UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
Four Penn Center
1600 John F. Kennedy Boulevard
Philadelphia, Pennsylvania 19103-2852

SUBJECT: Long-term Stewardship Assessment
BAE Systems
EPA ID: PAD003025415
1100 Bairs Rd
York, PA 17404

DATE: May 25, 2023

TO: Alizabeth Olhasso, Chief
RCRA CA Section South

FROM: Todd Richardson, RPM
RCRA CA

Remedy Assessment Summary:
On February 8, 2023 the United States Environmental Protection Agency's (USEPA) Land Chemicals and Redevelopment Division (LCRD) representative, Todd Richardson, conducted a Long-term Stewardship Assessment of the BAE Systems (Facility), located at 1100 Bairs Rd., York, Pennsylvania. Based on the site visit and inspection, and file review including the most recent Pennsylvania Department of Environmental Protection's (PADEP) June 14, 2021 Groundwater Monitoring Evaluation (GME) Inspection Report, information gathered concludes that the Facility is meeting the objectives of the March 6, 2006 RCRA Corrective Action Permit (expired in 2016), EPA's final remedy selected in the April 1, 2005 Statement of Basis, and March 6, 2006 Final Decision Response to Comments (FDRC). The objectives set forth for the BAE Systems Facility in the RCRA Corrective Action Permit, and the Statement of Basis include groundwater treatment and monitoring with institutional controls. Measures taken by the Facility, including soil removal and vapor extraction have effectively reduced contaminant levels below PADEP's Residential State Health Standards, while the current and anticipated land use remains industrial. Regarding groundwater, one of the two groundwater treatment systems, continues to be maintained and operated to reduce persistent on-site VOC contamination, and prevent further off-site migration. In 2016, the groundwater treatment system associated with the West Warehouse Area (WWA) was shut down and subsequently decommissioned and removed in 2019, as monitoring data indicated that contaminant levels had significantly decreased, meeting Non-Residential (NR) State-Wide Health Standards. A Monitored Natural Attenuation Study has also shown that natural attenuation is also occuring in the WWA. In the Eastern Property Boundary Area (EPBA), including the Old Drum Storage Area (ODSA), natural attenuation does not appear to be occuring, and groundwater treatment continues. However, a Permeable Reactive Barrier (PRB) Pilot Study conducted in the EPBA has produced favorable

results in significantly reducing VOC contaminant levels. It is anticipated that an expansion of the PRB may not only be effective in further reducing VOC concentrations in the EPBA, and in the off-site migrating plume, but could also reduce oxygen conditions to a point which would support enhanced bio-augmentation.

Introduction:
Long-term stewardship (LTS) refers to the activities necessary to ensure that engineering controls (ECs) are maintained and that institutional controls (ICs) continue to be enforced. The purpose of the EPA Region 3 LTS program is to periodically assess the efficacy of the implemented remedies (i.e, ECs and ICs) and to update the community on the status of the RCRA Corrective Action facilities. The assessment is conducted in twofold, 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 consists of approximately 135 acres and is located approximately 5 miles south of the City of York, Pennsylvania. Owned and operated by United Defense, operations at the facility include manufacturing and repair of armored military vehicles, including machining and welding of steel and aluminum, alkaline cleaning and etching, and final finishing and painting. Hazardous waste generated at the facility includes waste solvents, waste paint and thinner, and metal hydroxide sludge. The largest waste stream consists of chromium wastewater, and acids from dipping tanks from chromate conversion coating of aluminum. Most of these wastes are treated at an on-site wastewater treatment plant and discharged under a National Pollutant Discharge Elimination System (NPDES) Permit, issued by PADEP. Treated wastewater is discharge to an un-named tributary which runs through the facility and discharges to Codorous Creek. The remaining hazardous waste is containerized in 55-gallon drums prior to being shipped for off-site disposal.

Mixed residential and light industrial areas are located to the west of the facility on Bairs Rd, with the nearest resident approximately ¼ mile north of the facility. The former Penn Central Rail Road right of way runs through the northern portion of the facility from southwest to northeast. General ground water flow direction beneath the facility is east-southeast. There are no drinking water wells on the facility. According to the US Department of Agriculture, the facility is underlain by the Conestoga and Kinzeres Formations.

