

# THIRD FIVE-YEAR REVIEW REPORT

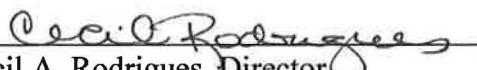
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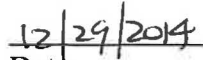
## SAUNDERS SUPPLY COMPANY SUPERFUND SITE

CHUCKATUCK, VIRGINIA

DECEMBER 2014

Prepared by:  
U.S. Environmental Protection Agency  
Region III  
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Date

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## **List of Acronyms**

ARAR	Applicable or Relevant and Appropriate Requirement
CCA	Copper, Chromium, and Arsenic
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
COC	Contaminant of Concern
EPA	United States Environmental Protection Agency
FS	Feasibility Study
LTTD	Low Temperature Thermal Desorption
MCL	Maximum Contaminant Level
mg/kg	milligram per kilogram
µg/L	microgram per liter
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
PCP	Pentachlorophenol
RA	Remedial Action
RACS	Response Action Contracting Strategy
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RD	Remedial Design
RI	Remedial Investigation
ROD	Record of Decision
SARA	Superfund Amendments and Reauthorization Act
SDWA	Safe Drinking Water Act
USACE	United States Army Corps of Engineers
VDEQ	Virginia Department of Environmental Quality



## EXECUTIVE SUMMARY

The Saunders Supply Company Superfund Site (Site), located in Chuckatuck, Suffolk County, Virginia, includes two properties – a portion of the Saunders Supply Company property and a portion of the Kelly Nursery property. Cleanup work at the Site included an emergency removal action and a remedial action. The removal action included construction of a pump and treatment system including the installation of extraction and monitoring wells, as well as the construction of a plant to treat contaminated ground water. Construction of the ground water pump and treat system was completed on April 22, 1998. This system, constructed pursuant to EPA's removal authority, was deemed operational and functional on June 1, 1999. EPA operated the system for ten years, until July 15, 2009, when operations were turned over to the Commonwealth of Virginia in accordance with the requirements of the State Superfund Contract. Treatment system operation and maintenance and semi-annual ground water monitoring are currently being performed at the Site by the Virginia Department of Environmental Quality (VDEQ).

The Record of Decision (ROD) for the Site was issued on September 30, 1991. The remedial action objectives are to: eliminate direct contact with the contaminated surface and subsurface soil, storm sewer sediments, and wastewater sediments; reduce contaminant levels in the concrete pads; eliminate direct contact with the water in the wastewater pond; and, reduce contaminant levels in the existing concrete storm sewer.

On September 27, 1996, EPA issued a ROD Amendment to change the soil and sewer sediment remedy from on-site low temperature thermal desorption to off-site incineration and disposal. In addition, EPA, anticipating construction of a ground water extraction and treatment system under the upcoming Removal Order, selected long-term treatment of the contaminated ground water and included continued operation of the ground water pump and treat system as a remedial action objective.

The remedial action objectives were accomplished by excavating the contaminated surface and subsurface soil and wastewater pond sediments and flushing out the storm sewer sediments with off-site treatment and disposal; treating and discharging the water in the wastewater pond; cleaning and disposal of the concrete pads; and long-term operation of the ground water pump and treat system. Although it was believed at the time of the original ROD that the storm sewer would require sliplining, an inspection with a television unit showed the sewer to be in good condition, therefore, no work was performed on the sewer except to replace two drop inlets with pre-cast units. The Site achieved remedial action construction completion status for the soil and sediment contamination with the signing of the Preliminary Close Out Report on December 17, 1999.

This is the third five-year review for the Site. The triggering action for this statutory review is the previous five-year review dated December 29, 2009. The assessment of the previous five-year review found that the remedy was constructed in accordance with the requirements of the ROD Amendment.

The remedy for the Site is protective of human health and the environment in the short term. Exposure pathways that could result in unacceptable risks are being controlled. All threats at the Site associated with ingestion or dermal contact with contaminated soil and sediment have been addressed through excavation and off-site treatment and disposal. In addition, there are no exposures to the contaminated ground water because everyone in the vicinity of the Site is

connected to the city of Suffolk public water supply and the ground water extraction system has prevented contamination from reaching either Monitoring Well-19D or Godwins Millpond.

Institutional controls have been implemented to prevent future exposure to, or ingestion of, contaminated ground water on the Saunders property while long-term ground water remediation is ongoing. Institutional controls for the Kelly property are being met through the Suffolk Department of Health.

Long-term protectiveness will be achieved when cleanup goals are met.

## Five-Year Review Summary Form

### SITE IDENTIFICATION

**Site Name:** Saunders Supply Company

**EPA ID:** VAD003117389

**Region:** 3

**State:** VA

**City/County:** Suffolk

### SITE STATUS

**NPL Status:** Final

**Multiple OUs?** No

**Has the site achieved construction completion?** Yes

### REVIEW STATUS

**Lead agency:** EPA

**If "Other Federal Agency" was selected above, enter Agency name:**

**Author name (Federal or State Project Manager):** Andrew Palestini

**Author affiliation:** EPA

**Review period:** February 2014 – November 2014

**Date of site inspection:** July 1, 2014

**Type of review:** Post-SARA

**Review number:** 3

**Triggering action date:** December 29, 2009

**Due date (five years after triggering action date):** December 29, 2014

### Five-Year Review Summary Form (continued)

*The table below is for the purpose of the summary form and associated data entry and does not replace the two tables required in Section VIII and IX by the FYR guidance. Instead, data entry in this section should match information in Section VII and IX of the FYR report.*

#### Issues/Recommendations

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

None.

##### Issues and Recommendations Identified in the Five-Year Review:

OU(s): 01	<b>Issue Category:</b>			
	<b>Issue:</b> EPA released the final non-cancer dioxin reassessment, publishing a non-cancer toxicity value, or reference dose (RfD), for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in EPA's Integrated Risk Information System (IRIS). The properties adjoining the Site were never sampled for dioxin.			
	<b>Recommendation:</b> EPA will evaluate the need to perform limited sampling for TCDD in surface soil outside the perimeter of previously excavated areas.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	EPA	VDEQ	1/30/16

##### Issues and Recommendations Identified in the Five-Year Review:

OU(s): 01	<b>Issue Category:</b>			
	<b>Issue:</b> Perfluorooctanoic acid (PFOA) and Perfluorooctane sulfonic acid (PFOS) have been identified as a newly identified groundwater contaminant by EPA. One potential source for PFOA/PFOS is firefighting, especially when using foam. At this site, PCP sludge was occasionally burned as a fire fighting exercise. However, EPA does not have any information that foam was used to extinguish the fires.			
	<b>Recommendation:</b> EPA will determine whether firefighting foam was used in the firefighting exercises. If foam was used or it cannot be determined whether foam was used, EPA will sample the ground water for PFOA and PFOS.			
Affect Current Protectiveness	Affect Future Protectiveness	Implementing Party	Oversight Party	Milestone Date
No	Yes	VDEQ	EPA	1/30/16

### Sitewide Protectiveness Statement (if applicable)

*For sites that have achieved construction completion, enter a sitewide protectiveness determination and statement.*

*Protectiveness Determination:*  
Protective in the short term.

