Block E Soil Remedy – Construction Project Bulletin

LOCKHEED MARTIN

April 2021

Introduction

Sometime in April 2021, Lockheed Martin will begin cleanup of contaminants in Block E soil (see graphics on pages 2 and 4), the last of the planned soil cleanups at the facility. Preparation for this phase of the Middle River Complex remediation has been ongoing for years, and included the discovery of polychlorinated biphenyls (PCBs) in the storm drains and outfalls for Block E that resulted in prior implementation of the full sediment remedy for Dark Head Cove and Cow Pen Creek. Lockheed Martin also identified a plume of trichloroethene (TCE)-contaminated groundwater (TCE is a solvent used historically to clean industrial parts) in the southeastern part of Block E. The remedial action strategy for treating this TCE groundwater plume is now being implemented.

Background

The Middle River Complex is located at 2323 Eastern Boulevard in Middle River, MD. The 160-acre complex is part of Lockheed Martin Chesapeake Industrial Park. Originally the home of the Glenn L. Martin Company, the site today includes 12 primary buildings, an active industrial area and yard, perimeter parking lots, an athletic field, a concrete-covered vacant lot in Block E, a trailer and parts storage lot, and various grassy spaces along its perimeter. The site is bordered on the north by Eastern Boulevard, the east by Wilson Point Road and Martin State Airport, the south by Dark Head Cove, and the west by Cow Pen Creek.

In the late 1990s Lockheed Martin began environmental testing at both the Middle River Complex and Martin State Airport to assess potential impacts from former industrial operations and disposal practices that were commonplace more than a half-century ago. Since then, Lockheed Martin has actively investigated groundwater, soil, and sediments at both locations. The company is now in different stages of planning and cleanup in the Middle River Complex remediation. Cleanup of sediments is complete, and in situ (meaning 'in place') sediment treatment monitoring is ongoing. The Complex consists of Tax Blocks A (two parcels), B, D, D Panhandle, E (two parcels), F, G, H, and I. Cleanup in Block B was completed in 2010, followed by receipt of a Maryland Department of the Environment (MDE) "No Further Action" letter. Block A does not require remediation, as documented in an MDE-issued "No Further Action Determination" in 2013. The company completed soil cleanups in Blocks D, D Panhandle, F, G, and H in late 2016, and in 2017 received "No Further Action" letters for these parcels from the Maryland Department of the Environment. Further investigation and remediation for Block I has been deferred since it includes ongoing industrial activities.

Block E includes a main parcel of 15.4 acres and a smaller half-acre lot at its southeastern corner, Block E2. Block E is the site of former Building D, which was built in the early 1940s and used primarily for aircraft design, assembly, and testing. Later, the western and southwestern portions of the building's basement housed offices, laboratories and manufacturing spaces for research, development, assembly, and testing of nuclear-powered auxiliary generators. Building D was demolished in 1971; today only the basement slab remains (at ground surface level). With respect to radiological activities, Building D was decontaminated in 1970 under the authority of the Atomic Energy Commission (the predecessor of the Nuclear Regulatory Commission [NRC] and the United States Department of Energy) and was determined to be suitable

This Project Bulletin presents Lockheed Martin's construction plans for soil cleanup in Tax Block E at the Middle River Complex in Middle River, MD, and is intended to help the community understand the plan and schedule and its effect on local roads. Lockheed Martin distributed a Citizens' Guide on the Plan and hosted an Information Session on the Block E Soil Remedial Plan in November 2019 at the Marshy Point Nature Center, and accepted public comments on the planned work. An update on Block E Soil Cleanup was also included in the Middle River Complex and Martin State Airport Newsletter in March 2020.

