

Semi-Annual Remediation Status Report

Former Philadelphia Energy Solutions Refinery
3144 West Passyunk Avenue, Philadelphia, PA

Prepared for

Philadelphia Energy Solutions Refining and Marketing LLC

Prepared by

Terraphase Engineering Inc.
100 Canal Pointe Boulevard, Suite 108
Princeton, New Jersey 08540

February 2022

Project Number P044.001.008



Contents

1	Introduction.....	1
2	136 Naphtha Release Area	2
3	No. 3 Separator Release Area.....	2
4	UDEX Release Area	3
5	Releases Occurring during Decommissioning and Demolition	4
5.1	860 Unit Cooling Tower and Hartranft Street Release Area	4
5.2	PB 881 Dike Roadway Release Area	4
6	Releases Identified during AST Closure	5
7	Closing	5

Figures

- 1 Post-2012 Release Areas Pursuing Act 2 Closure
- 2 Tank Groups



1 Introduction

On behalf of Philadelphia Energy Solutions Refining and Marketing LLC (PESRM), Terraphase Engineering Inc. (Terraphase) has prepared this *Semi-Annual Remediation Status Report* (Status Report) to document the progress of activities being completed by PESRM to characterize and remediate certain areas of the Former Philadelphia Energy Solutions Refinery (former PES; the Facility). The Facility, which is undergoing demolition in preparation for redevelopment, is located at 3144 West Passyunk Avenue, Philadelphia, Pennsylvania.

The releases discussed in this *Status Report* do not include those which are associated with “Pre-Existing Contamination” as defined in the Consent Order and Agreement (CO&A) among the Pennsylvania Department of Environmental Protection (PADEP), Evergreen¹, and PESRM, which are being addressed by Evergreen. In accordance with the CO&A, PESRM has assumed responsibility for releases of hazardous or regulated substances from the Facility which have been identified to have occurred after September 8, 2012. The releases discussed herein are:

1. A 2019 release of light naphtha from an aboveground line near 136 process unit at the former refinery (136 naphtha release);
2. A 2013 release from a process sewer near the No. 3 separator at the former refinery (No. 3 separator release);
3. A 2018 release from the UDEX feed line at the former refinery (UDEX feed release);
4. Releases that have occurred during decommissioning and demolition of the former refinery; and
5. Potential releases identified during the decommissioning and closure of aboveground storage tanks (ASTs) which are being completed in accordance with the *Storage Tank and Spill Prevention Act* (Act 32) and 25 PA Code §245 (Subchapter D).

PESRM plans to remediate the releases identified above in accordance with the *Land Recycling and Environmental Remediation Standards Act* (Act 2) and 25 PA Code §250. The location of these release areas is shown on Figure 1. The status of the characterization and remediation of each release area is discussed and summarized below.

This is the first *Status Report*. It discusses remedial activities completed through February 1, 2022. The next semi-annual *Status Report* will cover activities completed during the period from February 1 through August 1, 2022.

¹ Evergreen Resources Management Operations, a series of Evergreen Resources Group, LLC, is managing the legacy remedial work for Philadelphia Refinery Operations, a series of Evergreen Resources Group, LLC (“Evergreen”) and Sunoco (R&M), LLC. For clarity, Sunoco, Inc. n/k/a ETC Sunoco Holdings LLC, Sunoco, Inc. (R&M) n/k/a Sunoco (R&M), LLC and Evergreen shall be referred to collectively as “Evergreen” in this Report.



2 136 Naphtha Release Area

On February 22, 2019, approximately 53,000 gallons of petroleum-product, identified as light naphtha, was released to the ground surface from defects in above-ground piping associated with former Process Unit 137, near the location of the former Unit 136. The petroleum-product was observed by Stantec Consulting Services, Inc. (Stantec) while on-site performing routine monitoring. The response actions included the removal of water and product from a nearby storm sewer and culvert and from test pits installed along the compromised product line via a vacuum truck. The removed water/product mixture was stored in a waste oil tank and then treated via the on-site wastewater treatment system. The defective section of product line was replaced with new above-ground piping.

In March 2019, Stantec collected 20 soil samples in the vicinity of the release to determine the extent of the impacted area. Samples from the area outside and surrounding the release were collected based on visual observation of the extent of the impacts. The samples were analyzed for the unleaded gasoline parameters (“unleaded gasoline short list”) listed in Table III-5 Short List of Petroleum Products from the PADEP’s (2021) *Land Recycling Program Technical Guidance Manual*.

Between November 25 and December 12, 2019, PESRM conducted an excavation of the soil impacted by the release.

