

1990s–Present:
Lockheed Martin
creates and executes
plans to clean up
contamination at the
sites, as summd-d2plex.

Middle River Complex

LMC Properties, Inc. owns the Middle River Complex. A tenant that builds and tests aircraft parts is based in A-, B- and C-Buildings. Environmental cleanup and monitoring activities are ongoing at several areas of the site. Cleanup activities address historical contamination in site soils,

SOIL INVESTIGATIONS AND CLEANUP

Soil sampling found subsurface concentrations of polycyclic aromatic hydrocarbons (PAHs) and the metals mercury, arsenic and hexavalent chromium above risk-based health standards.

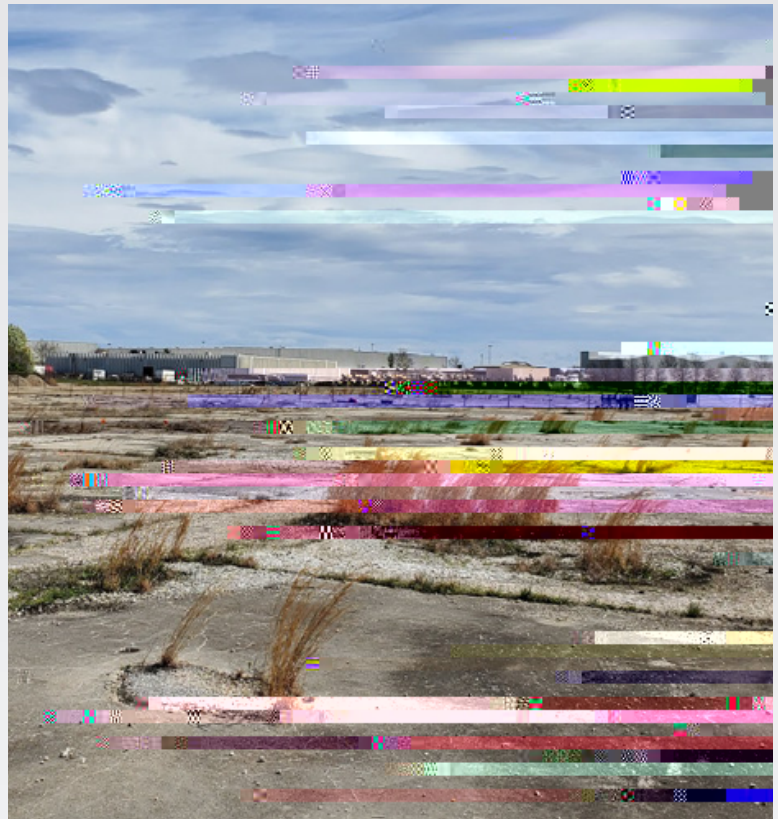
Lockheed Martin cleaned up soil in Tax Blocks B, D, D-Panhandle, F, G and H. MDE reviewed the cleanup results and made statements that “No Further Action” was needed (or similar certifications). For example, Block A received a “No Further Requirements Determination” because no cleanup was necessary.

Lockheed Martin cleaned up sites to risk-based industrial standards except the Block D Panhandle. Teams cleaned up the Block D Panhandle to a recreational standard so the land could be repurposed for public use in the future.

Soil investigations in Block E found elevated concentrations of polychlorinated biphenyls (PCBs) and chlorinated benzenes above risk-based health standards, in addition to PAHs. We completed the Block E risk-based soil cleanup in 2022. We are monitoring Block E to confirm the cleanup is meeting the intended objectives.

Many of the original underground storm drains and inlet structures for the historical building remained in Block E after the building was razed in the early 1970s. Lockheed Martin started cleaning and rehabilitating these storm drains in 2011 to protect surface water in Dark Head Cove. Block E cleanup activities included removing and replacing most of the existing storm drain pipelines.

