FOURTH FIVE-YEAR REVIEW REPORT FOR RENTOKIL, INC. (VIRGINIA WOOD PRESERVING DIVISION) SUPERFUND SITE HENRICO COUNTY, VIRGINIA

JULY 2018

Prepared by

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Date

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LIST OF ABBREVIATIONS & ACRONYMS

AOC	Administrative Order on Consent
ARAR	Applicable or Relevant and Appropriate Requirement
BTAG	Biological Technical Assistance Group
CCA	Chromated Copper Arsenate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
DNAPL	Dense Non-Aqueous Phase Liquid
DUP	Duplicate
EPA	United States Environmental Protection Agency
FFS	Focused Feasibility Study
FYR	Five-Year Review
HI	Hazard Index
HQ	Hazard Quotient
IC	Institutional Control
IRIS	Integrated Risk Information System
LDPE	Low Density Polyethylene
MCL	Maximum Contaminant Level
µg/kg	Microgram per Kilogram
µg/L	Microgram per Liter
mg/kg	Milligram per Kilogram
ND	Not Detected
NPL	National Priorities List
NS	Not Sampled
O&M	Operation and Maintenance
OU	Operable Unit
PAH	Polycyclic Aromatic Hydrocarbon
PCP	Pentachlorophenol
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RfD	Reference Dose
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
RPF	Relative Potency Factor
RPM	Remedial Project Manager
RSL	Regional Screening Level
TCDD	2,3,7,8-Tetrachlorodibenzo-p-dioxin
TEF	Toxicity Equivalence Factor
TEQ	Toxic Equivalent
UU/UE	Unlimited Use and Unrestricted Exposure
VDEQ	Virginia Department of Environmental Quality
VOC	Volatile Organic Compound
VPI	Virginia Properties, Inc.

I. INTRODUCTION

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

The U.S. Environmental Protection Agency (EPA) is preparing this FYR pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) Section 121, consistent with the National Contingency Plan (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fourth FYR for the Rentokil, Inc. (Virginia Wood Preserving Division) Superfund site (the Site). The triggering action for this statutory review is the completion date of the previous FYR. The FYR has been prepared because hazardous substances, pollutants or contaminants remain at the Site above levels that allow for unlimited use and unrestricted exposure (UU/UE).

The Site consists of one operable unit (OU). This FYR addresses the remedies for soil, sediment and groundwater.

EPA remedial project manager (RPM) Stepan Nevshehirlian led the FYR. Participants included EPA biological technical assistance group (BTAG) member Katie Matta, EPA geologist Herminio Concepcion, EPA toxicologist Linda Watson, Virginia Department of Environmental Quality (VDEQ) project manager Angie McGarvey, potentially responsible party (PRP) contractors Daniel Sheehan and Catherine Coffey from Arcadis, and Melissa Oakley and Amanda Goyne from Skeo (EPA's FYR contractor). Virginia Properties, Inc. (VPI), the PRP, was notified of the initiation of the FYR. The review began on July 18, 2017.

Site Background

The Site is located on Peyton Street and Oakview Avenue, about 10 miles north-northwest of Richmond, Virginia, in Henrico County (Figure 1). A wood-treating facility operated at the Site from 1957 until January 1990 which resulted in the contamination of soil, sediment and groundwater with hazardous chemicals. In 1976, Virginia Wood Preserving, a division of Rentokil, Inc., began operations on site. Chemicals used during operations included chromium zinc arsenate, chromated copper arsenate (CCA), pentachlorophenol (PCP), creosote, xylene and fire retardants.

Current site features include a large fenced, capped area at the former wood treating process area, two subsurface slurry walls, a building previously used as part of the groundwater dewatering system (the water facility building), six active monitoring wells and Wetland Areas A, B and C (Figure 2). The Site is not currently in use. Surrounding land use includes light industrial, commercial and residential use. There are two water-bearing units at the Site, separated by a clay hardpan. The upper (perched) aquifer consists of fluvial sediments and extends from the ground surface to about 4-7 feet below grade. The lower, or saprolitic, aquifer extends from the bottom of the hardpan (about 7-10 feet below grade) to the top of the Petersburg Granite bedrock. The bedrock serves as a confining layer and is encountered about 25 feet below ground surface.

A municipal water supply provides water to the area. Groundwater beneath the Site generally flows to the northeast, toward North Run Creek. Vertical groundwater movement is restricted by the hardpan. The primary surface water feature near the Site is North Run Creek, which flows into Talley's Pond about 1 mile southeast of the Site (Figure 1). North Run Creek continues to Upham Creek and then into the Chickahominy River.

For reference, Appendix A includes a list of documents reviewed during this FYR. Appendix B includes a timeline of site events.

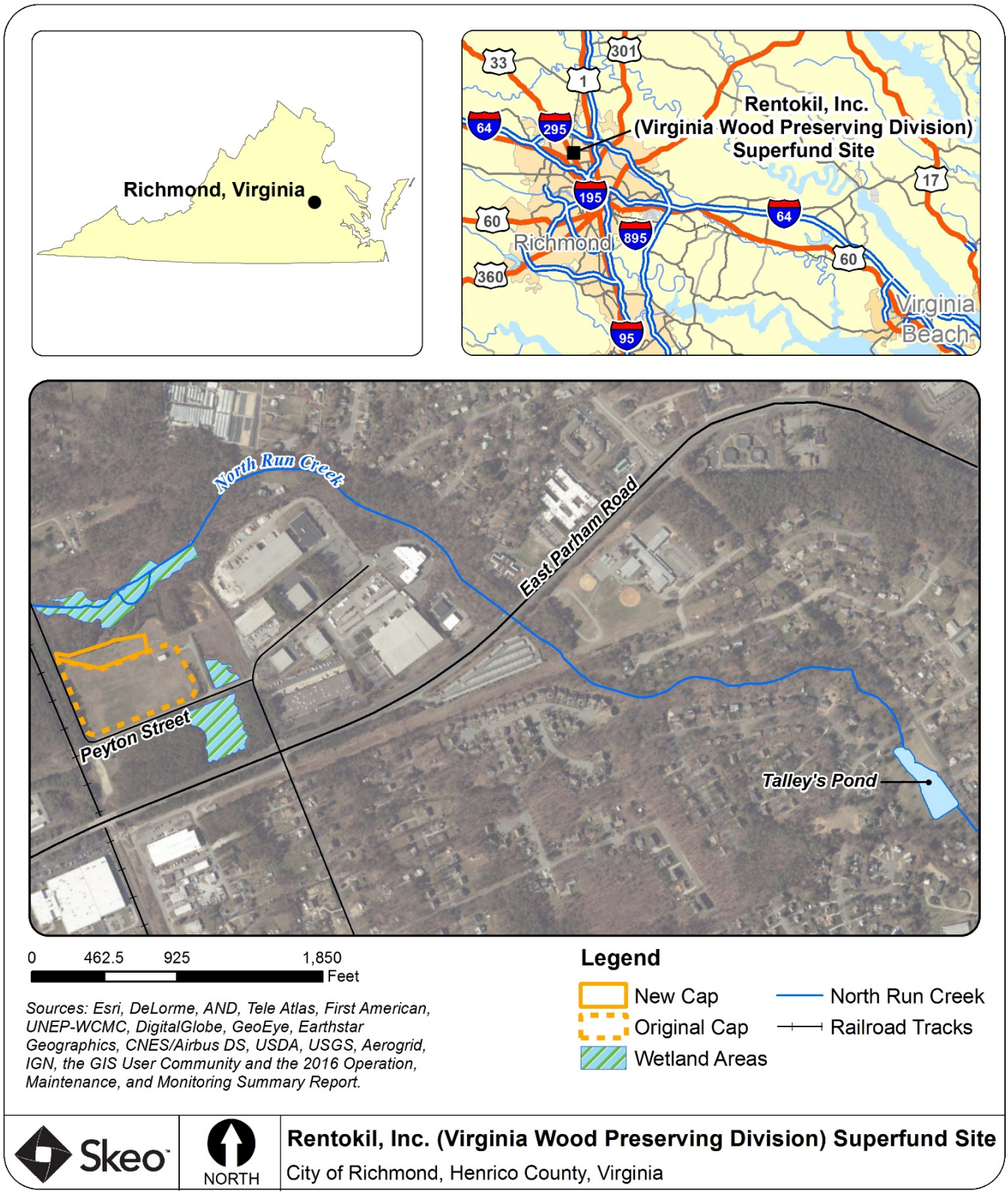
FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Rentokil, Inc. (Virginia Wood Preserving Division)		
EPA ID: VAD071040752		
Region: 3	**State:** Virginia	**City/County:** Richmond / Henrico

SITE STATUS	
NPL Status: Final	
Multiple OUs? No	**Has the site achieved construction completion?** Yes

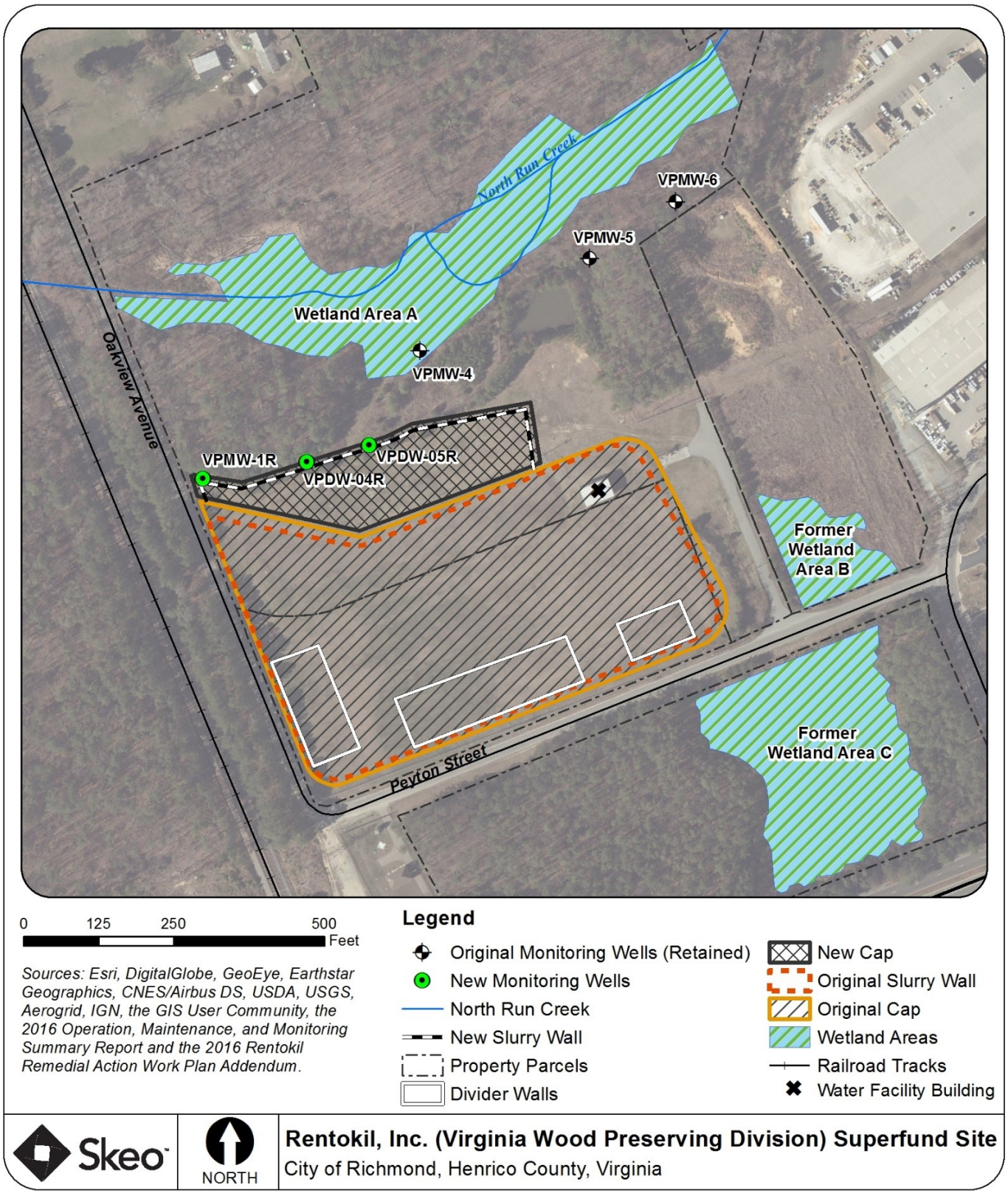
REVIEW STATUS
Lead agency: EPA
Author name: Stepan Nevshehirlian, with additional support provided by Skeo
Author affiliation: EPA Region 3
Review period: 7/18/2017 – 7/2/2018
Date of site inspection: 11/8/2017
Type of review: Statutory
Review number: 4
Triggering action date: 7/2/2013
Due date *(five years after triggering action date)*: 7/2/2018

Figure 1: Site Vicinity 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 Map of Current Site Features and Remedial Components



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II. RESPONSE ACTION SUMMARY

Basis for Taking Action

Rentokil, Inc. (name was subsequently changed to VPI) and EPA signed an Administrative Order on Consent (AOC) in December 1987 to conduct a remedial investigation and feasibility study (RI/FS). Rentokil conducted the RI/FS between 1987 and 1992. The baseline risk assessment determined that soil, sediment and groundwater could pose a cancer or a non-carcinogenic risk. Specifically, it identified unacceptable risks associated with incidental ingestion, inhalation and dermal absorption of site soil and sediment and with ingestion and dermal absorption of groundwater within both the perched and saprolite aquifers. The RI initially identified two on-site plumes of groundwater contamination centered around the former treatment area and the unlined pond. The primary contaminants of concern (COCs) included metals, PCP and carcinogenic polycyclic aromatic hydrocarbons (PAHs) for groundwater, soil and sediment.

The environmental assessment, performed as part of the RI, identified no significant impact to aquatic organisms in North Run Creek associated with surface water. It did find that concentrations of organic and inorganic contaminants in sediment in North Run Creek and wetland areas adjacent to the Site could potentially pose a risk to organisms.