Post-excavation soil sampling² conducted by Stantec involved the collection of twelve samples from the excavation base and sidewalls. Samples were analyzed for unleaded gasoline short list parameters. The post-excavation soil sample results identified no chemicals at concentrations greater than the applicable PADEP Statewide Health Standards (SHS) Medium Specific Concentrations (MSCs).

A Notice of Intent Remediate (NIR) was submitted in June 2021 to address the soil-related impacts associated with the release under the non-residential SHS. Langan Engineering and Environmental Services, Inc. (Langan) subsequently submitted a *Combined Remedial Investigation Report/Final Report* to PADEP on June 29, 2021 to document the remediation of the release area. PADEP identified technical deficiencies in the report and Langan subsequently rescinded the submittal in October 2021.

PESRM is in the process of working to address the technical deficiencies identified by PADEP and plans to provide an updated Remedial Investigation Report/Final Report to PADEP once the deficiencies have been addressed.

3 No. 3 Separator Release Area

The No. 3 Separator Remediation System is a 10-well total fluids recovery system installed by Evergreen in 2012 to address light non-aqueous phase liquid (LNAPL) from a prior release in the area of the property along the Schuylkill River near the No. 3 oil-water separator. In 2013, PESRM assumed primary

² The location of samples was detected using a systematic random approach.



responsibility for the No. 3 Separator Remediation System due to petroleum releases from a process sewer system, which connected the 137 Unit to the No. 4 Separator.

PESRM continued to operate and monitor the recovery system until October 2021 when it was shut down due to the termination of the compressed air supply from the facility as part of decommissioning. The compressed air had been used to power the pneumatic pumps for the system. Increases in LNAPL thicknesses were periodically observed in the monitoring and recovery wells associated with the system between 2013 and October 2021. These occasions of increased thickness are likely associated with leaks from the adjacent process sewer. The most recent instance of increased LNAPL thickness/product recovery coincided with the decommissioning of the 137 process unit during the spring and summer of 2021. Since the completion of decommissioning activities, the process sewer has been cleaned to remove residual oil.

After the shutdown of the plant air, skimmer pumps were used to continue to remove measurable LNAPL from the monitoring and recovery wells associated with the No. 3 Separator Remediation System. LNAPL has not been observed in the wells since skimming was completed in December 2021. Stantec (on behalf of PESRM) conducts bi-weekly LNAPL gauging of the monitoring and recovery wells.

PESRM is planning to submit a NIR the release under Act 2 in early 2022.

4 UDEX Release Area

In the summer of 2018, Stantec (on behalf of Evergreen) performed a routine annual well gauging event across the Facility. During their review and analysis of the data, Stantec identified LNAPL in two monitoring wells not previously identified (S-414 and S-283) and an increased LNAPL thickness in an additional well (S-382). In July 2018, Stantec (on behalf of Evergreen) collected samples of the LNAPL from the wells for analysis and fingerprint comparison to known products and refinery intermediates. The laboratory indicated that the LNAPL was a refinery intermediate called reformate. The laboratory also provided a basic interpretation indicating that the LNAPL collected from the two wells (that previously did not contain LNAPL) was a light petroleum distillate of unknown weathering degree. The LNAPL collected from the well with increased LNAPL thickness was chemically similar to the other samples, but also contained smaller amount of extremely weathered middle petroleum distillate. Based upon the results, it is believed that comingled LNAPL plumes are present in this area.

In late July 2018, PESRM identified a leak from an underground portion of a product line that conveys reformate (a feed for the UDEX unit). The line was emptied, isolated, bypassed and replaced with a new aboveground line constructed in the same location as the underground line. PESRM has retained Stantec to characterize and remediate the release area. Multiple rounds of subsurface investigation have been conducted to characterize the nature and extent of the release. Additionally, over 96,000 gallons of free product was recovered from the subsurface by skimmer pumps operated at three recovery wells between September 2018 and November 2021, and over 24,000 gallons of free product was converted to vapor, extracted, and combusted during a pilot test of soil vapor extraction (SVE) technology between



April 2021 and January 2022. A full-scale SVE system is being designed and is expected to begin operation in 2022.

PESRM is planning to submit a NIR this release in early 2022.

5 Releases Occurring during Decommissioning and Demolition

In addition to the legacy releases described above, PESRM is also addressing releases that have occurred during the decommissioning and demolition of the former refinery.