Current Site Status:
The April 2021 Annual Operations and Maintenance Summary Report for the Groundwater Remediation Systems states that the Eastern Property Boundary Area (EPBA) groundwater remediation system continued to treat contaminated groundwater and prevent off-site contaminant migration during the reporting period. Three out of the ten EPBA wells contained concentrations of PCE above its MCL of 5 ug/L, with a maximum concentration of 17 ug/L. One EPBA well also contained trichloroethene (TCE) at a concentration of 9.2 ug/L, above its MCL of 5 ug/L. All wells with MCL exceedances continue to exhibit stable or decreasing trends in contaminant concentrations.

After receiving EPA approval, the West Warehouse Area (WWA) groundwater remediation system was shut down in September 2016 for attainment monitoring; a July 2019 Final Report demonstrating

attainment of the non-residential Statewide Health Standards in the WWA was approved by PADEP in August 2019

Based on review of the 2022 Annual Groundwater Monitoring Report, and the PADEP's 2021 Groundwater Monitoring Evaluation, the groundwater treatment and remediation systems are effectively treating and containing the PCE and TCE contaminant plume. Recent analytical sampling data indicated that historically elevated PCE and TCE concentration in the ODSA have significantly decreased as a result of the PRB installation. However, there are some areas on the EPBA, which based on recent analytical data (for MW-19S and MW-39), exhibit the potential for off-site contaminant migration. EPA recommends expansion of the PRB to address areas of potential off-site plume migration.

The Facility conducts Site-Wide Groundwater Monitoring to evaluate current groundwater quality, and to monitor changes in groundwater chemistry across the site. According to the 2021 Hydro Terra Site-Wide Groundwater Sampling Report:

Groundwater flow patterns across the site remain consistent with prior years, despite the 2022 shutdown of three EPBA wells (RW-19, MW-48, and MW-49)

- Two TCE plumes and one small PCE plume in the Main Production Area of the Facility; one PCE plume in the MW-39 area, and a comingled PCE and TCE plume in the ODSA. The While the Main Production Area plumes are stable, the delineated PCE plume in the vicinity of MW-39, is being captured by the active MW-39 recovery well. The ODSA plumes within the EPBA central area, previously captured by recovery wells RW-19, MW-48 and MW-49, but are now being passively treated through the PRB injection area, as part of the PRB Pilot Study. PRB treatment has been shown to be effective in reducing historically elevated concentrations of PCE and TCE, in the OSDA well MW-19s and inactive recovery well MW-19, to below NR Medium Specific Concentrations (MSCs).
- Current quarterly groundwater monitoring planned for the ODSA, and MW-39 Areas are considered to be adequate to monitor for potential risks of off-site migration in these areas.

EPA recommends the continuation of annual site-wide groundwater monitoring.

Long Term Stewardship Site Visit:

On February 8, 2023, EPA and PADEP representatives conducted a LTS site visit at the BAE Systems Facility in York, Pennsylvania. The purpose of the site visit was to meet with Facility representatives to discuss the implemented remedies at the site, including engineering and institution controls. A tour of the Facility was also conducted which included visual inspection of MRT Landfill cover, monitoring well network, PRB area, and groundwater treatment system areas.

The following is a list of attendees and their contact information:

Name	Organization	Email
Todd Richardson	EPA	ricahrdson.todd@epa.gov
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Ryan Myers	Hydro-Terra	rmyers@hydro-terra.com

Information presented in the LTS checklist below was reviewed and discussed during the site visit meeting.

IC Review and Assessment Questions:	**Yes**	**No**	**Notes**
Have the ICs specified in the remedy been fully implemented? Implementation mechanism in place?	X		Declaration of Restrictive Covenant and Indenture of Easement - April 3, 2007, recorded May 17, 2007 – Once plume has been remediated, restrictive covenant will cease – all plumes on site or break-out areas
Do the ICs provide control for the entire extent of contamination (entire site or a specific portion)?	X		Addresses entire site, but IC does not prevent off-site migration
Are the ICs eliminating or reducing exposure of all potential receptors to known contamination?	X		Ingestion of VOCs
Are the ICs effective and reliable for the activities (current and future) at the property to which the controls are applied?	X		Prevents ingestion of onsite VOCs
Have the risk of potential pathway exposures addressed under Corrective Action changed based on updated screening levels and new technologies?		X	No change in screening levels. VI Pathway - Current level of VOCs below VI screening levels – compared in 2022 SW GW Report

Are modifications to the IC implementation mechanism needed? (i.e. UECA Covenant, Permit or Order)		X	UECA Covenant may be required as part of future site wide cleanup plan under Act2/One Clean Up Program
Are there plans to develop or sell the property?		X	Industrial developed site with some redevelopment/site modifications
Have all reporting requirements been met?	X		Reporting DMRs, Annual and Quarterly Reports, etc. Clean Up plan, attainment report, final report (future)