*Addendum Due Date (if applicable):*

*Protectiveness Statement:*

The remedy for the Site is protective of human health and the environment in the short term. Exposure pathways that could result in unacceptable risks are being controlled. All threats at the Site associated with ingestion or dermal contact with contaminated soil and sediment have been addressed through excavation and off-site treatment and disposal. In addition, there are no exposures to the contaminated ground water because everyone in the vicinity of the Site is connected to the city of Suffolk public water supply and the ground water extraction system has prevented contamination from reaching either Monitoring Well-19D or Godwins Millpond.

Institutional controls have been implemented to prevent future exposure to, or ingestion of, contaminated ground water on the Saunders property while long-term ground water remediation is ongoing. Institutional controls for the Kelly property are being met through the Suffolk Department of Health.

Long-term protectiveness will be achieved when cleanup goals are met.

**GPRA Measure Review:**

As part of this Five-Year Review 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 (HEUC)

Groundwater Migration: Contaminated Ground Water Migration Under Control (GMUC)

**Sitewide RAU:**

The Site achieved Site-Wide Ready for Anticipated Use (SWRAU) status on September 27, 2011.

**Saunders Supply Company Superfund Site  
Chuckatuck, Virginia  
Five-Year Review Report**

**I. Introduction**

The purpose of the five-year review is to determine whether the remedy at a site is protective of human health and the environment. The methods, findings, and conclusions of reviews are documented in Five-Year Review reports. In addition, Five-Year Review reports identify issues found during the review, if any, and recommendations to address them.

The Environmental Protection Agency (EPA) is preparing this five-year review pursuant to CERCLA § 121 (the Comprehensive Environmental Response, Compensation and Liability Act, as amended) and the National Contingency Plan (NCP). CERCLA § 121 states:

*If the President selects a remedial action that results in any hazardous substances, pollutants, or contaminants remaining at a site, the President shall review such remedial action no less often than each five 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 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.*

The Agency interpreted this requirement further in the NCP; 40 C.F.R. § 300.430(f)(4)(ii) 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 the initiation of the selected remedial action.*

EPA conducted this five-year review of the remedy implemented at the Saunders Supply Company Site (Site) in Chuckatuck, Suffolk City, Virginia due to the fact that, at the completion of the remedial action, hazardous substances, pollutants, or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure.

This is the third five-year review conducted at the Site. The triggering action for this five-year review is the date of the previous Five-Year Review Report, December 29,

2009. This review was conducted by the Remedial Project Manager (RPM) from February 2014 through December 2014. This report documents the results of the review.

This review covers the entire Site, as EPA did not divide cleanup at the Site into separate operable units. Ground water treatment and semi-annual ground water monitoring are currently being performed at the Site by the Virginia Department of Environmental Quality (VDEQ).

For this five-year review, the EPA project manager inspected the Site on July 1, 2014.

## **II. Site Chronology**

The purpose of this section is to list all important Site events and relevant dates.



**Table 1: Chronology of Site Events**

<b>Event</b>	<b>Date</b>
Wood treating operations began on the Site	1964
Preliminary Assessment	September 1, 1984
Site Inspection	March 20, 1986
Proposed for the National Priorities List (NPL)	January 22, 1987
Final listing on NPL	October 4, 1989
Remedial Investigation/Feasibility Study completed	May 1991
Wood treating operations ceased	June 1991
Record of Decision	September 30, 1991
Remedial Design (RD) started	July 22, 1992
RD completed	September 24, 1996
Record of Decision Amendment	September 27, 1996
Action Memo	June 19, 1997
Construction Start (ground water removal action)	January 19, 1998
Construction Complete (ground water removal action)	April 22, 1998
On-site mobilization for soil and sediment remedial action	November 25, 1998
Ground water system deemed operational and functional	July 15, 1999
Completion of soil and sediment remedial action	November 9, 1999
Preliminary Close Out Report	December 17, 1999
First Five-Year Review Report	December 29, 2004
Ground Water Treatment System Transferred to VDEQ	July 15, 2009
Second Five-Year Review Report	December 29, 2009

### **III. Background**

The purpose of this section is to describe the characteristics of the Site and to identify the threats that were posed to the public and the environment at the time of the initial Record of Decision (ROD).

#### **Physical Characteristics**

The Site is located in the town of Chuckatuck, Virginia, a rural area in the City of Suffolk. The Site encompasses approximately 7.3 acres and is comprised of a portion of the Saunders Supply Company property (Saunders property) and a portion of the adjacent Kelly property. A Site map is provided in Attachment 1.

The property slopes towards a drainage ditch immediately north of the Site and an intermittent unnamed stream west of the Site. These surface water drainage pathways discharge to Godwins Millpond, located approximately 500 feet north of the Saunders property. Godwins Millpond drains to Chuckatuck Creek. Drainage from the east side of the Site is received by storm sewers (catch basins) along Godwin Boulevard (State Route 10/32), which discharge to a drainage swale and are ultimately received by Cedar Creek, located approximately 1 mile to the east of the Site.

#### **Land and Resource Use**

The Saunders property is located in a mixed residential and commercial area and is currently used as a wholesale lumber yard. The Saunders Supply Company also owns and operates a hardware store that is located several hundred feet south and upgradient of the former wood treating facility that is not part of the Site. The Kelly Nursery and residence is located immediately to the north, and operates as a year-round nursery that grows and retails various annual and perennial flowers and potted plants. A gasoline station and a residential subdivision are located south of the Site. Commercial establishments and residences are located east of the Site, and a wooded area and intermittent stream are located to the west.

Godwins Millpond is used as a municipal drinking water source for the city of Suffolk. All of the ground water monitoring wells and three of the four extraction wells are located on the Kelly property, whereas the remaining extraction well and the ground water treatment building is located on the Saunders property.

#### **History of Contamination**

The original owners of the Saunders Supply Company purchased the property in 1946. The Saunders Supply Company used two processes in its wood treating operations: pentachlorophenol (PCP), and copper, chromium, and arsenic (CCA), with the operations changing and expanding over time. Onsite wood treatment began in 1964 on the northwestern portion of the Site in the first cylinder using PCP as a solution in No. 2 fuel

oil. A second cylinder was put into operation in 1971 and a third cylinder in 1974. The third cylinder used a CCA solution for the wood treatment process. The second cylinder was converted to the CCA process in 1981, and the first cylinder was converted to the CCA process in 1984. The Saunders Supply Company ceased all wood treating operations at the facility in June 1991. It currently operates as a lumber retail store.

From 1984 to 1991, the treated wood was air-dried on a concrete drip pad that collected the excess chemicals. Prior to 1984, the treated wood was placed on pallets to dry. These pallets were located directly on the ground in the southern portion of the property near the wood treating process area.

When in use, the PCP treatment solutions were periodically drained from the cylinders into a series of oil/water separators. The third and final oil/water separator in the series was an unlined pond, located southeast of the wastewater pond on the Saunders property. A crust-like residue that formed on the surface of the former pond was occasionally burned as a training exercise for the local fire department.

Sludge removed during annual maintenance of the PCP treatment cylinders or associated oil/water separators was used on the roads and/or around the lumber storage areas to control dust and weeds from approximately 1966 through 1981. After 1981, PCP sludge was disposed off-site. In 1969, a conical burner, used primarily for the disposal of lumber scraps and sawdust, was also used periodically to incinerate some of the sludge. The conical burner ceased operations in 1974.