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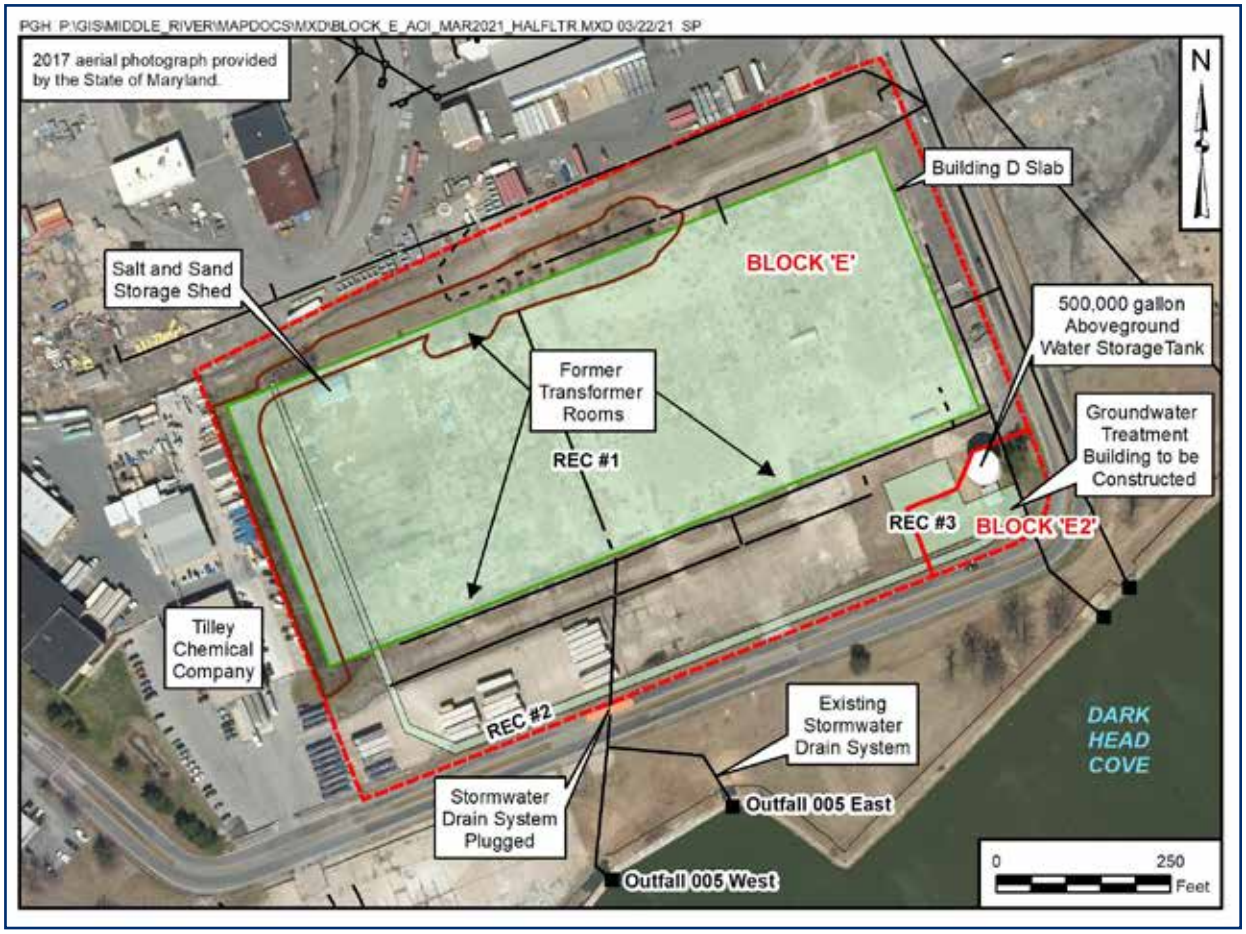
PROJECT PERMITS: Baltimore County and the Maryland Department of the Environment (MDE) are processing work permits. Baltimore County has approved Lockheed Martin's plan for stormwater management, and the Federal Aviation Administration and Maryland Aviation Administration have approved the use of construction cranes at the work site, which is near the flight path for Glenn L. Martin State Airport. Baltimore County is still reviewing grading and erosion and sediment control plans, as well as plans for discharge of wastewater from the cleanup process into the sanitary sewer line. Approval is anticipated in April. Finally, Baltimore County approved a proposed plan to mitigate just under one acre of trees that must be removed in Block E to accommodate construction. Trees and other plants will be planted in Block G, Block F, and Block D Panhandle to mitigate for the tree loss in Block E.

