



## **PROPOSED PLAN OF REMEDIAL ACTION**

Operable Unit 10 (OU-10) Archive Building  
Fort Dupont Redevelopment  
Delaware City, Delaware  
DNREC Project No. DE-1618



SEPTEMBER 2023

Delaware Department of Natural Resources and Environmental Control  
Division of Waste and Hazardous Substances  
Remediation Section  
391 Lukens Drive  
New Castle, Delaware 19720

### CONTENTS


- Figures: 1, 2, & 3
- Glossary of Terms

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**Approval:**

This Proposed Plan meets the requirements of the Hazardous Substance Cleanup Act.

Approved by:

Qazi Salahuddin, Environmental Program Administrator Remediation Section
10/02/2023
Date



### **What is the Proposed Plan of Remedial Action?**

The Proposed Plan of Remedial Action (Proposed Plan) summarizes the clean-up (remedial) actions that are being proposed to address contamination found at the Site for public comment. A legal notice is published in the newspaper for a 20-day comment period. The Department of Natural Resources and Environmental Control (DNREC) considers and addresses all public comments received and publishes a Final Plan of Remedial Action (Final Plan) for the Site.

### **What is the Fort Dupont Redevelopment Site, OU-10?**

The approximately 0.2-acre Operable Unit 10 (OU-10) is located at the intersection of Powers Lane and Engineer Road and is part of a larger Tax Parcel 22-00.90-0156 [Figure 1]. The majority OU-10 is developed with an approximately 3,323 square foot (SF) building with maintained vegetated lawn areas [Figure 2]. Portions of OU-10 also include utility corridors that cross both Powers Lane and Engineer Road.

OU-10 is the tenth of multiple areas within Fort DuPont Redevelopment Site intended to be investigated and redeveloped as part of a revitalization effort [Figure 3]. All additional areas which undergo environmental investigation will be recognized as sequentially numbered OUs and a separate Proposed Plan will published for each OU. This proposed plan addresses Operable Unit-10 (OU-10) only.

### **What happened at the Fort Dupont Redevelopment Site OU-10?**

Between 1871 and 1904, over 300-acre lands were acquired by the United States War Department for the formation of Fort Dupont. Fort Dupont was initially used as an auxiliary battery to Fort Delaware (located on Pea Patch Island) in 1863 in order to protect the western channel of the Delaware River. Prior to 1898, a mining casement was established at the fort to store mines for use in the western channel of the Delaware River. However, by July 1898, all mines placed in the river were removed due to maintenance problems. Of the total of 57 mines originally placed in the Delaware River, 22 were damaged, lost, or sank.

Prior to and during World War I (WWI) [early-1900s], the fort functioned as a coastal artillery installation under the North Atlantic Coast Artillery District. During this time, the coastal artillery units conducted service and subcaliber firing of all of its weapons frequently. The impact area for all weapons was in the Delaware River at either fixed or towed targets. In 1908, due to boat traffic in the river, subcaliber firing was limited during the summer months. By 1910, the service firing of direct fire guns was prohibited towards the Delaware River. And, by WWI, all weapons firing was cancelled due to an ammunition shortage. During this period, many of the weapons at Fort Dupont were dismantled and shipped to other posts for use during

the war or became obsolete.

From 1922 to 1940, Fort Dupont became an engineer post during the construction of the Chesapeake and Delaware (C&D) Canal. The engineer troops on the Site fired only small arms at the post rifle and pistol ranges. The rifle range was located along the southern boundary with the targets near the Delaware River and firing points up to 600 yards away. According to historical documentation, there were no backstops behind the targets and rounds would have impacted the Delaware River. However, by 1934, the traffic on the river hindered target practice and a new range was installed. A 15-target pistol range was constructed in 1930 located between the mortar and rifle batteries and was used for qualification shooting.