### **Initial Response**

Because of a complaint by a neighbor, the Virginia Department of Health, Solid Waste Management Division, and the Virginia State Water Control Board (collectively, Virginia) investigated the Site in the early 1980s. Based on this investigation, Virginia had the Saunders Supply Company install monitoring wells, excavate the contaminated soil around the conical burner area, and install a recovery well. The water from the recovery well was used as process water for the CCA chemical treatment of the lumber, since this process is a net consumer of water.

EPA proposed that the Site be listed on the National Priorities List (NPL) in January 1987. Although Saunders Supply Company initially retained an engineering firm to prepare a workplan for a Remedial Investigation/ Feasibility Study (RI/FS), the Company later informed EPA that it did not have the financial ability to perform the RI/FS. As such, EPA utilized Superfund monies to perform the RI/FS, and later, the remedial design, the removal action, the remedial action, and the long-term remedial action.

## **Basis for Taking Action**

The contaminants of concern (COCs) identified in the ROD for the Site included:

- Arsenic
- Chromium (hexavalent and total)
- Copper
- Dioxin
- Pentachlorophenol

Exposures to Site media were associated with significant human health risks, due to exceedance of EPA's risk management criteria for the RME and average exposure scenarios. The carcinogenic risks were highest for exposures to Site soil for current workers at the Saunders property and for future residents. Non-carcinogenic hazards were highest for exposure to ground water, due to the presence of PCP.

The ROD also noted that the ecological risk assessment found evidence indicating the potential for adverse ecological impacts in sediments of Godwins Millpond and the adjacent intermittent streams. However, spatial distribution of COCs did not provide any evidence that contaminants related to the Site were the causal agent of adverse ecological impacts. Agricultural and waste disposal activities in the vicinity of the Site may have contributed to the contamination, but it was not possible to specifically identify any source of contaminants.

## **IV. Remedial Actions**

The purpose of this section is to discuss initial plans, implementation history, and current status of the remedy.

### **Remedy Selection**

The initial ROD for the Site was signed on September 30, 1991. It was later amended on September 27, 1996.

Remedial Action Objectives (RAOs) were not specifically listed as such in the ROD. However, the objectives of the remedy can be inferred from the list of the major components of the remedy as summarized below:

- Eliminating direct contact with the contaminated surface and subsurface soil, storm sewer sediments, and the wastewater pond sediments by excavating and treating these wastes prior to disposing in an approved off-site facility;

- Reducing contaminant levels in the concrete pads by testing to determine whether they are a characteristic hazardous waste, scarification and treatment of the top one inch of the pads if they are a characteristic waste, removal of any residual soil, and off-site disposal of the remaining portion of the pads;
- Eliminating direct contact with the water in the wastewater pond by treating and discharging of the water as determined during the remedial design (RD);
- Reducing the contaminant levels in the existing concrete storm sewer by cleaning and sliplining the sewer; and
- Eliminating exposure to contaminated ground water by implementing a long-term ground water monitoring program and by implementing institutional controls to prevent on-site and off-site use of the Columbia and Yorktown aquifers as a source of potable water.

On September 27, 1996, EPA issued a ROD Amendment to document changes to the originally selected remedy. The ROD Amendment changed the soil and sewer sediment remedy to off-site incineration and disposal. In addition, EPA, anticipating construction of the ground water extraction and treatment system under the Action Memorandum, selected long-term treatment of the contaminated ground water.

RAOs were not specifically listed as such in the ROD. However, they can be inferred from the major components of the remedy as summarized below:

- Continue to operate and maintain the system to collect and treat groundwater to prevent further migration of the contamination and until PCP cleanup levels have reached the MCL of 1 ppb.

In the ROD, EPA selected low-temperature thermal desorption (LTTD) treatment of the excavated soil and the storm sewer sediments. The selected remedy also included dechlorination treatment of the wastewater pond sediments since they are a listed hazardous waste. All treated soil and sediments would then be shipped off-site for disposal, in accordance with the policy of the VDEQ in effect at the time of the ROD which mandated off-site disposal of soil containing Resource Conservation and Recovery Act (RCRA)-listed wastes.

Subsequent to issuing the ROD, EPA requested VDEQ to revise its policy to allow on-site disposal of soil containing RCRA-listed wastes if the soil were treated to reduce contaminants to health-based cleanup standards. Treatability studies performed during the RD verified that the LTTD treatment technology would achieve the cleanup goals. Since LTTD could reduce the contaminants to the health-based standards, VDEQ concurred with the EPA request to allow on-site disposal of the treated soil.

However, EPA performed additional soil sampling during the RD to more accurately determine the amount of soil requiring treatment and, thus, the cost of treating the soil and sediment. This soil sampling showed that the total amount of soil requiring treatment decreased from the 25,000 tons originally estimated in the ROD to 18,000 tons. Since the cost of mobilizing and demobilizing the LTTD equipment is a fixed cost that would be prorated over the entire amount of treated soil and sediments, the decrease in volume caused an increase in the cost per ton of soil treated.

Subsequently, an EPA cost analysis showed the cost of treating the soil and sediment at an off-site incinerator was comparable in cost to the on-site LTTD treatment remedy selected in the ROD. Since off-site incineration was comparable in cost to the on-site LTTD treatment, but rated higher in short-term effects, EPA selected off-site incineration in the ROD Amendment.

It was assumed in the ROD that all of the soil beneath the concrete pad in the former wood treating area exceeded the Site-specific cleanup levels and, therefore, the entire concrete pad had to be removed before the soil could be excavated. However, soil sampling during the remedial design indicated that only certain areas under the concrete pad required excavation and treatment. In addition, rather than use an off-site facility to dispose of those portions of the concrete pad which had to be removed, EPA decided the concrete pad was to be decontaminated and disposed of on-site as fill material in the wastewater pond area.

Along with the soil sampling, EPA also conducted routine ground water sampling at the Site during the remedial design. As a result of the monitoring, EPA detected Site-related contaminants in the Columbia aquifer began migrating from the Saunders property towards Godwins Millpond. Specifically, PCP was detected in May 1996 on the Kelly property at a maximum level of 41.6 micrograms per liter ( $\mu\text{g/L}$ ), well above the Maximum Contaminant Level (MCL) and Site clean-up level for PCP of 1  $\mu\text{g/L}$  and also exceeding the Removal Action Level of 30  $\mu\text{g/L}$ . This was the first time EPA detected PCP beyond the Saunders property. As such, EPA followed-up this detection with multiple sampling events; at first to verify the fact that PCP was migrating and then to delineate the extent of the contamination. After obtaining this information, EPA issued an Action Memo on June 19, 1997 in order to use its emergency removal authority to construct a system to collect and treat the ground water to prevent PCP from reaching Godwins Millpond and protect this drinking water source.

## **Remedy Implementation**

Ground water treatment began on April 22, 1998. The ground water extraction and treatment system was deemed to be operational and functional, under Remedial criteria, on July 15, 1999. The system includes four recovery wells screened in the Columbia (shallow) aquifer that deliver ground water to a treatment building for processing. The

major treatment process equipment includes a reaction tank and blower (to oxidize and precipitate iron and other heavy metals), a settling tank, a filter system, activated carbon units, and an effluent tank. A total of 4,312,556 gallons of ground water have been extracted and treated by the system from April 22, 1998 to June 30, 2014.

