REGION 3
PHILADELPHIA, PA 19103

DOCUMENTATION OF LONG TERM STERWARSHIP ASSESSMENT
RCRA Corrective Action
Long Term Stewardship (LTS) RCRIS code: CA88P2
Completed by: Quinton Ulrich
Date: 10/8/2025

Babcock & Wilcox Nuclear Operations Group
EPA ID: VAD046960449
1570 Mount Athos Road, Lynchburg, VA 24504

Long Term Stewardship Assessment Summary:

On August 8, 2025, the United States Environmental Protection Agency's (USEPA) Land, Chemicals, and Redevelopment Division (LCRD) representatives, Quinton Ulrich, Amanda Michel, and Khai Dao, conducted a long-term stewardship assessment site visit of the Babcock & Wilcox Nuclear Operations Group Corrective Action Cleanup site (Facility) in Lynchburg, Virginia.

EPA has determined that the Facility is in compliance with EPA's Final Decision and Response to Comments (FDRTC). EPA concludes that the implemented engineering and institutional controls are effective in meeting the objectives of protection of human health and the environment. Babcock & Wilcox Nuclear Operations Group will continue the operation and maintenance of the Facility's landfill caps, monitoring systems, groundwater remediation system, and the compliance with and maintenance of institutional and engineering controls.

Introduction:

Long-term stewardship (LTS) refers to the activities necessary to ensure that engineering controls (ECs) are maintained, institutional controls (ICs) continue to be enforced, and the remedy is protective based on current uses and exposures. The purpose of the EPA Region 3 LTS program is to periodically assess the efficacy of the implemented remedies and to update the community on the status of the RCRA Corrective Action facilities. The assessment is conducted in two-fold, which consists of a record review and a field inspection, to ensure that the remedies are implemented and maintained in accordance with the final decision.

Facility Background:

The Facility is located at 1570 Mount Athos Road in Lynchburg, Virginia in the northeast corner of Campbell County. The property consists of a 525-acre parcel along an oxbow of the James River and is situated approximately 2 miles east-northeast (downstream) of the City of Lynchburg.

The Facility is split into two sections, with one area owned and operated by Babcock & Wilcox Nuclear Operations Group (the B&W Property) and the other owned and operated by AREVA Federal Services (the AREVA Property). Manufacturing operations at the site include the management of nuclear materials and the fabrication of fuel-bearing precision components that serve as power units for the United States Nuclear Navy. AREVA also supports commercial nuclear utility outages, maintenance, and infrastructure/facility inspections.

In 1996, an RFI was completed at the facility which identified three main areas and two smaller areas of groundwater containing volatile organic compounds (VOCs).

- Groundwater Area A (B&W Property)
- Groundwater Area B (B&W Property)
- Groundwater Area C (B&W Property/AREVA Property)
- Landfill 1 (B&W Property; contains the two small groundwater VOC areas)

Sample results indicated that constituents of concern for Facility groundwater and surface water include trichloroethylene (TCE), tetrachloroethylene (PCE), and their breakdown products cis-1,2-dichloroethylene (cis-1,2-DCE) and vinyl chloride.

Landfill 1 consisted of eight trenches over an approximate 1-acre area to the west of Groundwater Area A. The trenches were used to dispose of sludges and filter cakes containing 45 percent calcium fluoride, 40 percent zirconium hydrous oxide, 10 percent calcium hydroxide, and 5 percent calcium sulfate generated by the site wastewater treatment system. The filter cakes also contained hydroxides of metals including iron, copper, aluminum, and potentially zirconium metal chips. Soil and waste sludge sampling, soil gas surveys, and groundwater monitoring completed in Landfill 1 confirmed the presence of PCE and TCE in both soil and groundwater. Low-level radioactive material was also detected in waste sludges and soil in two of the eight trenches. Both trenches were successfully excavated, and a Nuclear Regulatory Commission (NRC) survey was completed for the area's closure. The filter cake was also later excavated from Landfill 1 by B&W. All excavated soils and filter cake material was managed as Mixed Waste containing low-level radioactive and hazardous waste and shipped to a licensed mixed waste disposal facility. Landfill 1 remains under NRC jurisdiction for closure.