Groundwater Remedy 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		RW-19, RW-39, PRB PZ/MW, MW-39 Area PZs
Are the current groundwater flow rate and direction similar as mentioned in the previous studies?	X		Generalized GW flow direction has not changed even since shutdown of MW-45, MW-47, RW-19, MW-48 and MW-49.
Groundwater contaminants stable or decreasing in concentration?	X		Fluctuations with ODSA, PRB area, but rest of site stable or decreasing
Are groundwater monitoring wells still in place (# wells)?	X		97 MWs, PZs, Pumping Wells, plus 6 deep BMY wells (not currently monitored)
Any evidence or reason to re-evaluate the number and location of monitoring points and/or monitoring frequency?	X		Reduced monitoring for MTR Landfill recommended (quarterly to annual sampling), keep/modify quarterly EPBA/PRB monitoring
For wells where groundwater monitoring is no longer required, have the wells been decommissioned?	X	X	23 wells abandoned since last LTS visit; additional wells could be abandoned (BMY). Wells needed for Site GW Flow
Is there evidence of monitored natural attenuation occurring in groundwater?	X	X	MNA Study in 2016 showed some evidence in OMSA and other areas, but not in ODSA or MW-39 Area. PRB Study enhanced conditions for ODSA.

Has (active remediation system) been maintained as necessary?	X		WW remediation system closed and decommissioned 2019/2020, EPBA controls & electrical system upgrade in 2022; relocated EPBA discharge line and Outfall in 2021
Is the (groundwater containment system) effectively containing COCs and protecting potential receptors (surface water body and/or groundwater resource) via hydraulic control?	X		RW-39 only current active pumping well in EPBA. ODSA under evaluation for passively treating VOCs with PRB (not currently pumping)
Have notification letters been sent to the local POTW, County Department of Health, and Planning and Zoning Department regarding groundwater use restrictions?	NA	NA	Land Use Letters sent to York Countyand West Manchester Twp as part of NPDES permit renewal (2020)

Land Use / Construction Activities Questions:	**Yes**	**No**	**Notes**
Is the facility being used for residential purposes?		X	
Have there been recent construction or earth-moving activities or plans for such?	X		Several building expansion projects ongoing; Potential for MW-6 or other well relocations

Engineered Cap or Cover Remedial Review and Assessment Questions:	**Yes**	**No**	**Notes**
Have geosynthetic/vegetative landfill caps (name) been properly maintained?	X		Documented in Quarterly and Annual Reports
Have any repairs been necessary? (i.e. regrading, filling, root removal)		X	
Is the leachate collection system operating and effectively preventing groundwater contamination?	X		30 years of GW monitoring data showing no GW impacts, No significant threat to GW from sampled primary and secondary sump leachate

Vapor Intrusion Remedial Review and Assessment Questions:	**Yes**	**No**	**Notes**
Have there been construction of new structures within the vapor intrusion restriction zone(s)?	NA	NA	
Is the vapor intrusion mitigation system radius of influence effective for the structure in which its installed?	NA	NA	

Miscellaneous Review and Assessment Questions:	**Yes**	**No**	**Notes**

Is the security fence intact?	X		
Is the appropriate signage posted?	X/NA		Non-Potable water sign on EPBA GWTS

Financial Assurance:
Financial assurance is required for this Facility. A financial assurance evaluation, which includes a review of site operation and maintenance costs, is completed annually by BAE Systems. Post Closure Care Costs allowances were confirmed, and current cost documentation was provided.

