FIFTH FIVE-YEAR REVIEW REPORT FOR MID-ATLANTIC WOOD PRESERVERS, INC. SUPERFUND SITE ANNE ARUNDEL COUNTY, MARYLAND

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Prepared by

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Region III
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Date

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LIST OF ABBREVIATIONS & ACRONYMS

ARAR	Applicable or Relevant and Appropriate Requirement
CCA	Chromated Copper Arsenate
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
COC	Contaminant of Concern
EPA	United States Environmental Protection Agency
FYR	Five-Year Review
IC	Institutional Control
LMS	Local Machine Service, Inc.
MAWP	Mid-Atlantic Wood Preservers, Inc.
MCL	Maximum Contaminant Level
MCLG	Maximum Contaminant Level Goal
MDE	Maryland Department of the Environment
µg/L	Micrograms per Liter
mg/kg	Milligrams per Kilogram
mg/L	Milligrams per Liter
MWRA	Maryland Water Resources Administration
NCP	National Oil and Hazardous Substances Pollution Contingency Plan
NPL	National Priorities List
O&M	Operation and Maintenance
OU	Operable Unit
PRP	Potentially Responsible Party
RAO	Remedial Action Objective
RCRA	Resource Conservation and Recovery Act
RI/FS	Remedial Investigation and Feasibility Study
ROD	Record of Decision
RPM	Remedial Project Manager
RSL	Regional Screening Level
UAO	Unilateral Administrative Order
UU/UE	Unlimited Use and Unrestricted Exposure

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 Oil and Hazardous Substances Pollution Contingency Plan (NCP) (40 Code of Federal Regulations (CFR) Section 300.430(f)(4)(ii)), and considering EPA policy.

This is the fifth FYR for the Mid-Atlantic Wood Preservers, Inc. 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), which is addressed in this FYR. OU1 addresses the sitewide remedy.

Site Background

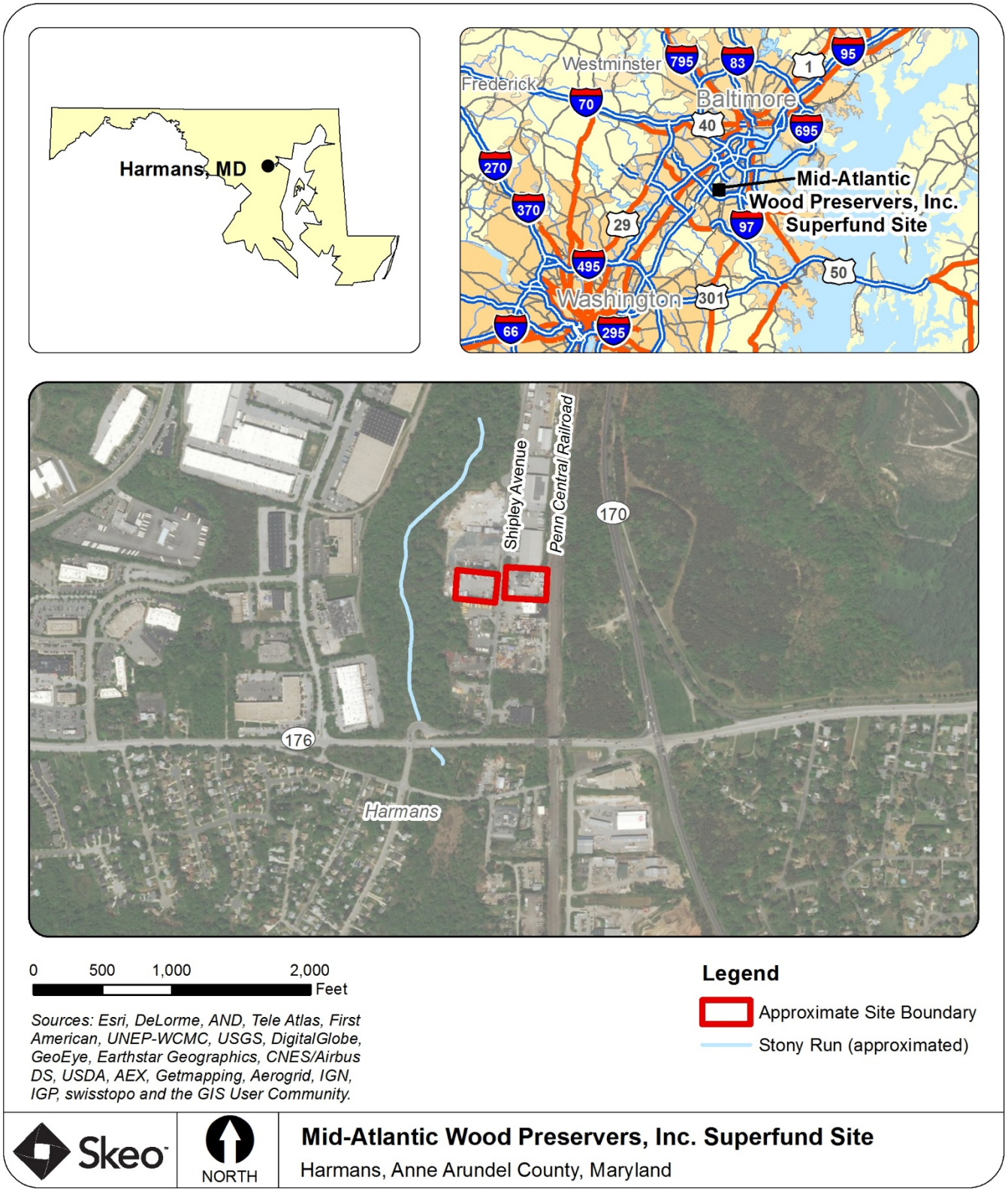
The approximately three-acre Site is located at 7457 and 7460 Shipley Avenue in Harmans, Anne Arundel County, Maryland, in a mixed commercial/industrial area. It is about 17 miles south of Baltimore (see Figure 1). The Site is divided into two areas – the Treatment Yard east of Shipley Avenue and the Storage Yard west of Shipley Avenue (Figure 2). The entire site surface was paved with asphalt as part of a response action in 1993. Local Machine Service, Inc. (LMS) leases the former treatment building and operates a recreational boat repair shop on the Treatment Yard. Site owners installed a Sharp Energy propane tank storage facility on the southeast part of the Treatment Yard in summer 2017. MBG Enterprises uses the Storage Yard property for vehicle storage, particularly school buses and garbage trucks.

From 1974 to February 1993, Mid-Atlantic Wood Preservers, Inc. (MAWP) operated a wood treatment facility on the property. The facility used chromated copper arsenate (CCA) to treat lumber. Processing took place in a plant in the Treatment Yard. After a minimal time drying on a concrete pad next to the treatment building, operators moved the wood to the Storage Yard. It is believed that in 1978, operators spilled about 3,000 gallons of CCA, which contaminated groundwater in the upper Patapsco aquifer.