A Human Health Risk Assessment (HHRA) was completed to evaluate groundwater for an industrial exposure scenario. Potential receptors including outdoor maintenance workers, outdoor construction workers, and trespassing children were assessed for exposure to VOCs and metals-bearing media including surface and subsurface soils, sediment (from small surface water drainage features at the Facility), and surface water (from springs and small surface water drainage features at the Facility). The HHRA concluded that neither VOCs nor metals posed a significant risk to human health under the industrial land use scenario.

While several remedial approaches were evaluated for site groundwater including Soil Vapor Extraction, Vacuum-Enhanced Pumping, and In-Situ Air Sparging, pilot tests indicated that none of the methodologies were effective in lowering TCE concentrations in Groundwater Area A. EPA ultimately determined that due to the difficulty and scale of groundwater impacts, the

restoration of the Facility groundwater to the Maximum Contaminant Levels (MCLs) is technically impracticable within the plume zones.

A Final Decision and Response to Comments was issued by EPA in 2015 which selected remedies for the Facility. The remedies applied to the property consist of Groundwater and Land Use restrictions implemented through Institutional Controls (ICs), continued operation of the Groundwater Pump-and-Treat system, groundwater monitoring until groundwater cleanup standards are met, and the implementation of a Material Management Plan for soils excavated from Groundwater Area A, Groundwater Area B, and Landfill 1.

Current Site Use:
Current Facility operations are similar to historical operations and include management of nuclear materials and the fabrication of fuel-bearing precision components to serve as power units for the nuclear navy.

Long-term Stewardship Site Visit:
On August 28, 2025, EPA conducted a long-term stewardship site visit with representatives from both BWXT Technologies, Inc and VADEQ to discuss and assess the status of the implemented remedies at the Facility.

The attendees were:

Name	Organization	Email Address	Phone No.
Quinton Ulrich	USEPA Region III	Ulrich.Quinton@epa.gov	(215) 814-2708
Khai Dao	USEPA Region III	Dao.Khai@epa.gov	(215) 814-5467
Amanda Michel	USEPA Region III	Michel.Amanda@epa.gov	(215) 814-2709
Ryan Kelly	VADEQ	Ryan.Kelly@deq.virginia.gov	(804) 659-1377
Lucas Lesniak	BWX Technologies, Inc	LJLesniak@bwxt.com	(434) 522-6395
Todd Nash	BWX Technologies, Inc	WTNash@bwxt.com	(434) 522-5496
Aidan Morse	BWX Technologies, Inc	ARMorse@bwxt.com	(434) 522-6470

Implementation Mechanism(s):
The Implementation Mechanism is the method for implementing Institutional Controls (ICs) and Engineering Controls (ECs) and other continuing obligations required as a condition of the Final Decision. At this Facility ICs for both Groundwater Use and Land Use are implemented through an environmental covenant. ECs are implemented pursuant to the Facility's Post-Remedial Care Plan and Materials Management Plan. The following ICs and ECs apply to the Facility

Institutional Controls (ICs) Status:
Groundwater Use Restriction: Groundwater at the property shall not be used for any purpose other than to conduct the operation, maintenance, and monitoring activities by VADEQ, EPA, or the NRC, unless it is demonstrated to EPA that such use will not pose a threat to human health or the environment or adversely affect or interfere with the selected remedy and EPA provide prior written approval for such use. BWXT is currently in compliance with the above use restriction.

