ENVIRONMENTAL ASSESSMENT OF PER AND POLYFLUOROALKYL SUBSTANCES (PFAS)

for

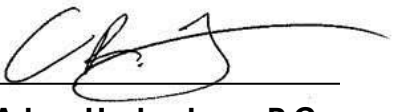
Perdue AgriBusiness LLC (PAB)
6906 Zion Church Road
Salisbury, Maryland

Prepared for:

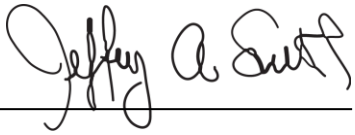
Perdue AgriBusiness LLC (PAB)
6906 Zion Church Road
Salisbury, Maryland 21804

Prepared by:

Langan Engineering and Environmental Services, LLC
1818 Market Street, Suite 3300
Philadelphia, PA 19103



Adam Hackenberg, P.G.
Senior Project Manager



Jeffrey A. Smith, P.G.
Senior Associate

Report Date: **January 21, 2025**
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TABLE OF CONTENTS

TABLES

APPENDICES

EXECUTIVE SUMMARY

Langan Engineering and Environmental Services, LLC (Langan) performed an Environmental Assessment of Per and Polyfluoroalkyl Substances (PFAS) for the Perdue AgriBusiness LLC (PAB) facility located at 6906 Zion Church Road in Salisbury, Wicomico County, Maryland (the "subject property" or "Zion Church Road [ZCR] Facility", see Figure 1 in Appendix A). This Environmental Assessment of PFAS was performed in response to a written request by the Maryland Department of the Environment (MDE) Controlled Hazardous Substance Enforcement Division ("CHS"), dated December 20, 2024. A primary goal of the assessment is to identify potential sources of PFAS that could affect soil and groundwater at the ZCR Facility. These areas are identified herein as "PFAS Areas of Interest" ("PFAS AOIs"), a term that is further defined in Section 1.1 of this report.

The Environmental Assessment of PFAS was performed using the ASTM International Standard Practice E1527-21: Phase I Environmental Site Assessment Process (ASTM E1527-21) as a guideline, except to the extent noted in Sections 1.4, 1.5, and 7 below.

Subject Property Layout

The ZCR Facility includes approximately 294-acres situated in a predominantly rural area to the east of Salisbury, Maryland at 6906 Zion Church Road. It is bounded to the west by the Salisbury Bypass (US Route 50) with residential properties beyond; to the north by Morris Leonard Road with residential, farm, and wooded/undeveloped properties beyond; to the east by Zion Church Road with residential, farm, mixed-use, and wooded/undeveloped properties beyond; and to the south by the Delmarva Central Railroad with residential and mixed-used properties beyond. The subject property, comprised of five lots on four tax parcels, is described by the Wicomico County Department of Assessments and Taxation as consisting of the following: Lot 1 (Parcel 0490), Lots 2 and 4 (Parcel 0087), Lot 3 (Parcel 0176), and Lot 5 (Parcel 0327). The subject property is owned by Perdue AgriBusiness LLC.

Subject Property Current Use

The ZCR Facility consists of a soybean processing plant, a feed mill, boiler house, grain receiving and storage facilities, an edible soybean oil refinery, two hatcheries, and a truck fleet garage, and related support facilities and operations. The eastern portion of the facility includes a grain elevator and grain storage silos, a feed mill, a boiler house, a soybean crush plant and soybean oil extraction plant, two hatcheries, a truck maintenance garage and associated wash bay, a maintenance shop, wastewater treatment facilities, and various support operations. The south-central portion of the facility includes outdoor grain storage silos, a soybean oil refinery, a tanker wash bay, and various support operations. The northern and western portions of the subject property include the following operations and features, among others: a former spray irrigation field and forest, former crop fields, a forest conservation area, a former poultry research farm, a soil stockpile, and a former borrow pit containing creek sediment dredge spoils.

Subject Property History

PAB's grain mill and hatchery operations began in 1958, expanding into soybean extraction and an additional hatchery through the late 1950s and early 1960s. The edible oil refinery and current soybean extraction plant were constructed in 1985. These operations have continued into present. Additionally, a poultry research farm was constructed in the 1980s in the northwestern

portion of the ZCR Facility, and was expanded around 1990; however, that facility ceased operations around 15 years ago according to PAB personnel interviewed during the site reconnaissance.

Adjoining Properties and Surrounding Area

Langan reviewed an environmental database search report prepared by an environmental database search provider (EDR) for the subject property and surrounding area. There were a number of environmental database listings in EDR's Radius Map™ Report for sites/properties surrounding the ZCR Facility, but none of these listings by their apparent nature of operations are expected to be indicative of potential PFAS concerns. Additionally, Langan did not observe obvious conditions likely to represent PFAS environmental concerns for the ZCR Facility from current uses of adjoining or surrounding properties. However, further assessment of potential PFAS sources in the surrounding area may be warranted, including with respect to agricultural application of biosolids and septic systems, both of which are considered to be suspected regional non-point sources of PFAS.

Conclusions

Langan performed an Environmental Assessment of PFAS for the ZCR Facility using ASTM E1527-21 as a guideline, except as noted herein. The following table summarizes our findings regarding PFAS AOIs that have been identified.

PFAS AOIs
AFFF Fire Suppression System: There is an aqueous film-forming foam (AFFF) fire suppression system associated with the Soybean Extraction Plant at the ZCR Facility. This system provides fire protection related to the use of hexane as a solvent in the soybean oil extraction process. Hexane is a volatile and flammable aliphatic hydrocarbon. AFFF is stored in two aboveground tanks inside Fire Station #3, one constructed in 1986 and the other constructed in 2012. The AFFF fire suppression system is presently equipped with Ansulite AFC3B 3% AFFF, which contains short-chain, C-6 fluorochemicals manufactured using a telomer-based process that does not produce perfluorooctane sulfonate (PFOS) or materials that would breakdown to yield perfluorooctanoic acid (PFOA). The AFFF system has been equipped with this product since 2021. The system was previously equipped with a variety of older AFFF products, at least some of which would have contained "long-chain" materials including PFOS and/or PFOA. PAB has indicated to MDE that there have been accidental triggers of the system in the history of the plant. The last reported accidental trigger occurred around November 2019. That event resulted in the discharge of Ansulite AFC3A 3% AFFF. AFFF discharged inside the Soybean Oil Extraction Plant would have been directed to the Extraction Plant Containment Sump, which leads to the facility's Wastewater Treatment Plant via underground process sewers. However, AFFF discharged via spray nozzles positioned above the Hexane Tank Enclosure and Extraction Plant Containment Sump could have fallen on the ground surrounding those structures.
Stockpiled Soil - Northwest: There is a soil stockpile in the northwestern corner of the subject property. It has a footprint of approximately 20,000 square feet and is estimated to be at least 10 feet high. Based on historical aerial imagery, the stockpile was originally created between 2015 and 2018. According to PAB, it contains excess soil from various construction projects at the ZCR Facility, including some soils that may have come from an on-going project involving the construction of new/expanded soybean oil extraction capacity to the west of the current Soybean Extraction Plant. This construction is taking place near the exterior areas that may have been affected by past discharges from the AFFF Fire Suppression System. Accordingly, excess soil removed during construction and placed in the soil stockpile could contain AFFF, and therefore PFAS.

Stockpiled Soil – East-Central: There is another soil stockpile in the east-central portion of the subject property, to the east of the Litter Building and Former Temporary Grain Ground Pile. This soil stockpile has a footprint of less than 700 square feet and is estimated to be at least 5 feet high. Based on historical aerial imagery, this stockpile appears to have been created since 2018. PAB reported that this stockpile contains excess soil from the aforementioned construction that is taking place near the exterior areas that may have been affected by past discharges from the AFFF Fire Suppression System. Accordingly, excess soil removed during construction and placed in this soil stockpile could contain AFFF, and therefore PFAS.

Wastewater Treatment Facility Impoundments: The wastewater treatment system at the ZCR Facility includes four clay-lined impoundments: an aeration basin, a wastewater basin, an emergency lagoon, and a sewage sludge holding pond. These impoundments are located to the north of the Wastewater Treatment Plant buildings and to the east of the Former Spray Irrigation Field. The aeration basin is an integral component of the wastewater treatment process. The wastewater basin was previously used to hold treated wastewater slated for discharge via spray irrigation. The sewage sludge holding pond is used for temporary storage of excess return activated sludge and sludge that is periodically removed from the sanitary lift station and disposed off-site. The emergency lagoon provides excess temporary storage in case of emergencies but is not part of the routine process. A variety of PFAS have been detected in wastewater and sludge samples collected at various stages in the treatment process including in the influent wastewater, DAF influent and effluent, DAF sludge, water and sludge in the emergency lagoon, sludge from the holding pond, and return activated sludge. For example, a sample of influent wastewater collected in August 2023 identified PFOS at a concentration of 1,500 ng/L, PFOA at a concentration of 33.2 ng/L, and other PFAS. Results are further discussed in Section 3.6. It is possible that some PFAS could have seeped from these clay-lined impoundments into underlying soil and groundwater.

PFAS in Groundwater at the ZCR Facility: PFAS have been detected in groundwater at the ZCR Facility in monitoring wells associated with the former spray irrigation operations (MW-1 through MW-6), in multi-level monitoring wells that were installed and sampled for PFAS in July 2024 on the western end of the property (MW-1W through MW-6W), and in several of PAB's water supply wells. MDE sampled MW-1 through MW-6 in December 2023. The results indicated concentrations of PFOS varying from not-detected (MW-1) to 1,370 ng/L (MW-3), and concentrations of PFOA varying from not-detected (MW-2, MW-6) to 159 ng/L (MW-3). A variety of other PFAS were also detected. Multi-level monitoring wells MW-1W through MW-6W were installed in July 2024, under a plan that was approved by MDE, to assess the presence and distribution of PFAS in groundwater along the western side of the subject property. The highest concentrations of PFAS identified by this sampling were in the west-central part of the property (MW-4W and MW-5W), generally at depths greater than 40 feet below ground surface (bgs). PFOS was detected at concentrations up to 990 ng/L (MW-5W, 50 feet bgs), and PFOA was detected at concentrations up to 72 ng/L (MW-4W, 50 feet bgs; MW-5W, 50 feet bgs). A variety of other PFAS were also detected. Relatively lower concentrations of PFAS have also been detected in some of the ZCR Facility's on-site water supply wells. PAB has added point of use treatment for drinking water at the facility, and has also added point of use treatment for water used in product contact processes. Groundwater sampling results are further discussed in Section 3.6.

Outfall 001 to Peggy Branch: A variety of PFAS have been detected in samples of treated effluent discharged to Peggy Branch through Outfall 001. The highest concentrations were detected in a sample collected by MDE in August 2023. Results from MDE's August 2023 sampling identified PFOS at a concentration of 694 ng/L and PFOA at a concentration of 40.5 ng/L. The August 2023 results are further summarized in Section 3.6. Since that time, lower concentrations of PFAS have been detected in samples collected from Outfall 001. Langan initiated monthly sampling of Outfall 001 and analysis of PFAS in November 2024, on behalf of PAB, as requested by MDE.