The upper-most formation under the Site is the Patapsco aquifer, which is about 150 feet thick. The shallow water table at the Site is 8 to 12 feet below the surface. There is a discontinuous clay layer about 30 feet below the ground surface. Groundwater moves toward the north-northwest. Residents and businesses near the Site receive potable water from the public water supply. There are no private drinking water wells near the Site. Stony Run flows north through a wetland area about 600 feet west of the Site.

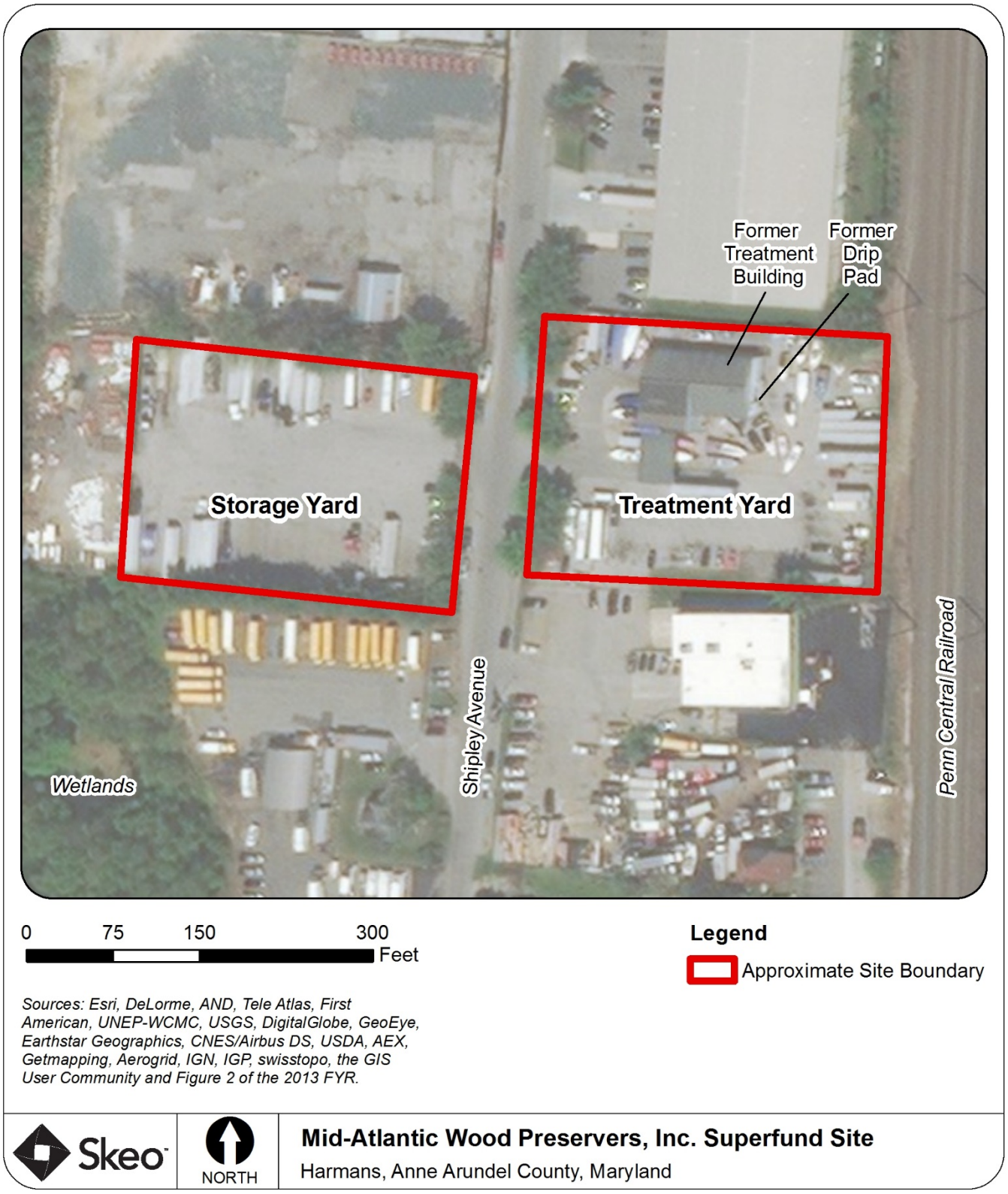
Appendix A provides a list of references used during this FYR and Appendix B provides a chronology of Site events.

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: Site Detail 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.

FIVE-YEAR REVIEW SUMMARY FORM

SITE IDENTIFICATION		
Site Name: Mid-Atlantic Wood Preservers, Inc.		
EPA ID: MDD064882889		
Region: 3	**State:** Maryland	**City/County:** Harmans/ Anne Arundel

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

REVIEW STATUS
Lead agency: EPA
Author name: Mark Conaron, with additional support provided by Skeo
Author affiliation: EPA Region 3
Review period: 10/3/2017 - 9/12/2018
Date of Site inspection: 11/2/2017
Type of review: Statutory
Review number: 5
Triggering action date: 9/12/2013
Due date *(five years after triggering action date)*: 9/12/2018

II. RESPONSE ACTION SUMMARY

Basis for Taking Action

The 1990 remedial investigation (RI) identified arsenic, chromium and copper in soils and slightly elevated levels of chromium in groundwater. Concentrations of copper, chromium and arsenic in Stony Run surface water were in the normal range for a freshwater stream. The risk assessment associated with the 1990 RI concluded that arsenic and chromium were contaminants of concern (COCs) (Table 1) and that the potential carcinogenic risk at the Site was driven by incidental ingestion and inhalation of on-Site surface soil by workers. Chromium concentrations in soils did not drive the remedial action.

Table 1: COCs, by Media

COC	Media
Chromium	surface soil, groundwater
Arsenic	surface soil

Response Actions

In August 1978, the Anne Arundel County Health Department found that water in a shallow residential well was contaminated with hexavalent chromium. The Maryland Water Resources Administration (MWRA) tested this well and found chromium levels above the drinking water standards. MWRA identified MAWP as the probable source of the groundwater contamination and mandated removal of contaminated soil, modifications to prevent further releases, and installation of a concrete drainage pad to collect CCA drippings. Public water was extended to all properties in the area.

In January 1983, EPA performed an investigation and found that concentrations of arsenic and chromium in groundwater levels still exceeded drinking water standards.

In June 1986, EPA listed the Site on the National Priorities List (NPL). In July 1986, MAWP signed a Consent Order and Agreement with EPA and the Maryland Department of the Environment (MDE) under which MAWP agreed to perform a remedial investigation and feasibility study (RI/FS). MAWP submitted the final RI/FS Report in August 1990.

