Sediment Cleanup
Middle River Complex, 2017-18

Season 2
Project Photo Tour
October 2017

LOCKHEED MARTIN

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Sediment Cleanup - Season 2
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September 2017

- **Lockheed Martin continues to remove metals and other contaminants from Cow Pen Creek.**
- **Season 2 cleanup (between mid-June 2017 and by February 2018) includes excavation and restoration of Cow Pen Creek, final bulkhead repairs, and placement of protective activated carbon onto sediment in areas not dredged in Dark Head Cove.**
- **Following creek restoration, submerged aquatic vegetation (SAV) will be reestablished by planting locally collected native wild celery seed in Spring 2018.**

Before project work began, a temporary water treatment system was installed. This system treats water collected from excavation areas, then discharges it back to the creek downstream of the excavation area.

Lighted buoys and a silt curtain were installed at the mouth of Cow Pen Creek to prevent boaters from entering work areas.

Temporary fencing was installed on the Hawthorne peninsula in preparation for work to begin.

Before excavation began, vegetation was cleared along the east side of Cow Pen Creek to create access for large equipment. Trees and mulch were stockpiled for reuse during creek restoration.

Sand bags were filled and installed, creating dams at the top and bottom of individual excavation areas.

A series large pumps diverted the creek water around the work area. The pipeline was buried in some locations.

Concrete and other debris was removed along the creek bank before excavation began.

Before work began in the creek, water was drawn down within the individual excavation segment, and fish were collected, counted, identified and placed in the creek below the dammed-off work area.

Sediments were excavated from the creek and loaded onto transfer trucks.

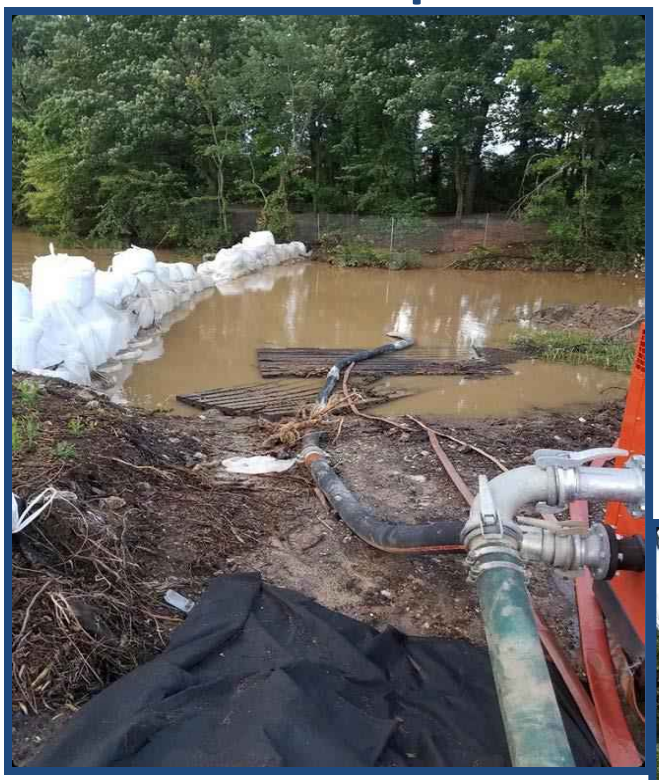
Excavation continued in the top excavation segment of the creek.