Dredge Spoils Deposits: There is a former soil borrow pit on the western portion of the subject property that has been used by PAB to emplace dredge spoils from periodic (permitted) dredging of sediment from the on-site portion of Peggy Branch (Creek). According to PAB, dredging typically takes place at

intervals of four years or more, to remove accumulations of sediment that form downstream of the discharge of treated wastewater effluent (at Outfall 001) and upstream of stormwater Outfall 002, where Peggy Branch passes through a culvert under the Delmarva Central railroad bed. The former borrow pit appears to have been created between 1989 and 1991. The bottom of the pit is currently at least 5 feet below the surrounding ground surface. Apparent dredge spoil deposits are present primarily in the northwestern half of the Former Borrow Pit, while the southeastern half contains standing water, estimated to be less than approximately 1 foot deep. PFAS have been detected in treated wastewater effluent discharged to Peggy Branch. To the extent that this PFAS sorbed to sediment in Peggy Branch, dredge spoils removed from Peggy Branch and deposited in the former borrow pit could contain PFAS.
Former Spray Irrigation Field: Prior to 2024, treated wastewater from the facility's Wastewater Treatment Plant was used, on a seasonal basis, to spray irrigate the farm fields located in the central portion of the subject property. It appears that spray irrigation began in this area between 1989 and 1991 based a review of historical aerial photographs. As noted above, with respect to Outfall 001 to Peggy Branch, a variety of PFAS have been detected in samples of treated effluent from the facility's Wastewater Treatment Plant. A variety of PFAS were also detected in the monitoring wells surrounding the Former Spray Irrigation Field when those wells were sampled by MDE in December 2023, with the highest concentrations detected in MW-3. Results from MDE's December 2023 sampling identified PFOS in MW-3 at a concentration of 1,370 ng/L and PFOA at a concentration of 159 ng/L. The December 2023 results are further summarized in Section 3.6.
Former Spray Irrigation Forest: Prior to 2024, treated wastewater from the facility's Wastewater Treatment Plant was used, on a seasonal basis, to spray irrigate a forested area in the northern portion of the subject property. This irrigation system is comprised of 4 separate sections that were operated alternately, with fixed spray irrigation risers and nozzles spaced at regular intervals. It appears that spray irrigation began in this area between 1991 and 1998 based a review of historical aerial photographs. As noted above, with respect to Outfall 001 to Peggy Branch, a variety of PFAS have been detected in samples of treated effluent from the facility's Wastewater Treatment Plant. A variety of PFAS were also detected in the monitoring wells surrounding the Former Spray Irrigation Forest when those wells were sampled by MDE in December 2023, with the highest concentrations detected in MW-3. Results from MDE's December 2023 sampling identified PFOS in MW-3 at a concentration of 1,370 ng/L and PFOA at a concentration of 159 ng/L. The December 2023 results are further summarized in Section 3.6.

1. INTRODUCTION

Langan Engineering and Environmental Services, LLC (Langan) performed an Environmental Assessment of Per and Polyfluoroalkyl Substances (PFAS) of the Perdue AgriBusiness LLC facility located at 6906 Zion Church Road in Salisbury, Wicomico County, Maryland (the "subject property" or "Zion Church Road [ZCR] Facility"). A Subject Property Location Map is provided in Appendix A (Figure 1).

The Environmental Assessment of PFAS was performed using the guidelines of ASTM International Standard Practice E1527-21: Phase I Environmental Site Assessment Process (ASTM E1527-21).

1.1 Purpose

The purpose of this Environmental Assessment of PFAS was to identify recognized environmental conditions (RECs), as that term is defined in ASTM E1526-21, associated with PFAS. The term "PFAS Area of Interest" or "PFAS AOI" will be used herein to refer to identified RECs involving PFAS. For the purpose of this assessment, PFAS AOI is defined as the presence of PFAS substances in, on, or at the subject property due to a release to the environment; (2) the likely presence of PFAS in, on, or at the subject property due to a release or likely release to the environment; or (3) the presence of PFAS containing products in, on, or at the subject property under conditions that pose a material threat of a future release to the environment.

1.2 Scope of Services

Langan's scope of services consisted of the performance of an Environmental Assessment of PFAS using the guidelines of ASTM E1527-21. Langan's scope of services, as it pertains to the elements of ASTM E1527-21, is described below.

On 8 July 2024, a United States Environmental Protection Agency (USEPA) rule became effective designating two per- and polyfluoroalkyl substances (PFAS) – perfluorooctanoic acid (PFOA) and perfluorooctanesulfonic acid (PFOS) including their salts and structural isomers – as hazardous substances under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA). Because of the complex and varied historical use of PFAS in various industries; limited prior disclosures of PFAS content on product specification sheets, Material Safety Data Sheets (MSDS), and Safety Data Sheets (SDS); the complex chemistry and chemical transformations associated with some PFAS; and the ever-growing and varied list of state regulations, it is not feasible to evaluate PFOA and PFOS without also considering other PFAS. As such, Langan incorporated a review of PFAS as a general class into this Environmental Assessment of PFAS.

1.2.1 Records Review and Local Government Interviews

Langan contracted a third-party provider to search environmental regulatory databases and provide historical records. The database search included select federal, state, local, and tribal standard source environmental databases within the approximate search radii specified by ASTM E1527-21.

Langan requested information about fires at the ZRC facility from the City of Salisbury (request submitted 11/14/2024) and the Salisbury Fire Department (requested submitted 12/12/2024). No responses were received as of the date of this report.

Langan supplemented the third-party-provided historical records with a review of online historical record sources including Google Earth Pro and Google searches.

1.2.2 Site Reconnaissance and Owner/Operator/Occupant Interviews

Langan performed reconnaissance of the subject property on November 11, 2024 and January 8, 2025. Langan walked the areas (or representative portions thereof) noted in the sections below, including representative and readily accessible interior areas and surrounding exterior areas. Langan also observed the ZCR Facility by vehicle from two of the bounding roadways, Zion Church Road to the east and Morris Leonard Road to the north. Langan observed the adjoining properties and the surrounding area from the periphery of the subject property and from public thoroughfares adjoining to or traveled on to access the subject property.

November 12, 2024 Site Reconnaissance

Jaclyn Mays (PAB's Director, Environmental Compliance and Services) led the November 12 site reconnaissance, which took place between approximately 9 AM and 4 PM. Ms. Mays has been associated with the ZCR Facility since February 2020. The weather on November 12 was partially cloudy with an average temperature of 50°F. The objective of this initial reconnaissance was to observe facility processes that generate process/wastewater and to identify chemicals used in those processes. Provided below is a list of areas observed/assessed during the November 12 site reconnaissance (see Appendix A, Figures 2, 2A, and 2B for locations of these areas):

- Hatchery #3
- Soybean Crush Plant
- Soybean Extraction Plant
- Foam and Fire Pump House (Fire Station #3)
- Soybean Oil Refinery
- Soybean Oil Refinery Tanker Wash
- Hatchery #2
- Wastewater Treatment Plant (and associated Outfall 001)
- Truck Garage and Truck Wash

In addition to Ms. Mays, other knowledgeable PAB personnel described the operations and process within each of these areas and answered questions about chemical usage.

January 8, 2025 Site Reconnaissance

Brian King (PAB Regional Environmental Compliance Manager) led the January 8 site reconnaissance, which took place between approximately 10 AM and 5 PM. Mr. King has been associated with the ZCR Facility since April 2024. The weather on January 8 was approximately 30°F and sunny, and the ground was covered with approximately 2 to 3 inches of snow. The objective of the January 8 site reconnaissance was to observe certain areas of the site that were not observed during the prior site reconnaissance. Provided below is a list of areas observed during the January 8 site reconnaissance (see Appendix A, Figures 2, 2A, and 2B for locations of these areas):

- Former Poultry Research Farm (eastern and western sections)
- Former Spray Irrigation Forest (representative portions of Zones 2 and 3)
- Stormwater Outfall 003 (at Morris Leonard Road)
- Stockpiled Soil - Northwest
- Dredge Spoils Area

- Maintenance Building
- Feed Mill (and surrounding buildings)
- Boiler House (for Feed Mill and Soybean Extraction)
- Grain Elevator and Grain Storage Areas
- Laydown Area Near Grain Storage
- Stormwater Outfall 002 (Peggy's Branch)
- Laydown Area Near Soybean Oil Refinery
- Litter Building (and surrounding areas)
- Main Process/Wastewater Lift Station

In addition to Mr. King, other knowledgeable PAB personnel described the operations and process within some of these areas (i.e., Feed Mill, Boiler House, Grain Elevator) and answered questions.

Photographs from the November 12 and January 8 site reconnaissance are provided in Appendix B.

The information obtained during the site reconnaissance (including information from interviews of PAB personnel) has been integrated into this report.

1.2.3 Evaluation, Report, and Parts Used in Concert

Langan evaluated the information obtained from the records reviews, site reconnaissance, and interviews described above, and from the user as described in Section 1.3 in concert with each other. Langan's findings, opinions, and conclusions are discussed throughout this report. Significant assumptions, or deletions, deviations, or exceptions to ASTM E1527-21 are noted in Section 1.4.

1.2.4 Non-ASTM Scope Services

The scope of services for the Environmental Assessment of PFAS did not include non-scope ASTM considerations.

1.3 User Responsibilities

Langan requested that the user provide the results of tasks for which the user is responsible, including the following items, among others: whether there are environmental clean-up liens against the property; PAB's specialized knowledge of the ZCR Facility and adjoining properties, or other relevant expertise of PAB; commonly known or reasonably ascertainable information about the subject property; and the degree of obviousness of the presence or likely presence of contamination and the ability to detect the contamination by conducting an appropriate investigation. Langan also asked PAB to provide previous environmental reports, site plans, utility plans, and an inventory of chemicals used in areas of the facility that generate process/wastewater. A summary of the user's responses and relevant information provided by the user is discussed in applicable sections of this report.

Langan did not perform a title search or a search for environmental liens or AULs, as that is the responsibility of the user.

1.4 Exceptions and Limiting Conditions/Deviations; Data Gaps

This Environmental Assessment of PFAS is subject to the limitations inherent in ASTM E1527-21 and the exceptions and limiting conditions/deviations stated in this section and throughout the report.

Consistent with MDE's request, this Environmental Assessment of PFAS was focused on, and limited to, identifying potential sources of PFAS in soil and groundwater. This assessment did not include evaluating or identifying recognized environmental conditions associated with other hazardous substances or petroleum products. In addition to considering potential sources of PFOA and PFOS, this Environmental Assessment of PFAS considers potential sources of other PFAS chemicals that are not hazardous substances as defined by ASTM E1527-21.

Given the purpose of this assessment and the nature of MDE's request, this Environmental Assessment of PFAS does not seek to identify "recognized environmental conditions" as that term is defined in ASTM E1527-21, but instead is intended to identify "PFAS Areas of Interest" ("PFAS AOIs"), as defined in Section 1.1 of this report.