During World War II (WWII), Fort Dupont served as a training center for engineer barge and dredge crews as well as a prisoner of war (POW) camp. Practice firing at Fort Dupont during this time was also limited due to the increased population in the area and river traffic. By the end of 1942, all mortars and larger weapons had been removed and salvaged for scrap metal. Furthermore, defense along the Delaware River shifted to concentrate at the mouth of the Delaware River at Cape Henlopen/Fort Miles. As a result, Fort Dupont became unnecessary and obsolete by fall of 1943. By May 1946, Fort Dupont was declared by the War Assets Administration as excess and transferred to the Federal Work Agency. During operation as a defense installation, the Site included hospital facilities, barracks, officer's quarters, mortar bunkers, gun batteries, communications buildings, an incinerator, warehouses, and maintenance shops. On-site staff support facilities included a theater, bakery, stables, fuel depot, jail, chapel, tennis courts, and a recreation facility.

The fort was transferred by Quitclaim Deed on January 28, 1947 to the State of Delaware. The State of Delaware operated the Governor Bacon Health Center (GBHC) on the Site. The GBHC consisted of two units: an adolescent unit for children considered to be socially and emotionally disturbed and an adult unit which provided intermediate nursing care. In 1984, the adolescent unit was closed but the adult unit continued operation. In 1987, GBHC was reassigned to the Division of Public Health (DPH) and then in 2011 to the Division for Aging and Adults with Disabilities (DSAAPD). In 2016, the Fort DuPont Redevelopment and Preservation Corporation assumed responsibility for the property's land use. Due to short staffing issues during the COVID-19 pandemic, the State of Delaware closed the GBHC in March 2020 to consolidate services to the Delaware Hospital for the Chronically Ill (Smyrna, Delaware).

In 1992, approximately 184-acres along the Delaware River and lands around the old batteries of Fort DuPont was dedicated as a State Park under the care of the DNREC Division of Parks and Recreation.

According to historical documentation, the structure on OU-10 was constructed in 1912 and was known/used as the Quartermaster's Stable, Building #030. Historical documentation indicate that the structure was used for stables until the 1940s when it was repurposed as a warehouse. The contents of the warehouse used are unknown. Later the State of Delaware used the structure for storage. At the time of the Site Investigation, the structure was under renovations. The structure is listed on the National Registry of Historic Places (NRHP) under

report NC-1499.030. Use and operations prior to the construction of the structure are unknown.

### **What is the environmental problem at the Fort Dupont Redevelopment Site, OU-10?**

A Limited Phase II Site Investigation (SI) report was completed on the OU-10 portion of the Site in July 2023. Eight (8) soil borings were advanced throughout OU-10 to terminal depths between 4 and 8 feet (ft.) below ground surface (bgs). Eight (8) shallow soil samples were collected from the 0 to 2 ft. soil interval and three (3) deeper soil samples were collected from the 2 ft. interval above the water table for each boring. Appropriate quality assurance (QA)/quality control (QC) soil samples were also collected during the sampling event. The quantity of deeper soil samples was fewer as the water table was encountered at shallower depths. The soil samples were screened at the DNREC-RS Screening Laboratory for target compound list (TCL) volatile organic compounds (VOCs), TCL semi-volatile organic compounds (SVOCs), TCL pesticides, polychlorinated biphenyls (PCBs) [EPA method 680], and Target Analyte List (TAL) inorganics. Based on the screening results, select soil samples were sent to a HSCA-approved laboratory for confirmatory analysis. The analytical results were compared to their respective February 2022 HSCA Screening Levels (SLs). According to the confirmatory laboratory results, two metals (arsenic and thallium) were detected at concentrations exceeding their respective HSCA SLs. The elevated arsenic was detected in only one shallow soil sample and thallium was detected in all eight shallow soil samples and two of the deep soil samples above its respective HSCA SL. No other analytes were detected above their respective HSCA SLs shallow and deep soil samples or their respective laboratory method detection levels (MDLs).

Additionally, three (3) soil borings were converted into three (3) monitoring wells on OU-10 as part of the investigation. Three (3) groundwater samples and associated QA/QC samples were collected and analyzed at a HSCA-approved laboratory for TCL VOCs, TCL SVOCs, TCL pesticides, PCBs, and total and dissolved TAL inorganics. According to the analytical results, total and dissolved metals (cobalt, iron, manganese) were detected above their respective HSCA SLs for groundwater. No other analytes were detected above their respective HSCA SLs or their respective laboratory MDLs. From November 7 to November 16, 2022, pressure transducers were placed in the monitoring wells on OU-10 to determine whether the shallow groundwater was tidally influenced. Based on the results, the transducers showed minimal tidal influence. The shallow groundwater generally flows northwest with an approximate horizontal gradient of 0.0011 ft/ft.