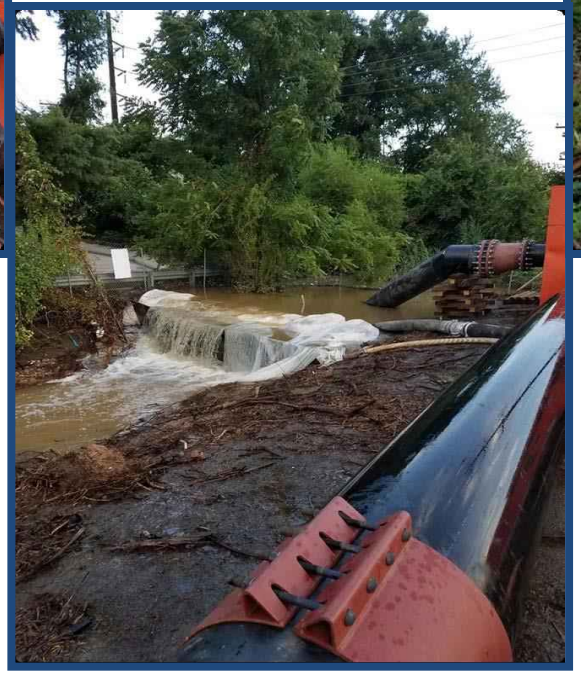
Loaded trucks hauled excavated sediment upland to handling bins, where sediment was mixed with drying agents and placed in loading trucks for offsite disposal at licensed landfills.

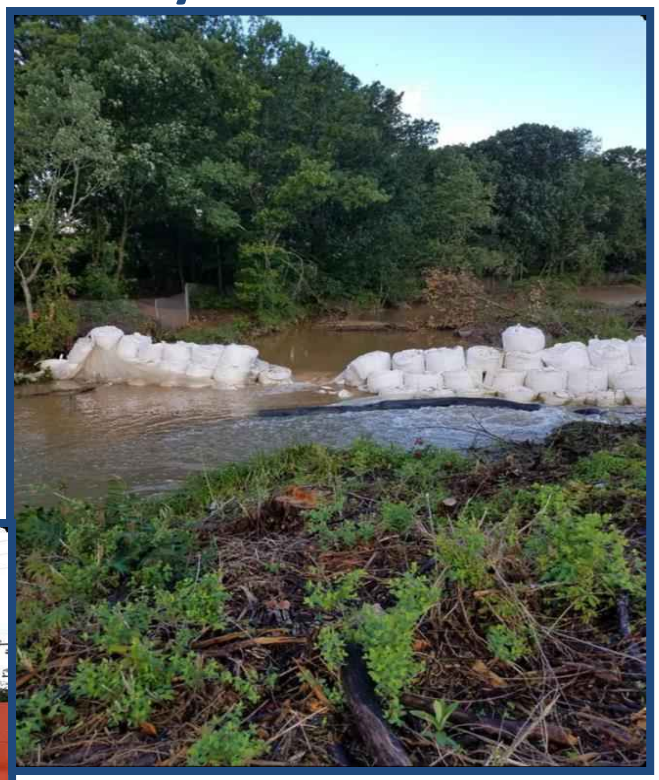
Timber mats were used during sediment excavation to minimize disruption of creek banks and upland areas.

To determine whether excavation was complete, surveys confirmed both the width and depth from which sediment was removed. Post-excavation samples were then sent for laboratory analysis to confirm whether cleanup goals were achieved; several locations required additional excavation to achieve those goals.

Multiple heavy rains complicated the creek cleanup. On July 28-29 both upper and lower dams overflowed and the lower gave way; dam repairs were made immediately on July 29.