Response Actions

Following fish kills in Talley's Pond in 1962, under the direction of the Virginia State Water Control Board, the site owner cleared, cleaned and replaced the blowdown sump with a concrete holding pond and constructed a covered, unlined pond in 1963. An underground pipe connected the concrete holding pond to the covered unlined pond. In 1987, Rentokil removed the contents of the unlined pond and disposed of the waste off-site (Figure C-1 in Appendix C). Because the unlined pond was not backfilled, the excavation filled with rainwater and groundwater. The sludge at the bottom of the former unlined pond was considered a listed hazardous waste. In 1989, the owners of Talley's Pond (the off-property pond) dredged the pond sediment, placed the sediment around Talley's pond and seeded the area. EPA added the Site to the Superfund program's National Priorities List (NPL) in March 1989.

Following the shut-down of wood treating operations in 1990, the site owner placed a polyvinyl chloride cover over the drip pad and constructed a roof over the concrete holding pond. In 1991, additional actions taken by the site owner included removal and off-site disposal of wood-treating equipment, aboveground storage tanks and treatment cylinders; placement of clean, compacted clay over the former treatment cylinder area; construction of a roof over the former tank farm; and placement of a layer of clean gravel over the entire surface of the Site.

In March 1992, EPA entered into an AOC with VPI (a wholly owned subsidiary of Rentokil, Inc.) for the performance of a removal action to prevent additional migration of contamination into North Run Creek. The removal action included the placement of heavy plastic over the CCA Disposal Area and construction of a berm and sediment trap. VPI completed the work between June and September 1992.

EPA selected a remedy to address site contamination in a June 1993 Record of Decision (ROD). The ROD did not specify remedial action objectives (RAOs). However, as can be inferred from the list of the major components of the remedy listed below, the objectives of the remedy are:

Source Control Response Objectives

- Reduce risks to human health by preventing direct contact with, and ingestion of, contaminants in the Site soil, wetland sediments, and pond sediments, and by preventing potential ingestion of contaminated ground water;
- Reduce risks to the environment by preventing direct contact with, and ingestion of, contaminants in the wetland sediments; and,

- Minimize the migration of contaminants from Site soil and wetland sediments that could result in surface water concentrations in excess of Ambient Water Quality Criteria.

Management of Groundwater Migration Response Objectives

- Eliminate or minimize the threat posed to human health and the environment by preventing exposure to the contaminants in the groundwater; and,
- Contain contaminated groundwater to protect human health and the environment.

The major components of the remedy selected in the ROD include the following:

- Demolition, decontamination and off-site disposal of existing site structures.
- Excavation and off-site incineration of K001 waste from the unlined pond.[1]
- Removal and on-site carbon adsorption treatment of surface water from the unlined pond, with discharge of treated water to North Run Creek.
- Closure of the unlined pond.
- Construction of a Resource Conservation and Recovery Act (RCRA) Subtitle C cap over the area of the Site where surface soil exceeds site-specific cleanup levels, as far into the wetlands as possible.
- Construction of a slurry wall around the perimeter of the area encompassed by the cap. Installation of a dewatering system within the confines of the cap/slurry wall to produce an intra-gradient condition, with on-site treatment of the collected groundwater and discharge to North Run Creek.
- Consolidation of surface soil outside the area to be capped (generally occurring in Wetland Areas A, B and C) that exceed site-specific cleanup levels, to the area of the Site to be capped.
- Excavation, on-site low temperature thermal desorption treatment, and on-site disposal of soil removed during installation of the dewatering system and slurry wall, and of about 5,150 cubic yards of soil in the following "hot spots": CCA Disposal Area, Fill Area, and dense non-aqueous phase liquid (DNAPL)-contaminated soils between the surface and the hardpan that occur within 25 feet of the concrete drip pad, the unlined pond and the former blowdown sump.
- Off-site disposal of drums excavated from the Fill Area.
- Dewatering of contaminated soil/sediment in Wetlands A, B and C prior to excavation, and treatment of the water in the on-site water treatment system prior to discharge to North Run Creek.
- Re-vegetation of the excavated wetland areas and mitigation for the loss of wetlands by the creation of wetlands of equal or better value.
- Excavation and on-site disposal of sediment from the oxbow of North Run Creek, north of the Site.
- Sampling of sediment in Talley's Pond and of the sediment previously dredged by the owner of the pond. Excavation, treatment and off-site disposal of sediment that exceeds site-specific cleanup goals.
- Implementation of institutional controls to prohibit residential development of the Site and to prohibit the use of site groundwater.
- Long-term groundwater monitoring.

EPA issued a ROD Amendment in August 1996 removing the requirement to treat "hot spots" of soil contamination and modifying the groundwater remedy to dispose of the extracted groundwater off-site based on groundwater modeling during the remedial design.

Since 2001, groundwater monitoring results for well VPMW-2 have consistently showed PCP concentrations at orders of magnitude above the MCL of 1 microgram per liter (µg/L). Well VPMW-2 was located just north and downgradient of the original cap and slurry wall (Figure 4). In 2011, EPA required that the PRP to develop a comprehensive remediation strategy to address contamination in this area. The PRP submitted a focused feasibility study (FFS) to EPA in November 2012. Based on the remedial alternatives in the FFS, EPA determined that extending the existing remedy containment system (which includes the original cap and slurry wall) was the

[1] K001 waste is a listed hazardous waste associated with wood treating processes.

most viable remedial option to address PCP contamination north of the original containment system. EPA documented this information in a December 2013 Determination of Necessary Additional Response Action.

The ROD selected risk-based soil cleanup goals based on a future industrial land use scenario. The ROD requires groundwater monitoring for at least 30 years to determine if maximum contaminant levels (MCLs) are being met at the site boundary. Site COCs and associated cleanup goals established for soil and sediment are listed in Table 2.

Table 2: COCs Established by the 1993 ROD and Associated Cleanup Goals

Groundwater COC[a]	
Arsenic	
Chromium	
Copper	
Zinc	
Total Carcinogenic PAHs	
PCP	
Soil and Sediment COC[a]	**Cleanup Goal (mg/kg)[b]**
Total Carcinogenic PAHs	5.1
PCP	48
Arsenic	33

[a] COCs established by the 1993 ROD. The ROD did not establish specific numeric values as groundwater cleanup goals, but requires groundwater monitoring to determine if MCLs are being met at the site boundary.
[b] Cleanup goals established by the 1993 ROD for areas outside the capped area.
mg/kg – milligrams per kilogram

Status of Implementation

In February 1994, VPI entered into a Consent Decree with EPA to perform the remedial design and implement the selected remedy. VPI performed the remedial design between May 1994 and May 1998. VPI's remedial contractor started remedy construction in May 1998. Remedial construction activities are summarized below.

- Demolition and disposal of remaining site structures and features associated with wood-treating operations. The debris was either disposed of off-site or capped on-site.
- Clearing, removal and dewatering of excavated soil and sediment from Wetland Areas A, B and C, including from the oxbow in North Run Creek within Wetland Area A. Cleanup included excavation of the top 24 inches of contaminated soil and sediment at the wetland areas. The PRP placed the contaminated media in the area that would later be capped, and then backfilled, re-graded and seeded the wetland areas. Following the wetland cleanup, Wetlands B and C were no longer designated as wetland areas. In accordance with U.S. Fish and Wildlife Service requirements, the PRP converted 6.81 acres of off-site cropland to wetlands as mitigation for disturbing the on-site wetland areas.
- The PRP dewatered the former unlined pond and inspected it for K001 sediment. The Site's remedial investigation presumed that about 70 cubic yards of K001 sediment remained at the bottom of the pond, and that it would require removal and off-site disposal. However, the previous pond cleanup conducted in 1987 included removal and disposal of all wood-treating residual materials. EPA agreed that visual determination could be used to determine the presence of K001 sediment in the pond, following dewatering. The PRP removed about 130,000 gallons of water from the pond and disposed of it off-site. The visual inspection determined that no K001 sediment was present in the pond and the PRP backfilled the area.

- Excavation and off-site disposal of 155 cubic yards of contaminated soil from the CCA Disposal Area. The excavation ranged from 2 to 4 feet in depth and was backfilled and seeded.
- In 1999, the PRP constructed a 30-inch wide soil bentonite slurry wall around the former process area from the ground surface to the bedrock-confining layer about 16-26 feet below ground surface. The ROD required off-site disposal of any drums encountered in the Fill Area. No drums were encountered. After completing the backfilling operation, the PRP capped the top of the slurry wall with 2 feet of clay material to prevent desiccation of the wall material during the setting process. In addition, five heavy vehicle crossings were installed to protect the slurry wall from damage from vehicular traffic under a future land use scenario. The PRP installed three lateral extraction wells within the saprolitic aquifer within the containment area to create a lower groundwater level (inward gradient) within the area surrounded by the slurry wall. The purpose of the inward gradient was to prevent contaminants from migrating beyond the containment area. The PRP also constructed a French drain system in the perched aquifer within the slurry wall. Until 2005, the extracted groundwater was pumped to the water extraction building (referred to as the water facility building) prior to being transported off-site for disposal. Although the ROD called for on-site treatment of extracted groundwater, a remedial design analysis determined that off-site disposal would be more cost-effective.
- Construction of a water facility building and facilities for use in the removal of groundwater from the lateral and French drain systems.
- To facilitate future site reuse, the PRP installed three subsurface divider wall structures within the containment area, within the confines of the slurry wall. The rectangular structures are constructed of reinforced concrete walls with embedded low-density polyethylene (LDPE) strips for connection to the cap. The walls allow for the future redevelopment of about 50,000 square feet of the containment area. Additional features incorporated into the containment area to facilitate future development include the installation of waterstops to each concrete construction joint to support future foundation construction and installation of utilities within the divider wall structures.
- Following the construction of the divider walls, the PRP covered the area surrounded by the slurry wall with a RCRA Subtitle C cap. The LDPE cap liner is attached to the inside and outside of the divider walls using the LDPE strips embedded in the walls.
- The sediments in Talley's Pond and the sediments that were previously dredged by the owner of Talley's Pond were sampled. Sampling results indicated none of the material exceeds site clean-up standards. Therefore, none of this material was removed.

EPA documented the completion of remedy construction in the September 1999 Preliminary Close Out Report.

A 2008 groundwater extraction test determined that site groundwater conditions, from a contaminant concentration and flow velocity/direction standpoint, are similar under extraction conditions and under the natural conditions observed since the shut-down of the extraction system. Based on the results, EPA and VDEQ agreed to the indefinite suspension of groundwater extraction system operation. In April 2015, with EPA approval, the PRP removed the groundwater extraction pumps and abandoned the groundwater extraction laterals per VDEQ requirements. The remainder of the groundwater extraction system, including the above-ground pumps, piping and tanks, was removed from the site in 2016. In January 2017, the PRP removed components of the containment area dewatering system from the water facility building. The building remains in place, but is no longer in use.

In 2009, EPA deleted a portion of the Site from the NPL. The notice of deletion was published in the Federal Register on January 27, 2009 and became effective on March 30, 2009. This partial deletion included the soil and sediment at former Wetland Areas B and C, and the groundwater at former Wetland Area C. The Federal Register notice identified former Wetland Area C as no longer subject to five-year reviews. VPI sold the former Wetland Area B property in 2008. At the time of this FYR, the 3.8-acre property is zoned for commercial and industrial use but has not yet been developed.

Additional Remedial Action to Extend Cap and Slurry Wall

In 2015, to facilitate the construction of the expanded containment system, the PRP plugged and abandoned all groundwater monitoring wells, except for VPMW-4, VPMW-5 and VPMW-6. In 2016, the PRP installed a new slurry wall to extend the existing slurry wall around the area of elevated PCP groundwater concentrations and capped the enclosed area located to the north of the original capped area. The slurry wall extension is 18 inches wide and installed to a depth of 15-26 feet below ground surface. The total length of the slurry wall is approximately 770 feet.

The PRP extended the cap in December 2016 to contain residual PCP-contaminated soil and prevent the infiltration of water. The new cap components include a non-woven geotextile, geomembrane, geocomposite drainage layer, 18 inches of protective cover soil, and 6 inches of vegetated topsoil. The new cap overlaps the original cap by a minimum of 12 inches. Following the extension of the containment system, the PRP installed three new monitoring wells north and downgradient of the extended system – wells VPMW-1R, VPDW-04R and VPDW-05R. Figure 2 shows current site and remedial features.

Institutional Control (IC) Review

The ROD requires implementation of institutional controls to prohibit residential development of the Site, to prevent exposure to untreated soil at the Site, and to prohibit the use of site groundwater. In December 2005, VPI filed a Deed Notice and Declaration of Environmental Covenants for the Site with the Henrico County Clerk's Office. The land and groundwater use restrictions apply to the area referred to as the "Restricted Area" in Exhibit B of the Deed Notice and Declaration of Environmental Covenants. A copy of the Deed Notice and Declaration of Environmental Covenants is included in Appendix D. The "Restricted Area" includes Wetland Area A, the former industrial process area (the parts of the Site occupied by the original and expanded cap and slurry wall systems) and former Wetland Area B (Figure 3). Institutional controls are currently in place at all properties located above contaminated groundwater. The institutional controls prohibit residential land use at the location of the expanded cap and slurry wall (IC Area B), but there are no institutional controls to prohibit activities that could compromise the integrity of the expanded cap or slurry wall (Figure 3). The intuitional controls should be modified to accurately reflect the expanded cap and slurry wall. Table 3 summarizes the land and groundwater use restrictions for the site areas.

