EPA ID No.:**	MSD980710941
Interviewer Name:	**Vance Evans**	**Affiliation:**	**EPA**
Subject Name:	**Angie McGarvey**	**Affiliation:**	
Subject Contact Information:			
Time:	**11:00 a.m.**	**Date:**	**8/4/2015**
Interview Location:	**Via telephone**		

Interview Format (circle one): In Person Phone Mail Other:

Interview Category: Interviewee #2 State Agency

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?
   VADEQ has spoken in detail with the RPMs and is working to address outstanding site issues.

2. What is your assessment of the current performance of the remedy in place at the Site?
   The building demolition was successful and the pilot study is working. There is the expectation that further remedial actions will be developed and that the agency will work to delineate the extent of groundwater contamination

3. Are you aware of any complaints or inquiries regarding site-related environmental issues or remedial activities from residents in the past five years?
   n/a, this state project manager has only had the site for four months.

4 .Has your office conducted any site-related activities or communications in the past five years? If so, please describe the purpose and results of these activities.

   EPA is the lead for the site activities. The state is serving in an oversight capacity.

3. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?
   No
4. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?
   Long-term institutional controls are essential to protect the environment from exposure to on-site contamination
5. Are you aware of any changes in projected land use(s) at the Site?
   The zoning needs to be clarified. It is zoned as residential, but the tax parcel shows it zoned for medium to heavy industrial use.

L.A. Clarke and Sons Superfund Site **Five-Year Review Interview Form**

Site Name:	**L.A. Clarke Superfund Site**	**EPA ID No.:**	
Interviewer Name:	**Vance Evans**	**Affiliation:**	**N/A**
Subject Name:		**Affiliation:**	**N/A**
Subject Contact Information:			
Time:		**Date:**	**07/28/2015**
Interview Location:	**Via telephone**		

Interview Format (circle one): **In Person** **Phone X** **Mail** **Other:**

Interview Category: **Interviewee #1**

Interviewee did not want to answer the interview questions but conveyed that there is frustration with the amount of information that EPA provides. Wants the EPA to keep them informed of the status and progress being made on cleaning up the site and provided contact information so that information can be emailed and or mailed to keep them informed.

Appendix D: Site Inspection Checklist

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: L.A. Clarke and Son	**Date of Inspection:** 03/19/2015
Location and Region: Spotsylvania County, VA, Region 3	**EPA ID:** VAD007972482
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature:** 65 and sunny

Remedy Includes: (Check all that apply)

- ☐ Landfill cover/containment
- ☒ Access controls
- ☐ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☒ Other: In-situ soil remediation and landfarming
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☐ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

1. **O&M Site Manager** _____ Name _____ Title _____ Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems, suggestions ☐ Report attached: _____

2. **O&M Staff** _____ Name _____ Title _____ Date
   Interviewed ☐ at site ☐ at office ☐ by phone Phone: _____
   Problems/suggestions ☐ Report attached: _____

3. **Local Regulatory Authorities and Response Agencies** (i.e., state and tribal offices, emergency response office, police department, office of public health or environmental health, zoning office, recorder of deeds, or other city and county offices). Fill in all that apply.

   Agency _____
   Contact _____ Name _____ Title _____ Date _____ Phone No.
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ Name _____ Title _____ Date _____ Phone No.
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ Name _____ Title _____ Date _____ Phone No.
   Problems/suggestions ☐ Report attached: _____

   Agency _____
   Contact _____ Name _____ Title _____ Date _____ Phone No.

Problems/suggestions ☐ Report attached: _____

Agency _____
Contact _____ _____ _____ _____
Name Title Date Phone No.
Problems/suggestions ☐ Report attached: _____

4. **Other Interviews** (optional) ☐ Report attached: _____

III. ON-SITE DOCUMENTS AND RECORDS VERIFIED (check all that apply)

1. **O&M Documents**

☐ O&M manual	☐ Readily available	☐ Up to date	☒ N/A
☐ As-built drawings	☐ Readily available	☐ Up to date	☒ N/A
☐ Maintenance logs	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

2. **Site-Specific Health and Safety Plan** ☐ Readily available ☐ Up to date ☒ N/A

☐ Contingency plan/emergency response plan ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

3. **O&M and OSHA Training Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

4. **Permits and Service Agreements**

☐ Air discharge permit	☐ Readily available	☐ Up to date	☒ N/A
☐ Effluent discharge	☐ Readily available	☐ Up to date	☒ N/A
☐ Waste disposal, POTW	☐ Readily available	☐ Up to date	☒ N/A
☐ Other permits: _____	☐ Readily available	☐ Up to date	☒ N/A

Remarks: _____

5. **Gas Generation Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

6. **Settlement Monument Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

7. **Groundwater Monitoring Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

8. **Leachate Extraction Records** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

9. **Discharge Compliance Records**

☐ Air ☐ Readily available ☐ Up to date ☒ N/A

☐ Water (effluent) ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

10. **Daily Access/Security Logs** ☐ Readily available ☐ Up to date ☒ N/A

Remarks: _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☐ PRP in-house ☒ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☐ _____