Technical Impracticability Zones (TI Zones) and Well Restriction: One landfill TI zone and three groundwater TI zones (Areas A, B, and C) were established as part of the Facility's Environmental Covenant. To prevent potential exposure to residual groundwater contaminants, no new wells, used for any purpose other than to conduct the operation, maintenance, and monitoring activities required by the VADEQ, EPA, or the NRC shall be installed on the property unless it is demonstrated to EPA that such wells are necessary to implement the selected remedy and EPA provides prior written approval to install such wells. No unauthorized groundwater wells were observed at the time of the visit. One monitoring well, MWA-35, was abandoned and relocated with EPA approval to avoid damage during the installation of a new on-site building.

Residential Land Use Restriction: The property shall not be used for residential purposes unless it is demonstrated to EPA that such use will not pose a threat to human health and the environment or adversely affect or interfere with the selected remedy, and EPA provides prior written approval for such use. No residential structures were observed at the facility at the time of the visit.

Materials Management Plan / Earth-Moving Restriction: Excavations or other earthmoving work completed within the three groundwater TI areas are subject to the site-specific Materials Management Plan (MMP) which was developed alongside the site's Statement of Basis. The MMP contains specific management protocols for soil, groundwater, and storm water within the TI areas, as well as requirements for record-keeping, transportation, and disposal. Soils being generated during shallow excavations associated with utilities and for the new on-site building were being managed in accordance with the site's MMP. The facility confirmed soils were being characterized and either returned to the excavation or relocated for storage.

Engineering Controls (ECs) Status:

Groundwater Recovery System and Routine Monitoring: The operation of an on-site Groundwater Recovery System along with routine groundwater sampling until groundwater cleanup standards are met is included as part of the Final Decision and Post-Remedial Care Plan for the facility. Groundwater monitoring results are submitted to EPA via annual report submittal. The recovery system is located in TI Area A (Figure 1). The Groundwater Recovery System was operational at the time of the visit.

Vapor Intrusion Mitigation Systems: A vapor intrusion control system, the design of which shall be approved in advance by EPA, shall be installed in each new structures constructed either above the contaminated groundwater plume or within 100-feet of the perimeter of the three on-site TI zones (Groundwater Areas A, B, and C), unless it is demonstrated to EPA that vapor intrusion does not pose a threat to human health and EPA provides prior written approval that no vapor intrusion control system is needed. The Facility confirmed that current vapor intrusion mitigation systems were inspected according to the post-installation care plans and the applicability of a vapor intrusion mitigation system for the new on-site building is currently being assessed.

On-Site Landfills: Three landfills are located within the Facility. Landfill 1 was created between 1973 and 1977 to store filter cake solids generated during the treatment of wastewater from on-site metal pickling. The landfill was then covered in soil and allowed to re-vegetate naturally. Landfills 2A and 2B were created in 1970 to store wastewater treatment plant sludges. Both Landfill 2A and 2B were closed in 2009 under VADEQ oversight with contaminated soils left in-

place and capped using engineered soil covers. The locations of all three landfills are included on Figure 1. During the visit, the facility confirmed that all landfill caps are inspected monthly, and groundwater monitoring occurs quarterly. All landfill caps and associated monitoring wells appeared to be in good condition at the time of the visit.

Financial Assurance:

Financial assurance for post-closure care is required for this Facility. The Facility maintains a standby trust agreement which demonstrates financial assurance for the decommissioning of non-Department of Energy operations performed at the site. Babcock & Wilcox are responsible for reassessing the adequacy of the trust's decommissioning funding every 3 years and completing annual cost adjustments to account for inflation. The last revision to the Financial Assurance for the facility was completed on April 1, 2025.

Reporting Requirements/Compliance:

The Facility is required to submit annual reports verifying the facility is still observing the activity and use limitations described in the Environmental Covenant.

The current owner of the facility is required to provide a minimum of 30 days notice to EPA if any of the following events occurs

I) Transfer of the property.
II) Changes in the use of the property from industrial.
III) Filing of applications for building permits for the Property and any proposals for property work inside a TI Zone, if such building or proposed Property work will affect the contamination of the property.