Langan made inquiries with the City of Salisbury and the Salisbury Fire Department about fires at the ZCR facility, as noted above, but no responses were received as of the date of this report. Langan does not expect this data gap to be significant based on the totality of additional information and records considered as part of this Environmental Assessment of PFAS.

Langan did not make any other government/agency inquiries specifically in support of this assessment. However, PAB has provided Langan with letters and other correspondence from MDE regarding PFAS at the ZCR Facility, including records and results of PFAS sampling performed by MDE at the ZCR Facility in August and December 2023.

This Environmental Assessment of PFAS included a limited review to identify PFAS AOIs potentially associated with adjoining properties and surrounding areas, to the extent that such off-site PFAS AOIs could specifically affect the environment at the ZCR Facility. Additional efforts may be made, at a later time, to perform a more extensive, in-depth assessment of potential sources of PFAS in the broader area surrounding the ZCR Facility.

This Environmental Assessment of PFAS did not include the assessment or identification of historic recognized environmental conditions (HRECs) or controlled recognized environmental conditions (CRECs), because PFAS have only recently been of regulatory concern and neither HRECs nor CRECs are expected to be present.

PFAS have been detected in background environmental samples across the globe, including in areas removed from or not associated with any specific recognized sources. This Environmental Assessment of PFAS did not evaluate background concentrations of PFAS. Langan's objective was to identify potential source of PFAS in soil and groundwater at the subject property, as requested by MDE.

During the site reconnaissance on January 8, 2025, the ground was covered with approximately 2 – 3 inches of snow and was not visible in most exterior locations. Therefore, it is possible that relevant conditions could have been obscured. Langan does not expect this data gap to be significant based on the totality of additional information and records considered as part of this Environmental Assessment of PFAS.

The site reconnaissance performed by Langan to support this Environmental Assessment of PFAS took place over the course of two days, November 12, 2024 and January 8, 2025. During

these site visits, Langan observed buildings and areas that were: a) readily accessible, and b) prioritized, based on professional judgement, as being potentially relevant to the identification of PFAS AOIs. Langan did not enter every building at the facility or walk all 294 acres of PAB's property, as doing so would not have been practicable within the limited reporting timeframe and was not necessary to determine that PFAS AOIs are present at the ZCR Facility. Langan does not expect this data gap to be significant based on the totality of additional information and records considered as part of this Environmental Assessment of PFAS.

This Environmental Assessment of PFAS is a component of PAB's ongoing efforts to evaluate the potential source(s) of PFAS that have been detected in wastewater and groundwater samples collected from the ZCR Facility, and in groundwater samples collected in surrounding areas. Langan expects that the information presented in this report will be supplemented with additional information and data obtained incrementally as PAB's source assessment and remedial investigation activities progress.

1.5 Data Gaps

Data gaps, if encountered, are discussed throughout the report. Given the purpose and scope of this Environmental Assessment of PFAS as requested by MDE, for purposes of this Assessment, Langan considers a data gap to be significant if it affects the ability of Langan to identify a PFAS AOI (as defined in Section 1.1 of this report). Langan did not identify significant data gaps (see Section 5.0).

2. SUBJECT PROPERTY DESCRIPTION AND CURRENT USE

The following sections describe the subject property location, ownership, physical setting, and current layout and operations.

2.1 Location, Legal Description, and Ownership

The approximately 294-acre subject property is located in a predominantly rural area to the east of Salisbury, Maryland at 6906 Zion Church Road. The subject property, comprised of five lots on four tax parcels, is described by the Wicomico County Department of Assessments and Taxation as consisting of the following: Lot 1 (Parcel 0490), Lots 2 and 4 (Parcel 0087), Lot 3 (Parcel 0176), and Lot 5 (Parcel 0327). The subject property is owned by Perdue AgriBusiness LLC. The eastern portion of the subject property is zoned I-2 (heavy industrial), and the western portion of the subject property is zoned I-1 (light industrial). The subject property is bounded to the west by the Salisbury Bypass (U.S. Route 50) with residential properties beyond; to the north by Morris Leonard Road with residential, farm, and wooded/undeveloped properties beyond; to the east by Zion Church Road with residential, farm, mixed-use, and wooded/undeveloped properties beyond; and to the south by the Delmarva Central Railroad with residential and mixed-used properties beyond. Surrounding properties to the north, east, and south are zoned A-1 (agricultural). Surrounding and nearby properties to the west and southwest are zoned R-20 (residential) or R-8 (residential).

2.2 Physical Setting

The physical setting that includes the geologic, hydrogeologic, hydrologic, and topographic characteristics of the subject property and surrounding area is discussed below.

2.2.1 Topography

The 2019 United States Geological Survey (USGS) 7.5-minute quadrangle topographic map for Salisbury depicts the subject property at elevations varying from approximately 40 to 60 feet above mean sea level (amsl). The regional topography is relatively flat, with ground surface elevation varying from approximately 15 to 60 feet amsl, and topography sloping downward to the west toward the Wicomico River, which is located approximately 3 miles west of the subject property at its nearest point.

Areas of higher elevation on the subject property include: an area of stockpiled soil in the northwestern portion of the property, several mounded areas within the Former Spray Irrigation Forest, the impoundment area associated with PAB's wastewater treatment facilities, and built-up land around the Litter Building. Areas of lower elevation are primarily located on the western portion of the site and include: a former borrow pit in the northwestern portion of the property containing dredge spoils deposits, a small pond located on the southern end of the Former Poultry Research Farm (eastern section), and the forested area in the western portion of the property.

2.2.2 Geology and Hydrogeology

Wicomico County lies within the Atlantic Coastal Plain physiographic province which is characterized by stratified sand, silt, and clay deposits thickening from a few feet to several thousand feet from west to east (USGS, 1997). The shallower sediments near the subject property consist of unconsolidated marine, estuarian, and fluvial deposits. According to the U.S. Department of Agriculture's (USDA) Natural Resources Conservation Service (NRCS) Soil Survey Geographic (SSURGO) data for Wicomico County, soils at the subject property consist primarily of high to moderately well-drained sands and loams with high infiltration rates.

The subject property is located within the Upper Wicomico River drainage basin covering an area of about 70 square miles. Shallow groundwater flow is typically topographically influenced, as shallow groundwater tends to originate in areas of topographic highs and flow toward areas of topographic lows, such as rivers, stream valleys, ponds, and wetlands. A broader, interconnected hydrogeologic network often governs groundwater flow at-depth or in the bedrock aquifer. Groundwater depth and flow direction are also subject to other natural and anthropogenic variables such as precipitation, evaporation, extent of vegetation cover, groundwater pumping, and coverage by impervious surfaces. Shallow groundwater flow at ZCR Facility was generally to the northwest towards Middle Neck Branch (Earth Data 2017) during the 2014-2016 time period. Historical water level data are included in Appendix C.

Based on well logs and other information provided by PAB, and site reconnaissance observations, there are 12 monitoring wells and 13 water supply wells on the subject property. Installation logs indicate that groundwater was encountered approximately 5 to 15 feet below ground surface (bgs). There are 20 wells identified in the Geocheck section of the Environmental Data Resources (EDR) Regulatory Database Report (Appendix D); some of these appear to correspond with wells that Perdue has identified on the subject property, but others do not. Some of the wells identified by EDR that do not correspond with known wells on the ZCR Facility have likely not been plotted with precise coordinates and therefore are not located on the subject property. A table of wells identified by Perdue is included in Appendix E.

This summary of regional geology and hydrogeology was developed largely from regional water resource evaluations by the USGS (1997 and 2001). The regional geological framework near the City of Salisbury consists of the unconfined Salisbury Aquifer (combined Beaverdam Sand and

Pensauken Formation; also known as the Columbia Aquifer) and the confined Manokin Formation (Aquifer) located below it. Both the Columbia and the Manokin Aquifers are underlain by confining units.

Locally, the Salisbury Aquifer directly underlies the subject property. Based on well logs from newly installed water supply wells 100, 200, and 300 in the Manokin Aquifer (260 feet total depth each) at the ZCR Facility, the Columbia Aquifer consists primarily of coarse sand and gravel and extends to a depth below grade of about 115 feet. Below the Columbia Aquifer is a clay confining bed (lower confining bed) that is about 25 feet thick. Beneath the lower confining bed is the Manokin Aquifer, which is comprised of clayey/silty medium to coarse-grained sand that extends to a depth of approximately 290 feet below grade (USGS, 1997). Beneath the Manokin Aquifer is the St. Marys Formation, which consist of clayey silt, silty clay, and very fine sand. The St. Marys Formation is considered the base of the local hydrogeological system for the purpose of this evaluation.

Based on a review of depth to groundwater measurements provided in two previous groundwater studies for the ZCR Facility (Earth Data 2017, Earth Data 2021), the depth to groundwater at the subject site has varied (spatially and temporally) from 6.6 to 15.6 feet below ground surface (bgs), with groundwater elevations fluctuating up to 2.5 feet seasonally and up to 5.6 feet over a span of years.

Information regarding the regional distribution of hydraulic conductivity of the Columbia Aquifer has not been located. At the subject property, no known aquifer testing has been performed; however, based on pumping data from 2010 to 2024, individual supply wells #1 through #5 have produced water at rates upward of several hundred gpm. Calculated historical pumping rates derived from 2010 to 2024 records at supply wells #1 through #5 ranged up to 722 gpm. In January 2023, specific capacity testing was performed for a new Columbia Aquifer water supply well (Well 6) at the ZCR Facility. This well was pumped for 8.3 hours at a sustained rate of 720 gpm with about 40 feet of drawdown, yielding a specific capacity value of 18 gpm per foot of drawdown.

The Manokin Aquifer is considered moderately productive in the vicinity of the City of Salisbury (USGS, 1997). In January 2024, specific capacity testing was performed for three newly installed Manokin Aquifer water supply wells (Wells 100, 200, and 300) at the ZCR Facility. These wells were reportedly pumped for 24 hours at a rate of 75 gpm with a drawdown of 5.9 feet, yielding a specific capacity value of 12.7 gpm per foot of drawdown.

2.2.3 Surface Water Hydrology

Peggy Branch

The Peggy Branch, a tributary of the Wicomico River, has its headwaters on the eastern margin of the subject property and passes through the southeastern corner of the subject property. According to a 2017 groundwater flow direction study performed by Earth Data, Peggy Branch flows to the west approximately 3 miles where it empties into the North Prong of the Wicomico River. The Wicomico River flows to the south and southwest approximately 27 miles where it empties into the Tangier Sound near Deal Island and eventually the Chesapeake Bay.

Middle Neck Branch

Middle Neck Branch, another tributary of the Wicomico River, lies approximately 225 ft north of the subject property at its nearest point. Flowing west, Middle Neck Branch merges with Peggy

Branch approximately 1.75 miles west of the PAB facility before continuing to empty into the North Prong of the Wicomico River.