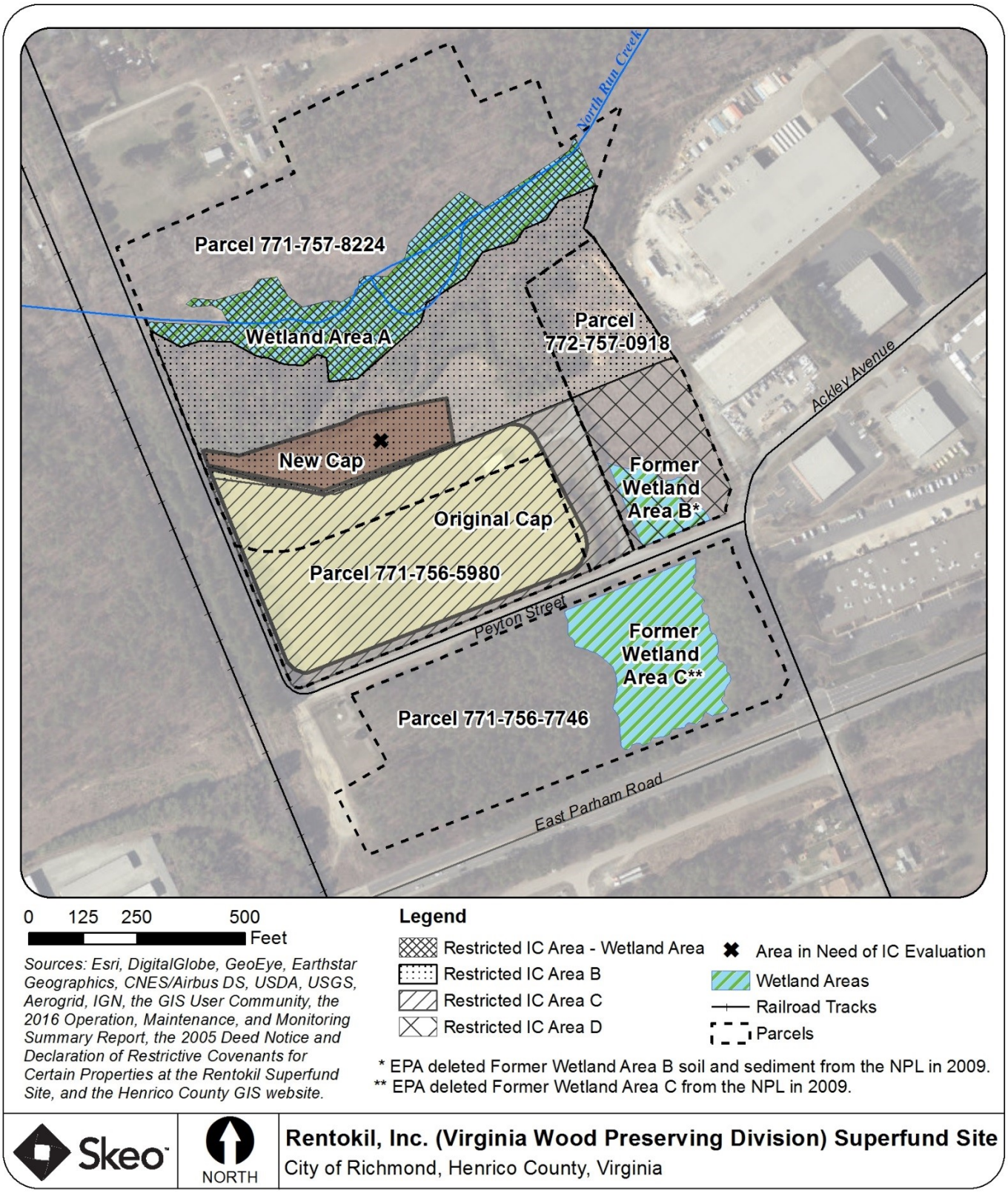
Table 3: Summary of Planned and/or Implemented Institutional Controls (ICs)

Media, Engineered Controls, and Areas That Do Not Support UU/UE Based on Current Conditions[a]		ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
IC Area: Wetland Area (3.24 acres) Equivalent site area: Wetland Area A	Soil	Yes	Yes	771-757-8224	Prohibit residential land use Prohibit the discharge of dredged or fill material, destruction or alteration of water courses, land disturbance, land clearing, cultivation, draining, ditching and building construction, except with prior written consent from the VDEQ and the Army Corps of Engineers [b]	2005 Deed Notice and Declaration of Environmental Covenants, recorded 12/1/2005
	Groundwater	Yes	Yes		Prohibit installation of wells and groundwater use	
IC Area: Area B (8.13 acres) Equivalent site area: former industrial process area – includes the new cap and slurry wall	Soil	Yes	Yes	771-757-8224 (excluding Wetland Area A) and northern half of parcel 772-757-0918	Prohibit activities that could compromise the integrity of the remedy or result in exposure to contaminated media	**None in place for newly expanded cap and slurry wall**
					Prohibit residential land use	2005 Deed Notice and Declaration of Environmental Covenants, recorded 12/1/2005
	Groundwater	Yes	Yes		Prohibit installation of wells and groundwater use	
IC Area: Area C (7.97 acres) Equivalent site area: former industrial process area – location of the original cap and slurry wall	Soil	Yes	Yes	771-756-5980 and part of parcel 771-757-8224	Prohibit residential land use Prohibit disturbance, digging and excavation of soil, and invasive construction Prohibit disturbance of the cap or placement of structures on the cap that would damage it in any way [b]	2005 Deed Notice and Declaration of Environmental Covenants, recorded 12/1/2005
	Groundwater	Yes	Yes		Prohibit installation of wells and groundwater use	
IC Area: Area D (2.36 acres) Equivalent site area: former Wetland Area B	Soil	Yes	Yes	Southern half of parcel 772-757-0918	Prohibit residential land use	2005 Deed Notice and Declaration of Environmental Covenants, recorded 12/1/2005

	Groundwater	Yes	Yes		Prohibit installation of wells and groundwater use	

Notes:
The 2005 Deed Notice and Declaration of Environmental Covenants states that the above restrictions will run with the land.
[a] The "IC Areas" referenced in the table above were established by the 2005 Deed Notice and Declaration of Environmental Covenants and do not coincide with parcel boundaries, or in some cases, with remedial features. Therefore, both the IC Area names and descriptions of equivalent site areas have been included to help clarify the Site's institutional controls.
[b] IC objectives included in the 2005 Deed Notice and Declaration of Environmental Covenants.

Figure 3: Institutional Control 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.

Systems Operations/Operation & Maintenance (O&M)

The PRP's O&M contractors, Arcadis and NewFields, perform O&M activities in accordance with the 2001 Final O&M Plan and 2016 Groundwater Monitoring Plan. The contractors document O&M activities in annual reports. This FYR included a review of O&M reports from 2013 through 2016. The current maintenance program for the Site includes inspection and maintenance of the slurry wall system, cap, stormwater management controls, and the security fence. No significant issues were noted regarding the condition or functionality of the cap, slurry wall or stormwater controls. Arcadis removes excess vegetation and tree growth that might pose a threat to the integrity of the cap. Cap vegetation is mowed twice a year. Vegetation on the expanded part of the cap was not yet fully established at the time of the site inspection. The area will be re-inspected and re-seeded as necessary in 2018. The security fence that surrounds the cap is cleared of vegetation and repaired, as needed.

There are no additional monitoring events required for the wetland areas. The maintenance and monitoring requirements for the restored wetlands located to the north of the Site were satisfied in 2010. The wetlands were sufficiently established at that time.

The 2016 Groundwater Monitoring Plan became effective following the installation of the new monitoring wells downgradient of the expanded cap and slurry wall area. Annual monitoring will continue until 2020. Biannual sampling will be requested to begin in 2021 in the event that groundwater analytical data supports a decreasing trend in COC concentrations. Prior to the expansion of the cap and slurry wall, NewFields performed semi-annual groundwater monitoring to evaluate water quality in the shallow aquifer downgradient of the Site and to monitor groundwater gradients in the vicinity of the containment system. On behalf of the PRP, NewFields documented monitoring results in semi-annual groundwater monitoring reports. See the Data Review Section of this FYR for additional information regarding groundwater monitoring.

III. PROGRESS SINCE THE PREVIOUS REVIEW

This section includes the protectiveness determinations and statements from the previous FYR as well as the recommendations from the previous FYR and the current status of those recommendations.

Table 4: Protectiveness Determinations/Statements from the 2013 FYR

OU #	Protectiveness Determination	Protectiveness Statement
1	Short-term Protective	The remedy is protective of human health and the environment. All threats at the Site associated with ingestion or dermal contact with contaminated soil and sediments have been addressed through capping of the Site and excavation and consolidation of those areas of contaminated soil and sediments previously located beyond the extent of the cap. The capped area is presently fenced to protect the integrity of the cap. The clean-up goals selected for the Site are protective of human health. The groundwater remedy is still in progress but in the interim, exposure pathways that could result in unacceptable risks are being controlled. Even though no one currently uses the contaminated groundwater, institutional controls have been implemented to prevent exposure to, or ingestion of, contaminated groundwater. Long-term protectiveness of the remedial action will be verified by continuing the groundwater monitoring downgradient of the slurry wall. Current data indicate that the plume generally remains in the area of VPMW-2, VPDW-3, and VPDW-4 and is not expanding.

Table 5: Status of Recommendations from the 2013 FYR

OU #	Issue	Recommendation	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	High levels of PCP contamination still present in near VPMW-2, VPDW-3 and VPDW-4.	Issue a decision document to address this contamination	Completed	The extension of the containment system (cap and slurry wall) addressed the PCP contamination near VPMW-2, VPDW-3 and VPDW-4. EPA determined that the extension of the original system is consistent with the remedy selected in the ROD. Therefore, there was no need to document the extension of the containment system in a decision document. EPA documented this information in a December 2013 Determination of Necessary Additional Response Action.	December 2016
1	EPA released the final non-cancer dioxin reassessment, publishing a non-cancer toxicity value, reference dose (RfD), for 2,3,7,8-tetrachlorodibenzo-p-dioxin (TCDD) in EPA's Integrated Risk Information System (IRIS). Based on this new reference dose, today's levels would be lower than the levels that were considered protective at the time the soil remediation was conducted at the Site. The protectiveness of the remedy needs to be reevaluated.	Evaluate existing site data for dioxin to confirm that implemented soil remedy is protective. Conduct sampling if needed.	Completed	This FYR included a screening-level risk evaluation to determine if the dioxin concentrations detected in soil during the RI would pose unacceptable risks, considering the updated TCDD toxicity value. The evaluation indicates that dioxin concentrations in soil at the time the RI was conducted could potentially pose unacceptable risks to human health under a future industrial land use scenario. However, the evaluation was performed on pre-remediation soil data. A review of soil dioxin data included in the Site's 1990 RI confirmed that dioxin contamination in soil was present within the same general footprint as PCP and other site contaminants that were addressed by the cap and other remedial components. Therefore, the implemented soil remedy is still considered protective. Additional sampling was determined unnecessary.	May 2018
1	Ecological exposures were not evaluated in the ROD.	Evaluate surface soil data. Conduct sampling if needed.	Completed	Following cleanup of the contaminated sediment and surface soil, the PRP backfilled, re-graded and seeded the remediated areas. The clean fill used to backfill remediated areas and the vegetative covers and caps create a barrier and there is no exposure to any remaining potentially contaminated soil or sediment for ecological receptors. Additionally, available surface soil concentration data from the RI for soil that potentially remains in place were evaluated and determined not to pose unacceptable risk to ecological receptors.	May 2018

OU #	Issue	Recommendation	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	Former Wetland Area B has been sold to a developer.	Until construction takes place, assure it complies with Restrictive Covenant and not damage the existing remedy.	Completed	As of the time of this FYR, the property remains undeveloped. Soil and sediment in former Wetland Area B was deleted from the NPL in 2009. Institutional controls restricting residential development and groundwater use in former Wetland Area B remain in place. Additionally, site-impacted groundwater is contained within the slurry wall and capped portion of the site. The fact that the property has been sold is no longer considered an issue that affects remedy protectiveness. Since former Wetland Area B groundwater remains on the NPL, this area will continue to be evaluated in future FYRs.	May 2018

IV. FIVE-YEAR REVIEW PROCESS

Community Notification, Involvement & Site Interviews

A public notice was made available by newspaper posting in the Henrico Citizen on March 1, 2018. It stated that the FYR was underway and invited the public to submit any comments to EPA. A copy of the press notice is in Appendix E. The results of the review and the report will be made available at the Site's information repository, located at the Henrico Government and Law Library at 4301 East Parham Road in Henrico and online at: https://www.epa.gov/superfund/search-superfund-five-year-reviews.

During the FYR process, interviews were conducted to document any perceived problems or successes with the remedy. The results of these interviews are summarized below. Completed interview forms are included in Appendix F.

The VDEQ project manager indicated she is very pleased with the status of the Site and is hopeful the property can be returned to productive reuse in the very near future.

The local government representative interviewed stated that Henrico County has not been kept informed of site activities. He suggested that EPA have a specific county contact on file to provide site-related updates and copies of FYR reports. A specific county contact has since been established. The County is not aware of any changes to projected site land use. The property remains classified for light industrial use. The County's planning department did recently receive notification from a real estate company regarding their intent to market the property for development in the near future.

EPA CIC Darriel Swatts interviewed three residents that live on Oakview Avenue, northwest of the Site. All three residents are connected to the public water supply and expressed that, overall, they have positive impressions of the project. They did, however, note that they have not been kept informed of site activities and that it would be helpful if EPA could provide updates to the community by mailing flyers or notifications. One of the residents noted that the Site seems to be kept secure, as the gate is always locked. That same resident expressed interest in being kept informed about future redevelopment of the Site.