Historical Middle River Complex documents describe the use of radioactive materials in the former D-Building, historically located in Block E. The Nuclear Regulatory Commission conducted a closeout verification survey of that parcel in 1994. The survey found no detectable radiation above background levels. It stated Block E was suitable for unrestricted use in its current condition, with the basement floor slab in place and the floor drains plugged with concrete.



The original building slab stayed in Block E after the building was torn down in the early 1970s.



During cleanup, crews removed and took the concrete slab off-site. The site restoration includes a large meadow of local grasses and flowering plants.

Lockheed Martin surveyed the area in 2004 and 2012, and did not find radiation significantly above background

GROUNDWATER INVESTIGATIONS AND CLEANUP

The site has groundwater contaminated with volatile organic compounds (VOCs), including trichloroethene (TCE) and chlorinated benzenes. Site investigations found three areas with elevated TCE levels that needed to be cleaned up. Two of these areas, located in Blocks G and I, are cleaned up. MDE granted these groundwater cleanup areas "No Further Action" designations, meaning that the groundwater cleanup activities met all of the objectives. Note that for Block I, this designation applies only to the area where we completed groundwater cleanup.

Lockheed Martin is currently cleaning up the third TCE-impacted groundwater area in Block E and Block F. We built a groundwater treatment system in 2020 and 2021. It takes groundwater from the ground, treats it, then discharges the treated water to the sanitary sewer under a discharge permit with Baltimore County. Additional remedial activities to target the highest contaminated areas began in 2022 and are anticipated to continue through 2025. We are monitoring another part of Block E that has low levels of chlorinated benzenes to ensure the compounds are breaking down naturally.

Teams currently monitor other groundwater VOC plumes in Block I, west of A-Building and south of C-Building, to ensure they do not move offsite at concentrations that impact people or the environment. We also check if these groundwater plumes migrate to areas we have already cleaned up. **These plumes are relatively stable and have not moved much.** Lockheed Martin samples groundwater across the site periodically. We use the data to learn the location of VOCs and other contaminants, including 1,4-dioxane and hexavalent chromium.

[Learn more about our groundwater cleanup efforts.](#)

SEDIMENTS AND SURFACE WATER

Sediment sampling found elevated concentrations of PAHs, polychlorinated biphenyls (PCBs), and metals such as cadmium. These levels meant Lockheed Martin needed to take action to lower the potential risks associated with long-term direct contact, fish taking in the contaminants and potential impact to organisms living in the sediment.

The Lockheed Martin team addressed contaminated sediments in the Cow Pen Creek and Dark Head Cove riverbeds in three phases between 2015 and 2018 using dredging, excavation and in-place (*in situ*) treatment. We checked the effectiveness of the activated carbon *in situ* treatment in Dark Head Cove during the first three years. Results told us that we met the cleanup objectives earlier than expected, removing the contaminants from exposure to the food chain. We monitored the restored areas within Cow Pen Creek and along its banks and upland areas between 2018 and 2022. Also, we have monitored restored submerged aquatic vegetation since 2018. We expect to complete our final monitoring in 2024 or 2025. In 2023, EPA issued the final approval for the *in situ* cleanup and MDE issued a “No Further Action Letter” confirming that the sediment cleanup is complete.

Our ongoing surface water monitoring program aims to ensure recreational users of the water bodies remain safe. Maryland Department of Natural Resources fishing advisories for the Chesapeake Bay and the Baltimore region apply to these waterways, as well as other local waterways.

Surface water sampling tells us about cleanup activity status at the site. The most recent water monitoring results demonstrate that:

- a) The groundwater treatment system is effective.505 506 507 ater treatment s509 TEMC /P ✗Len-USatioe 48ater treatment