2. **O&M Cost Records**

☐ Readily available ☐ Up to date

☐ Funding mechanism/agreement in place ☒ Unavailable

Original O&M cost estimate: _____ ☐ Breakdown attached

Total annual cost by year for review period if available

From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached
From: _____ Date	To: _____ Date	_____ Total cost	☐ Breakdown attached

3. **Unanticipated or Unusually High O&M Costs during Review Period**

Describe costs and reasons: _____

V. ACCESS AND INSTITUTIONAL CONTROLS ☒ Applicable ☐ N/A

A. Fencing

1. **Fencing Damaged** ☐ Location shown on site map ☒ Gates secured ☐ N/A

Remarks: The fence only partially surrounds the Site due to active railroad cutting through the Site.

B. Other Access Restrictions

1. **Signs and Other Security Measures** ☐ Location shown on site map ☐ N/A

Remarks: _____

C. Institutional Controls (ICs)

1. **Implementation and Enforcement**

Site conditions imply ICs not properly implemented ☐ Yes ☐ No ☒ N/A

Site conditions imply ICs not being fully enforced ☐ Yes ☐ No ☒ N/A

Type of monitoring (e.g., self-reporting, drive by): _____

Frequency: _____

Responsible party/agency: _____

Contact _____ _____ _____ _____

Name Title Date Phone no.

Reporting is up to date ☐ Yes ☐ No ☒ N/A

Reports are verified by the lead agency ☐ Yes ☐ No ☒ N/A

Specific requirements in deed or decision documents have been met ☐ Yes ☐ No ☒ N/A

Violations have been reported ☐ Yes ☐ No ☒ N/A

Other problems or suggestions: ☐ Report attached

2. **Adequacy** ☐ ICs are adequate ☒ ICs are inadequate ☐ N/A

Remarks: ICs are needed to restrict land uses based on current soil contaminant levels and proposed final cleanup goals.

D. General

1. **Vandalism/Trespassing** ☐ Location shown on site map ☒ No vandalism evident

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks: The property remains vacant and overgrown with vegetation.

3. **Land Use Changes Off Site** ☒ N/A

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☒ Applicable ☐ N/A

1. **Roads Damaged** ☐ Location shown on site map ☒ Roads adequate ☐ N/A

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☐ Applicable ☒ N/A

A. Landfill Surface

1. **Settlement** (low spots) ☐ Location shown on site map ☐ Settlement not evident

Arial extent: _____ Depth: _____

Remarks: _____

2.	**Cracks**	☐ Location shown on site map	☐ Cracking not evident
	Lengths: _____	Widths: _____	Depths: _____
	Remarks: _____		
3.	**Erosion**	☐ Location shown on site map	☐ Erosion not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
4.	**Holes**	☐ Location shown on site map	☐ Holes not evident
	Arial extent: _____		Depth: _____
	Remarks: _____		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: _____		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☐ N/A
	Remarks: _____		
7.	**Bulges**	☐ Location shown on site map	☐ Bulges not evident
	Arial extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☐ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Arial extent: _____
	☐ Ponding	☐ Location shown on site map	Arial extent: _____
	☐ Seeps	☐ Location shown on site map	Arial extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☐ No evidence of slope instability		
	Arial extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable	☐ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		

3. **Bench Overtopped** ☐ Location shown on site map ☐ N/A or okay

Remarks: _____

C. Letdown Channels ☐ Applicable ☐ N/A

(Channel lined with erosion control mats, riprap, grout bags or gabions that descend down the steep side slope of the cover and will allow the runoff water collected by the benches to move off of the landfill cover without creating erosion gullies.)

1. **Settlement** (Low spots) ☐ Location shown on site map ☐ No evidence of settlement

Arial extent: _____ Depth: _____

Remarks: _____

2. **Material Degradation** ☐ Location shown on site map ☐ No evidence of degradation

Material type:_____ Arial extent: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ No evidence of erosion

Arial extent: _____ Depth: _____

Remarks: _____

4. **Undercutting** ☐ Location shown on site map ☐ No evidence of undercutting

Arial extent: _____ Depth: _____

Remarks: _____

5. **Obstructions** Type: _____ ☐ No obstructions

☐ Location shown on site map Arial extent: _____

Size: _____

Remarks: _____

6. **Excessive Vegetative Growth** Type: _____

☐ No evidence of excessive growth

☐ Vegetation in channels does not obstruct flow

☐ Location shown on site map Arial extent: _____

Remarks: _____

D. Cover Penetrations ☐ Applicable ☐ N/A

1. **Gas Vents** ☐ Active ☐ Passive

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Gas Monitoring Probes**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

3. **Monitoring Wells** (within surface area of landfill)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

4. **Extraction Wells Leachate**

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ Evidence of leakage at penetration ☐ Needs maintenance ☐ N/A