for unrestricted use. In 1982, the NRC reviewed the post-decontamination survey and concluded that the site met NRC's criteria for unrestricted use. During a 1995 inspection, NRC and state personnel surveyed Building C and the area of former Building D, paying attention to drains, clean-outs, and holes in the pad, and the facility was again deemed suitable for unrestricted use. These approvals did allow some level of radioactive materials to remain sealed (with grout) in floor drains below ground surface. To properly handle any remaining radioactive materials, Lockheed Martin will take the appropriate precautions during remediation of Block E.

Long Term Goal

Environmental stewardship is an important aspect of Lockheed Martin's commitment to the communities in which it operates. The long-term goal for the Block E Remedial Action Plan and its related cleanup plans at the Middle River Complex site is to appropriately address the environmental impacts within Block E and receive a No Further Action letter from the MDE under the "industrial land use and restriction" category; Lockheed Martin's remediation goal targets this land use as the property will remain in industrial use for the foreseeable future. This does not preclude Block E from being developed for residential, commercial, or recreational use in the future, although these other types of development could require additional cleanup.



Graphic depicts area of work to support the Block E soil removal project.

Site Investigations

During site investigation, three "recognized environmental conditions" (RECs) were identified in Block E: (REC #1) the area occupied by former Building D; (REC #2) the remaining 1300 feet of a two-inch-diameter pipe running underground across Block E that was once used to carry fuel oil from a former 500,000-gallon, aboveground storage tank, to the Middle River Complex power plant in Block I; and (REC #3) the land around the former aboveground storage tank. PCBs were detected at elevated concentrations in concrete and soils in REC #1 in the area beneath former electrical transformer rooms, so remediation will be performed in accordance with the federal Toxic Substances Control Act "Risk-Based Disposal Approval Application" process. Because of this, the Block E remedial action plan consists of two documents—the final remedial action design that was submitted to the MDE and approved in 2020, and the final Risk-Based Disposal Approval Application, which was also submitted to the EPA and approved in 2021.

Lockheed Martin's investigations indicate that PCBs, chlorinated benzenes (also associated with electrical transformer oil), and polycyclic hydrocarbons (PAHs) in REC#1 are located at depths as great as 20 feet below the soil surface. The PAHs are a minor contaminant in Block E and might be associated with fill material placed historically at the site. PAHs are a common contaminant at the Middle River Complex (and are found generally elsewhere in urbanized areas).

Some PCBs appear to have previously migrated off Block E. This migration appears to be limited to sediment transported through the Block E stormwater drain system into Dark Head Cove. Lockheed Martin removed contaminated sediment from the storm drains and inlets in 2011, and in 2014-15 removed PCB-contaminated sediment from the lower portions of the Outfall 005 stormwater drain system. Portions of the Outfall 006 and 008 systems were cleaned in 2016 as part of the full sediment remedy for Cow Pen Creek and Dark Head Cove. To prevent the potential for further migration of contaminated soil and debris, the Outfall 005 system near Block E was plugged in 2015 to prevent contaminants from moving into Dark Head Cove. At the conclusion of the sediment remedy, Lockheed Martin began monitoring and cleaning out PCB-impacted sediments in the Block E storm drains annually, most recently in January 2021.

During the investigation of Block E, a radiologically contaminated floor drain pipe was identified when it was breached during characterization studies of the Building D foundational slab.

The Block E Cleanup Project

Remove Contaminated Pipe

Assuming all permits and regulatory approvals are received in March, Lockheed Martin will begin mobilizing construction equipment and installing erosion and sediment controls at Block E in April 2021, with remedy implementation expected to begin immediately following completion of erosion controls installation.