Based on a review of the documents uploaded to RCRAInfo and correspondence regarding planned and recently completed construction projects, the facility is compliant with its reporting requirements.

Mapping:

A geospatial mapping of the site and the areas of interest is presented in Figure 1.

Conclusions and Recommendations:

Conclusions

1. *The groundwater use restriction is being abided by*
2. *The residential land use restriction is being abided by*
3. *The soil management plan/earth moving restriction has been abided by.*
4. *The owner has submitted the required documentation verifying they are abiding by the activity and use limitations in the Environmental Covenant.*

Recommendations

1. *None. The site is in compliance.*

The Facility web fact sheet with additional information and available documents can be downloaded at https://www.epa.gov/hwcorrectiveactioncleanups/epa-rcra-id-vad046960449

Files Reviewed:

Alexander, Bevin R. (2017). *Corrective Action Environmental Covenant for BWXT Nuclear Operations Group (Formerly: Babcock and Wilcox) in Lynchburg, Virginia*. https://www.epa.gov/sites/default/files/2018-07/documents/ec_vad046960449.pdf

BWX Technologies, Inc. (2024). *Environmental Covenant 2023 Annual Report; BWXT Nuclear Operations Group – Lynchburg.*

BWX Technologies, Inc. (2025). *Environmental Covenant 2024 Annual Report; BWXT Nuclear Operations Group – Lynchburg.*

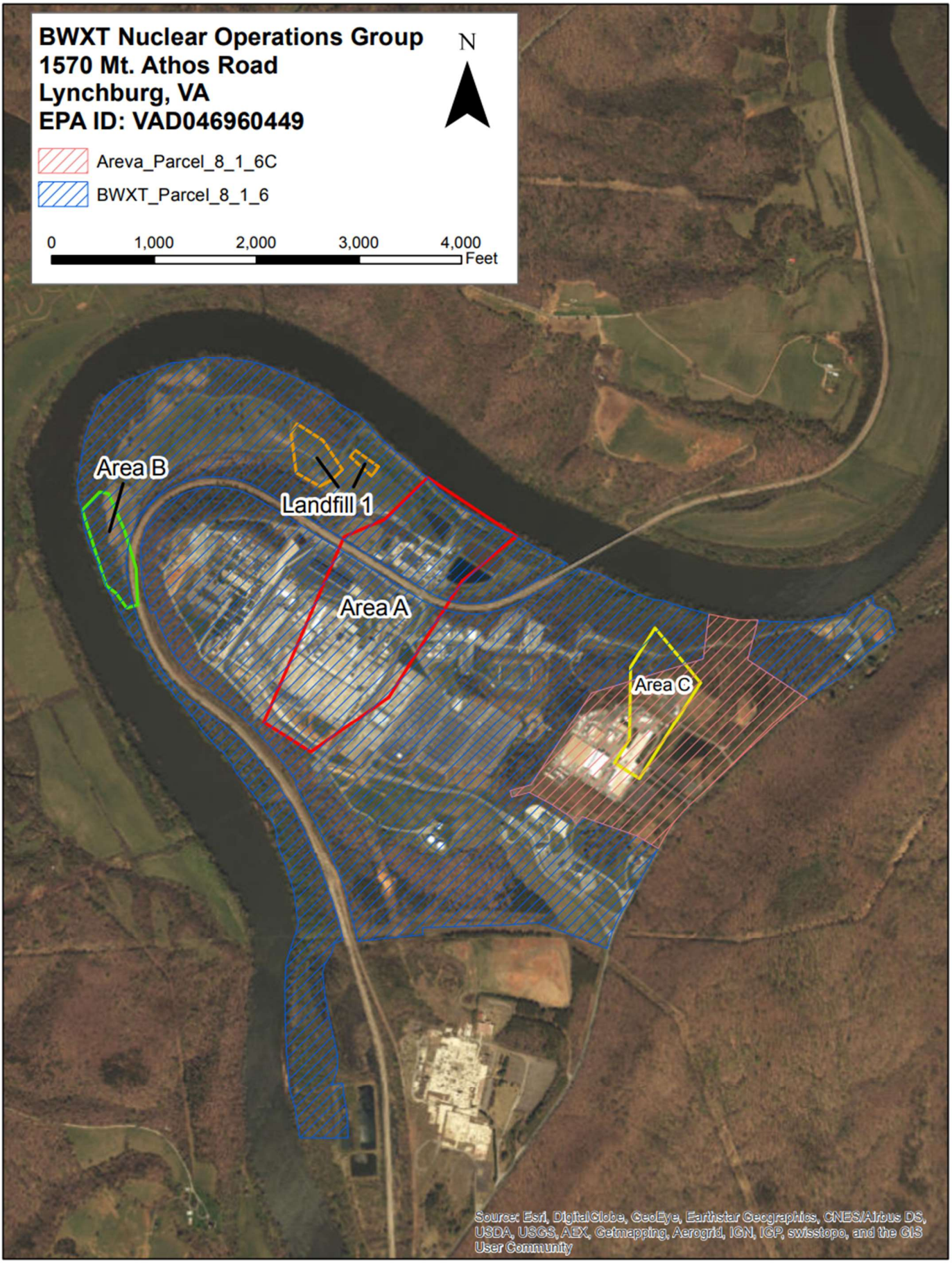
CB&I Federal Services, LLC (April 2016). *Final Materials Management Plan; BWXT Nuclear Operations Group. Inc.-Lynchburg.*