In December 1990 EPA signed the Record of Decision (ROD). The remedy was modified based on design sampling and closing the wood treating operation:

- Excavation, stabilization and off-Site disposal of "hot spots" of contaminated soils with arsenic concentrations greater than 1,000 milligrams per kilogram (mg/kg) and construction of an enlarged roofed drip pad that complies with Resource Conservation and Recovery Act (RCRA) Subpart W wood treating regulations.
- Capping of those portions of the Treatment Yard that were not covered by the treatment plant and enlarged drip pad or paved parking area with an asphalt/concrete cap. Contaminated soil areas in the Storage Yard exceeding 10 mg/kg of arsenic were also to be paved with an asphalt/concrete cap.
- Excavation of any off-Site soils containing arsenic above 10 mg/kg (i.e., background concentration of arsenic in area soil) and consolidation of those soils on the Site prior to paving with the asphalt/concrete cap. Excavation of arsenic-contaminated soil (>10 mg/kg arsenic) from the adjacent Number One Supply property, followed by backfilling with clean fill, topsoil and revegetation.
- Environmental monitoring to ensure the effectiveness of the remedy.
- Implementation of a deed restriction to preclude future land use that might compromise the effectiveness of the remedy.
- Consolidation of this material on the Site areas to be capped.
- Grading and proof rolling of the Treatment and Storage Yards, followed by covering the areas with compacted gravel and a compacted asphalt layer.

The remedial action objectives are to:

- Prevent direct contact (i.e., inadvertent ingestion and/or inhalation of contaminated dust) with soil containing greater than 10 mg/kg arsenic by consolidating and containing it beneath an asphalt cap.
- Prevent leaching of arsenic and chromium contamination from contaminated areas to the groundwater.

Soil and groundwater cleanup goals are listed in Table 2.

Table 2: Soil and Groundwater COC Cleanup Goals

COC	Medium	ROD Cleanup Goal
Arsenic	surface soil	10 mg/kg
Hexavalent chromium	surface soil	2.0 mg/kg
Chromium	groundwater	0.1 mg/L

COC	Medium	ROD Cleanup Goal
Notes: mg/L = milligrams per liter		

Status of Implementation

In December 1991, EPA issued a Unilateral Administrative Order requiring MAWP to implement the remedy. The PRP predesign sampling in April and June 1992 indicated that no soil on or off Site contained arsenic greater than 1,000 mg/kg. Therefore, excavation, stabilization and off-Site disposal of "hot spots" performed by the PRP was not necessary. Predesign sampling did find that soil on the adjacent Number One Supply property (immediately north of the Treatment Yard) was contaminated by stormwater runoff from the Site at concentrations greater than 10 mg/kg.

In February 1993, MAWP informed EPA that it was ceasing business operations and closing the facility. Because MAWP was ceasing its wood treating operations, there was no longer a need to expand the drip pad to prevent potential future releases of CCA, as outlined in the ROD. The remedial objectives were satisfied by extending the asphalt cap to all areas of the Treatment Yard that were not already paved or covered by existing buildings, including those areas previously planned to be covered by the expanded drip pad.

EPA approved the Remedial Action Work Plan and Remedial Design in May 1993. Remedial action began in June 1993. Construction activities progressed in a manner consistent with the ROD and the Remedial Design and Remedial Action Work Plans. Because of MAWP's decision to discontinue wood treatment operations and the predesign sampling, the final remedy implemented was an asphalt cap over the drip pad areas and:

- Excavation of arsenic-contaminated soil (>10 mg/kg arsenic) from the adjacent Number One Supply property, followed by backfilling with clean fill, topsoil and revegetation.
- Consolidation of this material on the Site areas to be capped.
- Grading and proof rolling of the Treatment and Storage Yards, followed by covering the areas with compacted gravel and a compacted asphalt layer.

In August 1993, EPA conducted the final inspection and confirmed that all significant items had been satisfactorily completed. In September 1993, EPA signed the Final Close-Out Report documenting completion of the remedial action. Groundwater, surface water and sediment monitoring data collected during 1993, 1996 and 1999 are described in the Data Review section of this FYR and Appendix G. In July 2000, EPA deleted the Site from the NPL.

Institutional Control (IC) Review

In June 1993, EPA became aware that MAWP was negotiating the sale of the Site property to the owner of a neighboring business and that the neighboring business intended to expand its trucking operation onto the Site after acquiring the property. EPA and the neighboring business negotiated an Agreement and Covenant Not to Sue under which the new owner agreed to perform operation and maintenance (O&M) activities, including environmental monitoring, as required by the EPA-approved O&M Plan. Under the agreement, the new owner was prohibited from excavating or regrading any portion of the Site without prior written approval from EPA. The Agreement and Covenant Not to Sue became effective in January 1994.

In July 1994, the new owner filed EPA-approved Restrictions on Land Use for the Site in the land records for Anne Arundel County, Maryland. The Restrictions on Land Use state that the parcels will not be used for agricultural or residential purposes and that the asphalt cap will not be removed, permanently penetrated or altered in such a way as to allow human contact with or infiltration of water into soils currently covered by the cap without prior approval from EPA; adequate measures to protect workers and the public; proper management of contaminated soils generated; and prompt installation of a new cap or functionally equivalent construction. The Restrictions on Land Use state that the restrictions on the use of the parcels run with the land.

EPA was not notified of two transfers in ownership in 2016 and 2017 as required by the 1994 Agreement and Covenant not to Sue that requires Site owners to notify EPA if the Site properties are transferred. In November 2016, the Site property owner transferred the Site property to G&G Ventures, which is associated with the Site property owner's family. In June 2017, G&G Ventures sold the Storage Yard property to 7457 Shipley Avenue LLC, also associated with the Site property owner's family. EPA has contacted the Site owners to reinforce this provision of the 1994 Agreement and Covenant Not to Sue and EPA will continue to check on the ownership of the Site.

Table 3: Summary of Implemented Institutional Controls (ICs)

Media, Engineered Controls and Areas That Do Not Support UU/UE Based on Current Conditions	ICs Needed	ICs Called for in the Decision Documents	Impacted Parcel(s)	IC Objective	Title of IC Instrument Implemented and Date (or planned)
Soils	Yes	Yes	Map 0008, Grid 0017, Parcel 0618, Lot 1A (Treatment Yard area) and Parcel 392 (Storage Yard area)	Prevent agricultural or residential use; prevent removal, permanent penetration or alteration of asphalt caps without prior approval from EPA	Restrictions on Land Use, July 5, 1994

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

The Site owners' continuing O&M obligations are to maintain the integrity of the asphalt cap now that the Site has been deleted from the NPL and EPA has determined that routine environmental monitoring is not necessary (see Data Review, Section IV of this FYR). The Environmental Monitoring/O&M Plan had been implemented by the Site property owner under the approved Remedial Action Work Plan and subsequently embodied in the Compliance Plan submitted by the Site property owner and approved by EPA in accordance with the 1994 Agreement and Covenant Not to Sue.