On-Site Stormwater Drainage Areas and Ditches

Stormwater is managed at the ZCR Facility by several retention ponds, underground storm sewers, and drainage ditches, with some storm water likely percolating on-site, particularly in constructed retention basins in the undeveloped western portion of the site (including the Former Spray Irrigation Field) and portions of the Former Spray Irrigation Forest. Otherwise, stormwater leaves the site through Peggy Branch (SW Outfall 002), a drainage ditch leading to Peggy Branch (SW Outfall 001), a drainage ditch leading to Middle Neck Branch (SW Outfall 003), and via overland flow and drainageways on the northcentral and northwestern portion of the subject property. Stormwater drainage is further described in Section 2.9.

2.3 Subject Property Description

The ZCR Facility consists of a soybean processing plant, a feed mill, a boiler house, grain receiving and storage facilities, an edible soybean oil refinery, two hatcheries, and a truck fleet garage, and related support facilities and operations. The facility normally operates 24 hours per day, 7 days per week, 52 weeks per year, and employs approximately 500 personnel (2022 SPPC Plan). Access to the ZCR Facility is provided via driveways on Zion Church Road, along the eastern edge of the facility. The facility is fenced along Zion Church Road, and the main facility area is protected with a guarded gate. Parking is available in parking lots along Zion Church Road.

The eastern portion of the facility includes a grain elevator and grain storage silos, a feed mill, a boiler house, a soybean crush plant and soybean oil extraction plant, two hatcheries, a truck maintenance garage and associated wash bay, a maintenance shop, wastewater treatment facilities, and various support operations (see Appendix A, Figure 2A). The south-central portion of the facility includes outdoor grain storage silos, a soybean oil refinery, a tanker wash bay, and various support operations (see Appendix A, Figure 2B). The northern and western portions of the subject property include the following operations and features, among others: a former spray irrigation field and forest, former crop fields, a forest conservation area, a former poultry research farm, a soil stockpile, and a former borrow pit containing dredge spoils (see Appendix A, Figure 2).

Photographs of the subject property and a checklist documenting Langan's observations relative to the features, activities, uses, and conditions outlined in Section 9.4 of ASTM E1527-21 are provided in Appendix B.

2.4 Current Subject Property Use

Current uses and operations of the ZCR Facility are described as follows in PAB's Stormwater Pollution Prevention Plan last updated June 5, 2024.

Grain Receiving, Storage, and Transfer

The Grain Elevator operation receives grain by truck and railcar, where the grain is dumped into below grade pits with conveyors before being transferred into onsite grain storage tanks/bins by overhead belts and conveyors. Truck receiving pits are partially enclosed with a roof cover and side walls. Grain dryers on site are used to control the grain moisture to specifications needed for further processing. Dust control equipment is utilized to control air emissions from the grain handling processes.

Feed Mill Operation

The Feed Mill receives grain and feed additives that are processed into animal feed. Received commodities are either conveyed from other operations at the site or transported via truck. The Feed Mill consists of tanks and bins, dust control systems, and receiving and loadout operations that have overhead cover, limiting storm water exposure. Animal fats and liquids are stored in bulk ingredient tanks. Other additives may be stored in bags or drums in onsite warehouses. Dust is controlled by baghouses and cyclones. Animal feed products are stored in bulk storage tanks.

Soybean Plant

The Soybean Plant receives soybeans from the grain storage on site and produces soybean meal and oil. Meal is stored in bulk tanks and the unfinished (crude) soybean oil is stored in above-ground tanks. The process utilizes baghouses to control airborne dust. Soybean meal can be loaded into trucks or conveyed to the Feed Mill. The truck loading area is partially enclosed. Crude soybean oil is pumped to the onsite Edible Oil Refinery via above ground double walled lines, to be further processed.

Wastewater Treatment Plant

The Wastewater Treatment Plant receives and treats all process wastewater from manufacturing activities on-site. Sanitary wastes are also added to the wastewater treatment process. Chemicals such as polymers and acids/bases are received and stored onsite in closed and monitored containers, and most are stored indoors as space allows.

Edible Oil Refinery

The Edible Oil Refinery processes crude soybean oil into an edible product. Crude soybean oil is received by pipeline from the Soybean Plant, or via truck and rail shipments. Other oilseed oils may be received via railcar or truck for processing at the Refinery. Stormwater is protected by containment systems, and storm water retention area and containments are checked regularly for oil. Containment water is processed via the onsite wastewater treatment systems as necessary. An oil truck staging area for temporary parking of loaded oil trucks is provided at the site.

Hatcheries

There are twin hatcheries (#2 and #3) on-site that receive fertilized eggs for incubation and hatching. Eggs are received and chicks are shipped by truck. Chemicals used in the hatchery are stored indoors. Hatchery wastes are loaded out and shipped via truck. Truck washing occurs in a wash bay at Hatchery 2, and the truck washwater, along with any other hatchery-generated wastewater, is pumped through enclosed wastewater lines to the onsite Wastewater Treatment Plant. Hatchery solid wastes are loaded into trucks and shipped to facilities that may use the material, such as composting businesses.

Truck Fleet Maintenance Garage

The Truck Fleet Garage has an indoor wash bay, a fueling station, and a truck and trailer maintenance shop. Fuels are stored according to the SPCC Plan for the site, and secondary containment structures are provided. Fuels are received via delivery trucks, and used fluids are also shipped via truck. Trucks awaiting maintenance park at this facility, and parts are stored indoors and outside.

General Equipment Storage Areas

The complex uses conveyors, pumps, motors, and composite and metal parts. Warehousing is provided for most equipment. There are areas where equipment is stored outside.

The following table summarizes subject property utility providers.

Table 2-1 Utility Providers

Utility	Providers
Electricity (used for cooling)	Delmarva Power
Natural gas	Chesapeake Utilities
Water	PAB On-Site Water Supply Wells
Sewer	PAB On-Site Wastewater Treatment Plant; Septic Systems for Some Offices (e.g., the Grain Office) that are Distant from on-Site Sanitary Sewer Tie-Ins

2.5 Hazardous Substances and Petroleum Products

Hazardous substance and petroleum product use at the subject property is primarily related to equipment maintenance and vehicle fueling. Langan observed hazardous substances and petroleum products stored in dedicated areas in the Maintenance Building.

2.5.1 Underground Storage Tanks (USTs) Potentially Containing PFAS or AFFF

The EDR Radius Map™ Report (Appendix D) did not identify any active or inactive USTs. Likewise, Brian King of PAB indicated during the site reconnaissance on January 8, 2025 that he is not aware of any underground storage tanks at the ZCR Facility. Furthermore, Langan did not observe evidence of USTs during the site reconnaissance.

2.5.2 Aboveground Storage Tanks (ASTs) Potentially Containing PFAS or AFFF

ASTs Identified in the EDR Radis Map™ Report

The EDR Radius Map™ Report (Appendix D) identified the following active ASTs at the ZCR Facility: two 25,000-gallon, one 550-gallon, and one 12,000-gallon no. 2 fuel oil ASTs, one 500-gallon and one 1,000-gallon used oil ASTs, one 25,000-gallon diesel fuel AST, one 1,000-gallon motor oil AST, one 275-gallon hydraulic oil AST, and one 500-gallon mineral oil AST. The petroleum products stored in these ASTs would not be expected to contain intentionally added PFAS.

ASTs Identified in PAB's SPCC Plan

PAB's 2022 Spill Prevention, Control, and Countermeasure (SPCC) Plan indicates that there are 117 ASTs that are subject to the SPCC Plan at the ZCR Facility. Appendix F of this report includes a table summarizing the contents, location, capacity, installation date, and other details for the ASTs identified in PAB's SPCC Plan. The contents of the ASTs are reported to include the following substances: soybean oil, soybean oil distillates, refined soybean oil, finished soybean oil, palm oil, no. 2 fuel oil, vegetable oil, used vegetable oil, crude soybean oil, diesel fuel, mineral oil, motor oil, soybean soapstock, soybean lecithin, used oil, hydraulic oil, hexane, hexane and soybean oil, transformer oil, and miscellaneous oils (motor oil, gear lubricant, grease, hydraulic

fluid, and gear and steam cylinder oil). The petroleum products stored in these ASTs would not be expected to contain intentionally added PFAS.

Site Reconnaissance

During the site reconnaissance on November 12, 2024, Langan observed two ASTs containing AFFF inside Fire Station #3 (a Foam and Fire Pump House), which serves the Soybean Oil Extraction Plant. Fire Station #3 is a small cinder block utility building. One of the AFFF ASTs is a horizontal tank with a capacity of 900 gallons, and the other is a vertical tank with a capacity of 500 gallons, as indicated by placards posted on the tanks. The 900-gallon tank was labeled as having been built in 1986, and the 500-gallon tank was labeled as having been built in 2012. Both tanks were identified/labeled as containing Ansulite AFC3B 3% AFFF. Section 3.3 provides additional details regarding these ASTs and the associated AFFF system.

2.5.3 Chemical Storage, Containers, or Equipment Potentially Containing PFAS or AFFF

PAB and Langan are in the process of compiling and evaluating a list of chemicals currently used in operations at the ZCR Facility. This list is being developed from various sources including: observations made during Langan's site reconnaissance (November 12, 2012 and January 8, 2005), information provided by area operators, and chemicals that are included in PAB's Tier II reporting for the ZCR Facility under Section 312 of the Emergency Planning and Community Right-to-Know Act of 1986. (EPCRA). In general, the chemicals identified to-date include the following, by operational area:

- Hatcheries: various cleaners and disinfectants including bleach, isopropyl alcohol, hydrogen peroxide, and other soaps and cleaners, as well as vaccines;
- Feed Mill: feed additives (nutritional ingredients and medicated additives), food-grade lubricating grease, and a pellet mill processing aid (MillSAVOR™);
- Boiler House: boiler water treatment chemicals (supplied by Condor);
- Soybean Crush and Extraction Plants: hexane (solvent used for oil extraction), food-grade mineral oil (used in for oil separation), clays (flowability agents), and vegetable oil products/intermediates (soapstock, lecithin, refined oil);
- Truck Garage: automotive fluids used to maintain trucks, e.g., motor oil, hydraulic fluid, diesel exhaust fluid, transmission fluid, antifreeze, etc.;
- Maintenance Shop: various oils and welding and soldering supplies;
- Truck Wash: soaps and cleaning solutions including PWS 100 powerwash solution and Penn-Brite;
- Soybean Oil Refinery: antioxidants, caustic soda, phosphoric acid, citric acid, hydrogen peroxide, and bleaching clays;
- Trailer Wash: soap and cleaning solutions;
- Wastewater Treatment Plant: wastewater treatment chemicals, e.g., acids/basis for pH adjustment, polymer-based flocculants, defoamer, and disinfectants;
- Environmental Garage: used oil and diesel exhaust fluid, oil sorbent products, universal wastes (e-waste, light bulbs, batteries, mercury devices, etc.);

- Other/Miscellaneous: general maintenance and cleaning supplies unrelated to core facility processes (paint, mineral spirits, hand lotion and sanitizer, cleaners and disinfectants, air fresheners, sealing foam, insecticides, caulks and sealants, adhesives, thread sealant, degreasers, cutting fluids, PVC cement, lubricants, penetrants, batteries, etc.) and small-quantity laboratory reagents.