The construction contract for remediation of the soil and sediments was awarded to Desco, Inc. on September 29, 1998. Mobilization of the construction contractor began on November 25, 1998, and the work at the Site commenced on March 9, 1999 with the approval of the Chemical Data Acquisition Plan.

The United States Army Corps of Engineers (USACE) performed full-time oversight of the construction activities for EPA. USACE was on-site during all of the work and inspected all elements of construction, especially those concerning adherence to and interpretation of the remedial design.

The pre-final inspection was conducted on November 9, 1999, which resulted in a list of minor construction items for correction by the contractor prior to final EPA approval. EPA, VDEQ, and USACE determined that the following remedial activities were completed according to design specifications and the ROD Amendment:

- Several Site structures and features from the former wood treating operation were demolished with the debris properly disposed of. The concrete drip pad was decontaminated and disposed of in the area of the former wastewater pond as fill. The small wood storage sheds and the remaining debris were disposed of in the John Holland landfill in Virginia.
- Site soil was excavated and transported to an off-site incinerator for treatment and disposal. During the remedial design, Saunders Supply Company representatives requested access to the large wood storage sheds so that they could maintain their active lumber business during the remedial action. To support the request, the remedial action was split into two phases. The final design did not allow access to the sheds during Phase 1 since this phase included excavation of the shallow soil in the area of the sheds. After the contaminated soil was excavated and the area was backfilled with clean material, a new truck entrance was constructed to allow access to the sheds. Since the Saunders Supply Company was given access to the sheds during Phase 2, a fence was constructed around the sheds to prevent access to the construction zone. During Phase 2, four deep excavations (up to 12 feet below ground surface), were made in the area around the former wood treatment facility in addition to the various shallow excavations. A total of 27,886 tons of soil was excavated and transported to the off-site incinerator (Bennett Environmental, in Quebec, Canada) for treatment and disposal. The excavations were then backfilled with clean soil and covered with crushed stone to restore the yard to the pre-construction condition.



- The former wastewater pond was dewatered and the listed hazardous waste sediments were excavated. The area was then backfilled with clean soil and covered with crushed stone. The sediments from the former wastewater pond and the former earthen separation pond were also transported to the incinerator for treatment and disposal.
- The concrete pad was scarified to remove staining from the CCA solution. However, rather than patching the scarified areas, the Saunders Supply Company agreed to a proposal from Desco Inc. to demolish and backfill the remaining portions of the concrete pad.
- The catch basins and storm sewer along Godwin Boulevard were cleaned. EPA decided the sewer did not require to be sliplined because it was more physically sound than thought at the time of the ROD. This decision is noted in a memorandum to the file. Another decision made by EPA during the remedial design was to replace the wooden catch basin located just before the sewer discharges to the drainage swale and to construct a new catch basin where the treatment plant discharge line was now placed to make sure the flow from the on-site ground water treatment plant could be handled properly.

The Site achieved construction completion status when the Preliminary Close Out Report was signed on December 17, 1999.

Although flooding of Godwin Boulevard occurred historically, an unplanned consequence of the remedial action was more frequent flooding in the roadway and on the two properties adjacent to the Saunders property. To alleviate this problem, EPA utilized the services of the USACE to investigate, design, and construct a storm water management system. EPA completed construction of the storm sewers in the summer of 2001 and subsequently performed other storm water management work to alleviate this additional flooding. As part of this storm water management plan, Saunders Supply Company agreed to install roof drains on its wood storage buildings and to connect them to the storm sewers.

EPA and VDEQ have determined that all remedial construction activities were performed according to the design specifications.

Institutional Controls, as identified in the ROD, are included in a Consent Decree settlement with the Saunders Supply Company and related individuals and entities. The institutional controls negotiated in the Consent Decree settlement place a restriction on the use of ground water on the Saunders Supply Company property until MCLs are achieved. The relevant institutional control for the Saunders Property is in a Title Notice filed by Saunders in 2004, which incorporates the institutional controls identified in the ROD. Also, the Consent Decree includes a provision that if Saunders transfers its



property, it will expressly reserve in the deed or other instruments an irrevocable and permanent easement which grants Saunders the right of access and the right to carry out and enforce the obligations and restrictions of the Consent Decree. The settlement states that ground water underlying the property, including ground water from either the Columbia or Yorktown aquifers, shall not be extracted, consumed, exposed or utilized in any way, except for the limited purpose of pumping and treating the contaminated ground water and monitoring ground water contamination levels in accordance with plans approved by EPA.

The Final Close Out Report will not be issued until all ground water levels have been met. EPA does not expect to reach the cleanup goals for all ground water contaminants for many years.

### **System Operation/Operation and Maintenance**

As stated previously, the ground water extraction and treatment system has been operating since April 22, 1998. Operation and maintenance of the treatment plant was performed by the EPA Removal Program contractor until June 1999 when it was transferred to the EPA Remedial Program. The Remedial Program utilized the services of the USACE under an Interagency Agreement to contract to a local firm to perform these functions until November 2002. At that time, EPA contracted with a Remedial Action Contractor (RAC) to continue system operation and maintenance. The RAC contractor performed operation and maintenance until July 15, 2009 when it was transferred to VDEQ, since CERCLA requires states to assume operations and maintenance of Fund-lead sites ten years after the site achieves Operational and Functional status. The system is currently being monitored and maintained according to the operation and maintenance (O&M) plan that was updated in June 2003. The primary maintenance activities are described below.

The maintenance activities consist of routine weekly maintenance checks, a comprehensive monthly inspection, and unscheduled maintenance as necessary (e.g., carbon unit change outs, repairs to blowers or pumps) or unforeseen modifications. During the weekly visits, the water level in the soda ash feed tank is checked and filled, if required, to make sure the tank does not empty out prior to the next weekly visit. All equipment is regularly inspected and maintained following a maintenance schedule. Also, system shutdowns are registered by the control system and an autodialer notifies the operator when this occurs.

In order to assess the treatment system performance, samples are collected during the monthly inspection at the treatment system influent, intercarbon sampling ports, and the effluent from the treatment system. These data are used to compare effluent concentrations to the discharge limits, determine removal efficiencies, and evaluate overall system performance. In addition, the four recovery wells and eleven ground water monitoring wells are sampled semi-annually to determine the changes that have occurred over time as a result of the operation of the treatment system.

Since July 2009, when VDEQ contractor assumed the operation and maintenance of the treatment plant, the annual cost for the extraction and treatment system is approximately \$61,438, after subtracting out other costs such as preparing and negotiating work plans and preparing and negotiating subcontracts.

## **V. Progress Since the Last Review**

The purpose of this section is to discuss the progress taken on follow-up actions included in the previous five-year report.

Below are the protectiveness statements from the second Five-Year Review Report:

The remedy for the Site is protective of human health and the environment in the short term. Exposure pathways that could result in unacceptable risks are being controlled. All threats at the Site associated with ingestion or dermal contact with contaminated soil and sediment have been addressed through excavation and off-site treatment and disposal. In addition, there are no exposures to the contaminated ground water because everyone in the vicinity of the Site is connected to the city of Suffolk public water supply and the ground water extraction system has prevented contamination from reaching either Monitoring Well-19D or Godwins Millpond.