The O&M Plan requires inspection of the paved areas in the Treatment Yard and Storage Yard on a weekly basis if the facility is in use or monthly if the facility is only in caretaker (dormant) status. The areas will be inspected to ensure that the paving is not deteriorating or cracking that would expose underlying soils. Results of each weekly inspection will be maintained in a Facility Operating Log. Any cracks or deterioration of the asphalt paving that are detected are to be repaired immediately. Repairs may consist of patching holes or recoating the surface area with asphalt. The date of any repairs to the paving will also be recorded in the Facility Operating Log.

EPA is not aware of the status of weekly inspections or repairs of the paved areas of the Site during the previous five years; findings during the FYR Site inspection indicate that the weekly inspections and needed repairs may not have been occurring. Site inspection participants noted that the Site's asphalt cap had been cut and removed in several areas. The asphalt cap was cracked throughout the Treatment Yard property. There were larger areas where gravel was exposed and the integrity of the cap could not be determined. The Site property owner addressed these issues in January 2018, after discussions with EPA. EPA also contacted the Site owners to reinforce Site O&M requirements so that inspections and repairs occur as required by the O&M Plan.

The Agreement and Covenant Not to Sue allows Site owners to make minor repairs (defined as actions covering less than 1,000 square feet) without advance approval from EPA. The document further requires that Site owners prepare a work plan for EPA's approval prior to implementing major repairs (defined as actions covering more than 1,000 square feet). In the past five years, EPA was provided an email with a brief outline of the repairs that were noted from the Site Inspection. No other repairs have been conducted at the Site.

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 Report

OU #	Protectiveness Determination	Protectiveness Statement
1	Protective	The remedial action continues to be protective of human health and the environment. The constructed remedy is functioning as intended by the ROD. The asphalt cap prevents any potential for direct contact with arsenic-contaminated soil. The asphalt cap successfully supports the vehicular traffic inherent to its productive reuse with no adverse wear apparent. Institutional controls protecting the integrity of the remedial action are in place.

The previous FYR Report listed one issue and recommendation (Table 5).

Table 5: Status of Recommendations from the 2013 FYR Report

OU #	Issue	Recommendation	Current Status	Current Implementation Status Description	Completion Date (if applicable)
1	Unauthorized digging through capped area.	Place a warning sign and evaluate placing the Site on the State of Maryland One Call Notification System.	Ongoing	There are not warning signs regarding digging in the capped area. Site inspection participants indicated that the Site is not on the State of Maryland One Call Notification System.	NA

IV. FIVE-YEAR REVIEW PROCESS

Community Notification & Involvement

A public notice was made available in the *Maryland Gazette* on May 26, 2018. It stated that the FYR was underway. The press notice is in Appendix D. The results of the review and the report will be made available at the Site's information repository, Severn Community Library, located in the Severn Square Shopping Center at 2624 Annapolis Road in Severn, Maryland and online at: https://www.epa.gov/superfund/search-superfund-five-year-reviews.

Data Review

Environmental monitoring was discontinued prior to the Site's deletion from the NPL in 2000; therefore, there is no data from the FYR period to review. Historical groundwater, surface water and sediment data are provided in Appendix G.

Groundwater monitoring

The groundwater monitoring program demonstrated that groundwater quality met maximum contaminant levels (MCLs) for chromium, the primary COC. The concentration trends remained stable or decreasing, indicating that the cap prevents leaching of contaminants. Therefore, the monitoring program was discontinued before the Site's deletion from the NPL in 2000.

Surface water and sediment monitoring in Stony Run

The stream monitoring program demonstrated to EPA's and MDE's satisfaction that surface water and sediment quality met performance standards; the program was discontinued before the Site's deletion from the NPL in 2000.

Site Inspection

The Site inspection took place on November 2, 2017. In attendance were representatives from EPA and MDE; the Storage Yard property owner; and representatives of Skeo (EPA FYR support contractor). The purpose of the inspection was to assess the protectiveness of the remedy. The Site inspection checklist is included in Appendix C. Site inspection photographs are included in Appendix E.

The Site inspection started on the Treatment Yard property at 7457 Shipley Avenue. LMS, a boat repair business, leases this property. LMS uses the former treatment building for its operations. Some of the gutters had fallen off the building, and the downspouts were discharging to the base of the building. During the inspection, there were boats stored on the Treatment Yard property associated with LMS. There were also many other parked trucks and vehicles, mostly on the northeast quarter of the Treatment Yard property. Site inspection participants identified a new use since the previous FYR: Sharp Energy uses the southeast corner of the Treatment Yard property to store a large propane tank (about 30 feet in length) as well as many smaller empty propane tanks and a propane delivery

truck. The Storage Yard property owner noted that the tank was installed in the summer of 2017. The Sharp Energy storage area is fenced.

Site inspection participants noted that to install the foundation and possibly other components of the large propane tank, the Site's asphalt cap was cut and removed in several areas, including two areas each approximately 10 feet by 10 feet in size. These cuts show that the asphalt cap is 3 to 4 inches thick. These areas of removed cap were filled with gravel. It appeared that the cap was also cut to install bollards around the large tank. The posts for the fence surrounding the Sharp Energy storage area likely also necessitated cutting the cap. The asphalt cap was cracked throughout the Treatment Yard property and vegetation was growing in the larger cracks, including saplings in some places. There were also larger areas (particularly west of the main building) where gravel was exposed and the integrity of the cap could not be determined.

Site inspection participants moved across Shipley Avenue to the Storage Yard property (7460 Shipley Avenue). MBG Enterprises uses the Storage Yard property for vehicle storage, particularly school buses and garbage trucks. During the inspection, bus drivers were moving buses in and out of the property for their school bus routes. The property has a small manned guard shack at the entrance. The asphalt cap on the Storage Yard property was in good shape though there were some small, shallow cracks evident. The Storage Yard property owner plans to apply sealant to the asphalt in the spring. Valley Nation Gases stores empty propane cylinders in a fenced area behind the MBG Enterprises parking lot.

Before the Site inspection, Skeo staff visited the Site's local information repository, Severn Community Library, located in the Severn Square Shopping Center at 2624 Annapolis Road in Severn, Maryland. There were not Site documents available at the library. EPA sent the library a copy of the Administrative Record in June 2018.

V. TECHNICAL ASSESSMENT

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

The remedy is partially functioning as intended by decision documents. The asphalt cap is designed to prevent exposure to contaminated soils and prevent surface water from leaching contaminants out of contaminated soil and into the groundwater under the Site. Institutional controls are in place to prevent damage to the cap; however, inspection participants noted several locations on the Treatment Yard area where the cap has been cut and removed. The Treatment Yard property owner subsequently repaired the damaged cap areas in January 2018.

The findings of the Site inspection indicate that the asphalt caps have not been resealed or repaired in the past five years. During the Site inspection, the Treatment Yard cap had many deep cracks and exposed areas; plants and small saplings were growing through the cap. The gutters had fallen off the south side of the treatment building. The Storage Yard cap had some shallow, surficial cracks. Following the Site inspection, the Treatment Yard property owner repaired the deep cracks and exposed areas in the Treatment Yard cap in January 2018. The Storage Yard property owner resealed the Storage Yard cap in Spring 2018.