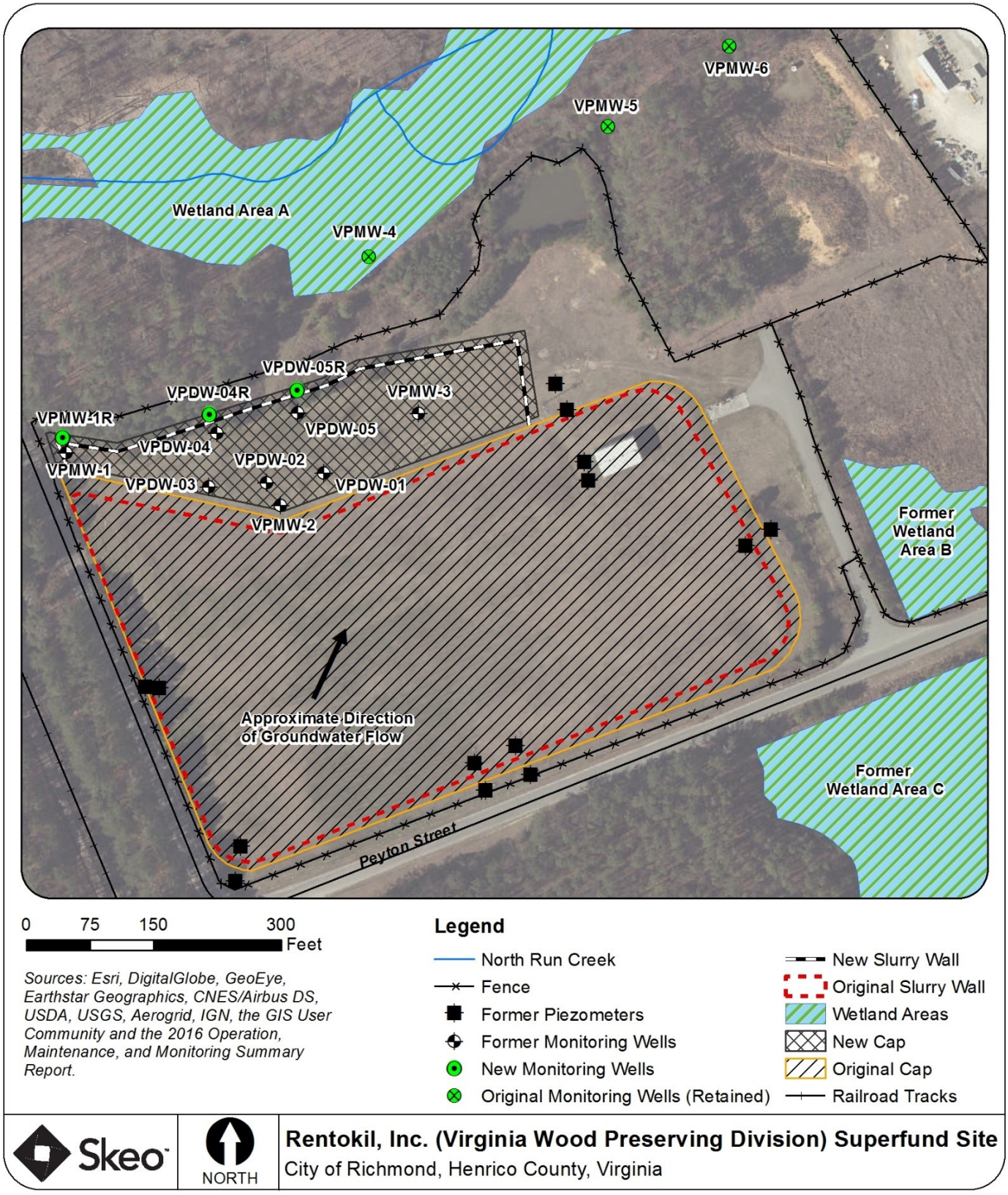
Data Review

This FYR included a review of groundwater monitoring data collected from the original monitoring well network from June 2013 through February 2015, as presented in the Site's semi-annual groundwater monitoring reports. It also included a review of groundwater data collected during the October 2017 sampling event. Figure 4 shows the original monitoring well network, which was sampled through February 2015. Groundwater monitoring was not performed in 2016. Sampling of the new well network began in October 2017.

In April 2015, the PRP abandoned eight monitoring wells (VPMW-1, VPMW-2, VPMW-3, VPDW-01, VPDW-02, VPDW-03, VPDW-04, and VPDW-05) to construct the expanded cap and slurry wall. In 2017, the PRP installed three new wells, immediately north of the expanded cap and slurry wall, VPMW-1R, VPDW-04R and VPDW-05R (Figure 4). These new wells, and the three original wells (VPMW-4, VPMW-5 and VPMW-6) make up the Site's new groundwater monitoring well network. The wells are installed in the saprolitic aquifer, which lies above a bedrock confining layer at about 20 to 30 feet below ground surface.

The primary goals of the groundwater monitoring program are to evaluate water quality in the shallow groundwater aquifer downgradient of the Site, and previously, to monitor the groundwater gradient near the original containment system. EPA based the decision to expand the cap and slurry wall primarily on the consistent presence of PCP concentrations in groundwater above the 1 µg/L MCL near wells VPMW-2, VPDW-3 and VPDW-4. This groundwater data review further confirms those groundwater conditions. The highest PCP concentrations were most consistently observed at well VPMW-2. Since June 2013, PCP was the only groundwater COC that consistently exceeded its MCL of 1 µg/L. Table 6 shows wells that had PCP MCL exceedances between June 2013 and February 2015.

Figure 4: Monitoring Wells and Piezometer Network



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.

Table 6: Monitoring Wells Where PCP Has Exceeded the MCL Between June 2013 and February 2015

Well ID	Sampling Date and PCP Result (µg/L)			
	PCP MCL = 1 µg/L			
	June 2013	January 2014	June 2014	February 2015
VPDW-01	NS	**1,400**	**1,500**	NS
VPDW-02	NS	**240**	**250**	NS
VPDW-03	NS	**4,200 J**	**4,300** (Dup)	NS
VPDW-04	**1,600 J**	**2,000**	**2,200**	**2,600 D** (Dup)
VPDW-05	**2.7 J**	**4.9 J (2.7*)**	0.83*	**3.2 D***
VPMW-2	**5,500** (Dup)	**14,000** (Dup)	**4,000**	**6,300 D**

NS – not sampled
J – estimated value
D – sample analyzed at a dilution factor greater than 1
Dup – Result from duplicate sample. In cases were duplicate samples were collected, the value above is the higher of the two values reported.
* All samples for which PCP was not detected at the standard detection limit of 10 µg/L were reanalyzed using EPA Method 8151A, which has a detection level for PCP below 1 µg/L.
Bold values indicate concentrations above the PCP MCL.
Note: All locations identified in Table 6 are now contained within the newly expanded cap and slurry wall system.

According to the Site's 2016 Remedial Action Work Plan Addendum, PCP concentrations at the Site's northernmost downgradient wells (VPMW-4, VPMW-5 and VPMW-6) have demonstrated declines in PCP relative to early sampling events, and have been below the MCL or detection limits since 2007. PCP concentrations at northern wells VPDW-04 and VPDW-05 routinely exceeded the MCL; however, PCP has not exceeded the MCL at downgradient well VPMW-4 since 2007. Groundwater near wells VPDW-04 and VPDW-05 flows directly toward well VPMW-4. This indicates that PCP-contaminated groundwater is not migrating beyond well VPMW-4 (Figure 4).

Since June 2013, MCL exceedances of other groundwater COCs have been infrequent. In June 2013, chromium exceeded its MCL of 100 µg/L at wells VPMW-1 (120 µg/L) and VPMW-4 (180 µg/L). In January 2014, benzo(a)pyrene exceeded its MCL of 0.2 µg/L in well VPMW-2 (estimated, duplicate result of 290 µg/L) and arsenic exceeded its MCL of 10 µg/L in well VPDW-02 (21 µg/L). In June 2014, arsenic exceeded its MCL of 10 µg/L at wells VPMW-4 (estimated value of 13 µg/L) and VPDW-02 (45 µg/L). However, no groundwater COCs exceeded their respective cleanup goals at well VPMW-4 in February 2015. It should be noted that the laboratory detection limit for benzo(a)pyrene is 10 µg/L, which is above the 0.2 µg/L MCL for the constituent. Laboratory detection limits used to analyze groundwater COCs should be as low as, or lower than, MCLs to accurately detect concentrations. This finding has been presented to the PRP and a new laboratory that can achieve the needed detection limits will be utilized in subsequent sampling events.

Data from 2013 to 2015 indicate that PCP, chromium, arsenic and benzo(a)pyrene concentrations were above MCLs outside the original containment system. The elevated COC concentrations occurred in a limited area directly north of the original slurry wall and cap containment system. Expansion of the containment system over that location of historically elevated COC concentrations is expected to contain and prevent off-site migration of groundwater contamination. October 2017 groundwater data from the new monitoring well network (VPDW-1R, VPDW-4R, VPDW-5R, VPMW-4, VPMW-5, and VPMW-6) help confirm the effectiveness of the expanded containment system. Of the constituents sampled, zinc was the only groundwater COC detected (17.9 µg/L at VPDW-5R and 19.8 µg/L at VPMW-6). There is no MCL established for zinc and the concentrations observed in October 2017 are consistent with those across the Site. Due to a lab error, PCP results were not available for the October 2017 sampling event. The wells were resampled for PCP in early 2018. PCP was not detected in any of the wells resampled for PCP in February 2018. Continued monitoring of the new well network is expected to confirm the effectiveness of the expanded containment system.

Groundwater Level Analysis

The PRP installed 14 piezometers inside and outside the original slurry wall to conduct performance monitoring and determine groundwater gradient (Figure 4). Groundwater depths in these piezometers were measured monthly until August 2014. During that time, groundwater level data indicated a flat gradient with occasional slight outward or inward gradients in limited areas of the Site. The PRP abandoned the piezometers in Spring 2015.

Site Inspection

The site inspection took place on November 8, 2017. In attendance were Stepan Nevshehirlian (EPA RPM); Katie Matta (EPA BTAG); Angie McGarvey (VDEQ); Catherine Coffey and Daniel Sheehan (Arcadis); and Amanda Goyne and Brice Robertson (Skeo). The purpose of the inspection was to assess the protectiveness of the remedy. The site inspection checklist is included in Appendix G. Site inspection photographs are included in Appendix H.

Site inspection participants gathered at the entrance to the Site's former industrial process area, located at 3000 Peyton Street. This area, which includes the capped areas and slurry walls, is fenced. The gate was locked and there was signage to deter trespassers. Site inspection participants entered the fenced area and walked to the water facility building for a site safety briefing and to discuss the inspection.

Site inspection participants inspected the cap and slurry wall areas. No damaged fencing was noted. The original cap was in good condition and vegetation is well established. No erosion was evident. Participants noted that one of the sanitary sewer tie-ins along the Peyton Street cap edge was damaged. The newly capped area was recently seeded; the vegetation was thin and absent in some areas. Arcadis and EPA will evaluate whether additional seeding is needed in 2018. Site inspection participants then left the fenced cap and slurry wall area to inspect the monitoring wells and observe Wetland Area A and North Run Creek. All monitoring wells were locked. Arcadis installed three new monitoring wells to replace the wells abandoned during the cap and slurry wall extension. Two of the new wells, VPDW-04R and VPDW-05R, were observed during the site inspection and found to be labelled inside the well casing, but not outside. EPA suggested that Arcadis ensure that all wells are labelled both inside and outside the well casing. VPMW-4 was not labeled and the concrete well base was cracked. Participants noted that VPMW-5 and VPMW-6 had standing water between the inner and outer (protective) well casings. EPA discussed these items with Arcadis, and Arcadis agreed to address the well issues noted. Site inspection participants observed the Wetland Area A, North Run Creek and the stormwater basin. No issues were noted in these areas. Site inspection participants left the fenced cap and slurry wall area and observed former Wetland Area B, which is fenced and supports well-established vegetation.

Following the site visit, Skeo staff visited the Site's local information repository, Henrico Government and Law Library, 4301 East Parham Road, Henrico, Virginia 23228. Library staff was unable to find the site in the library index system, but Skeo found one binder of oversized site maps from 1986. More recent site documents were unable to be located. EPA updated the information repository in May 2018 to provide public access to all relevant site documents.

V. TECHNICAL ASSESSMENT

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

Question A Summary:

Yes. There are no known complete exposure pathways at the Site.

In the early 1990s, the removal action and other cleanup actions performed by the site owner addressed immediate threats to human health and the environment. Excavation and consolidation of contaminated soil and sediment beneath the caps prevents unacceptable exposures to human and ecological receptors through direct contact. The caps also prevent infiltration of precipitation through the contaminated material, preventing additional

groundwater contamination. The slurry walls contain contaminated groundwater, preventing off-site migration of site-related COCs.

The ROD requires implementation of institutional controls to prohibit residential development of the Site, to prevent exposure to untreated soil at the Site, and to prohibit the use of site groundwater because the remedy leaves contamination in place at concentrations that do not allow for UU/UE. The 2005 Deed Notice and Declaration of Restrictive Covenants prohibits residential land use and groundwater use for portions of the Site with potential groundwater impacts and prohibits activities that could potentially affect the integrity of the original cap and slurry wall. However, there are no institutional controls to prohibit activities that could potentially affect the integrity of the new cap and slurry wall.

Data from 2013 to 2015 indicated that PCP, chromium, arsenic and benzo(a)pyrene concentrations were above MCLs outside of the original containment system. The new cap and slurry wall system is expected to contain that groundwater contamination, as well as the source of that contamination. October 2017 and February 2018 groundwater data from the new monitoring well network help confirm the effectiveness of the expanded containment system. It should be noted that the laboratory detection limit for benzo(a)pyrene is 10 µg/L, which is above the 0.2 µg/L MCL for the constituent. Laboratory detection limits used to analyze groundwater COCs should be as low or lower than MCLs in order to accurately detect concentrations.

While there is a commercial property located downgradient of the Site that is not connected to the public water supply, the review of available groundwater data indicates that groundwater contamination is confined within the site property boundaries.

Site O&M is adequate. Based on a review of the available O&M reports and the site inspection, no significant issues have been noted since the previous FYR regarding the condition or functionality of the cap, slurry wall or stormwater controls. A few minor O&M issues were noted during the FYR site inspection and were addressed by the PRP in January 2018.

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

Question B Summary:

Yes. The cleanup goals and exposure assumptions used at the time of the remedy selection remain valid. Although changes to toxicity data have occurred since remedy selection, the changes do not call into question the protectiveness of the remedy.

The ROD did not establish specific numeric values as groundwater cleanup goals, but requires groundwater monitoring to determine if MCLs are being met at the site boundary. While the current MCL for arsenic (10 µg/L) is lower than it was at the time of the ROD (50 µg/L), groundwater COC concentrations are compared to the current MCLs. Therefore, the change does not affect the protectiveness of the remedy. The evaluation of the soil cleanup goals in Appendix I demonstrates that the direct contact cleanup goals remain valid for the three soil COCs established by the ROD.

This FYR included a screening-level risk evaluation to determine if the soil dioxin concentrations detected on site during the RI would pose unacceptable risks, in light of the updated toxicity value (see Appendix I for additional details). A review of soil dioxin data confirmed that dioxin contamination in site soil was within the same general footprint as PCP soil contamination. Therefore, the implemented soil remedy is expected to have also addressed risks associated with TCDD in site soil.