Institutional controls have been implemented to prevent future exposure to, or ingestion of, contaminated ground water on the Saunders property while long-term ground water remediation is ongoing. Long-term protectiveness will be achieved once institutional controls are put into place on the Kelly property.

Long-term protectiveness of the remedial action will be verified through the continued monitoring of the ground water plume.

These protectiveness statements are based on the findings of the previous five-year review. Below is Table 3 from the previous five-year review report listing the only issue brought up as a result of the review and the recommendations/follow-up actions required.

**Table 3**  
**Recommendations and Follow-Up Actions**

Issue	Recommendation/ Follow-up Action	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness? (Y/N)	
					Current	Future
Formal ground water restrictions have not been implemented on the Kelly property.	Institutional control restricting the Columbia or Yorktown aquifers as a source of ground water must be implemented.	EPA	N/A	Should be completed as soon as possible.	No	Yes

As shown in Table 3, above, the only issue from the second five-year review is that an institutional control was required for the Kelly property. Institutional controls are still required to restrict using the Columbia and Yorktown aquifers on the Kelly property because EPA is concerned that pumping from these wells could draw the contamination toward the Kelly wells. EPA approached Mr. and Mrs. Kelly on several occasions to place this institutional control on their property but they refused to negotiate an agreement. In order to achieve this added level of protection, EPA requested the assistance of the Suffolk Health Department and they agreed to place a notice in their files to notify EPA if anyone applies for a permit to construct a well on this property, thus fulfilling the requirement for institutional controls. An institutional control prohibiting use of the Columbia and Yorktown aquifers as a source of drinking water at the Saunders property was implemented previously.

## **VI. Five-Year Review Process**

The purpose of this section is to describe the activities performed during the five-year review process as well as to provide a summary of findings, when appropriate.

### **Administrative Components**

The start date for the third five-year review is February 6, 2014 when Andy Palestini, the EPA Remedial Project Manager for the site and the leader of the Five-Year Review Team met with the members of the Saunders Supply Five-Year Review Team, including the hydrogeologist, toxicologist, biologist, and the community involvement coordinator. The purpose of the meeting was to identify any issues pertinent to the site and to discuss the time table for the five-year review report.

## **Community Involvement**

As stated previously in this report, EPA transferred operation and maintenance of the ground water extraction and treatment system to VDEQ on July 15, 2009. As part of the transfer process, EPA placed an ad in the *Suffolk News Herald* prior to the transfer to inform the public that VDEQ would be performing operation and maintenance of the system as of that date. To make sure the residents in the area of the Site were aware of the transfer, EPA also distributed a fact sheet informing the residents. EPA combined notice of the transfer with notice of the second five-year review by including information in both the newspaper ad and the fact sheet that EPA was actively performing a review that would be completed by December 2009.

For the third five-year review, EPA placed a notice in the *Suffolk News Herald* on September 30, 2014. This notice indicated that EPA was performing the five-year review, identified when the review would be complete and listed the name and contact information of the Community Involvement Coordinator where residents could submit any comments or concerns.

A public meeting was not held nor interviews conducted because of the historically low attendance at the previous meetings for the Proposed Remedial Action Plans for the ROD and the ROD Amendment as well as the meeting held to discuss the final design. In addition, no feedback was received from the community as a result of either of the previous five-year review reports. Finally, in support of transferring the operation and maintenance to VDEQ in July 2009, EPA placed an ad in the same newspaper and mailed out a fact sheet to the public. No feedback was received in response to these either.

## **Document Review**

The five-year review consisted of a review of relevant documents including the ROD and ROD Amendment, the RI and FS, the Ground Water Extraction and Treatment System Operation and Maintenance Manual, the Deep Ground Water Investigation, and the annual O&M Reports for the past five years. Applicable ground water cleanup standards, as listed in the 1991 ROD and 1996 ROD Amendment, were also reviewed.

## **Data Review**

### Soil and Sediment

The soil and sediment remedial action was conducted from November 1998 to December 1999. The selected remedy included excavation and transportation off-site for treatment and disposal of all of the soil and sediment which exceeded the health-based cleanup levels. No additional data review of the soil and sediment remediation was necessary

given that none of the soil and sediment which exceeded the Site-specific health-based cleanup levels were left on-site; it was all transported to an off-site incinerator for treatment and disposal according to the ROD, ROD Amendment, and design specifications.

### Ground Water

The ground water extraction and treatment system was installed in April 1998 under the Action Memo with four recovery wells screened in the Columbia aquifer, to prevent the further migration of ground water contaminants towards Godwins Millpond. In addition, eleven monitoring wells were installed on-site that are screened in the Columbia (shallow) aquifer and the top of the Yorktown (deeper) aquifer. The ROD Amendment states that PCP, arsenic, and chromium were the only contaminants associated with operations at the Site detected at elevated levels in the ground water. Ground water samples were collected and analyzed for PCP, arsenic, and chromium during system startup. Since then, PCP has been analyzed in the eleven Site monitoring wells and four recovery wells during each monitoring sampling event, while arsenic and chromium have been analyzed since January 2003.

For the first five-year review, EPA utilized the October 23, 2003 Ground Water Extraction and Treatment System Optimization Study prepared by CDM to evaluate the performance of the ground water treatment system. For the second review, EPA utilized the Deep Ground Water Investigation (February 2005) and the Hydrogeological Analysis Report (December 2006) to evaluate the performance of the system. These reports, as well as the analytical results of the semi-annual sampling, showed the levels of contaminants over the second five year period remained consistent with the initial five years. PCP levels continue to trend downward, while arsenic and chromium levels vary but do not exceed their historical highs. In the first five-year review report, EPA questioned whether the PCP plume in the Yorktown aquifer was being captured through pumping of the recovery wells. In the Hydrogeological Analysis Report, it was determined that the recovery wells are, in fact, capturing the COCs in both the Columbia and Yorktown aquifers. Although low levels of PCP, arsenic, and chromium were detected in the 2004 deep ground water sampling, they are not considered to be of concern. PCP was only detected once. The PCP may be residual contamination and the note on the analytical data report indicates that the result may be biased high due to the high turbidity of the sample, an indication that the PCP may have been absorbed on the solids. The levels of dissolved arsenic and chromium in the 2004 deep ground water sampling event were below the contract required quantification levels (as well as the respective MCLs). The ratio of total to dissolved concentrations suggest that arsenic and chromium are absorbed onto solids (or are part of the natural chemistry of the solids), are not mobile, and are not migrating at depth. In other words, the COCs at the Site are not migrating to the Yorktown aquifer because the ground water extraction system is containing all of the Site-related contaminants.

As part of the process of transferring the operation and maintenance of the ground water extraction and treatment system to VDEQ, EPA agreed to replace the four pumps located in the four recovery wells. However, while trying to remove the pump from RW-3, the pump became jammed and the well casing collapsed. Rather than replacing RW-3 at the same location, EPA decided to move it closer to the MW-7S/MW-8D well nest, which is where the highest levels of arsenic by far have always been detected. In addition, this new location would place the recovery well on the Saunders property. The field investigation work was completed in December 2009 and the well was installed in January 2010. This work was performed by EPA since the pump replacement started before the operation and maintenance was transferred to VDEQ. Analytical results of ground water sampling at this well show an increase of PCP recovery over that of RW-3.