The initial focus of the remediation will be on removing the radiologically-contaminated pipe from the southeast quadrant of the foundation. Prior to removal, floor drain pipes under the foundational slab will be screened for the presence of radioactive materials using remotely controlled pipe monitors like those used to inspect sewage systems, but fitted with a radiation detection sensor. Lockheed Martin believes the contaminated pipes that will be removed are relatively free of debris and will offer adequate passage to monitors. If pipe blockage is encountered where there is known radiological contamination in a floor drain pipe, contingency plans are in place to provide additional access points for the monitors. Concurrently with the floor slab and foundation concrete removal and shoring up the western property boundary, floor drain piping will be screened and, if contaminated with radioactivity, handled accordingly. Lockheed Martin's contractor will follow detailed planning documents approved by MDE and will be licensed by MDE for handling radioactive contamination. Protocols for clearing the site for unrestricted use will follow NRC guidelines to ensure that cleanup is thorough and complete.

Remove Contaminated Soil and Building D Slab

After the radioactively contaminated pipe and the area around it is excavated and removed from the ground, soil around the site known to be contaminated with PCBs will be excavated. Any water-saturated soil will be moved to containment areas on the Building D foundation slab for controlled draining prior to shipment to an approved disposal facility. Extracted groundwater, as well as any stormwater that contacts potentially contaminated soil, will be treated to remove contamination using a temporary, on-site treatment system before discharge to the sanitary sewer under permit with Baltimore County.

During slab removal, the slab will be broken-up sequentially and in small sections by concrete breakers mounted on excavators. To minimize disturbing any more soil than is necessary at any one time, the excavators will work from existing slab for the foreseeable future. Sub-slab soil within

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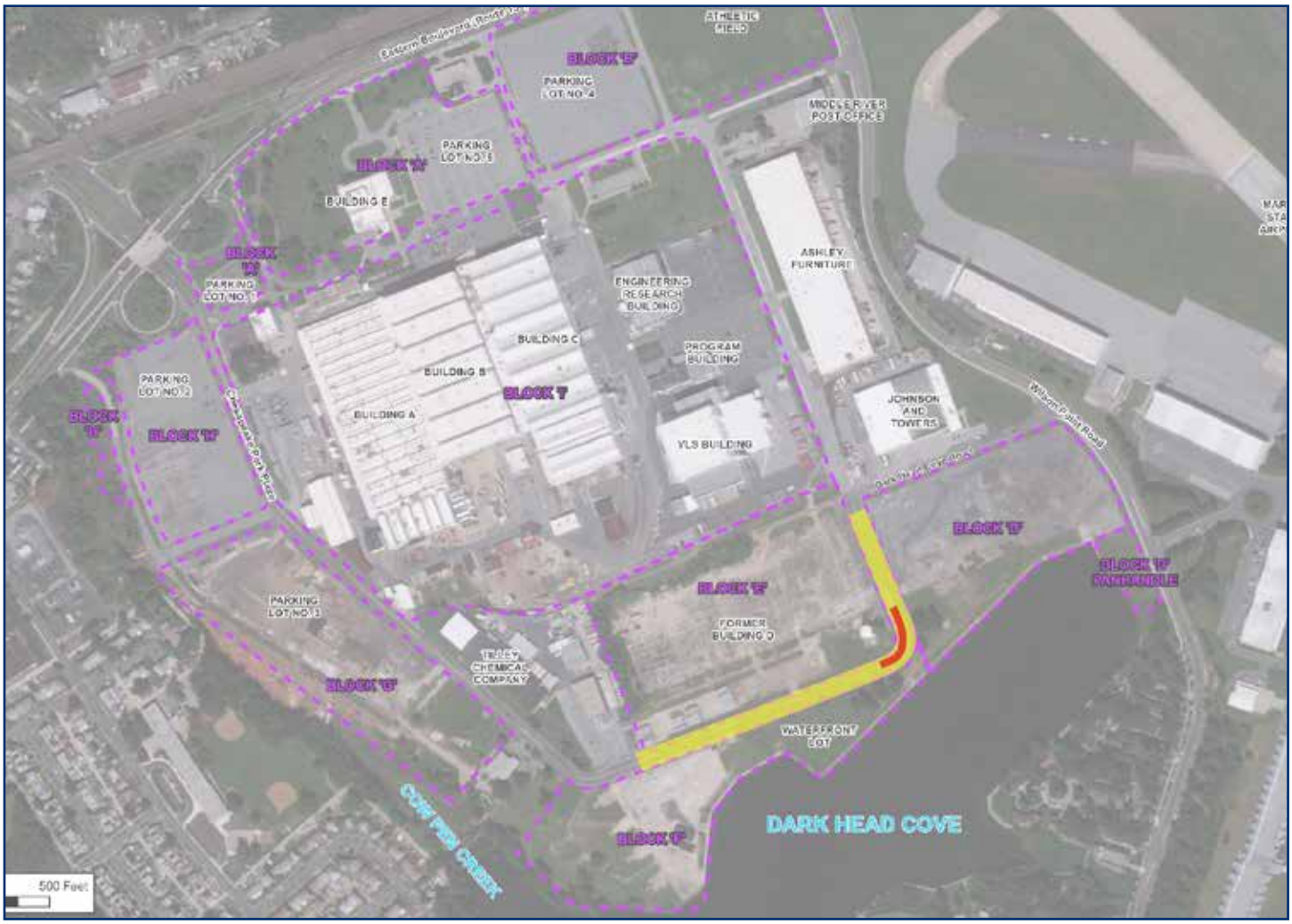
Significant truck traffic will support the project. Truck routes are depicted coming onto the site in blue and exiting the site in green. Trucks will not drive on Wilson Point Road and will take local roads to Eastern Boulevard.