The ROD did not evaluate risks to ecological receptors associated with surface soil. Available surface soil concentration data from the RI for soil that potentially remains in place were evaluated and determined not to pose unacceptable risk to ecological receptors. The clean fill used to backfill remediated areas and the vegetative

covers and caps create a barrier and prevents exposure to any remaining potentially contaminated soil or sediment for ecological receptors.

This FYR evaluated the chemical-specific Applicable or Relevant and Appropriate Requirements (ARARs) identified in the ROD and determined that there were no changes that affect the protectiveness of the Site's remedy.

Vapor intrusion does not pose a risk to human health because there are no exposure pathways. Groundwater contamination is confined to the Site, primarily within the areas now contained by the two slurry walls. The only enclosed structure located on site is the water facility building, which is no longer used.

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.

VI. ISSUES/RECOMMENDATIONS

Issues and Recommendations Identified in the FYR:

OU(s): 1	**Issue Category: Institutional Controls**			
	Issue: The institutional controls in place for parcel 771-757-8224, which includes the new cap and slurry wall, do not prohibit activities that could compromise the integrity of the new remedial features.			
	Recommendation: Revise the institutional controls for the property occupied by the new cap and slurry wall to include a prohibition on activities that could impact the integrity of the remedy and consider an Explanation of Significant Differences to include this restriction as part of the remedy.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA	7/2/2019

OTHER FINDINGS

In addition, the following recommendations were identified during the FYR. They warrant follow-up, but do not affect current and/or future protectiveness:

- Evaluate the need to reseed the expanded part of the cap in 2018.
- Ensure that method detection limits can detect groundwater constituents at cleanup goal concentrations. The PRP has already identified a new laboratory that will be utilized moving forward and can achieve the necessary detection limit for benzo(a)pyrene.

VII. PROTECTIVENESS STATEMENT

Sitewide Protectiveness Statement
Protectiveness Determination: Short-term Protective
Protectiveness Statement: The remedy is protective of human health and the environment in the short term because the cap prevents direct exposure to contaminated soil, the groundwater contamination remains on-site, the site is fenced, and monitoring is performed to ensure the integrity of the remedy. Long-term protectiveness of the remedial action will be achieved when groundwater monitoring with improved detection limits verifies that there is no migration of groundwater above MCLs downgradient of the slurry wall. Additionally, institutional controls will need to prohibit activities that could impact the integrity of the expanded cap and slurry wall. Although no one currently uses the contaminated groundwater, institutional controls have been implemented to prevent exposure to, or ingestion of, contaminated groundwater. There are also institutional controls to prevent residential use.

VIII. NEXT REVIEW

The next FYR Report for the Rentokil, Inc. (Virginia Wood Preserving Division) Superfund site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

Administrative Order by Consent, Virginia Wood Preserving Site. U.S. Environmental Protection Agency, Region 3. 1987.

Deed Notice and Declaration of Restrictive Covenants for Certain Property at the Rentokil Superfund Site, Henrico County, Virginia. April 20, 2005.

Final Operation & Maintenance Plan, Rentokil Facility, Henrico County, Virginia. NewFields. June 2001.

Focused Feasibility Study, Rentokil Site, Richmond, Virginia. Prepared by NewFields for Virginia Properties, Inc., A Rentokil Initial Company. November 2012.

Groundwater Monitoring Plan, Former Virginia Properties Superfund Site, Richmond, Virginia. Prepared by Arcadis U.S., Inc. for Rentokil Initial Environmental Services, LLC. November 14, 2016.

Groundwater Monitoring Report, Rentokil Site, Richmond, Virginia. Prepared by NewFields for Virginia Properties, Inc., A Rentokil Initial Company. December 2013.

Groundwater Monitoring Report, Rentokil Site, Richmond, Virginia. Prepared by NewFields for Virginia Properties, Inc., A Rentokil Initial Company. June 2014.

Groundwater Monitoring Report, Rentokil Site, Richmond, Virginia. Prepared by NewFields for Virginia Properties, Inc., A Rentokil Initial Company. February 2015.

Groundwater Monitoring Report, Rentokil Site, Richmond, Virginia. Prepared by NewFields for Virginia Properties, Inc., A Rentokil Initial Company. October 2015.

NPL Partial Site Deletion Narrative, Rentokil, Inc. (Virginia Wood Preserving Division), Richmond, Virginia.

2016 Operation, Maintenance, and Monitoring Summary Report, Former Virginia Properties Superfund Site. Prepared by Arcadis U.S., Inc. for Rentokil Initial Environmental Services, LLC. June 2017.

Operation, Maintenance, and Monitoring Summary Report for 2013, Virginia Properties, Inc., A Rentokil Initial Company. Prepared by NewFields for Rentokil Initial Environmental Services, LLC. December 2014.

Phase II Remedial Investigation Report, Volume I – Text, Virginia Wood Preserving Site, Richmond, Virginia. Prepared by Dames & Moore for Virginia Properties, Inc. February 1992.

Preliminary Close Out Report, Rentokil, Inc. Henrico County, Virginia. U.S. Environmental Protection Agency, Region 3. September 2, 1999.

Record of Decision: Rentokil Virginia Wood Preserving, VA. U.S. Environmental Protection Agency, Region 3. June 22, 1993.

Record of Decision Amendment, Rentokil, Inc. U.S. Environmental Protection Agency, Region 3. August 27, 1996.

Remedial Action Workplan Addendum, Former Virginia Properties Superfund Site, Richmond, Virginia. Prepared by Arcadis U.S., Inc. for Rentokil Initial Environmental Services, LLC. October 18, 2016.

Remedial Investigation Report, Volume I – Text, Virginia Wood Preserving Site, Richmond, Virginia. Prepared by Dames & Moore for Virginia Properties, Inc. May 31, 1990.

Rentokil, Inc. Superfund Site, EPA Determination of Necessary Additional Response Action Memorandum. U.S. Environmental Protection Agency, Region 3. December 4, 2013.

Rentokil, Inc. Superfund Site, Need for Additional Response Action letter. U.S. Environmental Protection Agency, Region 3. December 5, 2013.

Third Five-Year Review Report for Rentokil, Inc. Superfund Site, Henrico County, Virginia. U.S. Environmental Protection Agency, Region 3. July 2, 2013.

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
Wood treatment operations began on site	1957
Fish kills occurred in Talley's Pond	1962
Site owner cleared, cleaned and replaced the blowdown sump with a concrete holding pond and constructed a covered, unlined pond	1963
Site operators disposed of over 1,100 pounds of CCA in a surface pit on the northeastern part of the Site	1976
Rentokil, Inc. and EPA signed an Administrative Order by Consent to conduct an RI/FS, Rentokil started the RI/FS	December 1987
EPA added the Site to the NPL	March 31, 1989
Rentokil completed the RI/FS	1992
All facility operations ceased.	January 1990
EPA entered into an Administrative Order by Consent with the PRP for the performance of a removal action to prevent additional migration of site-related contamination into North Run Creek	March 1992
PRP started the removal action	June 22, 1992
PRP completed the removal action	September 29, 1992
EPA signed the ROD	June 22, 1993
PRP entered into a Consent Decree with EPA to perform the remedial design and implement the remedy selected by the ROD	February 1994
PRP began remedial design	May 2, 1994
EPA modified the remedy in an ROD Amendment to remove the requirement to treat "hot spots" of soil contamination	August 27, 1996
PRP completed remedial design and started remedial action	May 21, 1998
PRP completed remedy construction, EPA issued the Site's Preliminary Close Out Report	September 2, 1999
EPA completed the Site's first FYR	September 17, 2003
PRP ceased operation of the groundwater extraction system	2005
PRP filed a Deed Notice and Declaration of Environmental Covenants for the Site with the Henrico County Clerk's Office	December 1, 2005
EPA determined that the Site was ready for reuse and redevelopment	June 26, 2006
Developer purchased 3.8 acres of the site property (the part of the Site that includes former Wetland Area B)	July 28, 2008
EPA completed the Site's second FYR	September 22, 2008
EPA deleted a portion of the Site to accommodate industrial/commercial development. This partial deletion includes the soil and sediment at former Wetland Areas B and C and the groundwater at former Wetland Area C.	March 30, 2009
EPA submitted a letter to the PRP requiring development of a comprehensive remediation strategy to address the contamination north of the original containment system	March 3, 2011
PRP submitted an FFS to EPA that included remedial alternatives to address contamination north of the original containment system	November 8, 2012
EPA completed the Site's third FYR	July 2, 2013
EPA issued a Determination of Necessary Additional Response Action memorandum to the PRP regarding the need to expand the original containment system	December 4, 2013
PRP submitted the Remedial Design Workplan to EPA regarding the containment system expansion	April 2014
PRP submitted the initial Remedial Action Workplan to EPA regarding the containment system expansion	February 2015

Event	Date
To facilitate the construction of the expanded containment system, the PRP abandoned all piezometers in place and plugged and abandoned all groundwater monitoring wells, except for wells VPMW-4, VPMW-5 and VPMW-6	2015
PRP submitted the Remedial Action Workplan Addendum to EPA regarding the containment system expansion	October 18, 2016
PRP completed the updated Groundwater Monitoring Plan	November 14, 2016
PRP constructed the expanded containment system and slurry wall to address PCP contamination north of the original containment system	December 2016
PRP contractors removed components of the groundwater dewatering system from the water facility building	January 2017

APPENDIX C – SITE MAPS

Figure C-1: Historic Site Features

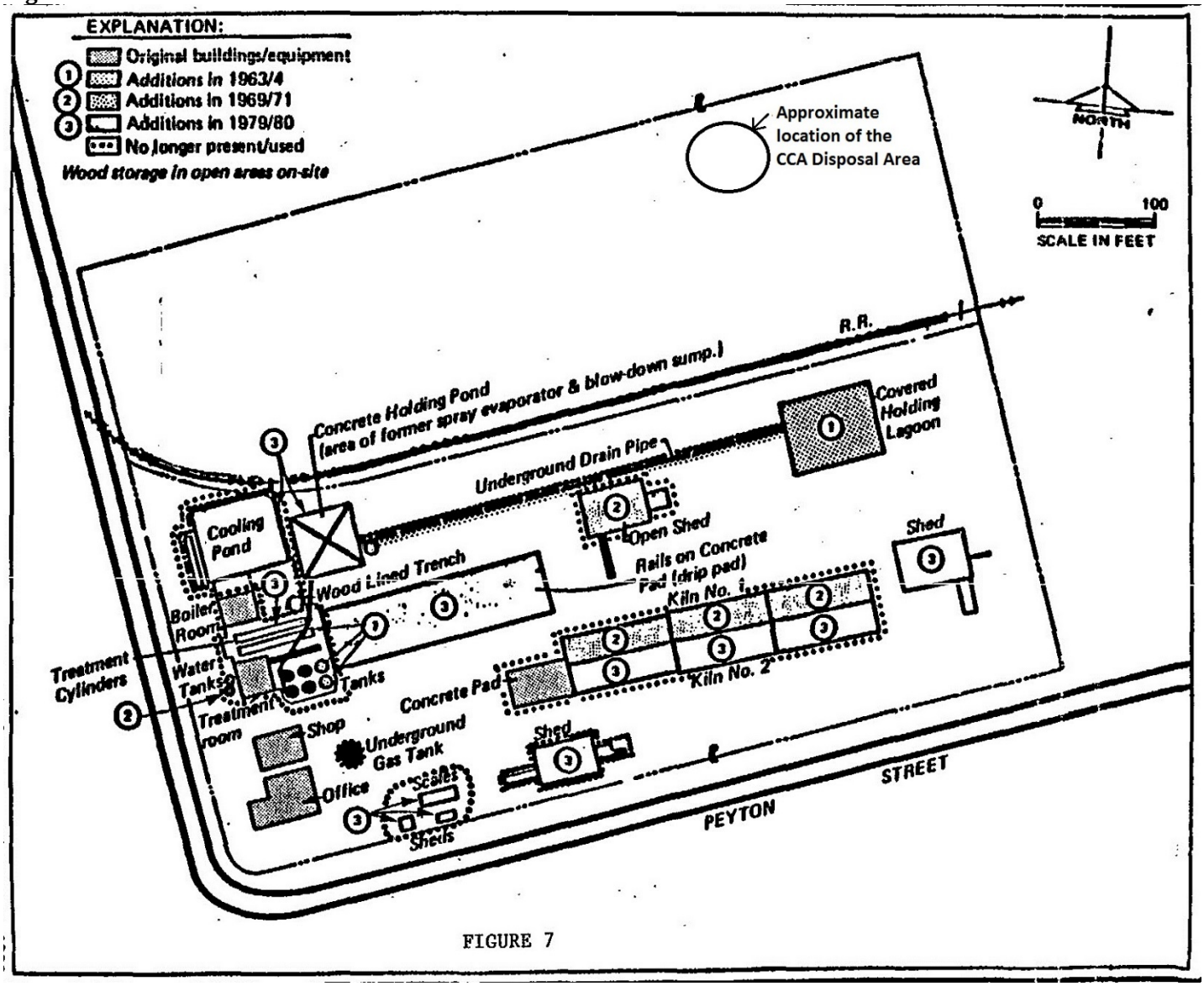


FIGURE 7

Note: Figure C-1 above is Figure 7 from the Site's 1993 ROD.

Figure C-2: Aerial Image of Talley's Pond

APPENDIX D – INSTITUTIONAL CONTROLS

Figure D-1: 2005 Deed Notice and Declaration of Restrictive Covenants

BK4021PG1211

DEED NOTICE
and
DECLARATION OF RESTRICTIVE COVENANTS FOR
CERTAIN PROPERTY AT THE
RENTOKIL SUPERFUND SITE,
HENRICO COUNTY, VA

THIS RESTRICTIVE COVENANT is made as of this _____ day of April, 2005, by VIRGINIA PROPERTIES, INC. ("VPI").

RECITALS

A. VPI is the owner in fee simple of three parcels of land in Henrico County, Virginia, containing approximately 37.594 acres and more particularly described on Exhibit A attached hereto (collectively the parcels are referred to as the "Property").