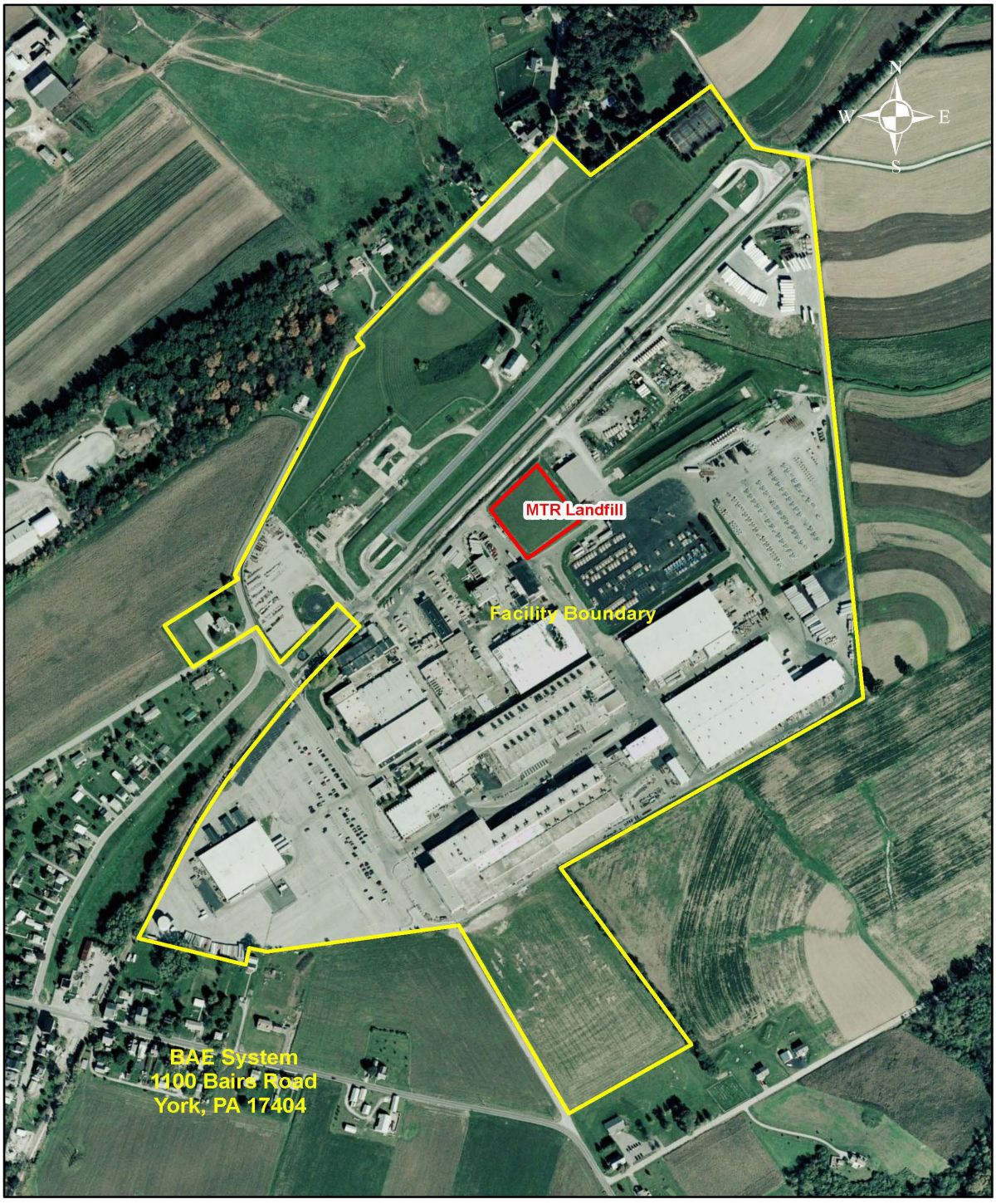
Reporting Requirements/Compliance:
All reporting requirements have been met. BAE Systems submits annual Sitewide Groundwater Sampling Reports, the last of which was received in January 2022 (report of 2021 groundwater sampling).

Mapping and Photographs:
The EPA facility website map is accurate and includes the approximately 135-acre BAE Systems York Facility property. A downloadable geospatial PDF map is available on EPA's corrective action facility webpage under the "Reports, Documents and Photographs" section, found at: https://www.epa.gov/sites/default/files/2016-03/documents/geospatialpdf_bae_systems.pdf
A Facility map and photographs taken during the 2/8/23 LTS site visit/inspection are included at the end of this report.

Conclusions and Recommendations:
Based on the file review, and LTS site visit conducted by the EPA and PADEP on February 8, 2023, EPA finds that the that institutional and engineering controls at the Facility continue to be effectively implemented and maintained. No deficiencies were noted. EPA recommends expansion of the PRB to address areas of potential off-site plume migration.