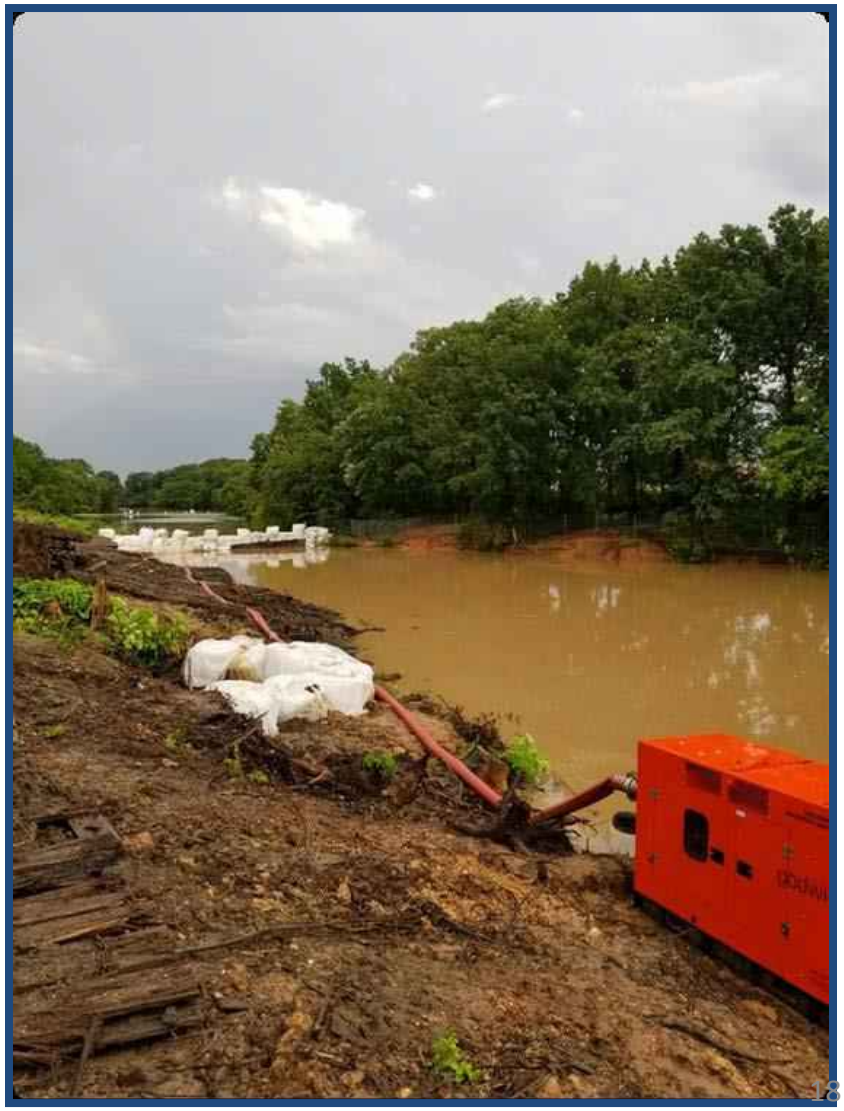






Repairs included reinforcing the sandbag dams, including adding metal reinforcement plates.

Heavy rains occurred again on Aug. 15, 18 and 21. The repaired dams held, so flood water had to be pumped out of the first excavation segment, sent to the treatment system, then discharged to the creek.



After these significant rains, sediment accumulated within the water treatment system, forcing the need to replace all the filter media, including the sand.

Before reconstructing the creek, clean backfill was brought in and stored.

Mats were used to help with back filling, compaction testing, and creek restoration.

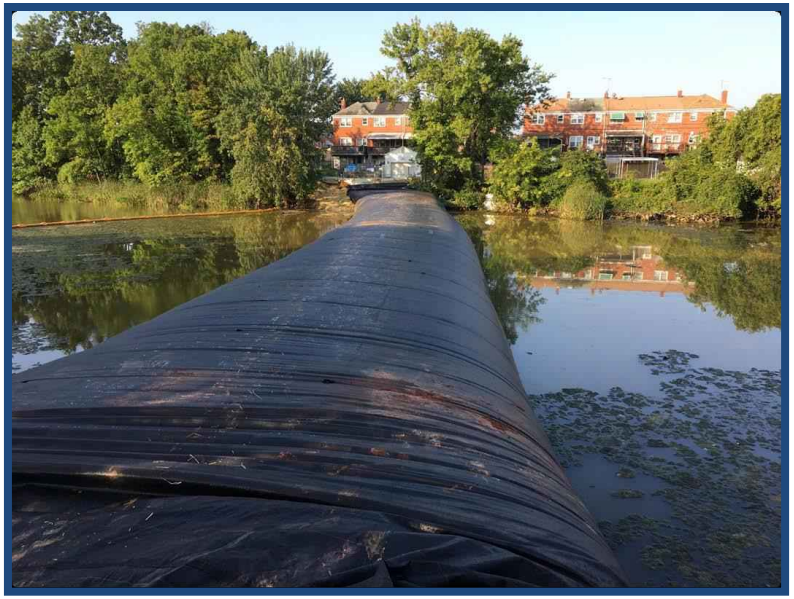
Top soil was placed on top of common fill, as the stream in the first work segment was reconstructed.