B. Portions of the Property were used for a wood preserving operation resulting in chemical contamination of soil and groundwater ("The Restricted Area"). The Restricted Area, as defined for the purposes of this Restrictive Covenant, is more particularly described on Exhibit B attached hereto.

C. The United States Environmental Protection Agency ("EPA") issued a Record of Decision for the Virginia Wood Preserving Site on June 22, 1993 ("ROD") and a Record of Decision Amendment on August 27, 1996, pursuant to the authority of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. §§ 9601-9675.

D. VPI entered into a Consent Decree which was entered by the United States District Court for the Eastern District of Virginia, Richmond Division, on September 30, 1994, and which was recorded in the land records of Henrico County, Virginia at Deed Book 2555, page 930, to accomplish work required by the ROD, and the ROD Amendment.

E. Pursuant to the Consent Decree and the ROD Amendment. VPI carried out a Remedial Action. As part of the Remedial Action, VPI constructed a slurry wall, and a multi-layered protective cap, and a groundwater drainage and removal system (the "Remedial Facility") in the area designated "AREA C -CAP AREA" on the Plat attached hereto as Exhibit B.

F. VPI also excavated soils and then undertook restoration of wetlands in area "B" and a portion of the area designated "WETLAND AREA - RESTRICTIVE COVENANT" on the Plat attached as Exhibit B. The wetland work was done under the oversight of EPA, the U S Army Corps of Engineers ("Corps") and the Virginia Department of Environmental Quality ("DEQ"), in consultation with the U.S. Fish & Wildlife Service.

G. VPI hereby places a restrictive covenant on the Restricted Area to implement Institutional

Controls (described below) as required by the Record of Decision Amendment and Section V(E) (Notice of Obligations to Successors-in-Title) of the Consent Decree. See Exhibit B for a schematic map of the Site boundary and Restricted Area.

RESTRICTIVE COVENANT

NOW, THEREFORE, due to the CERCLA remedial action, VPI, for itself, and its successors and assigns, does hereby declare, covenant and agree, that the Restricted Area shall hereinafter be subject to the following conditions and restrictions:

1. The Restricted Area shall not be used for residential use. Specifically, no building or structure shall be constructed or located on the Restricted Area for residential use or residential occupancy, including without limitation, single or multiple-family dwellings, residential trailers and/or mobile homes.

2. Except as required for monitoring the quality of groundwater or treating groundwater, as required by the Consent Decree, VPI agrees for itself, its successors and assigns, that no wells or other structure or equipment for the pumping or other taking of groundwater shall be constructed or installed on the Restricted Area, and no groundwater shall be pumped or otherwise taken from Areas B, C, and D of Exhibit B for potable or other use.

3. Pursuant to the Consent Decree, VPI has agreed for itself, its successors and assigns, to monitor and operate the Remedial Facility in accordance with the Operating and Maintenance Plan approved by EPA, or as revised from time to time and approved by EPA.

4. Except as provided by the Operation and Maintenance Plan, there shall be no disturbance, digging, excavation of the soils, or invasive construction in Area C of Exhibit B, and there shall be no disturbance or removal of the Remedial Facility (e.g. there shall be no disturbance of the cap or placement of structures on it that would damage it in any way)

5. The discharge of dredged or fill material, destruction or alteration of water courses, land disturbance, land clearing, cultivation, draining, ditching, or building construction is prohibited in the Wetland Area, except (a) as necessary to ensure the success of and in conjunction with the monitoring and maintenance of the Wetland Area; (b) with the prior written consent of the Virginia Department of Environmental Quality and the Army Corps of Engineers; or (c) for structures or observation or management of the ecological state of the Wetland Area which do not imperil the natural movement of water.

6. VPI may enforce this Restrictive Covenant by proceedings at law or in equity against any person violating or attempting to violate the covenants herein. In the event of any conveyance, assignment or transfer of the Restricted Area (as defined in Exhibit B hereto), VPI shall expressly reserve in the deed or other instrument effecting the transfer, an irrevocable and permanent easement which grants VPI: 1) the right to access for the purposes of carrying out its obligations under the Consent Decree and this Restrictive

Covenant; and 2) the right to carry out and enforce the land use restrictions set forth in the ROD, particularly at pages 63-64, and in paragraphs 1-5 of this Restrictive Covenant. Prior to such a conveyance, assignment or transfer of the Site (as defined in Exhibit B hereto), or any interest therein, VPI shall provide EPA with a copy of the proposed deed or other instrument of transfer. VPI shall enforce the terms of any such covenants or land use restrictions reserved in this instrument against all subsequent grantees of an assignment or transfer of the Restricted Area of the Site (as defined in Exhibit B hereto), or any interest therein.

7. VPI agrees to record this document in the Office of the Clerk of the Circuit Court of Henrico County, Virginia within thirty (30) days of its execution.

8. The covenants contained herein shall not hereafter be altered or breached in any respect without the express written approval and consent of EPA (as intentional third party beneficiary pursuant to § 55-22 of the Code of Virginia). This Restrictive Covenant is not intended to and does not grant or convey any interest in the Property to EPA.

IN WITNESS WHEREOF, VPI has executed this instrument, under seal, by its duly authorized officer or representative on the date first above written.

VIRGINIA PROPERTIES, INC.

By: Michael W Orick

Title: President

COMMONWEALTH OF ~~VIRGINIA~~ Texas

CITY/COUNTY OF Harris, to wit:

The foregoing instrument was acknowledged before me this 20 day of April, 2005, by Michael Orick, as President of Virginia Properties, Inc.

KELLY FORCE
NOTARY PUBLIC
STATE OF TEXAS
COMM. EXP. 03-18-2008

Kelly Force

Notary Public

My commission expires: 3/18/08

EXHIBIT A

Parcel 1:

ALL that certain piece, tract or parcel of land located in the County of Henrico, Virginia, and described as follows:

Beginning at a stone marker on the easterly right of way line of Oakview Avenue, where the said right of way line intersects the northerly right of way line of Peyton Street;

Thence N. 16° 12' W., along said easterly line of Oakview Avenue a distance of 335.38' to a point, which point is 10' south of a measured at right angles to the center line of a railroad spur track;

Thence in an easterly direction along a curve to the left which curve is 10' south of and parallel to the center line of said track having a radius of 304.56', a distance of 202.83' to a point;

Thence N. 74° 54' E., 548.51' to a rod'

Thence S. 15° 06 E., 290.0' to a rod;

Thence S. 74° 54' W., along the north line of Peyton Street, 710.38' to a stone;

Thence continuing along said street linen on a curve to the right having a radius of 20.0', tangent of 19.62' and length of 31.03' to the point of beginning and containing 4.965 acres.

Parcel 2:

ALL those certain pieces or parcels of land, situated, lying and being in the Brookland District, Henrico County, Virginia, designated as Parcel A, containing 23.675 acres, and Parcel B, containing 8.954 acres, on plat made by Foster & Miller, P.C., dated March 11, 1994, entitled "Plat of Two Parcels of Land Lying on the North Line of Parham Road, in the Brookland District of Henrico County, Virginia" (the "Plat"), a copy of which is attached hereto and recorded herewith, and to which reference is hereby made, said property being more particularly described on the Plat by metes and bounds, as follows:

Parcel A:

BEGINNNG at the point of intersection with the West line of Ackley Avenue, and the North line of Peyton Street; thence along the North line of Peyton Street South 74 degrees 58 minutes 04 seconds West for a distance of 347.08' to a point; thence North 14 degrees 59 minutes 33 second West for a distance of 290.00' to a point; thence South 75 degrees 00 minutes 27 seconds West for a distance of 548.51' to a point; thence along a curve to the right having a radius of 304.56' and a length 202.83' and being subtended by a chord of North 85 degrees 54 minutes 49 seconds West for a distance of 199.10' to a point on the East line of Oakview Avenue; thence along the East line of Oakview Avenue North 16 degrees 06 minutes 21 seconds West for a distance of 740.48' to a point; thence North 73 degrees 52 minutes 01 seconds East for a distance of 450.64' to a point on the East line of Mayfair Avenue; thence along the East line of Mayfair Avenue North 15 degrees 56 minutes 32 seconds West for a distance of 116.66' to a point; thence North 73 degrees 53 minutes 15 seconds East for a distance of 435.35' to a point on the West line of Russell Avenue; thence along the West line of Russell Avenue South 15 degrees 55 minutes 55 seconds East for a distance of 149.58' to a point; thence North 73 degrees 51 minutes 45 seconds East for a distance of 168.22' to a point; thence South 05 degrees 44 minutes 24 seconds East for a distance of 144.15' to a point; thence North 61 degrees 15 minutes 35 seconds East for a distance of 190.76' to a point; thence South 23 degrees 18 minutes 40 seconds West for a distance of 294.34' to a point; thence South 27 degrees 51 minutes 25 Seconds East for a distance of 408.84' to a point; thence South 16 degrees 08 minutes 57 seconds East for a distance of 306.07' to a point on the West line of Ackley Avenue; thence along the West line of Ackley Avenue through a nontangent curve having a radius of 271.73' and a length of 60.49' and being subtended by a chord of South 18 degrees 18 minutes 06 seconds West for a distance of 60.37' to the point of beginning. Said property being 23.657 acres more or less, and being part of Henrico County tax map parcel 98-B1-1.

Parcel B:

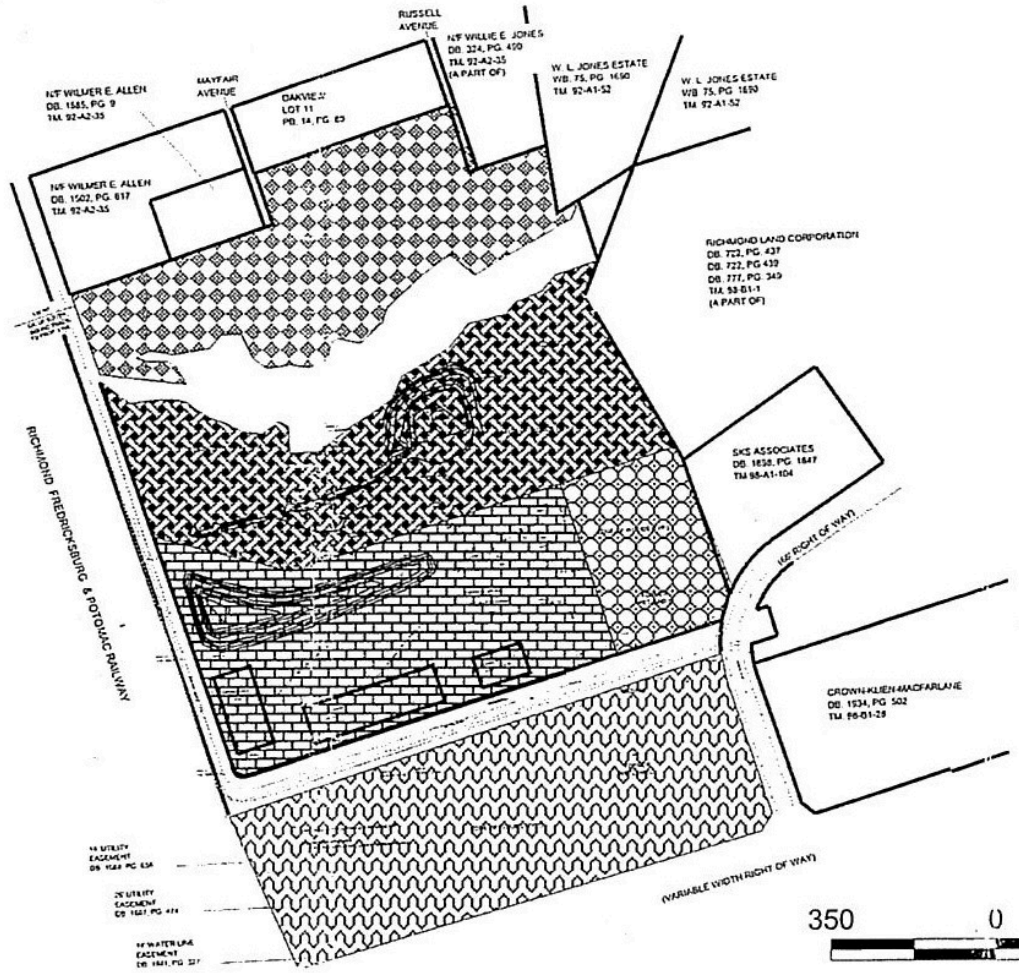
BEGINNING at the point of intersection with the West line of Ackley Avenue and the South line of Peyton Street; thence along the West line of Ackley Avenue through a curve having a radius of 271.73' and a length of 62.91' and being subtended by a chord of South 09 degrees 31 minutes 02 seconds East for a distance of 62.76' to a point; thence South 16 degrees 08 minutes 57 seconds East for a distance of 293.08' to a point; thence South 33 degrees 43 minutes 23 seconds West for a distance of 43.00' to a point on the North line of Parham Road; thence along the North line of Parham Road South 77 degrees 22 minutes 03 seconds West for a distance of 676.09' to a point; thence South 74 degrees 54 minutes 48 seconds West for a distance of 196.79' to a point; thence along a curve to the left having a radius of 7739.44' and a length of 148.40' and being subtended by a chord of South 74 degrees 21

minutes 50 seconds West for a distance of 148.40' to a point; thence along a non-tangent curve to the left having a radius of 1126.28' and a length of 130.42' and being subtended by a chord of North 19 degrees 48 minutes 54 seconds West for a distance of 130.35' to a point; thence North 23 degrees 07 minutes 56 seconds West for a distance of 138.01' to a point; thence along a curve to the right having a radius of 1166.28' and a length of 91.27' and being subtended by a chord of North 20 degrees 53 minutes 25 seconds West for a distance of 91.24' to the point of intersection of the West line of Oakview Avenue and the South line of Peyton Street; thence along the South line of Peyton Street North 74 degrees 58 minutes 04 seconds East for a distance of 1092.96' to the point of beginning. Said property being 8.954 acres more or less, and being a part of Henrico County tax map parcel 98-B1-1.

TOGETHER WITH and subject to all covenants, easements, and restrictions of record.