Ordinarily, institutional controls are designed to prevent exposure to contamination where levels do not allow for unlimited use/unrestricted exposure. At this Site, EPA is also concerned that pumping from the irrigation wells formerly used at the Kelly Nursery could cause the contaminants to move toward those wells, thus spreading the plume to areas that are not presently contaminated. The ROD required that institutional controls be implemented to restrict use of the contaminated ground water. Specifically, the institutional controls include restrictions on the Site to prohibit using either the Columbia aquifer or the Yorktown aquifer as a source of drinking water and restrictions of off-property ground water extraction until MCLs are achieved. The institutional controls negotiated in the Consent Decree with the PRPs place a restriction on the ground water on the Saunders Supply Company property. The settlement states that ground water underlying the property, including ground water from either the Columbia or Yorktown aquifers, shall not be extracted, consumed, exposed or utilized in any way, except for the limited purpose of pumping and treating the contaminated ground water and monitoring ground water contamination levels in accordance with plans approved by EPA.

EPA initiated efforts with Mr. and Mrs. Kelly to place similar restrictions on their property, but was not able to negotiate a suitable agreement which met EPA requirements. In order to achieve this protection, EPA approached the city of Suffolk for assistance. The Suffolk Health Department agreed to place a notice in their files to notify EPA if anyone submits a permit application to place a well on the Kelly property.

#### Surface Water

EPA has not sampled Godwins Millpond since the Remedial Investigation because the ground water monitoring results for MW-19D, the monitoring well closest to Godwins Millpond, indicate that the PCP plume has not reached this well. This means that the ground water extraction system is preventing contamination from reaching Godwins Millpond. Thus, the drinking water supply for the city of Suffolk is protected and there is no pathway for potential ecological receptors.



## Site Inspection

The Site inspection was conducted on July 1, 2014 by the RPM and the VDEQ project manager. Attending the inspection was a representative of Environmental Alliance, the subcontractor who performs the maintenance and operation of the ground water extraction and treatment system for VDEQ.

During the inspection, all three members of the party walked the entire area of the Site and the adjoining properties. Since all of the contaminated soil and sediments were previously excavated and transported off-site for treatment and disposal and flooding of the surrounding area was a concern in the years after the remedial action was completed (especially two of the neighboring properties of the Saunders Supply Company), this portion of the inspection primarily consisted of checking the storm water collection system and signs of erosion from recent flooding.

The major component of the Site inspection was inspecting the ground water treatment system and discussing the operations with Environmental Alliance. During the first two years of operation by VDEQ, several problems occurred at the plant, including equipment breakdowns and a couple of instances when flooding occurred in the plant. However, those problems have been corrected.

During the past five years, VDEQ instituted two major revisions to optimize the operations at the plant: going from four activated carbon filters to two activated carbon filters; and, replacing the sand filters with bag filters.

Initially, there were four activated carbon units arranged for two stage treatment in two parallel trains to protect the effluent from PCP breakthrough. The reason the number of activated carbon filters was reduced to two was because some activated carbon filter units had to be replaced before the carbon media was used up when they developed pin holes in the drums from corrosion. This also occurred while EPA operated the plant. It is believed that the designer of the plant initially used four activated carbon units to handle an expected high pressure. But this never occurred. By switching to two activated carbon units, VDEQ will be reducing their operations budget because this revision should enable more of the carbon to be used up before the unit needs to be replaced.

Replacing the sand filters with bag filters was instituted because using the bag filters is both easier to operate the plant (since the bag filters are replaced rather than backwashed) and cost effective.

As indicated previously, EPA transferred operation and maintenance of the ground water extraction and treatment system to VDEQ in July 2009. VDEQ decided to keep the operation and maintenance the same as when EPA was the lead. The subcontractor is still on-site at least one day every week for the routine maintenance checks: to check all of the equipment to make sure all systems are operational; the recovery well pumps are checked; the bag filters are replaced; and, pressure readings are taken of the carbon filters.

In addition, the soda ash feed tank is filled to make sure the tank does not become empty during the week. A weekly system monitoring checklist report is submitted for each trip. A critical device check is performed once per month during which samples are taken of the influent, effluent, and at the carbon unit to detect first stage breakthrough. The monthly monitoring between the stages detects first stage breakthrough. When first stage breakthrough occurs, the first stage unit is removed, the second stage unit moved to the first stage position, and a fresh unit installed in the second stage position. It appears that VDEQ is operating the system very well.

As stated previously, development in the immediate area of the Site has been virtually unchanged for the past ten years.

## **Interviews**

No specific interviews were conducted as part of the five-year review process. As indicated previously, a notice was placed in the *Suffolk News Herald* that included information to the public that EPA was conducting a five-year review of the Site but no feedback was received from the community.

## **VII. Technical Assessment**

The purpose of this section of the five-year review is to answer the following three questions:

- Is the remedy functioning as intended by the decision documents?
- Are the exposure assumptions, toxicity data, cleanup levels, and RAOs used at the time of remedy selection still valid?
- Has any other information come to light that could call into question the protectiveness of the remedy?

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

Yes.

The review of documents, Applicable or Relevant and Appropriate Requirements (ARARs), and the results of the Site inspection indicate that the entire remedy is functioning as intended by the decision documents - the ROD, Action Memo, and the ROD Amendment.

At present, exposure pathways for human and ecological receptors that could result in unacceptable risks are being controlled. The RAO to eliminate direct contact with the contaminated soil and sediment was achieved by excavating these wastes and transporting them off-site for treatment and disposal.



No one in the immediate vicinity of the Site uses ground water for residential use because everyone is connected to the city of Suffolk water system. As an added protection, institutional controls to restrict use of contaminated ground water on the Saunders property were negotiated in the Consent Decree with the Saunders Supply Company and related entities and individuals. Finally, Mr. Kelly agreed with EPA's request to not use his wells for his plant nursery business. In return, EPA agreed to supply him with a water treatment plant so that he may use pond water as an alternate water supply for the business. Construction was completed and the system is operating properly. However, in spite of the agreement with Mr. and Mrs. Kelly to not use ground water, institutional controls are still required to restrict using the Columbia and Yorktown aquifers on the Kelly property because EPA is concerned that pumping from these wells could draw the contamination toward the Kelly wells. That is, the institutional controls on the Kelly property are needed to protect the integrity of the remedy. EPA approached Mr. and Mrs. Kelly on several occasions to place this institutional control on their property but they refused to negotiate an agreement. In order to achieve this added level of protection, EPA requested the assistance of the Suffolk Health Department and they agreed to place a notice in their files to notify EPA if anyone applies for a permit to construct a well on this property, thus fulfilling the requirement for institutional controls.

The ground water extraction and treatment system has been effective in reducing the concentration of contaminants in the Columbia aquifer, especially PCP and has prevented contamination from reaching Godwins Millpond. At the time of the last five-year review, EPA was starting work on the deep ground water investigation. Through this report and the subsequent Hydrogeological Analysis Report, EPA is able to state that the extraction system is capturing the contaminants in the ground water. In addition, it has been determined that contamination is not migrating to the Yorktown aquifer.

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

Yes.