PAB has performed targeted outreach to the suppliers and manufacturers of specific chemical products used in the areas noted above, to ask if the current or previous formulations of those chemicals are PFAS-free. Over 20 such inquires have been made to-date. Suppliers/manufacturers who have responded have indicated that PFAS are not intentionally added to their products and/or that PFAS are not expected to be produced by their manufacturing process. PAB is awaiting responses regarding two cleaning products supplied by CleanEdge that are used in Hatchery #2.

As observed during Langan's site reconnaissance, chemicals were stored indoors in a variety of package types and sizes including totes, drums, gallon jugs, five-gallon pails, sacks of various sizes, pallets, ASTs, and other containers. Housekeeping practices where generally good in the operational areas that were observed. Some of the chemical products, such as cleaning products, are discharged to the process sewers after use, consistent with their intended use and labeling.

The chemical inventory and evaluation process is ongoing and includes continued development and organization of a list of chemicals from various sources, compilation and review of Safety Data Sheets (SDS) and other sources of information pertaining to product content, and additional targeted inquires with suppliers and manufacturers. However, at present, other than AFFF (discussed in Section 2.5 above), none of the chemicals identified in current use at the ZCR facility are known to involve more than incidental quantities of non-polymer PFAS.[1]

2.6 Air Emissions Potentially Involving PFAS

PAB maintains a current air permit (no. 045-0042) in accordance with MDE's Title V permitting requirements. It was issued July 1, 2015 and expired June 30, 2020, but is currently subject to an extension.

According to PAB's 2022 Air Permit Compliance Plan, regulated air emission sources at the subject property include fuel oil-fired boiler units, environmental bag filters and baghouses, cyclone receivers, bin vent filters, and mineral scrubbers. These controls are limited to the Boiler House, Oil Refinery, Feed Mill, and Soybean Crush Plant. Primary emissions of concern are grain dust and particulates and volatile organic compounds. Langan did not identify obvious impacts, such as visible emissions or odors, from air emission sources at the subject property.

Langan does not consider the air emissions as a likely source of PFAS at the subject property.

[1] The term "non-polymer PFAS" includes PFOS, PFOA, and other non-polymer PFAS being regulated. It does not include fluoropolymer products such as polytetrafluoroethylene (PTFE, aka Teflon). Examples of chemicals/materials in use at the ZCR Facility that may contain incidental quantities of PFAS include Teflon tape, soldering flux, and Gore-Tex fabric.

2.7 Waste Management

The following sections describe current hazardous and non-hazardous waste streams, and observations of fill areas or other solid waste throughout the subject property.

2.7.1 Hazardous Waste Potentially Containing PFAS

The EDR Radius Map™ Report (Appendix D) indicates that the ZCR Facility is a Resource Conservation and Recovery Act (RCRA) very small quantity generator (VSQG) and small quantity generator (SQG) of hazardous waste. The corresponding RCRA IDs are MDD000820605 and MDR000527928, respectively. According to PAB, one of these RCRA IDs is for the Edible Oil Refinery, and the other is for the rest of the ZCR Facility. At the Oil Refinery, there is a hazardous waste storage shed with two drums used to store solvent and flammable wastes from lab testing of soybean oil. For the rest of the ZCR complex, hazardous and other wastes are collected and temporarily stored in the Environmental Garage pending disposal. PAB's Director of Environmental Compliance and Services (Ms. Mays) indicated that these areas are inspected regularly. According the EDR Radius Map™ Report, hazardous wastes that have been generated on-site include ignitable waste, corrosive waste, chromium, lead, mercury, benzene, chloroform, 1,4-dichlorobenzene, spent halogenated solvent (waste codes F001 and F002), spent non-halogenated solvents (waste code F003), and methylene chloride. PAB reported to Langan that wastes stored in these areas do not contain intentionally added PFAS, and also that there have been no releases associated with the aforementioned storage areas.

The small quantities of hazardous wastes generated at the ZCR Facility, as noted above, are not expected to contain intentionally added PFAS. Further, Ms. Mays reported that she is not aware of current or past disposal of hazardous waste on the subject property. Additionally, Langan did not observe evidence of releases in the noted storage areas.

2.7.2 Non-Hazardous Waste Potentially Containing PFAS

Non-hazardous waste generated at the subject property includes used oil (recycled), scrap metal (recycled), waste grain, used pallets, and general refuse.

Langan observed three 55-gallon drums of used petroleum-based oil stored inside the Maintenance Building during the January 8, 2025 site reconnaissance. The drums were stored on raised pallets. Langan did not observe staining or evidence of release in the vicinity of the drums. According to PAB's Regional Environmental Manager (Mr. King), additional wastes including used oil, used diesel exhaust fluid, universal wastes, and other materials are placed in the Environmental Garage so that they can be assessed, and appropriate disposal arrangements can be made. Langan observed numerous labelled 55-gallon drums, used spill absorbent media, and a variety of universal wastes (electronics, fluorescent lights, etc.) in the Environmental Garage on January 8, 2025. PAB's environmental team handles the segregation and labeling of these materials and arranges for their off-site disposal through third-party vendors. No visible cracks or staining were noted in the Environmental Garage, and the containers appeared to be intact. Additionally, the materials observed in the Environmental Garage are not expected to contain intentionally added PFAS.

Scrap metal was observed in several outdoor laydown areas throughout the facility including in a laydown area to the northeast of the Soybean Oil Refinery, to the west of the Litter Building and Former Temporary Ground Grain Pile, and in the Former Poultry Research Farm (see photographs in Appendix B).

Ms. Mays indicated that waste grain is usually stored inside the Litter Building, but is sometimes stored outside if there is overflow. The Litter Building was empty during Langan's site reconnaissance on January 8, 2025.

Ms. Mays reported that general refuse is removed from the facility by Republic Services.

PAB's Director of Environmental Compliance and Services (Ms. Mays) reported that she is not aware of any current or past disposal of solid waste on the subject property (e.g., in landfills),

2.7.3 Fill Areas

Langan observed two areas of stockpiled soil and one area used for placement of dredge spoil deposits.

One of the soil stockpiles is located in the northwestern corner of the site, south of the Former Poultry Research Farm (western section) (Figure 2, Appendix A). This soil stockpile has a footprint of approximately 20,000 square feet and is estimated to be at least 10 feet high. It first appeared between 2015 and 2018 based on a review of historical aerial photographs (see Appendix D, EDR Aerial Photo Decade Package). PAB reported that this stockpile contains excess soil from various construction projects at the ZCR Facility, potentially including soil from an on-going project involving the construction of new/expanded soybean oil extraction capacity to the west of the current Soybean Extraction Plant. This construction is taking place near Fire Station #3 (where the AFFF is stored), the Hexane Tank Enclosure, and the Extraction Plant Containment Sump.

The other soil stockpile is located to the east/northeast of the Litter Building and Former Temporary Grain Ground Pile (Figure 2, Appendix A). This soil stockpile has a footprint of less than 700 square feet and is estimated to be at least 5 feet high. It is not readily apparent on the historical aerial photographs provided in Appendix D, the most recent of which was flown in 2018. PAB reported that this stockpile contains excess soil from the aforementioned new/expanded soybean oil extraction plant construction project.

PAB indicated that there is a former soil borrow pit on the western portion of the subject property that has been used to emplace dredge spoils from periodic (permitted) dredging of sediment from the on-site portion of Peggy Branch. According to PAB, dredging typically takes place at intervals of four years or more, to remove accumulations of sediment that form upstream of SW Outfall 002 (i.e., where Peggy Branch is culverted as it passes under the Delmarva Central railroad bed). This is done to maintain capacity and flow within the stream channel. The Former Borrow Pit has a footprint of approximately 22,000 square feet. It first appeared between 1989 and 1991 based on a review of historical aerial photographs (Appendix D). Standing water can be seen in the Former Borrow Pit on historical aerial photographs from 2007, 2015, possibly 2017, and 2018. Standing water was also observed during Langan's site reconnaissance, at an elevation at least 5 feet below the surrounding ground surface. Apparent dredge spoil deposits are present primarily in the northwestern half of the Former Borrow Pit, while the southeastern half contains standing water, estimated to be less than approximately 1 foot deep.

2.8 Wastewater

Process and sanitary wastewater from the operations at the ZCR Facility are treated on-site and discharged under authorization of NPDES Permit No. MD0000060 / State Permit No. 15-DP-0359 (the "Permit"). Process water is generated in several areas of the facility, including the two Hatcheries (Nos. 2 and 3), the Boiler House, the Truck Wash, the Soybean Crush Plant and

Extraction Plant, the Edible Soybean Oil Refinery, and the Tanker Wash (Figure 2, Appendix A). Process water is conveyed, via a network of collection sumps, process sewers, and lift stations, to an on-site Wastewater Treatment Plant located in the east-central portion of the facility (Figure 2, Appendix A). Wastewater treatment consists of equalization, pH adjustment, dissolved air floatation (DAF), aeration, chlorination/de-chlorination, and clarification prior to monitoring, and treated water is discharged to Peggy Branch via Outfall 001 (Figure 2, Appendix A). Prior to 2024, treated water was also discharged to the Spray Irrigation Field (Outfall 006) and to the Spray Irrigation Forest (Outfall 005) (see Figure 2, Appendix A) on a seasonal basis. The facility's permitted average daily flow limitation is 175,000 gallons.

On August 1, 2023, MDE's Wastewater Pollution Prevention and Reclamation Program notified PAB that they would be visiting the ZCR Facility to collect influent and effluent samples as part of their ongoing study to analyze levels of PFAS across treatment works in Maryland. MDE visited the site to collect process/wastewater samples on August 8, 2023. MDE collected samples from the combined process water influent at the Main Lift Station, the influent side of the DAF unit inside the Wastewater Treatment Plant, and treated effluent at the sampling point for Outfall 001 to Peggy's Branch. The samples were analyzed by MDE using USEPA Method 1633. PFAS were detected in all three of the samples collected, with PFOS occurring at the highest concentrations. The concentrations of PFOS detected varied from 694 ng/L in the treated effluent to 1,670 ng/L in the combined influent at the Main Lift Station. Additional steps taken in response to these findings are summarized in Section 3.6.

Based on a review of historical aerial photographs (see Appendix D, EDR Aerial Photo Decade Package), it appears that the Wastewater Treatment Plant was constructed between 1970 and 1974, and was expanded in subsequent years. Additionally, based on the aforementioned historical aerial photographs, it appears that spray irrigation was initiated between 1989 and 1991in the Spray Irrigation Field, and between 1991 and 1998 in the Spray Irrigation Forest.

PAB reported that there are septic systems for some of the offices at the Facility, including the Grain Office, that are too far away to connect to the sanitary sewer lines that lead to PAB's Wastewater Treatment Plant.