5.1 860 Unit Cooling Tower and Hartranft Street Release Area

On October 11, 2021, a petroleum release occurred during the removal of overhead pipelines within the pipe rack located near the 860 Unit Cooling Tower and Hartranft Street. The pipeline that caused the release was an out-of-service line used to remove water from two ASTs (PB-840 and PB-843) in the area. Both ASTs were formerly used to store crude oil. The total area of the release was approximately 1,600 square feet, and 1,200 square feet of this area is an asphalt roadway. NorthStar Contracting Group, Inc. (NorthStar) conducted immediate cleanup actions relating to the residual liquids remaining on the low-permeability asphalt. Soil located beneath this asphalt is not expected to have been impacted by the release. The remaining 400 square feet of the release occurred on soil adjacent to the asphalt.

NorthStar proceeded to conduct a limited soil excavation in the unpaved areas impacted by the release. Surficial soil up to 1 foot in depth was removed using an excavator and screened for signs of impact. Impacted soil was identified using a photoionization detector, olfactory evidence, and visual staining as indicators. Approximately 12 to 14 cubic yards of soil were removed and deposited in a roll-off container. Following soil excavation, post-excitation soil sampling activities were conducted by NorthStar.

Concentrations of the targeted constituents were either not detected above laboratory reporting limits or were detected at concentrations below the non-residential SHS MSCs. Impacted and potentially impacted soil was transferred to a roll-off container pending soil disposal approval.

PESRM will submit a NIR for this release with a Final Report submitted shortly thereafter.

5.2 PB 881 Dike Roadway Release Area

On November 16, 2021, a release occurred to soil during the removal of overhead pipelines within the pipe rack located along the dike roadway west of the PB 881 tank dike. The pipeline that caused the release was associated with ASTs that were formerly used to store crude oil. The releases occurred in three distinct areas that are approximately 640 square feet, 300 square feet, and 160 square feet, respectively. A prompt interim response, including a limited soil excavation, was conducted by NorthStar



immediately following discovery of the release. The soil is currently stored in a roll-off container and will be transported off-site to an appropriate receiving facility.

Initial post-excavation sampling identified concentrations of benzene and lead at concentrations greater than the non-residential SHS MSCs in two of the three release areas. Additional sampling was conducted in January 2022 to define the extent of the impacted soil in the areas. Additional remediation will be planned to address the remaining soil impacts once delineated.

PESRM will submit a NIR for this release with a Final Report submitted shortly thereafter.

6 Releases Identified during AST Closure

Removal of the ASTs and associated infrastructure began in December 2020. In accordance with Terraphase's (2021) *Aboveground Storage Tank Closure Work Plan* (the AST Work Plan), which was approved by the PADEP on April 23, 2021, site assessment sampling was initiated in May 2021 for tanks that had been adequately decommissioned and demolished to facilitate sampling. Bi-weekly status summary reports and teleconference calls have occurred since early May 2021 to document for PADEP the work performed as part of the AST closure effort.

As detailed in the AST Work Plan, the work is progressing in a phased approach and instead of submitting individual site assessment results, closure reports, and closure forms for individual tanks, the site assessment and site characterization results for tank groupings will be documented in Tank Group Closure reports. The property has been divided into eight Tank Groups (Figure 2). To date, demolition and site assessment/site characterization work has been performed primarily in Tank Groups 01 through 05. Additional details relating to AST closure progress are available in the Terraphase's *Bi-Weekly Status Summary Reports*, and updates to the AST closure program will be included in the next semi-annual Status Report. To date, releases have been identified in Tank Groups 01, 02, 03, and 05. PESRM is in the process of conducting site characterization in these areas and will submit a Site Characterization Report for each tank group where a release has been identified. Based on the findings of the site characterizations, releases in each tank group will be addressed by PESRM or by Evergreen through Corrective Action under Act 2 or Act 32.

7 Closing

Should you have any questions, please contact Joe Jeray (jjeray@hilcoglobal.com) and Julianna Connolly (jconnolly@hilcoglobal.com) at Hilco Redevelopment Partners (HRP).



Figures

- 1 Post-2012 Release Areas Pursuing Act 2 Closure
- 2 Tank Groups





File: N:\GIS\Prj\044_001_PESRM-PES\WXDS\NIR\Figure 1 - Release Areas.mxd 1/26/2022 Created by: Mia Coordinate System: NAD 1983 2011 StatePlane Pennsylvania South FIPS 3702 FT US