No surface water or sediment samples were collected as there were no surface water bodies or areas of sediment noted on OU-10 at the time of the investigation.

Contaminant concentrations above their respective HSCA SLs were retained as Contaminants of Potential Concern (COPCs) for carcinogenic and non-carcinogenic (Hazard Index, HI) risk assessment to human health. A Preliminary Human Health Risk Assessment (PHHRA) was completed as part of the Phase II SI report for multiple exposure scenarios including resident, indoor worker, composite (indoor and outdoor worker), outdoor worker, excavation worker,

recreational, and trespasser to on-site shallow and combination of shallow and deep soils. Additionally, PHHRA was calculated for the residential and indoor worker exposure scenarios to exposure to groundwater. The turbidity levels in all groundwater monitoring wells were detected greater than 10 NTUs, therefore, in accordance with the *Guidance for Human Health Risk Assessments (HHRA) under the HSCA*, only the dissolved metals exceeding their respective SLs were retained as COPCs.

According to the results of the HHRA, unacceptable carcinogenic risk was calculated for the residential exposure scenario to the shallow soils. The Contaminant of Concern (COC) driving the risk in shallow soils is arsenic. The HI risk for the residential exposure was below the action limits in shallow soils. No unacceptable carcinogenic and HI risk for all other receptor exposure scenarios to shallow soils. No unacceptable carcinogenic or HI risk was calculated for the residential exposure scenario to the combined soil. Since the risk of the combined soil passes the residential exposure scenario, the most conservative exposure scenario, therefore the remaining exposure scenarios are also acceptable. Unacceptable HI risk was calculated for the residential exposure scenario to groundwater. Resident and indoor worker carcinogenic risk and indoor worker HI risk for groundwater were acceptable. The dissolved cobalt and dissolved manganese were retained at the COCs in groundwater for a resident. Based on the non-toxic or non-volatile nature of the COCs in groundwater, no vapor intrusion screening level (VISL) calculations were necessary at the time of the SI.

A Sitewide Baseline Ecological Risk Assessment (BERA) is being completed as part of the Operable Unit 13 investigation and will be issued under separate cover.

### **What does the owner want to do at the Fort Dupont Redevelopment Site, OU-10?**

The Site will be redeveloped for commercial purposes as an office and storage facility with associated parking areas.

### **What additional clean-up actions are needed at the Fort Dupont Redevelopment Site, OU-10?**

**DNREC proposes the following remedial actions for the Site, which need to be completed before a Certificate of Completion of Remedy (COCR) can be issued.**

1. Close and abandon the monitoring wells in accordance with State and local regulations.
2. A proposed Environmental Covenant must be submitted to DNREC for approval within 60 days of the issuance of the Final Plan of Remedial Action.
3. An Environmental Covenant, consistent with Delaware's Uniform Environmental Covenants Act (7 Del.C. Chapter 79, Subchapter II) must be recorded in the Office of the New Castle County Recorder of Deeds within 60 days of the issuance of the Final Plan of Remedial Action. The Environmental Covenant must include the following activity and/or use restrictions:

- [a.] Use Restriction. Use of the Property shall be restricted solely to those non-residential type uses permitted within Commercial, Manufacturing, or Industrial Districts.
- [b.] Limitation of Groundwater Withdrawal. No groundwater wells shall be installed, and no groundwater shall be withdrawn from any well on the Property without the prior written approval of DNREC- RS and DNREC Division of Water.

4. A request for a Certification of Completion of Remedy (COCR) must be submitted to DNREC within 60 days of approval of the Remedial Action Completion Report.

### **What are the long-term plans for the Site after the cleanup?**

The Site use will be commercial.