Files Reviewed:
2022 Annual GME Report, PADEP, 6/2021
2021 Sitewide Groundwater Sampling Report, Hydro Terra Group, 1/2022
MNA Report, Leidos Inc., 7/2016
Permeable Reactive Barrier Pilot Study, Analytical Reports, Eurofins, June – July, 2022
Statement of Basis, EPA, 4/2005
Final Decision Response to Comments, EPA, 3/2006
Environmental Covenant, EPA, 3/2006

Facility Map and Photos




Non-Export Controlled per PS-2023-DR-165
MW-24
BAE Systems - York, PA February 08, 2023

Non-Export Controlled per PS-2023-DR-165

Riparian Buffer

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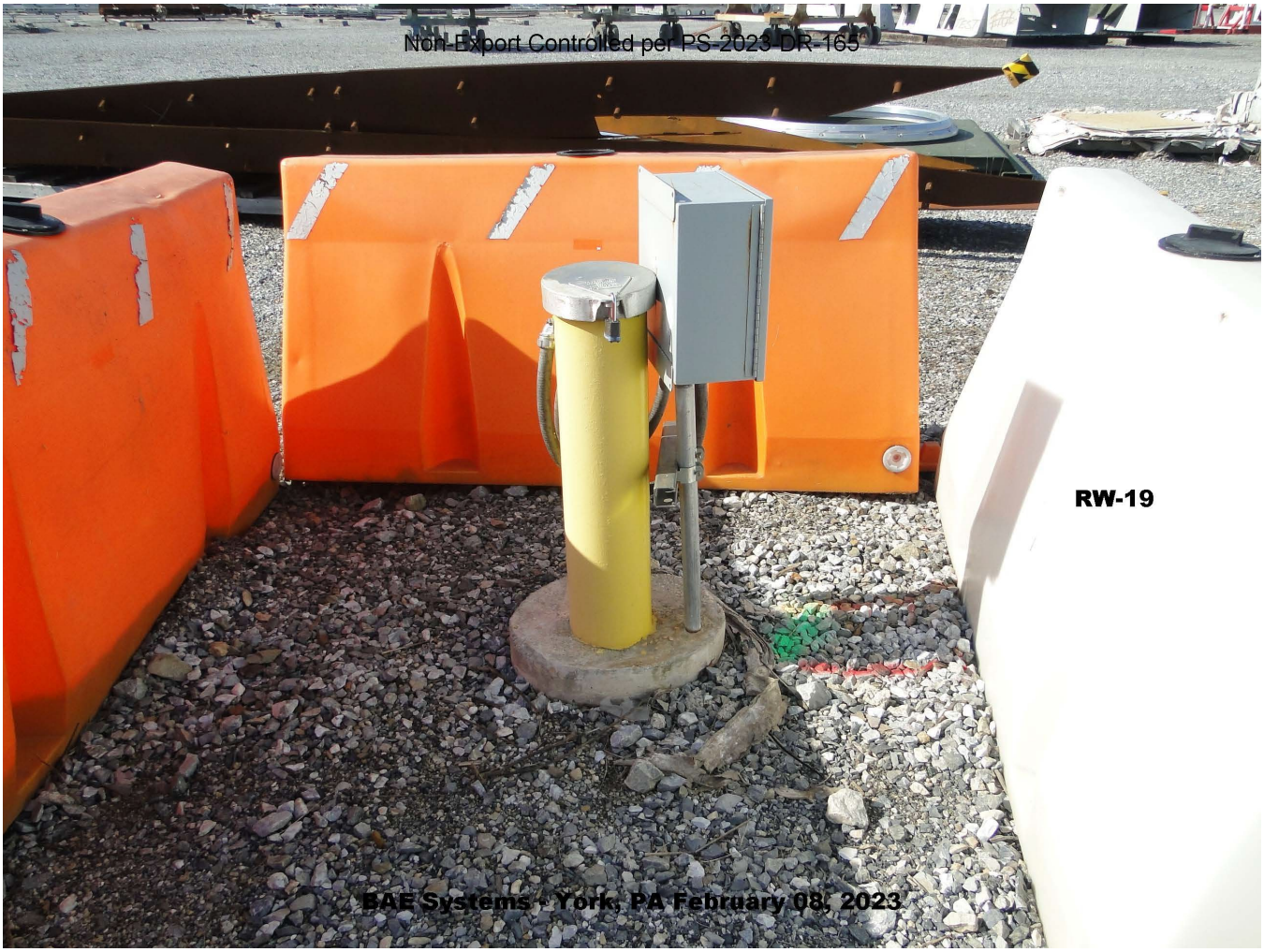
Non-Export Controlled per PS-2023-DR-165
cones identify location of PRB pilot study injection area
BAE Systems - York, PA February 08, 2023


Non-Export Controlled per PS-2023-DR-165
MW-19S
BAE Systems - York, PA February 08, 2023




Non-Export Controlled per PS-2023-DR-165
MW-19S
BAE Systems - York, PA February 08, 2023


Non-Export Controlled per PS-2023-DR-165
MW-1
BAE Systems - York, PA February 08, 2023

Non-Export Controlled per PS-2023-DR-165