2.9 Stormwater

Stormwater discharges at the ZCR Facility are covered by a General Permit for Discharges from Stormwater Associated with Industrial Activities (State Permit No. 20-SW, NPDES Permit No. MDR003337), which has an effective date of February 1, 2023 and expires on January 31, 2028. According to PAB's Stormwater Pollution Prevention Plan, last updated on June 5, 2024, PAB's General Stormwater Permit covers three primary stormwater outfalls where stormwater leaves the subject property:

- SW 001 to an off-site drainageway that leads to Peggy's Branch
- SW 002 Peggy's Branch
- SW 003 to an off-site drainageway that leads to Middle Neck Branch

The locations of these outfalls are depicted on Figure 2 (Appendix A). This figure also depicts stormwater retention basins and the network of underground stormwater pipes/drains at the ZCR Facility. Based on the drainage area and topographic figures presented in the aforementioned Stormwater Pollution Prevention Plan, most of the stormwater drainage from the operational portion of the facility drains to Peggy Branch, which exits the property at SW Outfall 002. A

relatively small area in the southeastern corner of the facility drains to SW Outfall 001, which empties into an off-site drainageway that leads to Peggy's Branch. SW Outfall 003 receives drainage from the western margins of the Soybean Oil Refinery and associated Tanker Wash. There is a drainageway (a ditch), evident on aerial photographs, that extends northerly from the Soybean Oil Refinery and associated Tanker Wash, along the western edge of the Former Spray Irrigation Field, through the Former Poultry Research Farm Area, and eventually to SW Outfall 003 along Morris Leonard Road. Langan observed SW Outfalls 002 and 003 during the site reconnaissance on January 8, 2025. At that time, the water in the drainageways around these Outfalls was frozen. The large, undeveloped western portion of the site, including the Spray Irrigation Field, drains inward, with some of the drainage potentially entering the drainage ditch that leads to SW Outfall 003. The easternmost portion of the Former Spray Irrigation Forest drains inward to a low-lying area, while the central portion of the Former Spray Irrigation Forest drains inward and off-site to the north to a tributary of Middle Neck Branch.

3. SUBJECT PROPERTY HISTORY AND RECORDS REVIEW

The following sections provide summaries of the historical uses of the subject property, and available information regarding documented environmental conditions associated with the historical uses.

3.1 Historical Summary

Langan compiled the following summary of the subject property history based on a review of readily available and reasonably ascertainable sources and interviews. For the parcels that comprise the subject property, Langan reviewed online property records available through the Maryland Department of Assessments and Taxation, State Archives, and the County Clerk's office. These online records, which extend back to 1966, indicate the subject property as being owned by PAB or other Perdue entities. Historical information regarding the subject property was compiled from the EDR reports (e.g., historical aerial photographs and topographic maps), information provided by PAB during the site reconnaissance, and company promotional materials including informational videos about the ZCR Facility. The EDR reports are provided in Appendix D, and other references are listed in Section 6.

Langan's assessment identified three facility operations that are no longer active: the Original Oilseed Crush Plant, the Former Marigold Plant, and the Former Poultry Research Farm. These former operations are summarized below:

- **Original Oilseed Crush Plant**. PAB's 2022 promotional video for the ZCR Facility indicates that there was an Oilseed Crush Plant originally built in 1961, preceding the current plant built in 1985. PAB personnel indicated that the Original Oilseed Crush Plant was located near the Feed Mill, but they did not have additional details regarding the former operations. There do not appear to be any remaining buildings associated with the Original Oilseed Crush Plant.
- **Former Marigold Plant**. During the site reconnaissance, PAB personnel indicated that, at one time, there was a "Marigold Plant" where marigold flowers were processed to make a dye that was added to poultry feed to give the flesh of finished meat birds a richer yellow color. The Marigold Plant was reportedly located in the vicinity of the Feed Mill and is no longer in operation. PAB personnel identified a small vacant cinder block building as having been potentially associated with the Former Marigold Plant.

- **Former Poultry Research Farm**. There was a Poultry Research Farm located in the northwestern portion of the ZCR Facility, accessible from Morris Leonard Road. PAB personnel reported that the Poultry Research Farm ceased operations around 15 years ago. The buildings associated with the Former Poultry Research Farm are still present, and were observed by Langan during the site reconnaissance on January 8, 2025. Those buildings included five long chicken barns and associated grain/feed silos; numerous "small flock" chicken houses; a small feed mill; various utility/storage buildings including office spaces; and a residence used by the former farm director. There are also a number of small utility buildings that are believed to have supplied heat to chicken barns. Langan observed the interiors of two of the large chicken barns, the former feed mill (and a nearby utility building), and two storage sheds. Photographs and descriptions of those building are provided in Appendix B.

Table 3-1 Subject Property History

Time Period	Historical Discussion
1900 – 1958	The earliest aerial photographs (1954) of the subject property and the older topographic maps (1900, 1901, 1902, 1942, 1943, 1946, 1950, and 1954) depict the property as a farmland with wooded land to the north and west. The subject property appears as farmland with small buildings apparent on the 1954 aerial photograph in the southeastern and northwestern portions of the property. Additionally, in the 1954 aerial photograph, there is a small clearing visible in the forested area, in the southcentral portion of what became the Spray Irrigation Forest. PAB's 2022 promotional video for the ZCR Facility indicates that PAB acquired the subject property at some point prior to 1958.
1958 – 1982	According to PAB's 2022 promotional video for the ZCR Facility, the facility's Feed Mill was constructed in 1958; its Grain Elevator was subsequently built in 1960; and its original Oilseed Crush Plant was built in 1961. The 1960 aerial photograph depicts buildings coinciding with the Feed Mill and Hatchery #2. The 1970 aerial photograph depicts the Feed Mill, Grain Elevator and Grain Storage facilities, Hatchery #2, and administrative buildings. The 1974 aerial photograph depicts several added structures/features including the Truck Garage (and Truck Wash), Hatchery #3, and the aeration and emergency ponds associated with the Wastewater Treatment Plant. Additionally, the 1974 aerial photograph depicts the U.S. Route 50 Salisbury Bypass under construction. The 1982 aerial photograph depicts more new structures/features including portions of the Former Poultry Research Farm in the northwestern corner of the property, the Litter Building, and additional structures associated with the Wastewater Treatment Plant. It also depicts expanded parking areas and an apparent widening of the most downstream, on-site portion of Peggy Branch.
1982 – Present	According to PAB's 2022 promotional video for the ZCR Facility, the current Soybean Oil Crush Plant was built in 1985, along with the Edible Oil Refinery. Additionally, according to historical aerial photographs, parking areas were expanded between 1982 and 1989. The 1998 aerial photographs depicts rows cut through the forested land on the northern portion of the ZCR Facility, potentially in connection with development of the wastewater irrigation system.

Based on the aerial photographs and topographic maps provided by EDR, PAB's 2022 promotional video for the ZCR Facility, and interviews with facility personnel, it is unlikely that the subject property was used for developed purposes other than agriculture prior to 1958.

Environmental concerns related to historical operations are discussed further in Section 3.6.

3.2 Regulatory Database Review

The subject property is identified on the Emergency Response Notification System (ERNS), RCRA VSQG, MANIFEST, AST, Facility Index System (FINDS), Toxics Release Inventory (TRIS), Oil Control Program - Case (OCPCASES), and Enforcement and Compliance History Online (ECHO) databases. The listings are related to hazardous waste generation, ASTs, and historical releases. EDR's environmental database report is attached as Appendix D.

Information regarding ASTs at the ZCR Facility was previously discussed in Section 2.5.2.

Current hazardous waste generation information is discussed in Section 2.7.1. PAB is listed in the database report associated with historical hazardous waste generation as a very small quantity generator (VSQG).

3.3 North American Industry Classification System (NAICS) Codes

PAB's 2018 Facility Response Plan (attached to the December 2022 Spill, Control, and Countermeasures (SPCC Plan) identifies the following NAICS codes with operations at the ZCR Facility:

- 311119 – Other Animal Food Manufacturing
- 311224 – Soybean and Other Oilseed Processing
- 311225 – Fats and Oil Refining and Blending

These NAICS codes are not among those identified by US EPA as being directly or indirectly affected by its rule designating PFOA and PFOS as hazardous substances under CERCLA.[2]

3.4 Fires and Fire Protection Systems

AFFF Fire Suppression System for the Soybean Oil Extraction Plant

The AFFF ASTs in Fire Station #3 are components of an AFFF fire suppression system that provides fire protection related to the use of hexane as a solvent in the soybean oil extraction process. Hexane is a volatile and flammable aliphatic hydrocarbon. PAB stores hexane in two 15,000-gallon horizontal ASTs located within an exterior covered enclosure to the north of the Soybean Oil Extraction Plant. The AFFF fire suppression system provides fire protection for: a) the Hexane Tank Enclosure, b) the interior of the Soybean Extraction Plant, and c) the Extraction Plant Containment Sump. The Extraction Plant Containment Sump is an open/exterior concrete sump/pit with a footprint of approximately 15 x 25 feet located adjacent to the north of the Soybean Oil Extraction Plant (Appendix A, Figure 2A). The AFFF ASTs and associated fire suppression system are serviced by an outside vendor.

As noted, the AFFF fire suppression system is presently equipped with Ansulite AFC3B 3% AFFF. The manufacturer's specification sheet for Ansulite AFC3B 3% AFFF indicates that it

[2] See Federal Register, Volume 89, No. 90, May 8, 2024, available at https://www.govinfo.gov/content/pkg/FR-2024-05-08/pdf/2024-08547.pdf

"contains short-chain, C-6 fluorochemicals manufactured using a telomer-based process" and that "[t]he telomer process produces no PFOS, and these C-6 materials do not breakdown to yield PFOA".[3] PAB has indicated that the AFFF fire suppression system has been equipped with Ansulite AFC3B 3% AFFF since 2021, and that it was equipped with other AFFF products previously. Those previous AFFF products included Ansulite AFC3A 3%, Buckeye BCF-3 Platinum 3%, and 3M FC783F. At least some of these earlier AFFF products would have contained "long-chain" materials including PFOS and/or PFOA.

PAB has reported that the AFFF system is not known to have been activated in response to a fire. However, PAB has indicated that there have been accidental triggers of the system in the past history of the plant. The last reported accidental trigger occurred around November 2019. That event resulted in the discharge of Ansulite AFC3A 3% AFFF. By design, AFFF discharged inside the Soybean Oil Extraction Plant would have been directed to the Extraction Plant Containment Sump, which leads to PAB's Wastewater Treatment Plant via underground process sewers. However, AFFF discharged via spray nozzles positioned above the Hexane Tank Enclosure and Extraction Plant Containment Sump could have fallen on the ground surrounding those structures.

Other Fire Protection Systems

PAB's Director of Environmental Compliance and Services (Ms. Mays) has reported that, to the best of her knowledge, AFFF has not been stored or deployed at the ZCR Facility, except at the Soybean Oil Extraction Plant, as noted above. Other fire suppression systems reportedly use water (water deluge), and some may be equipped with chemical extinguishing agents based on the facility's October 2022 Hazardous Waste Contingency Plan. Langan also observed numerous ABC handheld fire extinguishers throughout the facility, but these are not expected to contain AFFF. The fire systems and extinguishers at the ZCR Facility are serviced by a third-party vendor. PAB maintains several fire trucks that are kept in a garage bay adjacent to the Environmental Garage (north of the Feed Mill). Ms. Mays reported that in the past the facility's emergency response team has done training near the Litter Building, but to the best of her knowledge this training involved testing of the tanker truck and hosing and did not involve firefighting foam.

