

Summer 2019

Engineering solutions for the mid-Atlantic & around the world

The

# Chesapeake Engineer

Magazine

## Also...

*Fighting pollution on  
military installations*

*Latest technology  
aids WWI cleanup in  
DC*

## Delivering a high-tech space for Intelligence Command



**U.S. Army Corps of Engineers**  
*Baltimore District*



**On the Cover:** A view inside the new Secure Administrative/Operations Facility for the U.S. Army Intelligence and Security Command on Fort Belvoir, Virginia, July 1, 2019. (U.S. Army photo by Becca Nappi)



## Features

- 1** District Commander's column
- 2** Recycling plays key factor during nuclear plant project
- 4** Helping to fight pollution on Joint Base Andrews
- 6** What's happening in Ocean City?
- 8** Technology assists with WWI cleanup in DC
- 10** Dredging Baltimore Harbor

**11** Ellicott City status update

**12** High-tech facility for Intelligence Command

**14** Need a life jacket? We got you covered!

**16** Researching PFAS

**17** Robin Ernstrom, employee spotlight

The mission of the U.S. Army Corps of Engineers, Baltimore District, is to deliver vital engineering solutions in collaboration with our partners to serve and strengthen the Nation, energize the economy and reduce disaster risks.

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Col. John Litz, Baltimore District commander, looks at the SM-1A Deactivated Nuclear Power Plant's former control panel, located on Fort Greely, Alaska, April 24, 2019. Baltimore District, with its Radiological Center of Expertise, Fort Greely Garrison and Alaska District personnel are working closely on its decommissioning. (U.S. Army photo by Becca Nappi)

Baltimore District remains committed to delivering solutions for our Nation's toughest engineering and water resources challenges.

As I begin my second year as Commander of this esteemed District, I am proud to represent an organization of professionals who work tirelessly to seek innovative solutions and build collaborative partnerships that make a difference for our communities and our military and interagency partners.

Within this edition of "The Chesapeake Engineer," we highlight some diverse and interesting efforts. This includes the near-completion of the Secure Administrative/Operations Facility on Fort Belvoir, Virginia, for our Intelligence partners; water safety outreach at our lakes; using the latest technologies to find buried munitions in Washington, D.C.; and tracking emerging contaminants in conjunction with the University of Maryland, Baltimore County.

Though proud of the work we have recently accomplished, we are always looking ahead to future projects, studies and collaborations that will make sustainable differences to our infrastructure and the environment.

We remain steadfast in our commitment to find ways to move dirt, revolutionize the way we do business, and make a positive and lasting impact to our Nation.

Essays!

**BUILDING STRONG!**

COL John Litz  
Commander and District Engineer  
Baltimore District

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# Recycling — key factor in dismantling floating nuclear plant

By Chris Gardner

The U.S. Army Corps of Engineers recently completed the safe removal of more than 1.5 million pounds of radioactive material from STURGIS — a WWII Liberty Ship turned into the first floating nuclear power plant in the 1960s.

The Corps' Baltimore District was tasked with the unique mission to decommission and dismantle the STURGIS and its nuclear reactor, known as MH-1A. The reactor was used for several years to generate electricity for military and civilian use in the Panama Canal before being shut down in 1976.

Beginning in 2015, all remaining radioactive material was removed while the vessel was in Galveston, Texas. The radioactive waste was transported to a licensed disposal facility in Andrews County, Texas. After the radiological decommissioning was complete, the project team had to figure out how to handle the hundreds of thousands of remaining pounds of traditional debris that was not radiologically contaminated. STURGIS was dismantled at a shipyard in Brownsville, Texas, earlier this year.

"The STURGIS was a large vessel, and only a portion of the vessel was impacted by radiological contamination, so we had a lot of ship left to properly dispose of after the decommissioning was complete," said Baltimore District Project Manager Brenda Barber. "We looked at different alternatives for disposing of the more traditional waste and made a commitment to try to recycle as much of the vessel as possible."

With sustainability on their minds, the team implemented a process to recycle a tremendous amount of debris — approximately 600,000 pounds of lead and more than 5,000 tons of steel and other assorted recyclables.

This recycling effort reduced the project's overall environmental impact while the team simultaneously addressed the vessel's remaining low-level radioactive waste in an environmentally conscious and safe way.

"Not only was our team able to safely package and ship all of the radioactive components of the STURGIS barge, we were also able to safely separate non-radioactive recyclables so the STURGIS could live on in other ways," Barber said.