BEING a part of the same property conveyed to Richmond Land Corporation, a Virginia corporation, by the following deeds: (1) deed from A. J. Brent, Trustee, dated February 17, 1955, recorded March 3, 1955, Clerk's Office, Circuit Court, Henrico County, Virginia, in Deed Book 722, page 437; (2) deed from L. Paul Farley and E. J. Parley, also known as Elizabeth J. Farley, his wife, dated February 17, 1955, recorded March 3, 1955, Clerk's Office, Circuit Court, Henrico County, Virginia, in Deed Book 722, page 439; (3) deed from L. Paul Farley and Elizabeth J. Farley, his wife, dated January 20, 1956, recorded January 20, 1956, Clerk's Office, Circuit Court, Henrico County, Virginia, in Deed Book 777, page 349; (4) deed from Wesley D. Charles, unmarried, dated May 14, 1971, recorded July 16, 1971, Clerk's Office, Circuit Court, Henrico County, Virginia, in Deed Book 1471, page 28; (5) deed from Board of County Supervisors of Henrico County, Virginia, dated May 10, 1974, recorded June 24, 1974, Clerk's Office, Circuit Court, Henrico County, Virginia, in Deed book 1607, page 474; and (6) vacation of property by the Board of County Supervisors, Henrico County, Virginia, as to portions of Mayfair and Russell Avenues, January 28, 1976, a copy of said ordinance having been recorded March 1,1976, Clerk's Office, Circuit Court, Henrico County, Virginia in Deed Book 1669, Page 659.

NOTE: THE "RESTRICTED AREA" IS DEFINED AS: WETLAND AREA, AREA B, AREA C, AND AREA D



LEGEND

Properties Delineation

- Area A - (6.72 Acres)
- Area B - (8.13 Acres)
- Area C - CAP Area - (7.97 Acres)
- Area D - (2.36 Acres)
- Area E - (9.05 Acres)
- Wetland Area - Restrictive Covenant (3.24 Acres)

N
W E
S

350 0 350 700 Feet

Scale

EXHIBIT B

BK4021PG1217

NEWFIELDS
Two Midtown Plaza
1349 West Peachtree Street, Suite 2000
Atlanta, Georgia 30309
Tel: 404-347-9050 – Fax: 404-347-9080
www.newfields.com

RENTOKIL PROPERTY
Henrico County, Virginia

Real Estate Map

BK4021PG1218

CLERK'S CERTIFICATE

DO NOT REMOVE FROM DOCUMENT

INSTRUMENT #75039
RECORDED IN THE CLERK'S OFFICE OF
HENRICO COUNTY ON
DECEMBER 1, 2005 AT 04:22PM
YVONNE G. SMITH, CLERK

RECORDED BY: KLB

Instrument Control Number

[ ]

LR 200505075039 12/01/2005 4:22:00 PM

BK4021PG1210

Commonwealth of Virginia
Land Record Instruments
Cover Sheet - Form A

[ILS VLR Cover Sheet Agent 1.0.93]

4-20-05

TAX EXEMPT	CORP	
		Date of Instrument: [11/21/2005]
		Instrument Type: [~~NOT~~] DEC
		Number of Parcels [1]
		Number of Pages [7]
		City ☐ County ☒ [Henrico County] (Box for Deed Stamp Only)

First and Second Grantors

Last Name	First Name	Middle Name or Initial	Suffix
[Virginia Properties, Inc]	[ ]	[ ]	[ ]
[Rental Superfund Site	[ ]	[ ]	[ ]

First and Second Grantees

Last Name	First Name	Middle Name or Initial	Suffix
[~~Virginia Properties~~, Inc]	[ ]	[ ]	[ ]
[NA]	[ ]	[ ]	[ ]

Grantee Address (Name) [Virginia Properties, Inc]
(Address 1) [P O Box 5963]
(Address 2) [ ]
(City, State, Zip) [Kingwood] [TX] [77325-5963]

Consideration [0 00] Existing Debt [0 00] Assumption Balance [0 00]

Prior Instr. Recorded at: City ☐ County ☒ [Henrico County] Percent. in this Juris. [100]
Book [ ] Page [ ] Instr. No [ ]
Parcel Identification No (PIN) [ ]
Tax Map Num. (if different than PIN) [ ]
Short Property Description [ ]
[ ]
Current Property Address (Address 1) [3000 Peyton Street]
(Address 2) [ ]
(City, State, Zip) [Richmond] [VA] [23228]

Instrument Prepared By [Decker Hallman Barber & Briggs]
Recording Paid for By [Decker Hallman Barber & Briggs]
Return Recording To (Name) [Kathy Sims, Paralegal]
(Address 1) [260 Peachtree Street, Suite 1700]
(Address 2) [ ]
(City, State, Zip) [Atlanta] [GA] [30303]
Customer Case ID [1508/039] [ ] [ ]

Cover Sheet Page # 1 of 1

APPENDIX E – PRESS NOTICE

EPA REVIEWS CLEANUP RENTOKIL, INC. SITE

The U.S. Environmental Agency is reviewing the cleanup that was conducted at the Rentokil, Inc. Superfund Site located in Henrico County. EPA inspects sites regularly to ensure that cleanups conducted remain protective of public health and the environment. EPA's previous review of the site in 2013 determined that the remedy was working as designed and was protective. Findings from the current review that is being conducted will be available July 2018.

For questions or to provide site-related information for the review:
Contact: Darriel Swatts, *Community Involvement Coordinator*
Phone: 215-814-5536
Email: swatts.darriel@epa.gov

To access detailed site information including the Review Report once finalized: https://www.epa.gov/superfund/rentokil

Protecting human health and the environment

APPENDIX F – INTERVIEW FORMS

Rentokil, Inc. (Virginia Wood Preserving Division) Superfund Site — Five-Year Review Interview Form

Site Name: Rentokil, Inc. (Virginia Wood Preserving Division) **EPA ID No.:** VAD071040752

Interviewer Name: Darriel Swatts **Affiliation:** EPA CIC

Subject Name: Kevin D. Wilhite **Affiliation:** County Planner IV, Henrico County Planning Department

Subject Contact Information: Email: Wil13@henrico.us

Time: Not applicable **Date:** 12/6/2017

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

Interview Category: Local Government

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Response: *The Planning Department has kept a file on the Virginia Wood Preserving (Rentokil) Remediation Plan dating from the 1990s. However, we have apparently not received any additional information on this site since we were notified that the remediation work was completed in 1999.*

2. 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?

   Response: *I have no record of having received any of the past 5YR reports prepared by the EPA. It would be beneficial if copies of this report would be sent to Henrico County going forward.*

3. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

   Response: *I have checked with the Division of Police and they have indicated that there have not been any calls for service at this address since January 1, 2007.*

4. Are you aware of any changes to state laws or local regulations that might affect the protectiveness of the Site's remedy?

   Response: *I am not personally aware of any changes to state laws or local regulations that specifically impact the protection of the site, but I cannot guarantee that there have not been any such changes.*

5. Are you aware of any changes in projected land use(s) at the Site?

   Response: *The County's 2026 Comprehensive Plan has classified the future land use of this site as Light Industrial. This was the same designation for the site reflected in our previous 2010 Land Use Plan.*

6. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

   Response: *As previously stated, the Planning Department has not received any information on this site since 1999, although the Department of Public Works has indicated they were contacted by the EPA a few years ago about some ongoing work on this site. I believe it would be beneficial for the EPA to have a specific County contact on file to provide updates.*

7. Do you have any comments, suggestions or recommendations regarding the project?

   Response: *I would note that the Planning Department received recent notification from a real estate company on their intent to market the property for development in the near future.*

8. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?

   Response: *I do not have any objection to the use of my name in connection with the questionnaire. Let me know if you need any additional information.*

Site Name: **Rentokil, Inc.** **EPA ID No.:** **VAD071040752**

Interviewer Name: **Stepan Nevshehirlian** **Affiliation:** **EPA**
Subject Name: **Angie McGarvey** **Affiliation:** **Virginia DEQ**
Subject Contact Information: 1111 E. Main Street, Suite 1400, Richmond VA23219 Angela.mcgarvey@deq.virginia.gov 804-698-4084
Time: **NA** **Date:** **06-13-18**
Interview Location: **Email correspondence**

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

Interview Category: **State Agency**

1. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   Response: *Although it has taken a long time to get to this point, I am very pleased with the status of this Superfund site. The impacted property underwent a series of remedial actions to address the historical contamination left from the wood treating process. It appears that the project is ready to close out the remedial action phase and move to the long-term monitoring and maintenance phase. This phase will continue for the foreseeable future to ensure that actions taken remain protective. I am hopeful that this property can be returned to productive reuse in the very near future.*

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

   Response: *All remedies are in place and are performing as designed to contain the contamination and prevent future exposures to remaining 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?

   Response*: DEQ received a call from a Richmond resident on Oct. 29, 2015 with concerns about potential cancer in the area as a result of Rentokil-related past exposures. DEQ forwarded these concerns to EPA on November 4, 2015. EPA provided a response that ATSDR conducted a health assessment in 1988. DEQ tried to reach back to the caller but no response was received.*

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.

   Response: *DEQ produced a success story for our Superfund website. The success story was written in 2017 and is still posted.*

5. Are you aware of any changes to state laws that might affect the protectiveness of the Site's remedy?

   Response*: In 2011, DEQ added new Uniform Environmental Covenants Act Regulations (9VAC15-90). This regulations provides the authority and specific requirements for UECAs. UECAs replaced formerly referred to "deed restrictions".*

6. Are you comfortable with the status of the institutional controls at the Site? If not, what are the associated outstanding issues?

   Response***:*** *The institutional controls in place for the area where the new cap and slurry wall were installed need to be revised to prohibit activities that could compromise the integrity of the new cap and slurry wall. Additional, EPA should understand what happened under provision 6 of the current deed restriction when the eastern parcel was sold to Forest Parham, LLC in 2008.*

7. Are you aware of any changes in projected land use(s) at the Site?

   Response: *No.*

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

   Response: *No.*

9. Do you consent to have your name included along with your responses to this questionnaire in the FYR report?

   Response: *Yes.*

Site Name:	**Rentokil, Inc. (Virginia Wood Preserving Division)**	**EPA ID No.:**	**VAD071040752**
Interviewer Name:	**Darriel Swatts**	**Affiliation:**	**EPA CIC**
Subject Name:	**_____**	**Affiliation:**	**Resident**
Subject Contact Information:	**Oakview Avenue, Henrico**		
Time:	**Not noted**	**Date:**	**Last week of November 2017**

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

Interview Category: **Residents**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Response: *No. I've seen vehicles going in and out of the Site, but I never really knew what was going on.*

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   Response: *Good.*

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

   Response: *None that I'm aware of.*

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

   Response: *No.*

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

   Response: *No. Someone could visit the neighborhood and let the residents know what's happening. Flyers or notifications in mailboxes would be helpful.*

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   Response: *I have a well, but it's capped and not used for anything. I am on city water*.

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   Response: *No.*

Site Name:	**Rentokil, Inc. (Virginia Wood Preserving Division)**	**EPA ID No.:**	**VAD071040752**

Interviewer Name: **Darriel Swatts** **Affiliation:** **EPA CIC**
Subject Name: _____ **Affiliation:** **Resident**
Subject Contact Information: **Oakview Avenue, Henrico**
Time: **Not noted** **Date:** **Last week of November 2017**

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

Interview Category: **Residents**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Response: *Yes.*

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   Response: *Just fine. But the fence sometimes blocks wildlife (deer).*

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

   Response: *I have not had any problems with the Site.*

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

   Response: *No.*

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

   Response: *No. I just drive by and see that things are happening. It would be helpful if EPA could keep us informed by mail. Just let us know if there's anything dangerous happening.*

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   Response: *No. I am on city water.*

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   Response: *No.*

Site Name:	**Rentokil, Inc. (Virginia Wood Preserving Division)**	**EPA ID No.:**	**VAD071040752**
Interviewer Name:	**Darriel Swatts**	**Affiliation:**	**EPA CIC**
Subject Name:		**Affiliation:**	**Resident**
Subject Contact Information:	**Oakview Avenue, Henrico**		
Time:	**Not noted**	**Date:**	**Last week of November 2017**

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

Interview Category: **Residents**

1. Are you aware of the former environmental issues at the Site and the cleanup activities that have taken place to date?

   Response: *Very much so, yes.*

2. What is your overall impression of the project, including cleanup, maintenance and reuse activities (as appropriate)?

   Response: *As far as I know the cleanup went well. I've lived in this house since the mid-1990s, and my parents lived in the house before that. We were not really affected by the Site or cleanup.*

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

   Response: *None. Most of the local residents are probably not aware of the Site and its history.*

4. Have there been any problems with unusual or unexpected activities at the Site, such as emergency response, vandalism or trespassing?

   Response: *No.*

5. Has EPA kept involved parties and surrounding neighbors informed of activities at the Site? How can EPA best provide site-related information in the future?

   Response: *No. I haven't ever talked to anyone about the Site. I don't think I need to be informed of routine site activities, but I would want to know if there was something dangerous happening on site that could affect us.*

6. Do you own a private well in addition to or instead of accessing city/municipal water supplies? If so, for what purpose(s) is your private well used?

   Response: *I have a well, but there is no pump in it and it is not used for any purpose.*

7. Do you have any comments, suggestions or recommendations regarding any aspects of the project?

   Response: *The Site seems to be kept secure. The gate is always locked. I was at a county meeting about the site a long time ago and I left with the impression that they may redevelop the site at some point. I would be interested in knowing if that is something they are considering doing.*

APPENDIX G – SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Rentokil, Inc. (Virginia Wood Preserving Division)	**Date of Inspection:** 11/08/2017
Location and Region: Richmond, VA; EPA Region 3	**EPA ID:** VAD071040752
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature:** Cloudy and light rain/40s

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Monitored natural attenuation
- ☒ Groundwater containment
- ☒ Vertical barrier walls
- ☒ Other: While the original remedy called for on-site treatment and discharge of extracted groundwater, EPA approved VPI's request to modify that remedial component to allow for off-site disposal of extracted groundwater. Site groundwater was never treated on site.