The previous 5YR noted the digging of the cap. EPA is evaluating the provisions of the PPA to determine proper follow up of action. EPA provided the PPA to the property owner to remind the owner of their continuing obligations under the PPA.

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

This FYR reviewed the Site's groundwater and surface water applicable or relevant and appropriate requirements (ARARs) (see Appendix F). Although the 1990 ROD listed chromium as the only groundwater COC, this FYR evaluated arsenic. Arsenic was excluded as a COC because its concentrations were below the 1990 ARARs, but the ARAR for arsenic has since become more stringent. The groundwater MCL for arsenic was reduced to 10

micrograms per liter (µg/L) in 2006. The post-construction groundwater sampling results showed attainment of the ARARs, including the revised MCL of 10 µg/L for arsenic in groundwater (Appendix G). This FYR compared the Site's arsenic and chromium soil cleanup goals against the current EPA soil screening levels (see Appendix I). This comparison found that the soil cleanup goals are below or within EPA's range of acceptable risk for both residential and commercial/industrial exposures. Therefore, the soil cleanup goals are still valid.

The 1990 RI analyzed three surface water samples. All three samples were below the detection limits for arsenic, chromium and copper. Sampling performed during the remedial design and post-construction activities demonstrated that there is no impact to Stony Run from the Site. The 1993 Final Close-out Report stated that contaminant concentrations in Stony Run surface water were within the normal range expected in a freshwater stream and were not considered an environmental threat.

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: Operations and Maintenance**			
	Issue: There have been continued instances of unauthorized cutting and removal of the asphalt cap. Additionally Property has changed hands without notification to EPA.			
	Recommendation: Conduct regular inspections of the cap and Site. Also, notify the property owners of cap restrictions and O&M requirements under the PPA. EPA is evaluating the PPA to determine the best follow up action.			
Affect Current Protectiveness	**Affect Future Protectiveness**	**Party Responsible**	**Oversight Party**	**Milestone Date**
No	Yes	PRP	EPA/State	9/30/2019

VII. PROTECTIVENESS STATEMENT

Protectiveness Statement(s)

Operable Unit:	*Protectiveness Determination:*	*Planned Addendum Completion Date:*
OU1 (sitewide)	Short-term Protective	Click here to enter a date

Protectiveness Statement:
The remedy at OU1 currently protects human health and the environment because the asphalt cap prevents exposure to contaminated soils, institutional controls are in place to prevent damage to the cap, and groundwater cleanup goals have been met. In order for the remedy to be protective in the long term, the land use restriction to protect the cap need to be followed.

VIII. NEXT REVIEW

The next FYR Report for the Mid-Atlantic Wood Preservers, Inc. Superfund Site is required five years from the completion date of this review.

APPENDIX A – REFERENCE LIST

1986. Administrative Order on Consent in the Matter of: Mid-Atlantic Wood Preservers Site. U.S. EPA Docket No. III-86-13-DC.

1990. Remedial Investigation: Mid-Atlantic Wood Preservers Site. Dames & Moore. January 15, 1990.

1990. Draft Feasibility Study Report: Mid-Atlantic Wood Preservers Site. Dames & Moore. July 20, 1990.

1990. Record of Decision: Mid-Atlantic Wood Preservers Site. U.S. EPA. December 31, 1990. https://semspub.epa.gov/src/document/03/101533.

1993. Closeout Report: Mid-Atlantic Wood Preservers Superfund Site. U.S. EPA. September 23, 1993. https://www.epa.gov/superfund/midatlanticwoodpreservers.

1994. Restrictions on Land Use. Book 6700, Pages 507-510A. Anne Arundel County Circuit Court Land Records. https://mdlandrec.net/main.

1998. Five-Year Review Report: Mid-Atlantic Wood Preservers Superfund Site. U.S. EPA. August 20, 1998. https://www.epa.gov/superfund/midatlanticwoodpreservers.

2013. Fourth Five-Year Review Report for Mid-Atlantic Wood Preservers Superfund Site. U.S. EPA. September 12, 2013. https://www.epa.gov/superfund/midatlanticwoodpreservers.

APPENDIX B – SITE CHRONOLOGY

Table B-1: Site Chronology

Event	Date
MAWP (also known as Fort McHenry Lumber Company) began operating a facility on the Site that pressure treated wood with CCA	1974-Febrary 1993
Anne Arundel County Health Department sampled a residential well northeast of the Site and found a high concentration of chromium, a substance used by MAWP	August 15, 1978
MAWP entered into an Administrative Order on Consent with MWRA requiring MAWP to take action to address groundwater contamination	October 1979
EPA listed the Site on the NPL	June 10, 1986
MAWP entered into an administrative consent order with EPA that required MAWP to perform an RI/FS	July 11, 1986
EPA issued a ROD selecting an asphalt cap over arsenic-contaminated surface soil as well as environmental monitoring and institutional controls	December 31, 1990
EPA issued a Unilateral Administrative Order directing MAWP to implement the ROD	December 30, 1991
EPA approved the Remedial Design Work Plan	March 18, 1992
MAWP notified EPA that it was ceasing business operations and closing the facility	February 4, 1993
EPA approved the final remedial design developed by MAWP	May 14, 1993
Contractors mobilized to the Site to begin construction	June 17, 1993
EPA signed Final Close-Out Report documenting the completion of remedial action	September 23, 1993
Department of Justice approved an Agreement and Covenant Not to Sue negotiated between EPA and the new Site property owner	January 24, 1994
The new Site property owner filed land use restrictions on the Site land records for Anne Arundel County, Maryland	July 5, 1994
EPA issued the first FYR Report for the Site	August 26, 1998
EPA deleted the Site from the NPL	July 18, 2000
EPA issued the second FYR Report for the Site	August 26, 2003
EPA issued the third FYR Report for the Site	September 26, 2008
EPA issued the fourth FYR Report for the Site	September 12, 2013
Deed recorded for transfer of the Site property from the Site property owner to G&G Ventures, Inc.	November 10, 2016
Deed recorded for transfer of the Storage Yard Site property from G&G Ventures, Inc. to 7457 Shipley Avenue LLC	June 21, 2017

APPENDIX C – SITE INSPECTION CHECKLIST

FIVE-YEAR REVIEW SITE INSPECTION CHECKLIST

I. SITE INFORMATION

Site Name: Mid-Atlantic Wood Preservers, Inc.	**Date of Inspection:** 11/02/2017
Location and Region: Harmans, Maryland; Region 3	**EPA ID:** MDD064882889
Agency, Office or Company Leading the Five-Year Review: EPA	**Weather/Temperature:** Partly cloudy, 65 degrees F

Remedy Includes: (Check all that apply)