VAPOR INTRUSION MITIGATION

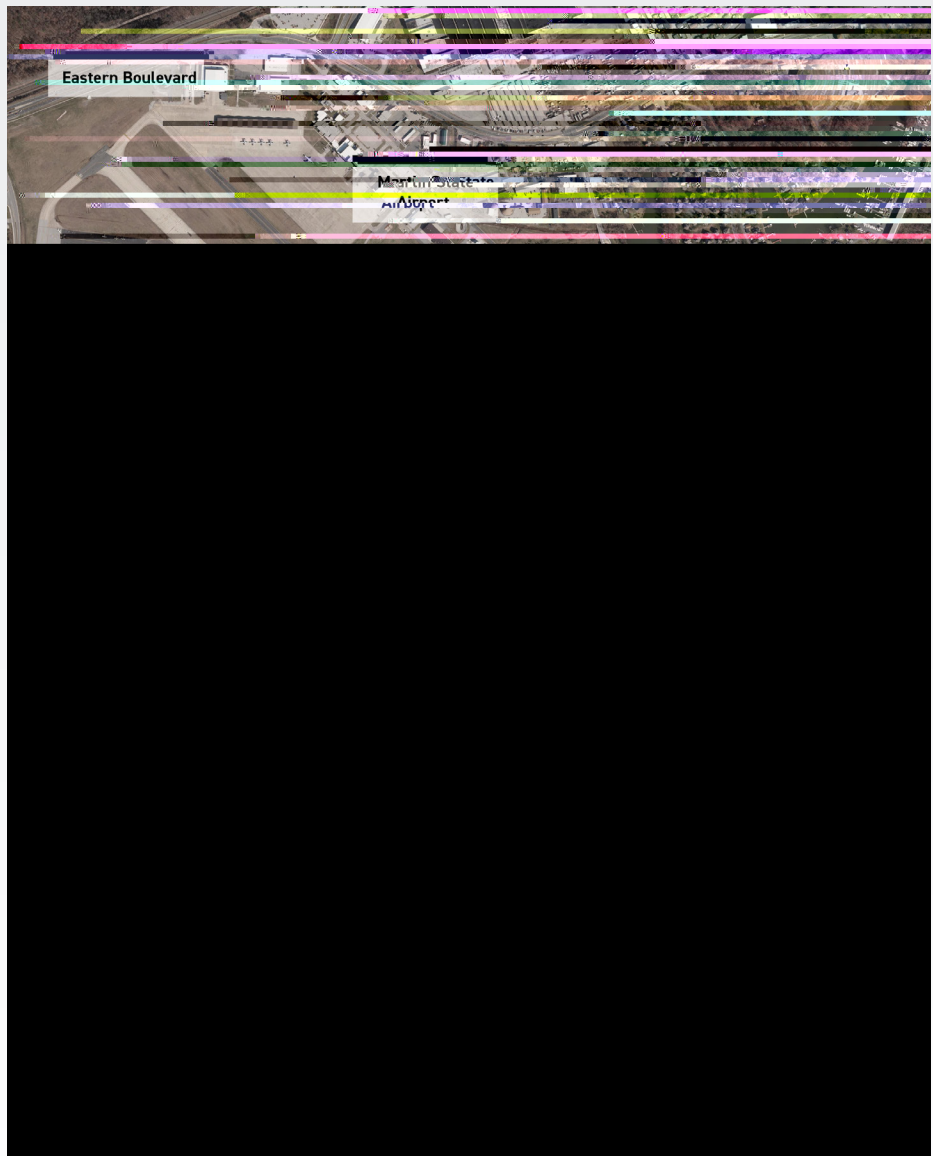
Lockheed Martin has sampled indoor air and sub-slab vapor for VOCs in Block I, at A-, B- and C-Buildings since 2006. Lockheed Martin's investigation of soil vapor and indoor air in and around buildings at the Middle River Complex indicates that indoor air quality is safe from historically used chemicals.

Three sub-slab depressurization systems (SSDS) currently operate at the site: one beneath the former plating shop in the south end of A-Building, one beneath the south end of the C-Building basement, and one in Drop Hammer Building. These systems stop contaminants found in soil vapor beneath the building from entering the building and impacting indoor air quality via a process called vapor intrusion.

MDE has approved a higher basement-specific TCE screening level where workers are typically exposed to air in the A-Building basement for a short time (i.e., low occupancy). TCE concentrations in indoor air in the A-Building basement have never gone above this basement-specific screening level.