### **How can I find additional information or comment on the Proposed Plan?**

The complete file on the Site including Brownfield Investigation-equivalent Site Investigation and the various reports and correspondences is available online at:

<https://den.dnrec.delaware.gov/>

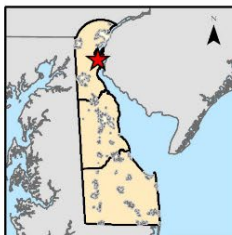
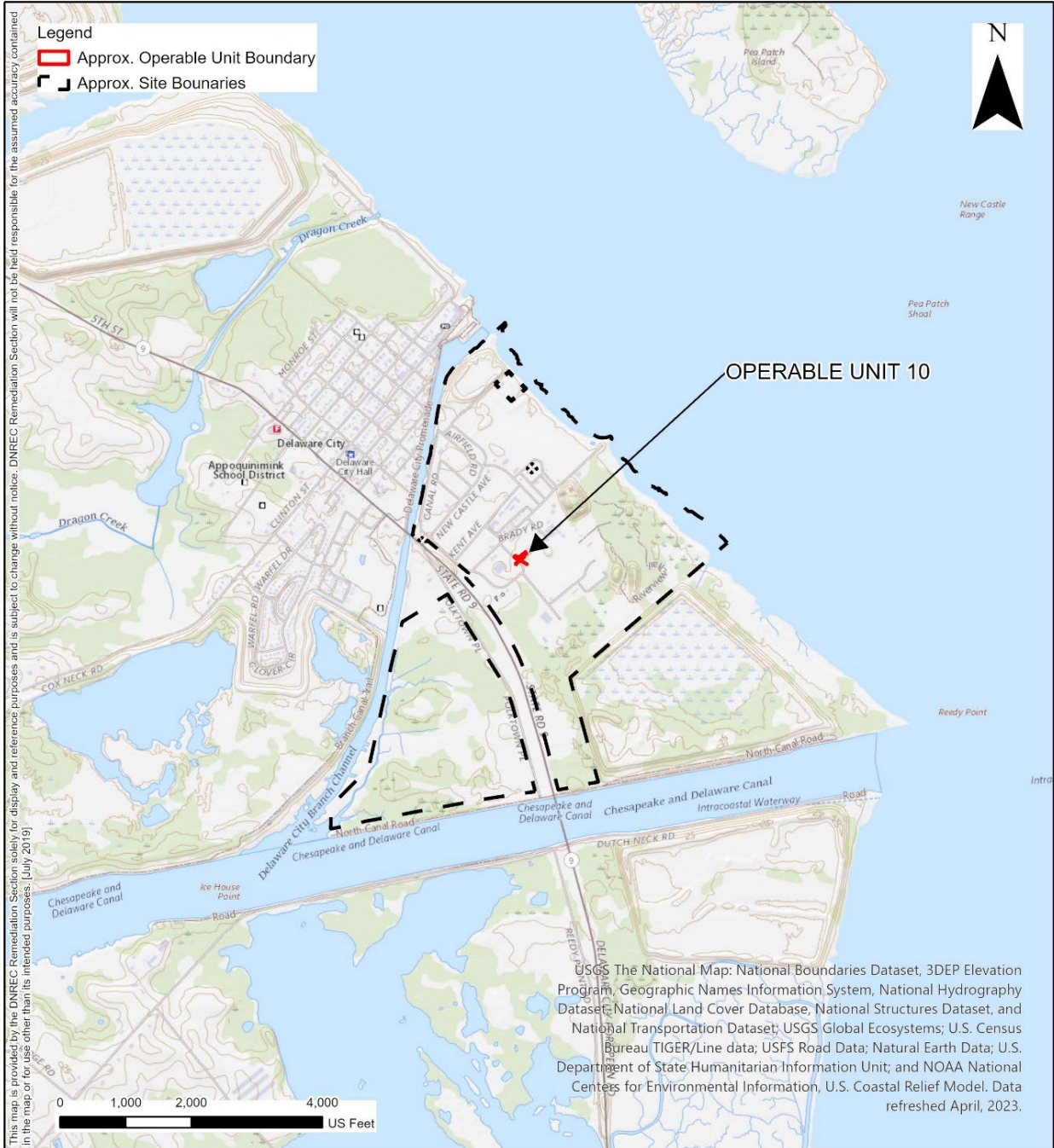
The 20-day public comment period begins on October 8, 2023 and ends at close of business (4:30 pm) on October 30, 2023. Please send written comments to the DNREC Morgan McGee-Solomon, Project Officer via email to [RS\\_Public\\_Comments@delaware.gov](mailto:RS_Public_Comments@delaware.gov); or written letter to 391 Lukens Drive, New Castle, DE 19720.