#### Changes in Standards and TBCs

*Have standards identified in the ROD been revised, and does this call into question the protectiveness of the remedy? Do newly promulgated standards call into question the protectiveness of the remedy? Have TBCs used in selecting cleanup levels at the site changed, and could this affect the protectiveness of the remedy?*

Although groundwater monitoring is conducted for various Site related contaminants of concern (COCs), the only performance standard identified in the decision documents is PCP-1.0 µg/L. Since PCP is the most pervasive of the COCs, the groundwater treatment system will operate until cleanup levels are achieved for PCP.

On February 17, 2012, EPA released the final non-cancer dioxin reassessment, publishing a non-cancer toxicity value, or reference dose (RfD), for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in EPA's Integrated Risk Information System (IRIS). The result of this change in toxicity is that the cleanup standards for soils may be impacted. Therefore, EPA will evaluate whether these changes impact the soils on the adjacent property.

In addition, PFOA/PFOS have been identified as a newly identified groundwater contaminant by EPA. One potential source for PFOA/PFOS is firefighting foam. At this site, PCP sludge was occasionally burned as a fire fighting exercise. At this time, EPA does not have any information that foam was used to extinguish the fires. However, EPA will conduct a more extensive evaluation to determine if groundwater sampling for PFOA/PFOA is necessary.

#### Changes in Exposure Pathways

*Has land use or expected land use on or near the site changed?*

No.

*Have human health or ecological routes of exposure or receptor been newly identified or changed in a way that could affect the protectiveness of the remedy? Are there newly identified contaminants or contaminant sources? Are there unanticipated toxic byproducts of the remedy not previously addressed by the decision documents? Have physical site conditions or the understanding of these conditions changed in a way that could affect the protectiveness of the remedy?*

The major new exposure route of concern would be vapor intrusion into local residences. Recently, EPA has become aware that in such situations, vapors from subsurface contamination can infiltrate buildings located on or near the contamination. However, low level detections of volatile organic contamination in the ground water suggests this pathway does not appear to be a concern at the Site.

#### Changes in Toxicity and Other Contaminants Characteristics

*Have toxicity factors for contaminants of concern at the site changed in a way that could affect the protectiveness of the remedy? Have other contaminant characteristics changed in a way that could affect the protectiveness of the remedy?*

Of the toxicity changes, some have increased while others have decreased, making it impossible to generalize about whether the risks would be higher or lower if recalculated today. However, the most recent ground water results (June 2014) continue to show

MCL exceedances. Since MCLs continue to be exceeded and current toxicity values may change again in the coming years, protectiveness is best assessed at the time when it is believed that ground water cleanup has been achieved. Therefore, it is recommended that the ground water be evaluated at the end of the remedy to ensure protectiveness at that time.

#### Changes in Risk Assessment Methods

*Have standardized risk assessment methodologies changed in a way that could affect the protectiveness of the remedy?*

There have been significant changes in EPA's risk assessment guidance since 1992. These include changes in dermal guidance, inhalation methodologies, and exposure factors. These changes are best assessed by performing a final risk assessment when groundwater cleanup standards have been achieved.

#### Expected Progress towards Meeting RAOs

*Is the remedy progressing as expected?*

In general, it appears that the remedy is progressing as expected.

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

No.

#### Technical Assessment Summary

According to the Site inspection, there are no changes in the physical conditions of the Site that would affect the protectiveness of the remedy. The ARARs for soil contamination cited in the ROD were met. In addition, there have been no other substantive changes in the toxicity factors for the COCs that were used in the baseline risk assessment, and there has been no change to the standardized risk assessment methodology that could affect the protectiveness of the remedy.

Based on the analyses in the two investigations performed prior to the last five-year review, the remedy as a whole is functioning as intended by the decision documents - the ROD, the Action Memo, and the ROD Amendment. The operating extraction system appears to be working effectively. Through both investigations, EPA has determined that the extraction system is effectively capturing the contaminants in the Columbia aquifer and preventing the contaminants from migrating to the Yorktown aquifer as well as delineating the eastern boundary of the contaminated plume.

There is no other information that calls into question the protectiveness of the remedy.

## VIII. Issues

The purpose of this section is to provide details on any issues related to the current Site operations, conditions, or activities which would prevent the remedy from being protective.

**Table 4: Issues**

Issues	Affects Current Protectiveness (Y/N)	Affects Future Protectiveness (Y/N)
On February 17, 2012, EPA released the final non-cancer dioxin reassessment, publishing a non-cancer toxicity value, or reference dose (RfD), for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in EPA's Integrated Risk Information System (IRIS). The properties adjoining the Site were never sampled for dioxin.	No	Yes
PFOA/PFOS have been identified as newly identified groundwater contaminants by EPA. One potential source for PFOA/PFOS is firefighting, especially when using foam. At this site, PCP sludge was occasionally burned as a fire fighting exercise. However, EPA does not have any information that foam was used to extinguish the fires.	No	Yes

## IX. Recommendations and Follow-up Actions

The purpose of this section is to specify the required and suggested improvements to current Site operations, activities, remedy, or conditions.

**Table 5: Recommendations and Follow-Up Actions**

Issue	Recommendations and Follow-up Actions	Party Responsible	Oversight Agency	Milestone Date	Affects Protectiveness (Y/N)	
					Current	Future
EPA released the final non-cancer dioxin reassessment, publishing a non-cancer toxicity value, or reference dose (RfD), for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD).	EPA will evaluate the need to perform limited sampling for TCDD in surface soil outside the areas that were previously excavated.	EPA	VDEQ	1/30/2016	No	Yes
PCP sludge was occasionally burned in a pit as a fire fighting exercise.	EPA will determine if foam was used to extinguish the fires. If foam was used or it cannot be determined whether foam was used, EPA will sample the ground water for PFOA/PFOS.	EPA	VDEQ	1/30/2016	No	Yes