Final stream reconstruction included seeding; placing erosion matting and straw within the wetlands and floodplain areas; and conducting the final as-built survey.

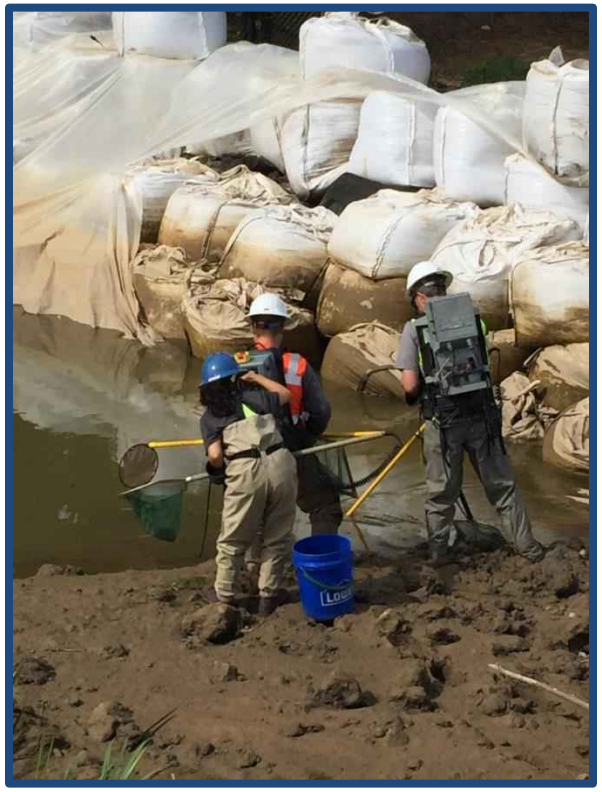
The adjacent flood plain was backfilled. Top soil was also placed on the wetlands.

Preparations to begin excavating the second segment included installing additional bypass piping and an upper sandbag dam.

The lower part of the creek is wider, so the lower dam needed to be larger and was created by filling a bladder dam with water. Temporary barriers and fencing were installed to protect the community by preventing access to the area.