Figure 1: Operable Unit 10 (OU-10) Location Map

Figure 2: OU-10 Layout Map

Figure 3: OU Location Map

MMS:dh; MMS23076.docx; DE-1618 II B8; QS23193



Sources: Approx. Site Boundaries [DNREC]

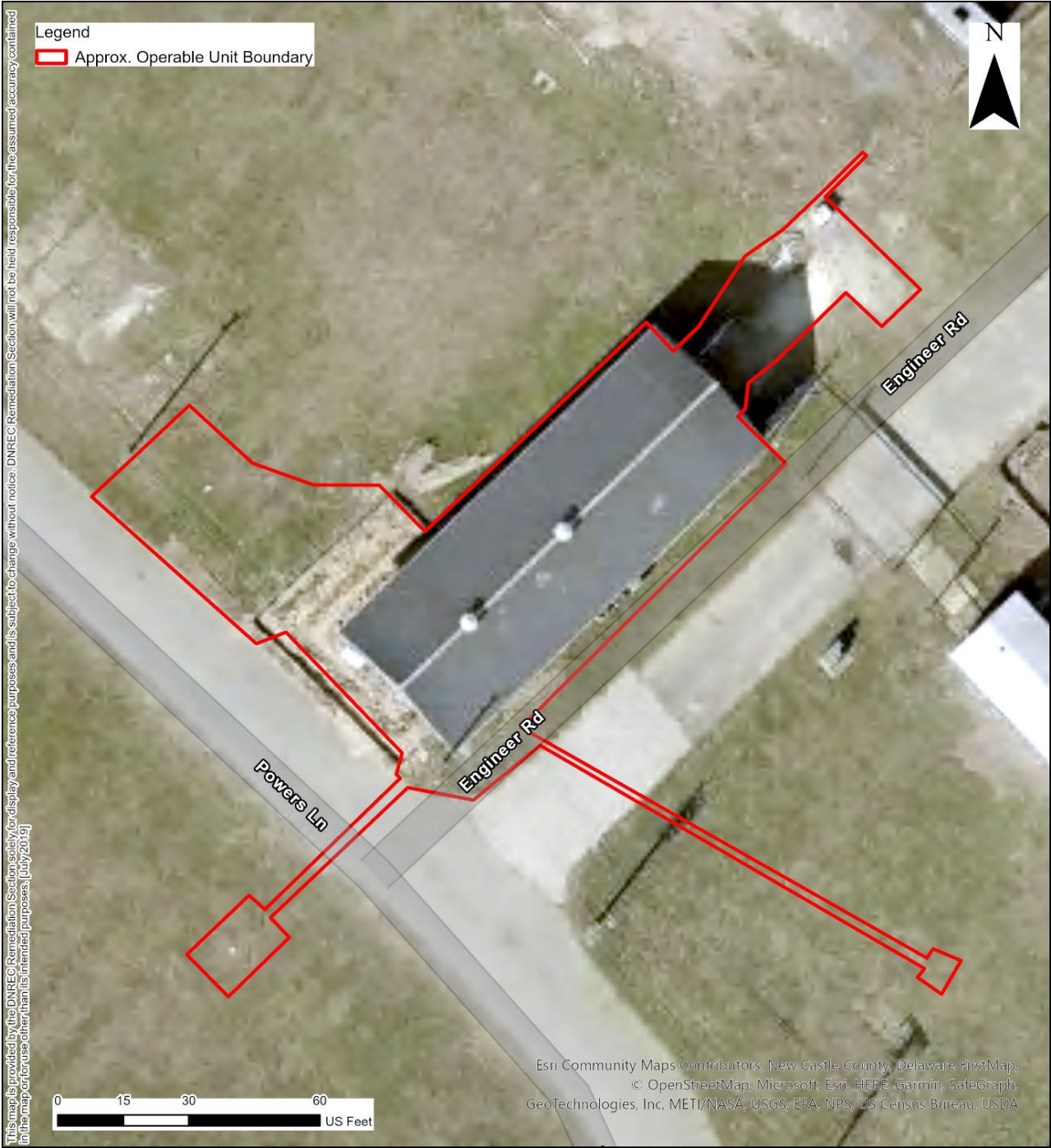


1:24,000

1 inch equals 2,000 feet