previously delineated areas will be excavated from two-to-six feet deep, with the exception of three areas beneath the site of former transformer rooms, which will be excavated to depths of up to twenty feet. These deep excavations will require metal sheets to be driven into the ground to shore up the side walls. (Use of pile-driving cranes has been approved by the Federal Aviation Administration and the Maryland Aviation Administration.) When the holes are refilled (with clean soil), the steel sheets will be removed using the crane.

On the west side of the Building D foundation slab, the soil slope has fallen onto the slab. Here, a retaining wall will be constructed using 'nail wall' shoring to contain the exposed soil face. This will involve inserting relatively small bars, or 'nails', typically metal, into the soil, and grouting them in place. The 'soil nails' anchor a steel mesh which is then covered with concrete to hold the slope in place. Nail walls have become a common technique in highway construction.

Truck Traffic

Lockheed Martin will be moving an estimated 21,000 cubic yards (or 800 truckloads) of impacted soil (primarily Toxic Substances Control Act [TSCA]-regulated material), 600 truckloads of demolished concrete, which will mostly be recycled locally, except for TSCA-regulated waste, and 1,000 truckloads of backfill for the excavated areas. Trucks will likely operate 10 hours a day, five-six days a week. All trucks will be inspected to ensure no soils or debris on the exterior of the vehicle before leaving the site. As a precaution, trucks will be screened for radioactivity before leaving the site. Appropriate signage will be affixed to the trucks if necessary. Loads will be secured with tarps, and truck safety systems will be checked before leaving the site. Excavated soil will be disposed at approved and licensed waste receiving facilities; contaminated soil and concrete will also be shipped to approved locations. Trucks will not drive on Wilson Point Road and will take local roads to Eastern Boulevard.



During project work, temporary lane closures will be required, and that location is depicted in red. Also, for approximately one month in late summer to early fall closure of the entire roadway section shown in yellow will be required for soil removal and installation of new stormwater piping under Chesapeake Park Plaza, so work can be conducted safely.

