

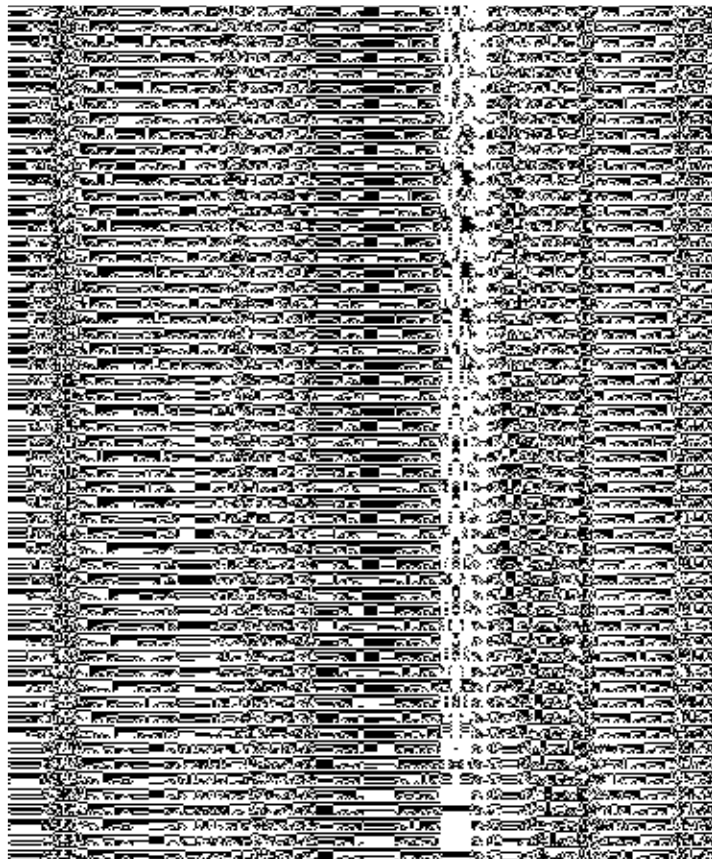
Lockheed Martin has completed construction of the system for cleaning groundwater at the Middle River Complex at 2323 Eastern Boulevard. Utility hook-ups were completed in April. Startup and tracer testing of the system began in late April and ran through late June.

Tracer testing is the final test of the treatment system prior to beginning groundwater treatment. Tracer testing involves injecting a benign solution of a salt, i.e., bromide, into the groundwater, then sampling surrounding monitoring wells, sewer systems and storm water outfalls to determine the distance the injected liquid has traveled underground. This makes sure the injected solution has traveled to the intended places.

“We want the tracer solution to be found in the monitoring wells,” Chris Pike, from Tetra Tech, contractor to Lockheed Martin, said. “This indicates it is traveling in the groundwater aquifer; however, we do not want the bromide solution to make its way into the sewer system,” he added. “If we find it in the sewer system during the tracer test, we will consider a variety of system adjustments, such as reducing injection volumes and pressures when we inject remediation solution.”

The remediation solution is a mixture of water, vegetable oil and lactate (a non-toxic food additive that is produced from the sugars of corn or beets). This food mixture will stimulate naturally occurring microbes in the soil to consume and break down concentrations of trichloroethene (TCE), the contaminant found at the site.

Tom Blackman, Lockheed Martin’s project manager for the site, said, “This is a major milestone for the Middle



As part of construction of the groundwater treatment system, Lockheed Martin removed more than 3,000 cubic yards (about 200 truckloads) of contaminated soil and hauled it to a licensed landfill. Clean soil was added to replace the contaminated soil that had been removed. The groundwater remediation program also includes land-use controls such as deed restrictions to prevent groundwater use, and monitoring for—and as necessary, removal of—contaminated vapors that might intrude into the indoor air

**Silt Curtain
& Boom**

of present and future buildings on site. The groundwater treatment system that is being implemented, along with land-use controls and the vapor mitigation system for the existing buildings at the Middle River Complex, will reduce the potential for risk of exposure to contaminated groundwater under both current and future conditions at the site.

In the fall of 2013, as part of its preparation for cleanup of sediment in Cow Pen Creek and Dark Head Cove, Lockheed Martin collected samples in Dark Head Cove. These samples revealed higher concentrations of polychlorinated biphenyls (PCBs) than had previously been detected, and very low levels of uranium and thorium. These contaminants were located in submerged sediments eight-to-ten feet beneath the surface of Dark Head Cove near the location of Outfall 005. As a consequence, the decision was made between Lockheed Martin and the Maryland Department of the Environment to clean up this location before the full sediment remedy is implemented.

The resulting Outfall 005 Sediment Removal Action has three parts: installation of a floating boom, with silt-control curtains attached (see photo on page 3); dredging of the area; and cleanup of Outfall 005. Lockheed Martin presented these plans at a public information session held at Marshy Point Nature Center on April 14, 2014, as part of its ongoing public involvement and outreach efforts to inform and educate the community about proposed remediation work.