Fires

Numerous PAB personnel reported that there have been grain dryer fires the ZCR Facility, and that those fires have been extinguished with water. An internet search identified news stories related to at least two such dryer fires that occurred in 2021. PAB personnel interviewed during the site reconnaissance did not recall any other types of fires that have occurred at the ZCR Facility.

On November 14, 2024, Langan used an online form (https://salisbury.md/departments/fire/fire-report-request) to request records from the City of Salisbury related to fires at the ZCR Facility,

[3] Ansul Product Data Sheet "Ansulite AFC3B 3% AFFF Concentrate" accessed January 14th, 2025. Website: https://www.ttkfire.com/images/ttkfire/product/ansul/firefighting-foam/ANSUL_3AFFF.pdf

specifically the dryer fire that occurred in May 2021. As of the date of this report, no response has been received.

On December 12, 2024, Langan submitted a request to the Salisbury Fire Department for records related to fires at the ZCR Facility, using an online form (https://www.salisburyfd.com/page/contact-us). As of the date of this report, no response has been received.

3.5 Biosolids

Biosolids (sludge) resulting from the treatment wastewater are recognized as a potential source of PFAS. These materials are sometimes beneficially reused as soil amendments on agricultural fields. PAB's Director of Environmental Compliance and Services (Ms. Mays) reported that she is not aware of any land application of biosolids on the former farm fields or elsewhere at the ZCR Facility.

3.6 PFAS-Related Environmental Reports, Sampling Events, and Regulatory Correspondence

Provided below is a brief summary of prior PFAS-related environmental reports, sampling events at the ZCR Facility, and regulatory correspondence:

- August 1, 2023 – MDE's Wastewater Pollution Prevention and Reclamation Program notified PAB that they would be visiting the ZCR Facility to collect influent and effluent samples as part of their ongoing study to analyze levels of PFAS across treatment works in Maryland.
- August 8, 2023 – MDE collected water samples from: the combined process water influent at the Main Lift Station, the influent side of the DAF unit inside the Wastewater Treatment Plant, and treated effluent at the sampling point for Outfall 001 to Peggy Branch.
- December 20, 2023 – MDE's Water and Science Administration asked PAB's drilling contractor (Somerset Drilling) to suspend installation of new water supply wells in the confined aquifer (Manokin Formation) at the ZCR Facility, in response to findings from the August 2023 PFAS sampling.
- December 28, 2023 – MDE collected additional water samples at various locations within the ZCR Facility including: various points in the process and sanitary water collection/conveyance system; treated effluent at Outfall 001 to Peggy Branch; return activated sludge from the wastewater treatment process; monitoring wells MW-1 through MW-6 (associated with the Former Spray Irrigation Field and Spray Irrigation Forest); and various water supply wells and drinking water point of use locations within the facility.
- January 29, 2024 – PAB collected samples, for PFAS analysis, from three out-of-service "residential-style" water supply wells, two at the Former Poultry Research Farm, and one on an adjacent PAB-owned property at the southwest corner of Morris Leonard Road and Zion Church Road.
- February 28, 2024 – PAB collected additional samples, for PFAS analysis, as requested by MDE, from various points in the process water and sanitary water collection/conveyance systems (some of these were at locations that had been previously sampled in August 2023).

- March 20, 2024 – PAB collected additional wastewater samples from various points, as requested by MDE.
- March of 2024 – PAB offered a plan for voluntary on-property monitoring and quarterly testing of PFAS in response to results of the prior sampling events, which was approved by MDE in May 2024.
- July 2024 – On behalf of PAB, per the above-noted plan, Earth Data, Inc. installed and sampled six multi-level monitoring wells on the western portion of the ZCR Facility.
- September 2024 – Earth Data issued a report on the July 2024 well installation and sampling activities titled *Results of Temporary PFAS Monitoring Well Installation and Testing*.
- September 12, 2024 – MDE issued a letter designating PAB as a responsible person (as defined by Section 7-201) of the Environmental Article) for PFAS detected in groundwater at the western edge of the ZCR Facility and in well and surface water samples collected by MDE to the west of the ZCR Facility.
- October 14, 2024 – PAB collected PFAS samples from various water supply wells and point-of-use locations at the ZCR Facility.
- November 8, 2024 – MDE Issued a letter requesting that PAB take certain actions to address PFAS in wastewater including: a) monthly sampling of treated effluent from Outfall 001 and analysis for PFAS, and b) "assessment of the facility's processes, materials, and any third-party waste streams to identify sources of PFAS that may enter the facility's discharges, stormwater runoff, or sludge."
- November 20, 2024 – Langan performed the initial monthly sampling of treated effluent from Outfall 001 in response to MDE's November 8 letter.
- November 27, 2024 – On behalf of PAB, Langan submitted an initial monthly progress report in response to MDE's November 8 letter.
- December 17, 2024 – Langan performed the second monthly sampling of treated effluent from Outfall 001 in response to MDE's November 8 letter.
- December 20, 2024 – MDE issued a letter summarizing actions taken by MDE and PAB in response to the identification of PFAS in wastewater and groundwater at the ZCR Facility and requesting that PAB provide a report "that is equivalent to a Phase I Environmental Site Assessment ("ESA") to determine all potential sources of PFAS in soil and groundwater at the site."
- December 30 and 31, 2024 – Langan performed quarterly sampling of the six multi-level monitoring wells that were installed by Earth Data in July 2024. Validated PFAS analytical results are pending.
- December 31, 2024 - On behalf of PAB, Langan submitted the second monthly progress report in response to MDE's November 8 letter. That report included PFAS analytical results for the wastewater effluent sample collected on November 20, 2024.
- January 15, 2025 - Langan performed the third monthly sampling of treated effluent from Outfall 001 in response to MDE's November 8 letter.

MDE provided PAB with laboratory analytical reports for the above-noted PFAS sampling and analysis performed on August 8, 2023 and December 28, 2023. Langan is in the process of compiling and evaluating laboratory analytical data for PFAS samples collected at the ZCR

Facility by MDE, PAB, Earth Data, and Langan. Sample location maps and tabulated data summaries will be provided in a subsequent deliverable. Langan expects to use the available PFAS analytical data to support the development of an initial Conceptual Site Model (CSM).

4. ADJOINING PROPERTIES AND SURROUNDING AREA

The following section describe current and historical uses of and database listings for adjoining properties and the surrounding area.

The current use of adjoining and surrounding properties is summarized in Table 4-1.

Table 4-1 Current Use of Adjoining Properties and Surrounding Area

Direction	Adjoining Properties	Surrounding Area
North	Morris Leonard Road residences and agricultural land lay to the north of the property. Middle Neck Branch also flows north of PAB.	Residential and agricultural properties
East	Zion Church Road residences lay directly east of PAB.	Residential and agricultural properties, as well as a commercial storage warehouse.
South	Old Ocean City Road residences and agricultural land lay to the south of the property. The Delmarva Central Railroad and Peggy Branch also run south of PAB.	Residential and agricultural properties, as well as a several gas stations, an elementary school, and PAB's corporate office and facility.
West	U.S. Route 50 lays directly adjacent to the western boundary of PAB.	Residential and agricultural properties

Langan reviewed EDR's Radius Map™ and Lightbox Database, identifying 18 sites within 1 mile of the subject property that have been registered in state and federal environmental databases. The locations of these sites are depicted on Figure 4, Appendix A.

D & D Trucking

A Google search reported this company as a towing business erroneously placed within the adjacent property search area. The property was listed in MDE's Oil Control Program (OCPCASES) database, a database regulating oil-related activities in the state including ASTs, USTs, oil-contaminated soil treatment facilities, and oil transportation. D & D trucking is listed because of a vehicle accident and associated release of oil.

Connectiv Power

A Google search reported this company is related to Delmarva Power, Salisbury's primary source of electricity, but gave no address or additional identifying information. With no other information provided from EDR, it is suspected that this facility was a former electric provider. Google Maps shows a densely wooded area, while EDR reports the facility is closed. The property was listed in MDE's OCPCASES, with no information regarding the release.

Felicia Matthews Residence

According to EDR and SDAT, this property is a residence. The property was listed in MDE's OCPCASES as it has an active AST/UST for heating oil.

Kims International Inc.

According to EDR and SDAT, this property is a historic gas station. The property was listed in EDR's HIST AUTO database as a former gas station. SDAT's database currently lists the property

as a residence, despite the gas station operating in 2008 per the EDR report. It is suspected that the address listed in the EDR report is erroneous.

George Ennis Residence

According to EDR and SDAT, this property is a residence. The property was listed in MDE's OCPCASES as it had a closed oil UST, as well as MD's LEAD database, a database related to lead investigations in the state.

Ennis Petrol

According to EDR and SDAT, this property was a commercial business. The property was listed in MDE's OCPCASES as it has a closed oil AST.

Howard Cordrey Residence

According to EDR and SDAT, this property is a residence. The property was listed in MDE's OCPCASES as it has an active AST/UST for heating oil.

A S Trucking

A Google search yielded no information on the operation or formal address of this property; Langan suspects the business is a trucking company based on its name. Google Maps shows a storage facility at corner denoted in the EDR report, while the EDR reports A S Trucking is closed. The property was listed in MDE's OCPCASES, with no information regarding the release.

Preston R. Smith Plumbing & Heating

According to EDR, this property was a plumbing and HVAC business. The property was listed in MDE's OCPCASES as it had a closed UST; EDR also reports that the business is closed.

Winterplace Farm

A Google search reported this site as an equestrian training and performance facility. The property was listed in MDE's OCPCASES, with no information regarding the release.

Hobbs Road Station

According to EDR and Langan observation, this property is a gas station and convenience store. The property was listed in MDE's OCPCASES as it had five closed USTs and has two active USTs; EDR also reports three petroleum releases at the site.

Allen Withers Residence

According to EDR and SDAT, this property is a residence. The property was listed in MDE's OCPCASES as it has a closed heating oil UST, as well as MD's LEAD database, a database related to lead investigations in the state.

Texaco

According to EDR and Langan observation, this property was a gas station and convenience store; it was replaced by the current Winter Place Market and Deli, which is described below. The property was listed in MDE's OCPCASES as it had three closed USTs; an additional incident of motor oil groundwater contamination was report to OCPCASES in 2001 and closed in 2002.

Winter Place Market and Deli

According to EDR and Langan observation, this property is a gas station and convenience store. The property was listed in MDE's OCPCASES as it had a closed UST.

Case Residence

According to EDR and SDAT, this property is a residence. The property was listed in MDE's OCPCASES as it has a closed heating oil UST.

BFI

A Google search yielded no information on the operation or formal address of this property. Google Maps shows a residential area, while EDR reports the facility is closed. The property was listed in MDE's OCPCASES, with no information regarding the release.