- ☒ Landfill cover/containment
- ☐ Access controls
- ☒ Institutional controls
- ☐ Groundwater pump and treatment
- ☐ Surface water collection and treatment
- ☐ Other: Groundwater and surface water monitoring has been completed.
- ☐ Monitored natural attenuation
- ☐ Groundwater containment
- ☐ Vertical barrier walls

Attachments: ☒ Inspection team roster attached ☐ Site map attached

II. INTERVIEWS (check all that apply)

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

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

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

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

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

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

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

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

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

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

1. **O&M Documents**

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

Remarks: _____

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

Remarks: _____

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

Remarks: _____

4. **Permits and Service Agreements**

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

Remarks: _____

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

Remarks: _____

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

Remarks: _____

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

Remarks: _____

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

Remarks: _____

9. **Discharge Compliance Records**

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

Remarks: _____

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

Remarks: _____

IV. O&M COSTS

1. **O&M Organization**

☐ State in-house ☐ Contractor for state

☐ PRP in-house ☐ Contractor for PRP

☐ Federal facility in-house ☐ Contractor for Federal facility

☒ Current Site owners

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

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

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

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

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

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: Fencing is present, but is not part of remedy.

B. Other Access Restrictions

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

Remarks: Signs are present, but are not part of remedy. 2013 FYR Report recommended considering placing warning signs to deter unauthorized disturbance of the capped areas; such signs have not been added.

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): self-reporting

Frequency: NA

Responsible party/agency: Site owners

Contact	Site property owners	Site property owners	NA	_____
	Name	Title	Date	Phone no.

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

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

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

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

Other problems or suggestions: ☐ Report attached

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

Remarks: Although adequate, institutional controls have not been enforced; the cap has been cut and removed without EPA approval.

D. General

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

Remarks: _____

2. **Land Use Changes On Site** ☒ N/A

Remarks: _____

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

Remarks: _____

VI. GENERAL SITE CONDITIONS

A. Roads ☐ Applicable ☒ N/A

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

Remarks: _____

B. Other Site Conditions

Remarks: _____

VII. LANDFILL COVERS ☒ Applicable ☐ N/A

A. Landfill Surface

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

Arial extent: _____ Depth: _____

Remarks: _____

2.	**Cracks**	☐ Location shown on site map	☐ Cracking not evident
	Lengths: _____	Widths: _____	Depths: _____
	Remarks: There are many deep cracks in the treatment yard property; the few cracks on the Storage Yard property are shallow.		
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: The asphalt cap on the treatment yard property has several holes, including areas where the cap was cut and removed during the Sharp Energy propane storage facility installation.		
5.	**Vegetative Cover**	☐ Grass	☐ Cover properly established
	☐ No signs of stress	☐ Trees/shrubs (indicate size and locations on a diagram)	
	Remarks: The cover is asphalt, not vegetated.		
6.	**Alternative Cover** (e.g., armored rock, concrete)		☒ N/A
	Remarks: Asphalt cap has cracks and holes, as noted above.		
7.	**Bulges**	☐ Location shown on site map	☒ Bulges not evident
	Arial extent: _____		Height: _____
	Remarks: _____		
8.	**Wet Areas/Water Damage**	☒ Wet areas/water damage not evident	
	☐ Wet areas	☐ Location shown on site map	Arial extent: _____
	☐ Ponding	☐ Location shown on site map	Arial extent: _____
	☐ Seeps	☐ Location shown on site map	Arial extent: _____
	☐ Soft subgrade	☐ Location shown on site map	Arial extent: _____
	Remarks: _____		
9.	**Slope Instability**	☐ Slides	☐ Location shown on site map
	☒ No evidence of slope instability		
	Arial extent: _____		
	Remarks: _____		
B. Benches		☐ Applicable	☒ N/A
	(Horizontally constructed mounds of earth placed across a steep landfill side slope to interrupt the slope in order to slow down the velocity of surface runoff and intercept and convey the runoff to a lined channel.)		
1.	**Flows Bypass Bench**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		
2.	**Bench Breached**	☐ Location shown on site map	☐ N/A or okay
	Remarks: _____		

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

Remarks: _____

C. Letdown Channels ☐ Applicable ☒ N/A

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

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

Arial extent: _____ Depth: _____

Remarks: _____

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

Material type:_____ Arial extent: _____

Remarks: _____

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

Arial extent: _____ Depth: _____

Remarks: _____

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

Arial extent: _____ Depth: _____

Remarks: _____

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

☐ Location shown on site map Arial extent: _____

Size: _____

Remarks: _____

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

☐ No evidence of excessive growth

☐ Vegetation in channels does not obstruct flow

☐ Location shown on site map Arial extent: _____

Remarks: _____

D. Cover Penetrations ☐ Applicable ☒ N/A

1. **Gas Vents** ☐ Active ☐ Passive

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

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

Remarks: _____

2. **Gas Monitoring Probes**

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

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

Remarks: _____

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

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

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

Remarks: _____

4. **Extraction Wells Leachate**

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

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

Remarks: _____

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

Remarks: _____

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

1. **Gas Treatment Facilities**

☐ Flaring ☐ Thermal destruction ☐ Collection for reuse

☐ Good condition ☐ Needs maintenance

Remarks: _____

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

☐ Good condition ☐ Needs maintenance

Remarks: _____

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

☐ Good condition ☐ Needs maintenance ☐ N/A

Remarks: _____

F. Cover Drainage Layer ☐ Applicable ☒ N/A

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

Remarks: _____

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

Remarks: _____

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

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

☐ Siltation not evident

Remarks: _____

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

☐ Erosion not evident

Remarks: _____

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

Remarks: _____

4. **Dam** ☐ Functioning ☐ N/A

Remarks: _____

H. Retaining Walls ☐ Applicable ☒ N/A

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

   Horizontal displacement: _____ Vertical displacement: _____

   Rotational displacement: _____

   Remarks: _____

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

   Remarks: _____

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

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

   Area extent: _____ Depth: _____

   Remarks: _____

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

   ☐ Vegetation does not impede flow

   Area extent: _____ Type: _____

   Remarks: _____

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

   Area extent: _____ Depth: _____

   Remarks: _____

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

   Remarks: _____

VIII. VERTICAL BARRIER WALLS ☐ Applicable ☒ N/A

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

   Area extent: _____ Depth: _____

   Remarks: _____

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

   ☐ Performance not monitored

   Frequency: _____ ☐ Evidence of breaching

   Head differential: _____

   Remarks: _____

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

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

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

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

   Remarks: _____

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

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

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

Remarks: _____

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

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

☐ Good condition ☐ Needs maintenance

Remarks: _____

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

☐ Good condition ☐ Needs maintenance

Remarks: _____

3. **Spare Parts and Equipment**

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

Remarks: _____

C. Treatment System ☐ Applicable ☒ N/A

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

☐ Metals removal ☐ Oil/water separation ☐ Bioremediation

☐ Air stripping ☐ Carbon absorbers

☐ Filters: _____

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

☐ Others: _____

☐ Good condition ☐ Needs maintenance

☐ Sampling ports properly marked and functional

☐ Sampling/maintenance log displayed and up to date

☐ Equipment properly identified

☐ Quantity of groundwater treated annually: _____

☐ Quantity of surface water treated annually: _____

Remarks: _____

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

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

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

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

Remarks: _____

4. **Discharge Structure and Appurtenances**

☐ N/A ☐ Good condition ☐ Needs maintenance

Remarks: _____

5. **Treatment Building(s)**

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

☐ Chemicals and equipment properly stored

Remarks: _____

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

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

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

Remarks: _____

D. Monitoring Data

1. **Monitoring Data**

☐ Is routinely submitted on time ☐ Is of acceptable quality

2. **Monitoring Data Suggests:**

☐ Groundwater plume is effectively contained ☐ Contaminant concentrations are declining