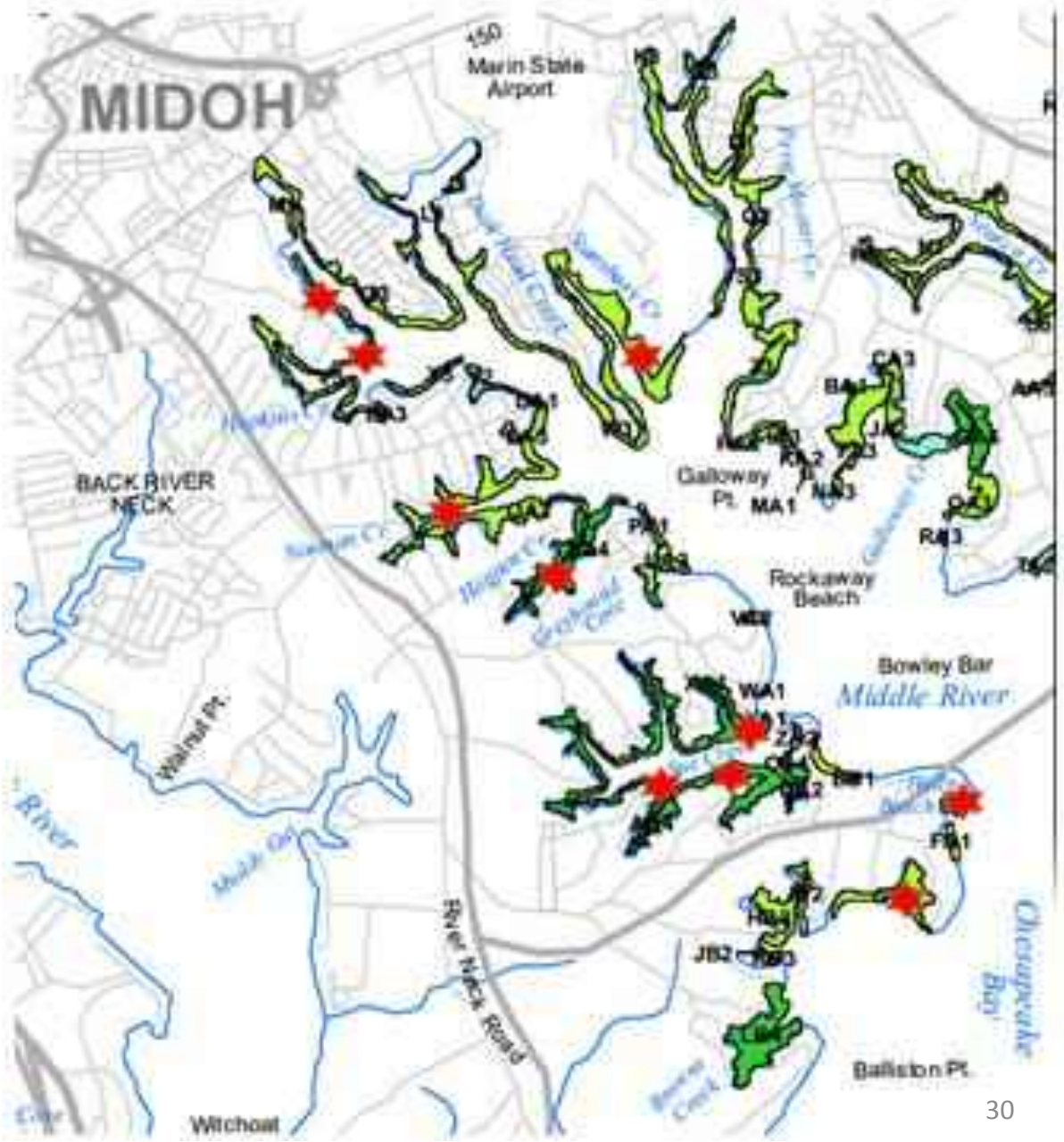
In the second excavation segment, fish were again retrieved, counted, identified, and released downstream of the dam.



Vandals damaged the fence on August 15, and again September 7 and 8. Lockheed Martin has been collaborating with the Hawthorne civic leaders and the Baltimore County Police to protect everyone from construction site hazards.

The final phase of sediment cleanup will be to place activated carbon in areas of Dark Head Cove where there was no dredging. PCBs (polychlorinated biphenyls) will attach to the carbon, which reduces their impact to the environment. The carbon material was received and stored under plastic sheets.

Submerged aquatic vegetation (SAV) was removed in Cow Pen Creek during cleanup, and will be replanted when cleanup is finished. This map shows where seeds from local native wild celery plants were harvested for replanting in Cow Pen Creek.



Wild celery seed was collected to plant in the late Spring 2018, following completion of Cow Pen Creek excavation and restoration activities.

This photo tour will be updated periodically as sediment cleanup continues as late as early 2018.

Lockheed Martin wishes to thank the contractors, the regulators and permitting authorities, and the community for their cooperation in helping make this project a success.

For questions, comments or concerns please contact:
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