Remove and Replace Storm Drain Systems, and Fuel Oil Pipe

The storm drain system originally installed to service former Building D is still in place at the site. Much of this legacy storm drain system will be removed and replaced with a system designed to manage stormwater for Tax Block E after the cleanup, when Block E will have become primarily a vegetated field. The storm drain piping on the north side of former Building D will remain in place, but it will be plugged where it tied into the former Building D foundation. Portions of the storm drain piping on the east side of former Building D will be removed and replaced on the south side only. New piping will be routed to existing outfalls on Dark Head Cove. (The outfalls themselves were replaced during the earlier sediment remediation project.) This new piping will entail construction work in Chesapeake Park Plaza road and in Tax Block F, where the former seaplane ramp is located.

The abandoned 1300-feet of fuel pipe is buried three-to-four feet below ground. It will be excavated with a standard excavator and will be removed in the summer or fall of 2021.

Remove and Replace Chesapeake Park Plaza Soil; Road Closure

The top foot of soil in the median strip of Chesapeake Park Plaza road south of Block E will be removed and replaced. This is an area where small quantities of PCBs were noted in investigations. This soil is being removed to prevent any contaminated soil from getting to Dark Head Cove. Removal of this soil will be completed at the same time that new stormwater piping is run under Chesapeake Park Plaza. To accommodate this work, this section of the roadway will be closed for approximately one month in late summer to early fall so that the work can be conducted safely. The road closing will be coordinated and approved by Baltimore County.