E. Monitored Natural Attenuation

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

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

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

Remarks: _____

X. OTHER REMEDIES

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

XI. OVERALL OBSERVATIONS

A. Implementation of the Remedy

Describe issues and observations relating to whether the remedy is effective and functioning as designed. Begin with a brief statement of what the remedy is designed to accomplish (e.g., to contain contaminant plume, minimize infiltration and gas emissions).

The asphalt cap is designed to prevent receptor exposure to contaminated soils under the Site. Institutional controls are in place to prevent damage to the cap. However, violations of the institutional controls have occurred. Site inspection participants noted several locations on the Treatment Yard area where the cap has been cut and removed. There are also many cracks in the asphalt cap on the Treatment Yard area.

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.

The asphalt caps was repaired in January 2018. The Treatment Yard cap has many deep cracks and exposed areas; plants and small saplings are growing through the cap in many places. The Storage Yard cap has some shallow, surficial cracks.

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.

None identified.

D.	Opportunities for Optimization
	Describe possible opportunities for optimization in monitoring tasks or the operation of the remedy. None identified.

Site Inspection Roster:
Mark Conaron (EPA Region 3 RPM)
Aaron Mroz (EPA Region 3)
Martin Gehlhaus (EPA Region 3)
Katie Matta (EPA Region 3)
Dixon Wood (MDE)
Storage Yard property owner
Hagai Nassau (Skeo)
Amanda Goyne (Skeo)

APPENDIX D – PRESS NOTICE

EPA REVIEWS CLEANUP

Mid-Atlantic Wood Preservers

The U.S. Environmental Agency (EPA) is reviewing the cleanup that was conducted at the Mid-Atlantic Wood Preservers, Inc. Superfund Site located in Harmans, near the BWI airport. EPA inspects sites regularly to ensure that cleanups conducted remain protective of human 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 September 2018.

For questions or to provide site-related information for the review:

Contact: Larry Johnson, *Community Involvement Coordinator*
Phone: 215-814-3239
Email: johnson.larry-c@epa.gov

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

Protecting human health and the environment

APPENDIX E – SITE INSPECTION PHOTOS

Boat repair shop on the Treatment Yard area

Deteriorated asphalt at the front of the Treatment Yard area

Repaired asphalt at the front of the Treatment Yard area

Cracks in the asphalt cap at the Treatment Yard area

Damaged rain gutter at the Treatment Yard area

Propane distribution business on the Treatment Yard area

Propane distribution business on the Treatment Yard area

Area where asphalt cap was cut and removed during propane tank installation at the Treatment Yard area

Repaired Propane Tank installation in the Treatment Yard area

Areas where asphalt cap was cut and removed during propane tank installation at the Treatment Yard area

Repaired asphalt from the propane tank installation in the Treatment Yard area

Area where asphalt cap was cut and removed during propane tank installation at the Treatment Yard area

Repaired asphalt from the propane tank installation on the Treatment Year area

Entrance to the Storage Yard area

The Storage Yard area

The Storage Yard area

APPENDIX F – DETAILED ARARs REVIEW TABLES

CERCLA Section 121(d)(1) requires that Superfund remedial actions attain "a degree of cleanup of hazardous substance, pollutants, and contaminants released into the environment and control of further release at a minimum which assures protection of human health and the environment." The remedial action must achieve a level of cleanup that at least attains those requirements that are legally applicable or relevant and appropriate. In performing the FYR for compliance with ARARs, only those ARARs that address the protectiveness of the remedy are reviewed.

Groundwater ARARs
The 1990 ROD identified the following ARARs for groundwater:

- Federal MCLs and non-zero maximum contaminant level goals (MCLGs).
- State of Maryland requirements contained in Code of Maryland Regulations 26.04.01 pertaining to drinking water quality standards.

Table F-1 compares the current values of the groundwater ARARs against their values at the time of the 1990 ROD. Although the 1990 ROD listed chromium as the only groundwater COC, this ARAR review evaluates arsenic and copper. These contaminants were excluded as COCs because their concentrations were below the 1990 ARARs. Since the 1990 ROD, the ARAR for arsenic has become more stringent and the ARAR for chromium has become less stringent. The ARAR for copper has not changed.

Table F-1: Previous and Current ARARs for Groundwater

Contaminant	1990 ARAR (µg/L)		Current ARAR (µg/L)		ARAR Change
	Federal[a]	State[a]	Federal[b]	State[c]	
Arsenic	50	50	10	10	More stringent
Chromium	50	50	100[d]	100	Less stringent
Copper	1,300 proposed	NA	1,300	N/A	No change

Notes:
a. 1990 ROD, pages 10 and 12
b. Current federal standards can be found at: https://www.epa.gov/ground-water-and-drinking-water/table-regulated-drinking-water-contaminants (accessed 3/27/2018).
c. Current state standards can be found at: http://www.mde.state.md.us/programs/Water/Water_Supply/Pages/Regulations.aspx (accessed 3/27/2018). The standards for arsenic and chromium can be found at http://www.dsd.state.md.us/comar/comarhtml/26/26.04.01.06.htm. The state regulation for copper (at http://www.dsd.state.md.us/comar/comarhtml/26/26.04.01.06-2.htm) requires water suppliers to comply with the federal standard.
d. ARAR is for total chromium
NA = not available

Soil ARARs
The 1990 ROD did not specify ARARs for soil. EPA developed soil cleanup goals to protect human health based on ingestion of soil.

Surface Water ARARs
The 1990 ROD identified the following surface water ARARs:

- Federal Ambient Water Quality Criteria.
- State of Maryland requirements contained in Code of Maryland Regulations 26.08.01 through 26.08.04 pertaining to water pollution regulations.

The 1990 RI analyzed three surface water samples. All three samples were below the detection limits for arsenic, chromium and copper. Table F-2 compares the current values of the surface water ARARs against the detection limits from the RI. As shown in Table F-2, some of the current surface water ARARs are more stringent than the detection limits achieved during the 1990 RI.