Remarks: _____

5. **Settlement Monuments** ☐ Located ☐ Routinely surveyed ☐ N/A

Remarks: _____

E. Gas Collection and Treatment ☐ Applicable ☐ N/A

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Gas Collection Wells, Manifolds and Piping**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Gas Monitoring Facilities** (e.g., gas monitoring of adjacent homes or buildings)

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☐ N/A

1. **Outlet Pipes Inspected** ☐ Functioning ☐ N/A

Remarks: _____

2. **Outlet Rock Inspected** ☐ Functioning ☐ N/A

Remarks: _____

G. Detention/Sedimentation Ponds ☐ Applicable ☐ N/A

1. **Siltation** Area extent: _____ Depth: _____ ☐ N/A

☐ Siltation not evident

Remarks: _____

2. **Erosion** Area extent: _____ Depth: _____

☐ Erosion not evident

Remarks: _____

3. **Outlet Works** ☐ Functioning ☐ N/A

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☐ N/A

1. **Deformations** ☐ Location shown on site map ☐ Deformation not evident

Horizontal displacement: _____ Vertical displacement: _____

Rotational displacement: _____

Remarks: _____

2. **Degradation** ☐ Location shown on site map ☐ Degradation not evident

Remarks: _____

I. Perimeter Ditches/Off-Site Discharge ☐ Applicable ☐ N/A

1. **Siltation** ☐ Location shown on site map ☐ Siltation not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Vegetative Growth** ☐ Location shown on site map ☐ N/A

☐ Vegetation does not impede flow

Area extent: _____ Type: _____

Remarks: _____

3. **Erosion** ☐ Location shown on site map ☐ Erosion not evident

Area extent: _____ Depth: _____

Remarks: _____

4. **Discharge Structure** ☐ Functioning ☐ N/A

Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

1. **Settlement** ☐ Location shown on site map ☐ Settlement not evident

Area extent: _____ Depth: _____

Remarks: _____

2. **Performance Monitoring** Type of monitoring: _____

☐ Performance not monitored

Frequency: _____ ☐ Evidence of breaching

Head differential: _____

Remarks: _____

IX. GROUNDWATER/SURFACE WATER REMEDIES ☐ Applicable ☒ N/A

A. Groundwater Extraction Wells, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Pumps, Wellhead Plumbing and Electrical**

☐ Good condition ☐ All required wells properly operating ☐ Needs maintenance ☐ N/A

Remarks: _____

2. **Extraction System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

B. Surface Water Collection Structures, Pumps and Pipelines ☐ Applicable ☒ N/A

1. **Collection Structures, Pumps and Electrical**

☐ Good condition ☐ Needs maintenance

Remarks: _____

2. **Surface Water Collection System Pipelines, Valves, Valve Boxes and Other Appurtenances**

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

☐ Readily available ☐ Good condition ☐ Requires upgrade ☐ Needs to be provided

Remarks: _____

C. Treatment System ☐ Applicable ☒ N/A

1. **Treatment Train** (check components that apply)

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon adsorbers

☐ Filters: _____

☐ Additive (e.g., chelation agent, flocculent): _____

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of groundwater treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

2. **Electrical Enclosures and Panels** (properly rated and functional)

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Tanks, Vaults, Storage Vessels**

☐ N/A ☐ Good condition ☐ Proper secondary containment ☐ Needs maintenance

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

☐ N/A ☐ Good condition (esp. roof and doorways) ☐ Needs repair

☐ Chemicals and equipment properly stored

Remarks: _____

6. **Monitoring Wells** (pump and treatment remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☐ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

1. **Monitoring Wells** (natural attenuation remedy)

☐ Properly secured/locked ☐ Functioning ☐ Routinely sampled ☐ Good condition

☐ All required wells located ☐ Needs maintenance ☐ N/A

Remarks: _____

X. OTHER REMEDIES

If there are remedies applied at the site and not covered above, attach an inspection sheet describing the physical nature and condition of any facility associated with the remedy. An example would be soil vapor extraction.

XI. OVERALL OBSERVATIONS	
A.	**Implementation of the Remedy**
	Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions). The soil remedy has been implemented as per an understanding with Region 3. However, no decision document has been issued to record changes to soil cleanup goals and possible land uses.
B.	**Adequacy of O&M**
	Describe issues and observations related to the implementation and scope of O&M procedures. In particular, discuss their relationship to the current and long-term protectiveness of the remedy. There are no operating facilities at the Site. O&M only includes inspection to monitor for trespassing and damage.
C.	**Early Indicators of Potential Remedy Problems**
	Describe issues and observations such as unexpected changes in the cost or scope of O&M or a high frequency of unscheduled repairs that suggest that the protectiveness of the remedy may be compromised in the future. A decision document is needed to record proposed changes to the cleanup levels and the remedy.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None noted.

Appendix E: Photographs from Site Inspection

Site entrance along Jim Morris Road.

Sign on locked entrance gate.

Access road in North Terrace.

Drainage Ditch #2.

Massaponax Creek floodplain.

Massaponax Creek.