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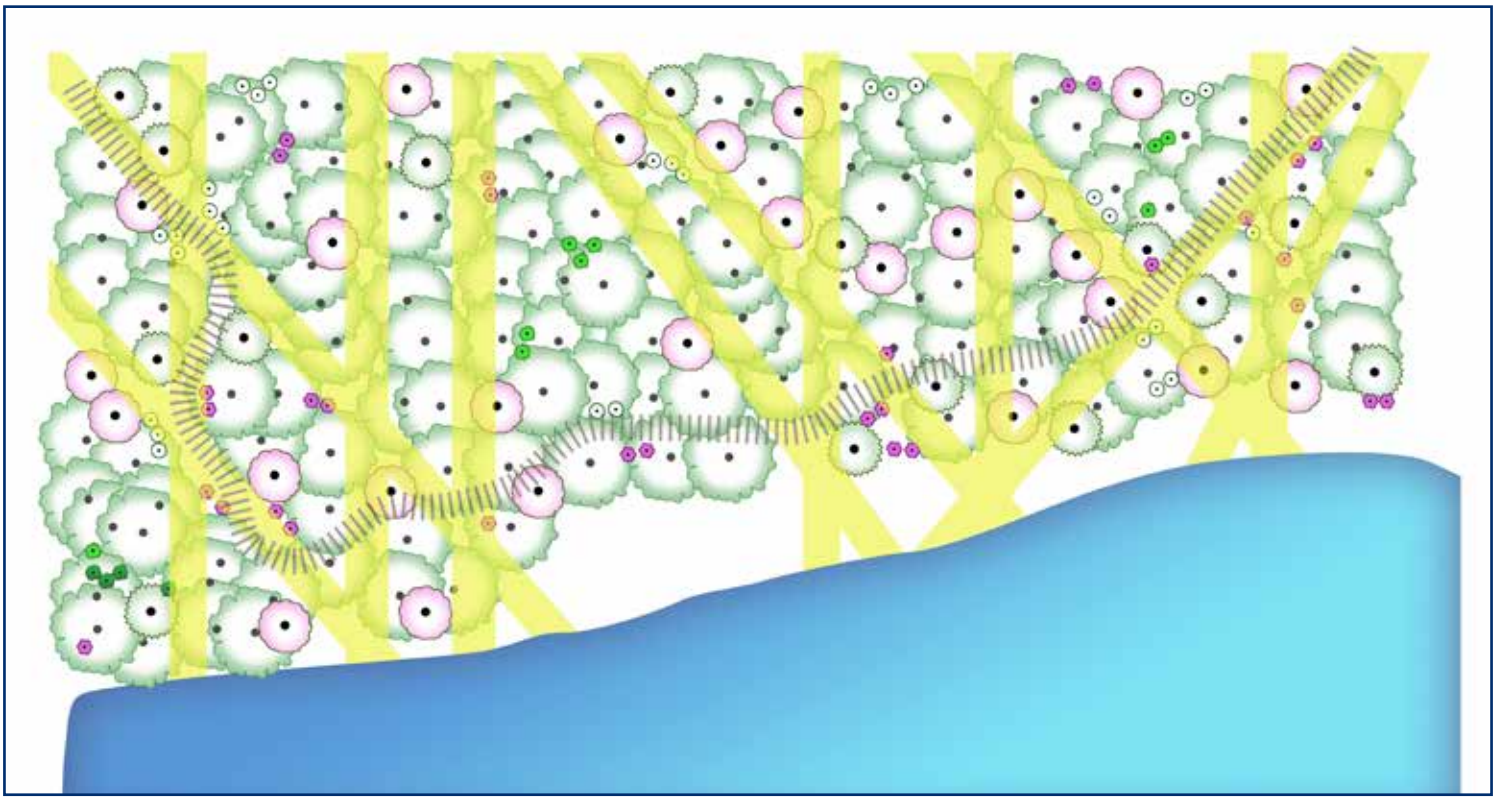
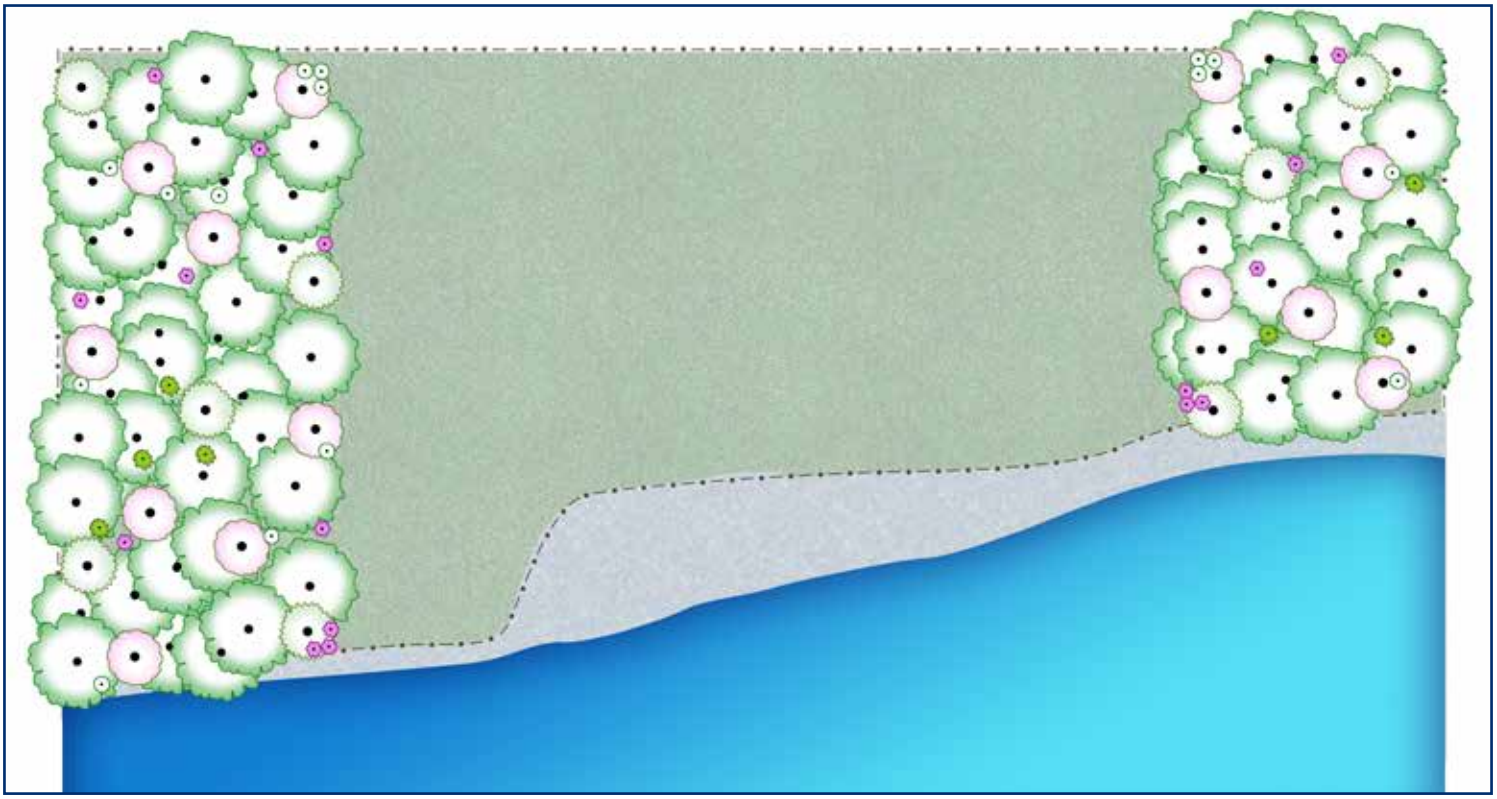