The Maryland Department of the Environment approved the plan for installation of the floating boom and dredging and will continue to review plans as they are prepared. The first phase—the boom with silt-control curtain—was installed within Dark Head Cove on May 14. Lockheed Martin also met with Baltimore County for its review of the initial dredging plans. Because polychlorinated biphenyls (PCBs) at a level above 50 parts per million were identified (the PCBs were measured in concentrations up to 3,600 parts per million immediately

adjacent to Outfall 005), plans for the initial dredging must also be reviewed by the U.S. Environmental Protection Agency.

The plans call for removal of the identified contamination to begin in 2015.

Please note that dredging of the sediment within Dark Head Cove had already been proposed as part of Lockheed Martin's final remedy for cleaning up sediment contamination from the Middle River Complex. These plans were approved by the Maryland Department of the Environment and the U.S. Environmental Protection Agency in 2013.

lights have been fixed to the boom to make it visible to boaters at night. An informational sign has also been placed nearby at the Wilson Point Park boat ramp to provide boaters with answers to questions about the boom line and signage and the importance of adhering to the instructions. The sign includes links to Lockheed Martin and Maryland Department of the Environment (MDE) websites.

For more information on this project, the MDE web link is: [\[redacted\]](#) and states: "Out of an abundance of caution, MDE is issuing an advisory to avoid contacting sediments in this area of Dark Head Cove because of the contamination of the sediments."

Because the boom impacts the waters of Maryland, installation required approval from the Maryland Department of the Environment, and also the Maryland Board of Public Works.

While Lockheed Martin contractors were digging trenches last summer to install the piping for the Block E groundwater system, two underground storage tanks were discovered. The tanks were found on the southern perimeter near the remaining foundation of former Building D. Sampling of the tanks revealed quantities of petroleum in one and trichloroethene in the other. The tanks were pumped empty and the material properly disposed of. The tanks, and soil contaminated with trichloroethene near the second tank, were removed and disposed of following Maryland Department of the Environment regulations.

Lockheed Martin conducted additional investigations in the vicinity of the two tanks. Results of these investigations revealed trichloroethene in the groundwater and soil at concentrations too high to be removed solely by the groundwater treatment system now being installed. Consequently, plans are underway for a separate cleanup action to take place this autumn. These plans call for a high vacuum extraction of groundwater and vapors which will then be treated prior to discharge. If permitted by Baltimore County, treated groundwater will be discharged to the Baltimore County sanitary sewer system. The vapors will be cleaned w

Guard, which leases land from the Maryland Aviation Administration. Many of the treatment system permits will be issued to the Maryland Aviation Administration as the property owner.

One key permit currently in review is the Environmental Assessment, which is anticipated to be released soon by the Federal Aviation Administration (FAA) for public review. The Environmental Assessment is conducted under the National Environmental Policy Act with the Federal Aviation Administration as the overarching authority. The Environmental Assessment notes the potential for environmental impact from the construction and operation of the groundwater treatment facility and includes recommendations for what can be done to lessen any impacts that might occur. A Notice of Availability will be published when the Draft Environmental Assessment is released and the document will be available through the public library in Essex for review or comment.

Construction of the groundwater treatment system is scheduled to begin in the spring of 2015 with operation beginning approximately one year later, assuming no delays.

Innovation at Work: Lockheed Martin to Test Proven Technology in New Setting

Flux meters are used in monitoring wells to find out the specific depths where contaminants are moving through an aquifer. (Flux refers to flow, in this case groundwater movement, over a period of time.) They work very simply: the meter contains an alcohol that is depleted as water moves through it, plus activated carbon to absorb contaminants.

The combination of the diminishing alcohol and the contaminants captured by the absorbent shows how much water and contaminant is moving through any point along the length of the meter.

Now imagine using flux meters to figure out where contaminants may be entering Frog Mortar Creek. Four rows
continued on page 6

of vertical plastic pipes will ultimately be installed in Frog
Mortar Creek later this summer, with twelve pipes in each

Permit applications cover a variety of topics, such as storm water management, site erosion and sediment control and grading, among others. Permit applications for work in both tidal and non-tidal wetlands go to the U. S. Army Corps of Engineers, as well as the Maryland Department of the Environment. For some of the Lockheed Martin projects it is yet to be determined which agency will require a permit, or if public comment will be required.

Only a few permit applications require public review, and the form of the public review also varies. Some permit applications require public meetings. More typically, if public comment is required, the permit application is noted on an agency's website, usually allowing up to 45 days for people to submit comments, often online.

One thing is common as to how all public agencies handle permits. All comments, negative or positive,

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All documents are available at the Essex Library,
410-887-0295, or on Lockheed Martin's Web site
at <http://lockheedmartin.com/middleriver>

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Friday and Saturday, 9 a.m. to 5:30 p.m.

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