## **X. Protectiveness Statement**

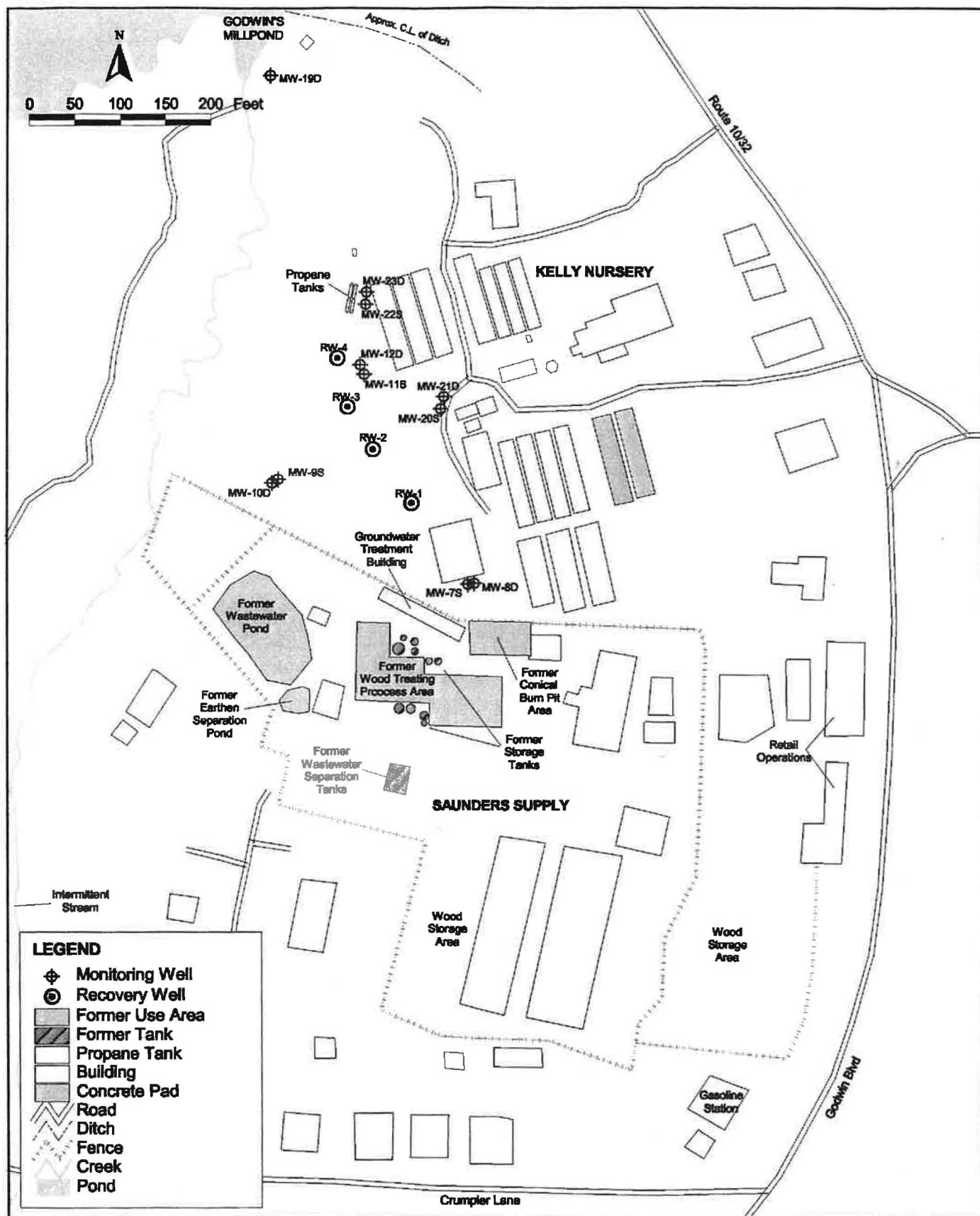
The remedy for the Site is protective of human health and the environment in the short term. Exposure pathways that could result in unacceptable risks are being controlled. All threats at the Site associated with ingestion or dermal contact with contaminated soil and sediment have been addressed through excavation and off-site treatment and disposal. In addition, there are no exposures to the contaminated ground water because everyone in the vicinity of the Site is connected to the city of Suffolk public water supply and the ground water extraction system has prevented contamination from reaching either Monitoring Well-19D or Godwins Millpond.

Institutional controls have been implemented to prevent future exposure to, or ingestion of, contaminated ground water on the Saunders property while long-term ground water remediation is ongoing. Institutional controls for the Kelly property are being met through the Suffolk Department of Health.

Long-term protectiveness will be achieved when cleanup goals are met.

## **XI. Next Five-Year Review**

Since current Site conditions do not allow for unlimited use and unrestricted exposure, EPA will conduct another five-year review of the Saunders Site by December 2019, five years from the date of this review.



**CDM**

**Saunders Supply Company Site  
Chuckatuck, Virginia**

**Figure 1-1  
Site Map**





**Table 3**  
**April 2014 Groundwater Sampling Data**  
**Saunders Supply Company Superfund Site**  
**Cuckatuck, Virginia**

Location ID Sample Date	EPA- MCLs	MW-7S 04/17/14	MW-8D 04/17/14	MW-9S 04/17/14	MW-10D 04/17/14	MW-11S 04/17/14	MW-12D 04/17/14	MW-19D 04/17/14	MW-20S 04/17/14	MW-21D 04/17/14	MW-22S 04/17/14	MW-23D 04/17/14	RW-1 04/16/14	RW-2 04/16/14	RW-4 04/16/14	RW-5 04/16/14
<b>DISSOLVED METALS (µg/L) E200.8</b>																<i>Dup</i>
Arsenic	<b>10</b>	<b>1,540</b>	<b>944</b>	2.90	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
Chromium	<b>100</b>	73.5	19.4	13.9	7.42	1.28	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00
<b>TOTAL METALS (µg/L) E200.8</b>																
Antimony	<b>6</b>	<b>19.3</b>	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Arsenic	<b>10</b>	<b>1,570</b>	<b>1,120</b>	3.71	< 1.00	5.63	2.90	< 1.00	< 1.00	4.65	< 1.00	< 1.00	<b>15.4</b>	< 1.00	< 1.00	2.81 1.81
Barium	<b>2,000</b>	74.2	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Chromium	<b>100</b>	79.4	35.6	19.9	7.87	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	< 1.00	19.9	< 1.00	< 1.00	< 1.00 1.47
Cobalt	<b>NG</b>	< 1.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Copper	<b>1,300</b>	4.90 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Cyanide (E335.4)	<b>200</b>	< 5.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Lead	<b>15</b>	< 0.200	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Manganese	<b>NG</b>	6.22 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Nickel	<b>NG</b>	< 1.00	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Selenium	<b>50</b>	1.31 J	--	--	--	--	--	--	--	--	--	--	--	--	--	--
Zinc	<b>NG</b>	26.9	--	--	--	--	--	--	--	--	--	--	--	--	--	--
<b>SVOCs (µg/L) SW8270D</b>																
Benzo (a) pyrene	<b>0.2</b>	--	< 0.0533	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (b) fluoranthene	<b>0.2*</b>	--	< 0.0533	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (g,h,i) perylene	<b>0.2*</b>	--	< 0.0533	--	--	--	--	--	--	--	--	--	--	--	--	--
Benzo (k) fluoranthene	<b>0.2*</b>	--	< 0.0533	--	--	--	--	--	--	--	--	--	--	--	--	--
Dibenzo (a,h) anthracene	<b>0.2*</b>	--	< 0.0533	--	--	--	--	--	--	--	--	--	--	--	--	--
Indeno (1,2,3-cd) pyrene	<b>0.2*</b>	--	< 0.0533	--	--	--	--	--	--	--	--	--	--	--	--	--
Pentachlorophenol (SW8151)	<b>1</b>	<b>1.47</b>	<b>1.33</b>	< 0.0784	<b>2.45</b>	< 0.0785	<b>1.82</b>	< 0.0258 **	< 0.147	0.736	< 0.0796	< 0.0251 **	<b>7.33</b>	< 0.0765	< 0.0788	<b>150 85.2</b>

µg/L = micrograms per liter

DUP = Blind field duplicate sample

J = Estimated value less than reporting limit

NG = No Guidance value for specified analyte

SVOCs = Semi-Volatile Organic Compounds

-- = Not Analyzed

< = analyte not detected at or above the specified laboratory detection limit

\* = MCL value listed is referenced from MCL Regulation for Benzo(a)pyrene / (PAHs)

\*\* = PCP Samples for these well were recollected on 4/28/14 due to sample breakage at laboratory

Results formatted in **bold** are in exceedance of the EPA-MCLs guideline.

EPA-MCL = US Environmental Protection Agency Primary Drinking Water Regulations, Maximum Contaminant Level, November 2013.