Environmental Standards, Inc. (2025). *Landfills 2A and 2B 2024 Annual Groundwater Monitoring Report*.

USEPA (2014). *Corrective Action Statement of Basis Babcock and Wilcox Nuclear Operations in Lynchburg, Virginia*. https://www.epa.gov/sites/default/files/2015-10/documents/babcockwilcoxl_sb.pdf

USEPA (2000-2025). *RCRAInfo [Internet].* USEPA Land, Chemicals, and Redevelopment Division. Retrieved from https://rcrainfo.epa.gov/rcrainfoprod/action/secured/login

Figure 1: Geospatial Site Map and Areas of Interest


BWXT Nuclear Operations Group
1570 Mt. Athos Road
Lynchburg, VA
EPA ID: VAD046960449
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Areva_Parcel_8_1_6C
BWXT_Parcel_8_1_6
0
1,000
2,000
3,000
4,000
Feet
Area B
Landfill 1
Area A
Area C
Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN, IGP, swisstopo, and the GIS User Community

Table 1
Corrective Action Remedy Summary
Areas of Implemented Engineering and Institutional Controls

Facility Name	Babcock & Wilcox Nuclear Operations Group			
Address	1570 Mount Athos Road, Lynchburg, VA 24504			
EPA ID Number	VAD046960449			
Are there restrictions or controls that address:	**Yes**	**No**	**Areas**	**Description of restrictions, controls, and mechanism**
Groundwater	X		Sitewide	Groundwater use prohibition; Groundwater recovery system
Residential Use	X		Sitewide	Residential land use restrictions established in Exhibit B of the EC
Excavation	X		Within the TI areas	Facility Materials Management Plan
Vapor Intrusion	X		Within the TI areas + within a 100-foot buffer zone	Vapor intrusion assessment/controls requirement as part of the TI areas established in Exhibit C of the EC
Capped Areas	X		Landfill 1, Landfill 2A, Landfill 2B	Landfill caps inspected and maintained, and groundwater monitoring completed as part of the EC
Other Engineering Controls		X		
Other Restrictions		X		