Table F-2: Current ARARs for Surface Water

Contaminant	1990 RI Detection Limits (µg/L)[a]	Current ARAR (µg/L)			
		Federal[b]		State[c]	
		Aquatic life (freshwater, chronic)	**Human health** (water + organism)	**Aquatic life** (freshwater, chronic)	**Human health** (water + organism)
Arsenic	10	150	0.018	150	0.18
Chromium	10	74[d] (Cr III) 11 (Cr VI)	100 (total Cr)[e]	74 (Cr III) 11 (Cr VI)	100 (total Cr)
Copper	4.0	9[f]	1,300	9	1,300

Notes:

a. RI Report, page 4-1. All three surface water samples were below these detection limits.
b. National Recommended Water Quality Criteria can be found at: https://www.epa.gov/wqc/national-recommended-water-quality-criteria (accessed 3/27/2018). This table presents the more stringent values (aquatic life chronic, human health water + organism) rather than the less stringent values (aquatic life acute, human health organism only).
c. Maryland's surface water standards can be found at: http://www.dsd.state.md.us/comar/comarhtml/26/26.08.02.03-2.htm (accessed 3/27/2018). This table presents the more stringent values (aquatic life chronic, human health water + organism) rather than the less stringent values (aquatic life acute, human health organism only).
d. Based on hardness of 100 mg/L.
e. Based on MCL.
f. EPA's aquatic life criteria for copper can be found at https://www.epa.gov/wqc/aquatic-life-criteria-copper and in "Aquatic Life Ambient Freshwater Quality Criteria – Copper," February 2007, EPA-822-R-07-001, page 19, https://nepis.epa.gov/Exe/ZyPDF.cgi/P1000PXC.PDF?Dockey=P1000PXC.PDF.

mg/L = milligrams per liter

APPENDIX G – REVIEW OF HISTORICAL DATA

Table G-1: Groundwater Sampling Data

Sample Location	Groundwater Concentration (mg/L)								
	First Round (December 1993)			Second Round (November 1996 and February 1997)			Third Round (February 1999)		
	Arsenic	Chromium (III)	Copper	Arsenic (dissolved)	Chromium (dissolved)	Copper (dissolved)	Arsenic (dissolved)	Chromium (dissolved)	Copper (dissolved)
MW-1	ND	ND	ND	ND	0.0074	ND	ND	ND	ND
MW-20 (MW-1 duplicate)	NS	NS	NS	NS	NS	NS	ND	ND	ND
MW-2	ND	0.08	ND	NS	NS	NS	NS	NS	NS
MW-3	ND	ND	ND	NS	NS	NS	NS	NS	NS
MW-4	ND	ND	ND	NS	NS	NS	NS	NS	NS
MW-5	ND	ND	ND	NS	NS	NS	NS	NS	NS
MW-6	ND	ND	ND	NS	NS	NS	NS	NS	NS
MW-7	ND	ND	ND	NS	NS	NS	NS	NS	NS
MW-8	ND	0.14	ND	NS	NS	NS	NS	NS	NS
MW-9	ND	ND	ND	NS	NS	NS	NS	NS	NS
MW-10	ND	0.06	ND	NS	NS	NS	NS	NS	NS
GW-1	NS	NS	NS	ND	0.014	0.0074	ND	0.008	0.006
GW-2	NS	NS	NS	ND	0.0082	0.0078	0.028	0.063	0.009
GW-5 (GW-2 duplicate)	NS	NS	NS	ND	0.018	0.0057	NS	NS	NS
Detection limit	0.005	0.06	0.03	0.005	0.005	0.005	0.005	0.005	0.005

Notes:
The groundwater cleanup goal for chromium is 0.1 mg/L.
mg/L = milligrams per liter
NS = not sampled
ND = concentration was below detection limit

Table G-2: Surface Water Sampling Data

Sample Location	Surface Water Concentration (mg/L)								
	First Round (December 1993)			Second Round (November 1996)			Third Round (February 1999)		
	Arsenic	Chromium (III)	Copper	Arsenic (total)	Chromium (total)	Copper (total)	Arsenic (total)	Chromium (total)	Copper (total)
SW-1	0.007	ND	ND	ND	ND	ND	ND	ND	ND
SW-2	ND	ND	ND	ND	ND	ND	ND	ND	ND
SW-3	ND	ND	ND	ND	ND	ND	ND	ND	ND
SW-4 (SW-2 duplicate)	NS	NS	NS	NS	NS	NS	ND	ND	ND
Detection limit	0.005	0.06	0.03	0.005	0.005	0.005	0.005	0.005	0.005

Notes:
mg/L = milligrams per liter
NS = not sampled
ND = concentration was below detection limit

Table G-3: Sediment Sampling Data

Sample Location	Sediment Concentration (mg/kg)								
	First Round (December 1993)			Second Round (November 1996)			Third Round (February 1999)		
	Arsenic	Chromium (III)	Copper	Arsenic (total)	Chromium (total)	Copper (total)	Arsenic (total)	Chromium (total)	Copper (total)
SD-1	0.70	ND	ND	ND	ND	6.5	ND	ND	4.0
SD-2	1.1	ND	ND	ND	ND	3.9	ND	ND	3.3
SD-3	7.1	9.3	8.4	ND	ND	6.2	ND	ND	3.0
SD-4 (SD-2 duplicate)	NS	NS	NS	NS	NS	NS	ND	ND	7.4
Detection limit	0.25	4.0	2.0	15	4.0	3.0	15	4.0	3.0

Notes:
mg/kg = milligrams per kilogram
NS = not sampled
ND = concentration was below detection limit

APPENDIX H – TOXICITY REVIEW

This FYR compared the Site's arsenic and chromium soil cleanup goals against the current EPA soil screening levels. As shown in Table I-1, this comparison found that the soil cleanup goals are below or within EPA's range of acceptable risk for residential exposures. Screening levels for commercial/industrial exposures are less stringent than screening levels for residential exposures, so the Site's soil cleanup goals are also below or within EPA's range of acceptable risk for commercial/industrial exposures.

Table I-1: Health Evaluation of Soil Cleanup Levels

COC	1990 ROD Cleanup Level (mg/kg)	2018 EPA Residential Screening Level[a] (mg/kg)		Cancer Risk[b]	Noncancer HQ[c]
		1×10^{-6} Risk	HQ=1.0		
Arsenic	10	0.68	35	1.5×10^{-5}	0.3
Hexavalent chromium	2.0	0.3	230	6.7×10^{-6}	0.01

Notes:

a. Current EPA Regional Screening Levels (RSLs), dated November 2017, are available at https://www.epa.gov/risk/regional-screening-levels-rsls-generic-tables-november-2017 (accessed 3/27/2018).

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 = (cleanup level ÷ cancer-based RSL) × 10^{-6}.

c. The noncancer hazard quotients (HQs) were calculated using the following equation:
HQ = cleanup level ÷ noncancer-based RSL.

mg/kg – milligrams per kilogram