**FIGURE 1**  
**OPERABLE UNIT 10 (OU-10)**  
**ARCHIVE BUILDING**  
**FORT DUPONT REDEVELOPMENT**  
**(DE-1618)**  
**LOCATION MAP**  
 DELAWARE CITY, DELAWARE





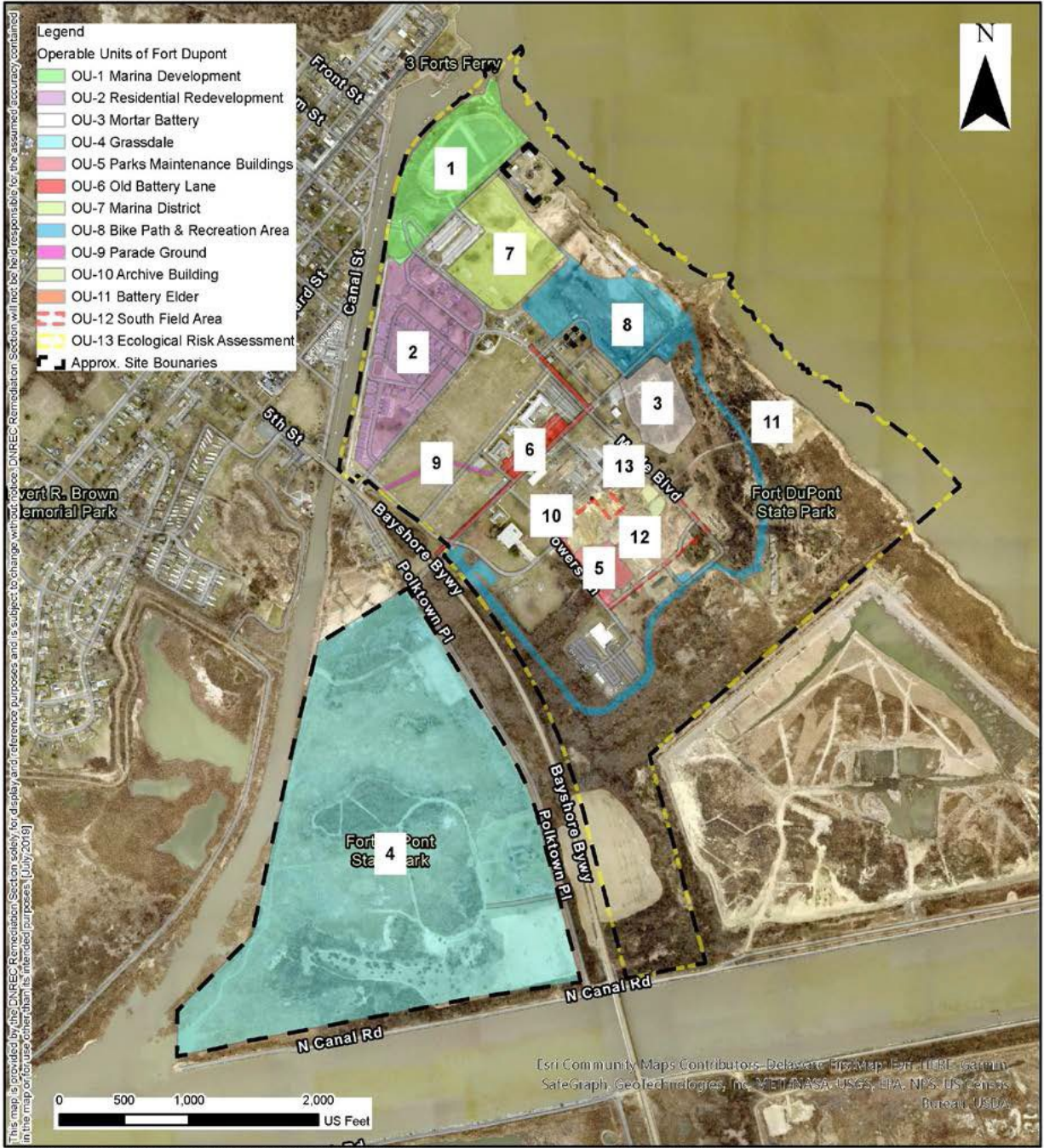
Sources: 2023 Aerial Imagery [New Castle County GIS]; Approx. Site Boundaries [DNREC]