0 305 610
Feet
1 inch = 610 feet

Notes: Aerial imagery source Maxar 10/19/2019

SAFETY FIRST



CLIENT: Philadelphia Energy Solutions Refining and Marketing LLC

PROJECT: February 2022 Semi-Annual Status Summary

PROJECT NUMBER: P044.001.007

Post-2012 Release Areas Pursuing Act 2 Closure

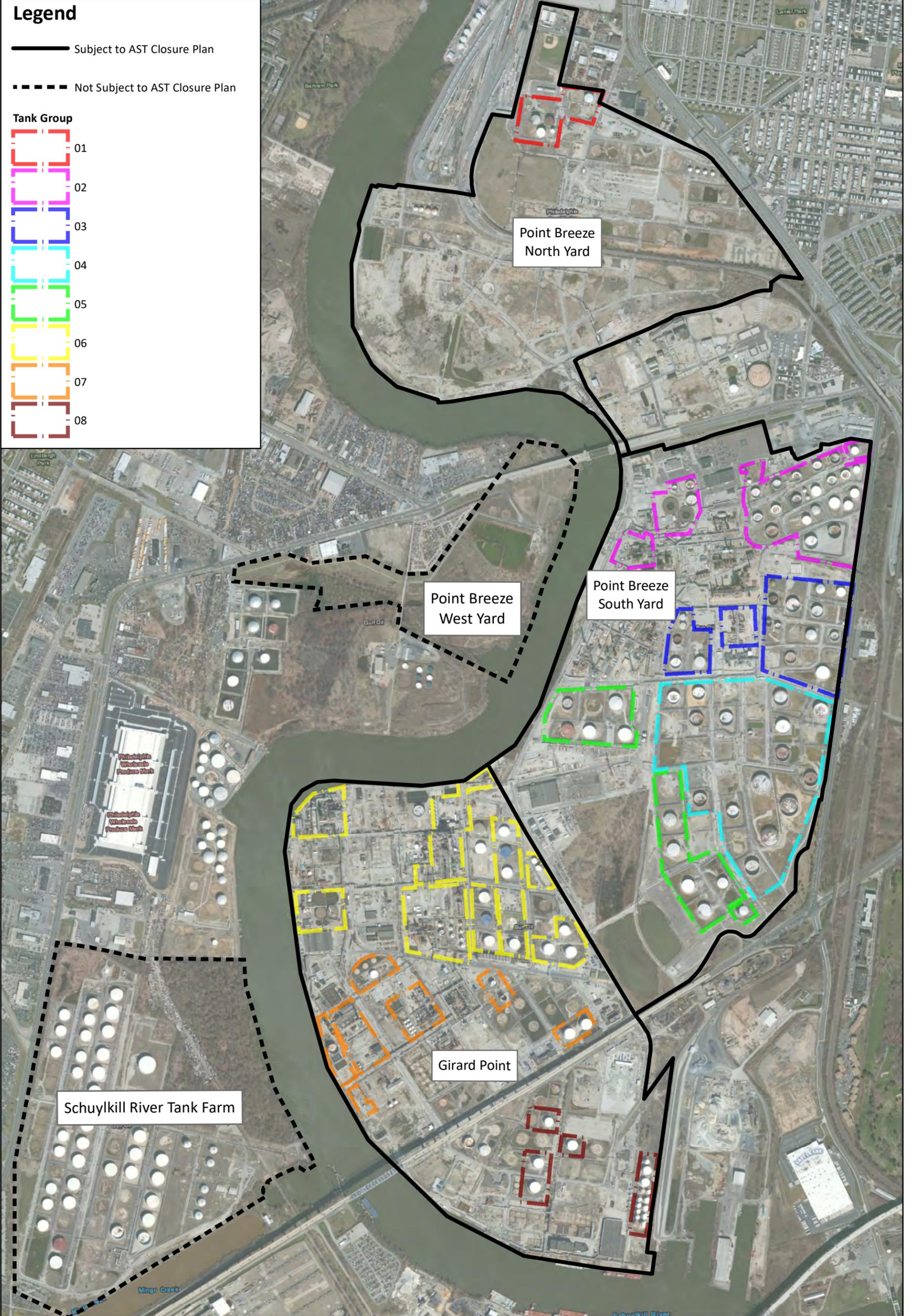
Figure 1

Legend

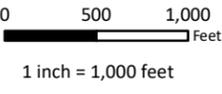
- Subject to AST Closure Plan
- Not Subject to AST Closure Plan

Tank Group

- 01
- 02
- 03
- 04
- 05
- 06
- 07
- 08



File: N:\GIS\PI\P044.001_PESRM-PES\MXD\Semi Annual Status Summary - Feb 2022\Figure 2 - Tank Groups.mxd 1/31/2022 Created by: Mia Coordinate System: NAD 1983 StatePlane Pennsylvania South FIPS 3702 Feet



Notes: Aerial imagery source Maxar 10/19/2019

 	CLIENT: Philadelphia Energy Solutions Refining and Marketing LLC	Tank Groups Figure 2
	PROJECT: February 2022 Semi-Annual Status Summary	
PROJECT NUMBER: P044.001.007		