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 Henrico County Planning Department
   Contact Kevin D. Wilhite (Name) | County Planner IV (Title) | 12/6/2017 (Date) | _____ (Phone No.)
   Problems/suggestions ☐ Report attached: Interviews are summarized in Section IV; completed interview forms are included in Appendix F.

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

4. **Other Interviews** (optional) ☒ Report attached: Interviews are summarized in Section IV; completed interview forms are included in Appendix F.

Oakview Avenue Resident #1

Oakview Avenue Resident #2

Oakview Avenue Resident #3

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: The PRP submits groundwater monitoring data in biannual Groundwater Monitoring and Site Evaluation Reports.			
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
	☒ Arcadis performs O&M for Rentokil.	

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: Site fencing appeared to be in good condition. The entrance gate to the Site is secured with a lock.

B. Other Access Restrictions

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

Remarks: Signage is clearly posted at the Peyton Street gate entrance to deter trespassers.

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: Arcadis

Contact	Name	Title	Date	Phone no.
	Catherine L. Coffey	Senior Environmental Scientist	_____	_____

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: Institutional controls are in place to prevent groundwater use, protect the integrity of the original cap and slurry wall, and to prohibit residential land use for most of the Site. However, the land use restrictions in place do not prevent activities that could potentially affect the integrity of the new cap and slurry wall.

D. General

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

Remarks: Previous instances of trespassing were discussed during the site inspection, but no evidence was observed during the inspection.

2. **Land Use Changes On Site** ☒ N/A

Remarks: The County's Planning Department recently received notification from a real estate company regarding their intent to market the property for development in the near future.

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: Site roads are in good condition.

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: Vegetative cover is properly established over the original capped area. Vegetative cover over the newly extended capped area is thin; site inspection participants observed bare spots.		
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: There are no active monitoring wells located within the surface of the caps.

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: Outlet pipes were free of vegetation and appeared to be in good condition.

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: Groundwater monitoring and water level measurements.

   ☒ Performance not monitored

   Frequency: The PRP performs semi-annual groundwater monitoring and previously collected monthly water level measurements to assess the performance of the original slurry wall. ☐ Evidence of breaching

   Head differential: _____

   Remarks: In January 2017, PRP contractors removed components of the groundwater dewatering system from the water facility building.

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: Monitoring wells on site are used to assess the performance of the slurry wall and cap (they are not part of a pump and treat remedy). All monitoring wells are secured with locks. At the time of the site inspection, monitoring well VPMW-4 was not labeled and the concrete base of the well was cracked. Recently installed monitoring wells VPDW-04R and VPDW-05R were not labeled outside the well casing, and standing water was observed inside the casing of wells VPMW-5 and VPMW-6. A weight was also observed stuck in the well casing of well VPMW-5.

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 Site's final remedy included demolition and off-site disposal of site structures, drum disposal, removal of the former site pond, construction of a slurry wall around the former process and storage areas, installation of a de-watering system, construction of a RCRA cap over the area encompassed by the slurry wall, excavation and consolidation of contaminated soil and wetland sediment beneath the cap, mitigation of wetland loss, institutional controls, and groundwater monitoring. In 2016, in accordance with the ROD, the PRP extended the slurry wall and cap to address an additional area of soil contamination north of the original cap. Based on the findings of the FYR site inspection, the remedy seems to be effective and functioning as designed. The caps are in good condition and appear to be well-maintained. They prevent exposure to contaminated soil and sediment. The slurry walls and caps prevent the migration of contaminated groundwater and institutional controls are in place to prevent groundwater use and prohibit residential land use. However, the institutional controls do not prohibit activities that could potentially affect the integrity of new cap and slurry wall. While previous groundwater monitoring indicated the consistent presence of PCP north of the original slurry wall at concentrations high above the PCP MCL,

	the new containment system is expected to contain that groundwater contamination, as well as the source of that contamination. Data from the new monitoring well network will be used to evaluate the performance of the new containment system. A review of groundwater data confirms that groundwater contamination has not migrated off-site.
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. O&M procedures are implemented as prescribed by the O&M manual. Based on FYR site inspection observations, O&M activities seem to be adequate. Vegetation on the original cap is well-established and the fence surrounding the cap is in good condition. The newly capped area was recently seeded; the vegetation is thin and absent in some areas. Arcadis and EPA will evaluate whether additional seeding is needed in 2018. At the time of the site inspection, site inspection participants noted several minor O&M issues. Monitoring well VPMW-4 was not labeled and the concrete base of the well was cracked. Recently installed monitoring wells VPDW-04R and VPDW-05R were not labeled outside the well casing, and standing water was observed inside the casing of wells VPMW-5 and VPMW-6. A weight was also observed stuck inside the well casing of well VPMW-5. Site inspection participants also noted that one of the sanitary sewer tie-ins along the southern edge of the original cap was damaged. EPA discussed these items with Arcadis, and Arcadis agreed to address the O&M issues.
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. No early indicators of potential remedy problems were identified at the time of the site inspection.
D.	**Opportunities for Optimization**
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. The PRPs would like EPA to consider decreasing the required frequency and time period for groundwater monitoring.

Site inspection roster:
Stepan Nevshehirlian (EPA RPM)
Katie Matta (EPA BTAG)
Angie McGarvey (VDEQ)
Catherine Coffey (Arcadis)
Daniel Sheehan (Arcadis)
Amanda Goyne (Skeo)
Brice Robertson (Skeo)

APPENDIX H – SITE INSPECTION PHOTOS

Gated site entrance off Peyton Street

Inside water facility building formerly used to house cap dewatering system

Looking northwest across original capped area

Looking southwest across original capped area (sanitary sewer tie-ins visible along Peyton Street side of the cap)

Damaged sanitary sewer tie-in along Peyton Street cap edge

Looking northeast along newly capped area (left) and original capped area (right)

Looking northeast at newly capped area

Looking northeast across newly capped area

New monitoring well VPDW-5R

VPMW-4 (not labelled and has cracked concrete base)

North Run Creek

VPMW-5 (standing water outside inner well casing)

Looking north toward on-site stormwater basin

Gate to former Wetland Area B

Looking southeast across Peyton Street toward former Wetland Area C

APPENDIX I – SCREENING LEVEL RISK REVIEW

Soil Cleanup Goals

The ROD selected soil cleanup goals based on an anticipated industrial land use. Table I-1 evaluates the current validity of the soil cleanup goals using 2017 EPA Regional Screening Levels (RSLs); the RSLs incorporate current toxicity values and standard default exposure factors. The evaluation demonstrates that the soil cleanup goals for arsenic, PCP and PAHs remain valid for commercial/industrial use as the concentrations are within EPA's risk management range of 1×10^{-6} to 1×10^{-4}.

Table I-1: Review of Soil Remedial Goal

COC	Soil Remedial Goal (mg/kg)	Composite Worker RSLs (mg/kg)[a]		Risk[b]	HQ[c]
		Cancer-Based RSL (10^{-6} Risk)	Non-Cancer RSL (Hazard Quotient (HQ) = 1.0)		
Total carcinogenic PAHs	5.1	2.1[d]	220	2.4×10^{-6}	0.02
PCP	48	4.0	2,800	1.2×10^{-5}	0.02
Arsenic	33	3.0	480	1.1×10^{-5}	0.07

Notes:

a) EPA's soil RSLs, dated November 2017, available at https://semspub.epa.gov/work/HQ/197033.pdf, accessed 01/04/2018.

b) Cancer risk calculated using the following equation, based on the fact that RSLs are derived based on 1×10^{-6} risk: Cancer risk = (cleanup goal ÷ cancer-based RSL) × 10^{-6}.

c) Noncancer HQ calculated using the following equation: HQ = (cleanup goal ÷ non-cancer RSL).

d) EPA's cancer-based RSL for benzo(a)pyrene is 2.1 mg/kg for commercial/industrial exposure. The ROD established a soil cleanup goal of 5.1 mg/kg for total carcinogenic PAHs. EPA's *Provisional Guidance for Quantitative Risk Assessment of Polycyclic Aromatic Hydrocarbons* (EPA/600/R-93/089, July 1993), recommends that a relative potency factor (RPF) be used to convert concentrations of carcinogenic PAHs to an equivalent concentration of benzo(a)pyrene when assessing the cancer risks posed by these substances from oral exposures. These RPFs are based on the potency of each compound relative to that of benzo(a)pyrene.

e) EPA's non-cancer RSL for benzo(a)pyrene is 220 mg/kg for commercial/industrial exposure.

Dioxin Evaluation

The site's baseline risk assessment quantified risks associated with dioxins, but did not identify dioxins as a soil COC, thus, a cleanup goal was not established for this contaminant group. In 2012, EPA updated the toxicity value for TCDD. This FYR included a screening-level risk evaluation to determine if the soil dioxin concentrations detected on site during the 1990 RI would pose unacceptable risks, in light of the updated toxicity value. The evaluation was conducted by identifying the soil samples exhibiting the highest dioxin and furan results and then converting the concentrations to TCDD toxic equivalent (TEQ) concentrations. The conversion of the maximum detected concentrations to dioxin TEQs is included in Table I-2. The screening-level risk evaluation of the total dioxin TEQ concentrations was conducted by comparing the concentrations to EPA's RSLs based on industrial land use (Table I-3). Industrial RSLs were used for this evaluation because soil cleanup goals were based on a future industrial land use scenario and institutional controls are in place to prohibit residential land use. The comparison shows that the TCDD concentrations in these samples are equivalent to cancer risks that exceed the upper end of EPA's risk management range of 1×10^{-6} to 1×10^{-4} and are also equivalent to noncarcinogenic hazard quotients greater than 1.

This evaluation is conservative since it focused on the most highly contaminated samples collected prior to remedial activities. A review of soil dioxin data included in the Site's 1990 RI confirmed that dioxin contamination in site soil was initially present within the same general footprint as PCP soil contamination. Therefore, the soil remediation conducted at the site is expected to have also addressed risks associated with TCDD in site soil.

Table I-2: Dioxin TEQ Conversion of 1990 RI Soil Samples Exhibiting the Highest Dioxin and Furan Concentrations

Analyte	TEF[a]	Sample SO-6-1		Sample SO-7-1		Sample SO-9 and SO-9D (duplicate)[b]	
		Sample Concentration (µg/kg)[c]	Adjusted Sample Concentration (µg/kg)[d]	Sample Concentration (µg/kg)	Adjusted Sample Concentration (µg/kg)	Sample Concentration (µg/kg)	Adjusted Sample Concentration (µg/kg)
2,3,7,8-TCDD	1	ND	ND	ND	ND	ND	ND
1,2,3,7,8-PeCDD	1	0.26	0.26	0.19	0.19	0.26	0.26
1,2,3,4,7,8-HxCDD	0.1	2	0.2	1.6	0.16	1.4	0.14
1,2,3,6,7,8-HxCDD	0.1	12.6	1.26	11.1	1.11	4.5	0.45
1,2,3,7,8,9-HxCDD	0.1	3.9	0.39	3.2	0.32	2.4	0.24
1,2,3,4,6,7,8-HpCDD	0.01	446	4.46	320	3.2	234	2.34
OCDD	0.0003	2380	0.714	2420	0.726	1140	0.342
1,2,3,7,8-PeCDF	0.03	0.14	0.0042	0.1	0.003	ND	ND
2,3,4,7,8-PeCDF	0.3	ND	ND	0.026	0.0078	ND	ND
1,2,3,4,7,8-HxCDF	0.1	1.5	0.15	1.4	0.14	0.59	0.059
1,2,3,6,7,8-HxCDF	0.1	0.44	0.044	0.38	0.038	0.26	0.026
1,2,3,7,8,9-HxCDF	0.1	0.28	0.028	0.28	0.028	ND	ND
1,2,3,4,6,7,8-HpCDF	0.01	86.8	0.868	67.6	0.676	35	0.35
1,2,3,4,7,8,9-HpCDF	0.01	6.2	0.062	4.1	0.041	3.7	0.037
OCDF	0.0003	393	0.1179	716	0.2148	148	0.0444
Total Dioxin TEQs (µg/kg)[e]			8.5581		6.8546		4.2884
Total Dioxin TEQs (mg/kg)			8.56×10^{-3}		6.85×10^{-3}		4.29×10^{-3}

µg/kg = microgram per kilogram

mg/kg = milligram per kilogram

a. Toxicity Equivalence Factor (TEF) values are from Table 2 of the December 2010 Recommended TEFs for Human Health Risk Assessments of 2,3,7,8-TCDD and Dioxin-Like Compounds by the EPA's Office of the Science Advisor.
b. Maximum value from SO-9 or SO-9D (duplicate) used for this analysis.
c. Sample concentrations are from Table B-1.5 of the 1990 RI.
d. TEF × Sample Concentration = Adjusted Sample Concentration
e. Sum of Adjusted Sample Concentrations = Total Dioxin TEQ Concentration

ND - not detected

Table I-3: Industrial Screening-Level Risk Evaluation of Total Dioxin TEQs

1990 RI Samples	Dioxin TEQ (mg/kg)	Industrial RSL[a] (mg/kg)		Cancer Risk[b]	Noncancer HQ[c]
		1 x 10^{-6} Risk	HQ=1.0		
SO-6-1	8.6 x 10^{-3}	2.2 x 10^{-5}	7.2 x 10^{-4}	**4 x 10^{-4}**	**12**
SO-7-1	6.9 x 10^{-3}			**3 x 10^{-4}**	**10**
SO-9/SO-9D[d]	4.3 x 10^{-3}			**2 x 10^{-4}**	**6**

Notes:
Bold = noncarcinogenic HQ exceeds 1.0 or cancer risk exceeds EPA's risk management range of 1 x 10^{-6} to 1 x 10^{-4}.

a. Current EPA RSLs, dated November 2017, are available http://semspub.epa.gov/src/document/11/197059 (accessed 1/26/2018).

b. The cancer risks were calculated using the following equation, based on the fact that RSLs are derived based on 1 x 10^{-6} risk:
Cancer risk = (TEQ concentration ÷ cancer-based RSL) × 10^{-6}

c. The noncancer HQ was calculated using the following equation:
HQ = TEQ concentration ÷ noncancer-based RSL

d. Maximum values from SO-9 or SO-9D (duplicate) used for this analysis