Richard Kadera Residence

According to EDR and SDAT, this property is a residence. The property was listed in MDE's OCPCASES as it has a closed motor oil UST.

Vivian Hoprich Residence

According to EDR and SDAT, this property is a residence. The property was listed in MDE's OCPCASES as it has a closed heating oil UST.

None of these listings are expected to be indicative of potential PFAS concerns.

Langan did not observe obvious conditions likely to represent PAFS environmental concerns for the subject property from current uses of adjoining or surrounding properties.

5. CONCLUSIONS, FINDINGS AND OPINIONS

Langan performed an Environmental Assessment of PFAS for the ZCR Facility using ASTM E1527-21 as a guideline, except as noted herein. The following table summarizes our findings regarding PFAS AOIs that have been identified.

Table 5-1 Conclusions, Findings and Opinions

PFAS AOIs
AFFF Fire Suppression System: There is an aqueous film-forming foam (AFFF) fire suppression system associated with the Soybean Extraction Plant at the ZCR Facility. This system provides fire protection related to the use of hexane as a solvent in the soybean oil extraction process. Hexane is a volatile and flammable aliphatic hydrocarbon. AFFF is stored in two aboveground tanks inside Fire Station #3, one constructed in 1986 and the other constructed in 2012. The AFFF fire suppression system is presently equipped with Ansulite AFC3B 3% AFFF, which contains short-chain, C-6 fluorochemicals manufactured using a telomer-based process that does not produce perfluorooctane sulfonate (PFOS) or materials that would breakdown to yield perfluorooctanoic acid (PFOA). The AFFF system has been equipped with this product since 2021. The system was previously equipped with a variety of older AFFF products, at least some of which would have contained "long-chain" materials including PFOS and/or PFOA. PAB has indicated to MDE that there have been accidental triggers of the system in the history of the plant. The last reported accidental trigger occurred around November 2019. That event resulted in the discharge of Ansulite AFC3A 3% AFFF. AFFF discharged inside the Soybean Oil Extraction Plant would have been directed to the Extraction Plant Containment Sump, which leads to the facility's Wastewater Treatment Plant via underground process sewers. However, AFFF discharged via spray nozzles positioned above

the Hexane Tank Enclosure and Extraction Plant Containment Sump could have fallen on the ground surrounding those structures.
Stockpiled Soil - Northwest: There is a soil stockpile in the northwestern corner of the subject property. It has a footprint of approximately 20,000 square feet and is estimated to be at least 10 feet high. Based on historical aerial imagery, the stockpile was originally created between 2015 and 2018. According to PAB, it contains excess soil from various construction projects at the ZCR Facility, including some soils that may have come from an on-going project involving the construction of new/expanded soybean oil extraction capacity to the west of the current Soybean Extraction Plant. This construction is taking place near the exterior areas that may have been affected by past discharges from the AFFF Fire Suppression System. Accordingly, excess soil removed during construction and placed in the soil stockpile could contain AFFF, and therefore PFAS.
Stockpiled Soil – East-Central: There is another soil stockpile in the east-central portion of the subject property, to the east of the Litter Building and Former Temporary Grain Ground Pile. This soil stockpile has a footprint of less than 700 square feet and is estimated to be at least 5 feet high. Based on historical aerial imagery, this stockpile appears to have been created since 2018. PAB reported that this stockpile contains excess soil from the aforementioned construction that is taking place near the exterior areas that may have been affected by past discharges from the AFFF Fire Suppression System. Accordingly, excess soil removed during construction and placed in this soil stockpile could contain AFFF, and therefore PFAS.
Wastewater Treatment Facility Impoundments: The wastewater treatment system at the ZCR Facility includes four clay-lined impoundments: an aeration basin, a wastewater basin, an emergency lagoon, and a sewage sludge holding pond. These impoundments are located to the north of the Wastewater Treatment Plant buildings and to the east of the Former Spray Irrigation Field. The aeration basin is an integral component of the wastewater treatment process. The wastewater basin was previously used to hold treated wastewater slated for discharge via spray irrigation. The sewage sludge holding pond is used for temporary storage of excess return activated sludge and sludge that is periodically removed from the sanitary lift station and disposed off-site. The emergency lagoon provides excess temporary storage in case of emergencies but is not part of the routine process. A variety of PFAS have been detected in wastewater and sludge samples collected at various stages in the treatment process including in the influent wastewater, DAF influent and effluent, DAF sludge, water and sludge in the emergency lagoon, sludge from the holding pond, and return activated sludge. For example, a sample of influent wastewater collected in August 2023 identified PFOS at a concentration of 1,500 ng/L, PFOA at a concentration of 33.2 ng/L, and other PFAS. Results are further discussed in Section 3.6. It is possible that some PFAS could have seeped from these clay-lined impoundments into underlying soil and groundwater.
PFAS in Groundwater at the ZCR Facility: PFAS have been detected in groundwater at the ZCR Facility in monitoring wells associated with the former spray irrigation operations (MW-1 through MW-6), in multi-level monitoring wells that were installed and sampled for PFAS in July 2024 on the western end of the property (MW-1W through MW-6W), and in several of PAB's water supply wells. MDE sampled MW-1 through MW-6 in December 2023. The results indicated concentrations of PFOS varying from not-detected (MW-1) to 1,370 ng/L (MW-3), and concentrations of PFOA varying from not-detected (MW-2, MW-6) to 159 ng/L (MW-3). A variety of other PFAS were also detected. Multi-level monitoring wells MW-1W through MW-6W were installed in July 2024, under a plan that was approved by MDE, to assess the presence and distribution of PFAS in groundwater along the western side of the subject property. The highest concentrations of PFAS identified by this sampling were in the west-central part of the property (MW-4W and MW-5W), generally at depths greater than 40 feet below ground surface (bgs). PFOS was detected at concentrations up to 990 ng/L (MW-5W, 50 feet bgs), and PFOA was detected at concentrations up to 72 ng/L (MW-4W, 50 feet bgs; MW-5W, 50 feet bgs). A variety of other PFAS were also detected. Relatively lower concentrations of PFAS have also been detected in some of the ZCR Facility's on-site water supply wells. PAB has added point of use treatment for drinking water at the facility, and has also added point of use treatment for water used in product contact processes.

Groundwater sampling results are further discussed in Section 3.6.
Outfall 001 to Peggy Branch: A variety of PFAS have been detected in samples of treated effluent discharged to Peggy Branch through Outfall 001. The highest concentrations were detected in a sample collected by MDE in August 2023. Results from MDE's August 2023 sampling identified PFOS at a concentration of 694 ng/L and PFOA at a concentration of 40.5 ng/L. The August 2023 results are further summarized in Section 3.6. Since that time, lower concentrations of PFAS have been detected in samples collected from Outfall 001. Langan initiated monthly sampling of Outfall 001 and analysis of PFAS in November 2024, on behalf of PAB, as requested by MDE.
Dredge Spoils Deposits: There is a former soil borrow pit on the western portion of the subject property that has been used by PAB to emplace dredge spoils from periodic (permitted) dredging of sediment from the on-site portion of Peggy Branch (Creek). According to PAB, dredging typically takes place at intervals of four years or more, to remove accumulations of sediment that form downstream of the discharge of treated wastewater effluent (at Outfall 001) and upstream of stormwater Outfall 002, where Peggy Branch passes through a culvert under the Delmarva Central railroad bed. The former borrow pit appears to have been created between 1989 and 1991. The bottom of the pit is currently at least 5 feet below the surrounding ground surface. Apparent dredge spoil deposits are present primarily in the northwestern half of the Former Borrow Pit, while the southeastern half contains standing water, estimated to be less than approximately 1 foot deep. PFAS have been detected in treated wastewater effluent discharged to Peggy Branch. To the extent that this PFAS sorbed to sediment in Peggy Branch, dredge spoils removed from Peggy Branch and deposited in the former borrow pit could contain PFAS.
Former Spray Irrigation Field: Prior to 2024, treated wastewater from the facility's Wastewater Treatment Plant was used, on a seasonal basis, to spray irrigate the farm fields located in the central portion of the subject property. It appears that spray irrigation began in this area between 1989 and 1991 based a review of historical aerial photographs. As noted above, with respect to Outfall 001 to Peggy Branch, a variety of PFAS have been detected in samples of treated effluent from the facility's Wastewater Treatment Plant. A variety of PFAS were also detected in the monitoring wells surrounding the Former Spray Irrigation Field when those wells were sampled by MDE in December 2023, with the highest concentrations detected in MW-3. Results from MDE's December 2023 sampling identified PFOS in MW-3 at a concentration of 1,370 ng/L and PFOA at a concentration of 159 ng/L. The December 2023 results are further summarized in Section 3.6.

6. REFERENCES

Langan referenced the following documents in preparing this Environmental Assessment of PFAS report:

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7. LIMITATIONS AND DEFINITIONS

This Environmental Assessment of PFAS report was prepared for Client and is intended to be used in its entirety. Excerpts taken from this report are not necessarily representative of the assessment findings. The Client is the sole intended beneficiary of the report.

Langan's scope of services for this Environmental Assessment of PFAS is described in Section 1.2 and has been agreed to between Langan and the Client. No other services beyond those explicitly stated are implied.

This report is not intended to be an exhaustive assessment of the subject property. A goal of the Environmental Assessment of PFAS is to reduce uncertainty about unknown conditions at the subject property that could be relevant to the existence and identification of potential sources of PFAS in soil or groundwater at the subject property. No environmental site assessment can wholly eliminate uncertainty regarding the potential for PFAS AOIs in connection with the subject property. Therefore, Langan cannot "verify", "insure", "certify", or "guarantee" that the subject property is free of potential environmental concerns that have not been identified in this report.

No expressed or implied representation or warranty is included or intended in this report, except that our services were performed using the care and skill ordinarily followed by professionals providing similar services under similar circumstances in similar locations at the same point in time.

The conclusions provided in this report are based solely on information obtained through completing the standard activities described herein and are intended exclusively for the purpose stated herein, at the specified subject property, as it existed at the point in time the assessment was performed. The conclusions provided in this report do not apply to conditions and features of which Langan was not made aware of through good faith efforts to complete the activities as scoped and agreed to, and which we did not have the opportunity to evaluate.

Langan reviewed an environmental database search report prepared by an environmental database search provider for the subject property and surrounding area. The database search report includes a listing of properties identified on select federal, state, local, and tribal standard source environmental databases within the approximate minimum search radii outlined in ASTM E1527-21. This information was supplied to Langan by the environmental database search provider, and to the environmental database search provider by government sources; therefore, neither Langan nor the environmental database search provider can verify the completeness and accuracy of the database information. Appendix D contains a copy of the report, with specific source and property descriptions, and the dates of the last update for each database searched. Langan reviewed the database search report on a record-by-record basis to evaluate if certain properties identified in the database report are likely to represent an environmental concern for the subject property. The evaluation criteria included factors such as distance, groundwater gradient, nature of the listing, and regulatory status. Unless specifically discussed in the body of this report, the facilities listed on the database do not appear to represent an environmental concern to the subject property.