Martin State Airport

Lockheed Martin has completed thorough environmental studies at Martin State Airport. The studies have primarily focused on an area called the Dump Road Area, which is between Taxiway T or "Tango" and Frog Mortar Creek. Lockheed Martin's work is subject to review and approval by MDE's Land Restoration Program. The team has also conducted environmental investigations around the Main Terminal, Strawberry Point, Greater Strawberry Point, and in Frog Mortar Creek and Stansbury Creek. Lockheed Martin coordinates investigations, cleanup, and permitting activities at Martin State Airport with the State of Maryland, through Maryland Aviation Administration (the property owner) and with the Maryland Air National Guard (a major airport tenant).



Martin State Airport includes three areas (shown with blue labels) with ongoing groundwater cleanup or monitoring and two areas where surface water has been sampled.



DUMP ROAD AREA

Investigations in the Dump Road Area found chlorinated volatile organic compounds (CVOCs), including TCE, cis-1,2 dichloroethene, and vinyl chloride. The CVOCs were at levels above federal and Maryland standards in groundwater moving from the Dump Road Area towards Frog Mortar Creek. To protect the creek, Lockheed Martin installed extraction wells and built a groundwater treatment plant. Treated, clean groundwater discharges to Frog Mortar Creek. We test it often to ensure it meets permit requirements. The groundwater treatment plant has been extremely successful at reducing contamination in Frog Mortar Creek by capturing and treating contaminated water before it reaches the creek.

We are also targeting the sources of contamination (source areas) by injecting bacteria and nutrients into the ground between the taxiway and runway and expanding the extraction well network in the Dump Road Area to better target the upgradient source areas. One injection has already been completed, and more are planned to help reduce contamination in the source area across the taxiway. The additional extraction wells are planned to be installed and operational in 2024.

Lockheed Martin also coordinates with the Maryland Aviation Administration and the Maryland Air National Guard to control the risk of exposure to airport maintenance or construction workers in the area. Lockheed Martin, MDE and Maryland Aviation Administration are working together to determine what environmental conditions may need to be addressed to support airport operations and how to effectively close the landfill.

MAIN TERMINAL

Investigations for the airport Main Terminal area surrounding Hangars 1 through 6 showed low levels of fuel-related compounds. We expect them to degrade naturally without impacting nearby waterways.

Background radiation – radiation that comes from natural sources and is always in the environment. This includes solar and cosmic radiation, as well as radioactive elements in the ground, building materials and the human body.

Cadmium – an element found naturally in soil and rocks. Cadmium is also found in some foods and in man-made consumer products such as batteries, plastics, pigments, paints and metal coatings. Cadmium does not break down in the environment and generally does not dissolve in water. In the ground, cadmium typically attaches to soil and sediment.

Chlorinated volatile organic compounds (CVOCs) – chemicals typically used as cleaning and degreasing agents. They include methylene chloride, perchloroethylene, trichloroethene, 1,1,1-trichloroethane, 1,1,2-trichloroethane, and carbon tetrachloride.

Chlorinated benzenes – chemicals historically used at the site in dielectric fluid, along with polychlorinated biphenyls in electric transformers.

Chromium – an element found naturally in the earth's soil and water and all plants. Ore refining, chemical and refractory processing, cement plants, automobile and aircraft parts production, tanning, and chrome pigments may also add chromium to the environment.

EPA – U.S. Environmental Protection Agency

Hexavalent chromium – a type of chromium that is not typically found naturally in the earth's soil, and is typically produced by industrial processes. It may be used for plating metal parts or as pigments.

in situ – in place. In remediation, it typically means injecting treatment materials into the ground instead of removing groundwater or soil out of the ground to be treated.

MDE – Maryland Department of the Environment

Mercury – a metal used in man-made products such as batteries and thermometers, which also occurs naturally.

Polycyclic aromatic hydrocarbons (PAHs)