Remedial Review Questionnaire

IC Review and Assessment Questions:	**Yes**	**No**	**Notes**
• Have the ICs specified in the remedy been fully implemented? Implementation mechanism in place?	X		
• Do the ICs provide control for the entire extent of contamination (entire site or a specific portion)?	X		
• Are the ICs eliminating or reducing exposure of all potential receptors to known contamination?	X		
• Are the ICs effective and reliable for the activities (current and future) at the property to which the controls are applied?	X		
• Have the risk of potential pathway exposures addressed under Corrective Action changed based on updated screening levels and new technologies?	X		
• Are modifications to the IC implementation mechanism needed? (i.e., UECA Covenant, Permit or Order)		X	BWXT expressed interest in revising the site's Materials Management Plan to make the language used in the document clearer.
• Are there plans to develop or sell the property?		X	Facility operations will remain the same for the foreseeable future.
• Have all reporting requirements been met?	X		

Groundwater Review and Assessment Questions:	**Yes**	**No**	**Notes**
• Is groundwater onsite used for potable purposes?		X	
• Is the Facility connected to a public water supply?		X	
• Have any new wells been installed at the facility?	X		MWA-35 was relocated 50-feet from original location and MWA-30D was abandoned with EPA approval to accommodate new Bay AAA building footprint. No other installation/abandonment noted.

• Are the current groundwater flow rate and direction similar as mentioned in the previous studies?	X		
• Groundwater contaminants stable or decreasing in concentration?	X		Groundwater conditions appear stable.
• Are groundwater monitoring wells still in place (# wells)?	X		Approximately 144 wells based on historical documentation and recent abandonments/reinstallation
• Any evidence or reason to re-evaluate the number and location of monitoring points and/or monitoring frequency?		X	Current plan appears sufficient to monitor the TI areas.
• For wells where groundwater monitoring is no longer required, have the wells been decommissioned?		X	No decommissioning required.
• Is there evidence of monitored natural attenuation occurring in groundwater?	X		Groundwater contaminant concentrations appear stable.
• Has (active remediation system) been maintained as necessary?	X		Pump and treat system operational at the time of the visit.
• Is the (groundwater containment system) effectively containing COCs and protecting potential receptors (surface water body and/or groundwater resource) via hydraulic control?	X		
• Have notification letters been sent to the local POTW, County Department of Health, and Planning and Zoning Department regarding groundwater use restrictions?	X		

Surface and Subsurface Soil Review and Assessment Questions:	**Yes**	**No**	**Notes**
• Is the facility being used for residential purposes or purposes not covered by the IC?		X	
• Have there been recent construction or earth-moving activities or plans for such?	X		

Engineered Cap or Cover Review and Assessment Questions:	**Yes**	**No**	**Notes**
• Have geosynthetic/vegetative landfill caps (name) been properly maintained?	X		Caps appeared to be in good condition at the time of the visit.
• Have any repairs been necessary? (i.e., regrading, filling, root removal)	X		Caps appeared to be in good condition at the time of the visit.
• Is the leachate collection system operating and effectively preventing groundwater contamination?	X		Landfill-area groundwater monitoring does not currently show signs of contaminant migration.

Vapor Intrusion Review and Assessment Questions:	**Yes**	**No**	**Notes**
• Have there been construction of new structures within the vapor intrusion restriction zone(s)?	X		Construction is ongoing; need for vapor intrusion barrier is being assessed for the new building.
• Is the vapor intrusion mitigation system radius of influence effective for the structure in which its installed?	X		All buildings with active VI systems installed with EPA approval.

Miscellaneous Review and Assessment Questions:	**Yes**	**No**	**Notes**
• Is the security fence intact?	X		Access is heavily restricted by site security checkpoints.
• Is the appropriate signage posted?	X		Site access is heavily restricted.
• Has the Facility factsheet on EPA's website been revised with information from this LTS?	X		
• Are the Human Health and Groundwater EI determinations accurate?	X		

Site Photos Unavailable due to Security Restrictions