The original tree planting approach submitted to Baltimore County used the entirety of the Block D Panhandle for mitigation. To help maintain views between the street and the water, plantings would have been selected, planted, and trimmed to ensure viewing lanes. A walking path (hashed lines) and viewing lanes (yellow lines) are shown on the conceptual planting plan, shown from a bird's eye view.



After hearing concerns from some community members, this revised conceptual planting plan clusters about half the trees originally planned for the Block D Panhandle into two groupings, on the northern and southern portions of the parcel. The center area would remain clear of plantings. The final planting determination remains under discussion with Baltimore County and the community.

This conceptual graphic depicts a springtime view of the revised planting plan, which maintains an unplanted area in the center, and a view from Wilson Point Road to Dark Head Cove.

Site Restoration

In the final step of soil cleanup, Block E will be graded in accordance with a Baltimore County-approved stormwater management plan. Much of the site will be restored as a pollinator meadow, with a smaller portion restored as grass. A gravel access road will also be constructed so that contractors can access the water tower and pump house and groundwater remediation building after the soil remediation is completed.

The remediation of Block E is currently anticipated to take from April through November 2021. Work hours will typically be five days per week, 7:00 a.m. to 5:00 p.m. with the possibility of some Saturday hours, only if necessary to maintain the project schedule.

Additional Work

At the same time as the soil and slab removal work is proceeding, the building for the Block E groundwater treatment operation will be erected. Concurrently, the salt and sand storage shed in the northwest corner of Block E will be demolished to make way for the soil remediation.

Tree Mitigation

One element of Lockheed Martin's project to clean up soil in Block E includes removing about one acre of 'volunteer' trees, that is, trees that have self-seeded in the area, their seeds having been carried to the spot by natural dispersal—by wind or animals. Because the trees are within the Chesapeake Bay Critical Area, Baltimore County requires that the effect of the trees' removal be mitigated.

In Baltimore County, Critical Area permitting requires that when a grouping of trees, or "forest" (not individual trees), which is located within 1000 feet of Chesapeake Bay waterways, is removed, it must be replaced. This replacement is called mitigation. These permits must be issued before the cleanup begins. As required, Lockheed Martin submitted a mitigation plan to the Baltimore County Department of Environmental Protection and Sustainability and that plan was approved on February 25, prior to start of work in April. Locations on the Block D Panhandle and Blocks F and G were identified to plant replacement trees.

Meanwhile, members of the Wilson Point community expressed concerns that if trees were planted on Block D Panhandle, the parcel may not be acceptable for future use as a park by the County. It is planned that the original mitigation tree-planting approach will be adjusted (see figures for each plan) to reduce the number of trees to be planted on the Block D Panhandle. At this time, discussions remain underway with the community and the county regarding the tree mitigation planting approach. Final plans will be shared with the community.

For More Information

As cleanup work proceeds, any questions may be directed to:
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