1:360

1 inch equals 30 feet

**FIGURE 2**  
**OPERABLE UNIT 10 (OU-10)**  
**ARCHIVE BUILDING**  
**FORT DUPONT REDEVELOPMENT**  
**(DE-1618)**  
**OU LAYOUT MAP**  
 DELAWARE CITY, DELAWARE



Sources: 2022 Aerial Imagery (New Castle County GIS), Approx. Site Boundaries (DNREC), Approx. Operable Unit Boundaries (Fort Dupont Redevelopment and Preservation Corp.)



1:12,000 1 inch equals 1,000 feet

**FIGURE 3**  
**FORT DUPONT REDEVELOPMENT**  
**(DE-1618)-**  
**OU LOCATION MAP**  
**DELAWARE CITY, DELAWARE**

## Glossary of Terms Used in this Proposed Plan

<b>Brownfield Development Agreement (BDA)</b>	This legal agreement is between a potential developer of a Delaware-certified Brownfields Site and the DNREC. The developer agrees to investigate and cleanup a Brownfields property under the oversight of the Department in exchange for liability protection.
<b>Brownfield Investigation (BFI)</b>	Thorough environmental study of a site which includes 1) sampling of site environmental media and/or wastes on the property and 2) conducting a preliminary risk assessment using the data collected to determine the risk posed to human health and the environment.
<b>Certified Brownfield</b>	A Brownfield that DNREC has determined is eligible for partial funding through the Delaware Brownfields Program
<b>Certification of Completion of Remedy (COCR)</b>	A formal determination by the Secretary of DNREC that remedial activities required by the Final Plan of Remedial Action have been completed.
<b>Contaminant of Concern (COC)</b>	Potentially harmful substances at concentrations above acceptable levels.
<b>Contaminated Materials Management Plan</b>	A written plan specifying how potentially contaminated material at a Site will be sampled, evaluated, staged, transported, and disposed of properly.
<b>Exposure</b>	Contact with a substance through inhalation, ingestion, or direct contact with the skin. Exposure may be short term (acute) or long term (chronic).
<b>Final Plan of Remedial Action</b>	DNREC's adopted plan for cleaning up a hazardous site.
<b>Hazardous Substance Cleanup Act (HSCA)</b>	Delaware Code Title 7, Chapter 91. The law that enables DNREC to identify parties responsible for hazardous substances releases and requires cleanup with oversight of the Department.
<b>Human Health Risk Assessment (HHRA)</b>	An assessment done to characterize the potential human health risk associated with exposure* to site related chemicals.
<b>Preliminary Risk Assessment</b>	A quantitative evaluation of only the most obvious and likely risks at a site
<b>Risk</b>	Likelihood or probability of injury, disease, or death.
<b>Risk Assessment Guidance for Superfund (RAGS)</b>	An EPA guidance document for superfund sites
<b>Site Inspection (SI)</b>	Environmental study of a site which includes the sampling of soils, groundwater, surface water, sediment and/or wastes on the property, as appropriate. This evaluation is performed on behalf of the United States Environmental Protection Agency (U.S. EPA).
<b>RS</b>	Remediation Section of DNREC, which oversees cleanup of sites that were contaminated as a result of past use, from dry cleaners to chemical companies
<b>EPA</b>	United States Environmental Protection Agency