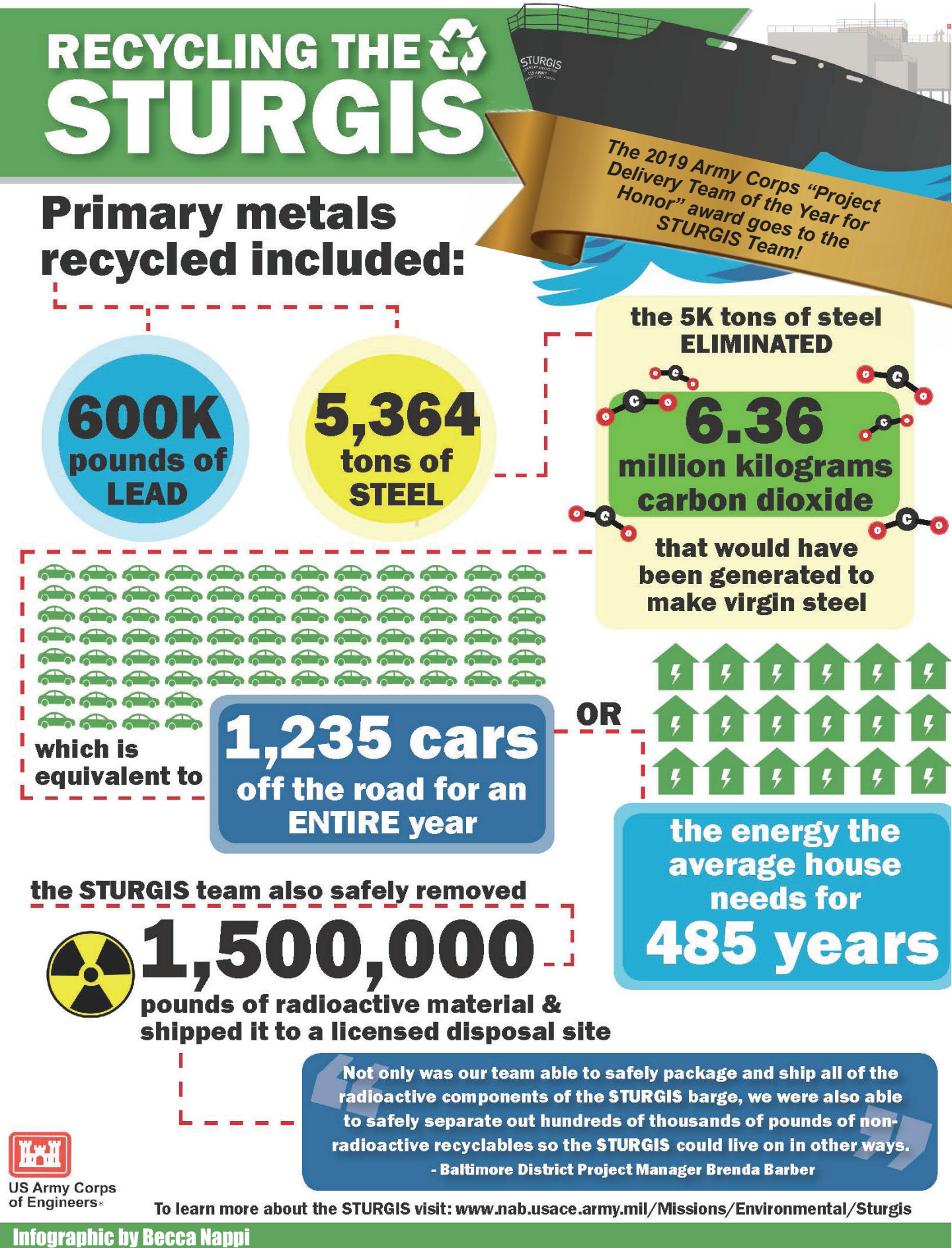
Most of the recycling ended up being lead shielding and the steel that made up the ship itself.

Both lead and steel are highly recyclable due to their recovery rates. According to the International Lead Association, recycled lead is used more than mined lead. Common uses include lead-based batteries often found in vehicles and lead sheeting that can be used in construction for roofing as well as radiation shielding in the healthcare industry. Recycled steel can be reused in anything from automobiles to cans to building materials.

Recycling metal like steel and lead has significant environmental benefits, including less impact on landfills, minimization of emissions, and a reduction in the requirement for mining or producing virgin material.

Though difficult to quantify, recycling lead reduces the need for lead mining and its associated human health and environmental impacts. Efficiently collecting and recycling lead also reduces the amount of hazardous lead released into the environment.

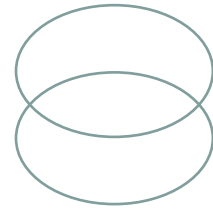
"In addition to being the right thing to do for the environment, our focus on recycling also provided the project with cost savings on disposal, which made the entire effort a win-win," Barber said. ■







Logs and debris lodge open swing gates, creating a potential security concern, on Joint Base Andrews in Prince George's County, Maryland, Feb. 19, 2019. (U.S. Army photo by Sarah Lazo)



## Battling a different kind of breach — logs and pollution.

By Sarah Lazo

When considering security concerns on a military installation, one might think of phishing scams or access control vulnerabilities; however, the U.S. Army Corps of Engineers is battling a different kind of breach — logs and pollution.

The Corps is assisting Joint Base Andrews, in Prince George's County, Maryland, in addressing potential security issues when drift and debris from local streams lodge swing gates open, providing access for people and pollution.

This is one element in a much larger effort to help protect JBA and the environment.

This multimillion-dollar design project will not only tackle base-perimeter security features, but also include streambank stabilization and restoration, and stormwater outfall repairs to combat erosion and reduce pollution from getting into local waterways at seven targeted locations on the installation.

"We are supporting base operations and benefitting the environment at the same time," said Vaso Karanikolis, Army Corps, Baltimore District, program manager.

# Army Corps helps Joint Base Andrews increase security, reduce pollution



Project site plans are reviewed during an interagency site visit to discuss a stormwater management project on Joint Base Andrews in Prince George's County, Maryland, Feb. 19, 2019. (U.S. Army photo by Sarah Lazo)

The project will help the joint base comply with state-enforced Municipal Stormwater Sewer System (MS4) permits, falling in line with the Environmental Protection Agency's Total Maximum Daily Load (TMDL) that caps harmful runoff into the Chesapeake Bay.

Maryland installations are required to remove or treat 20 percent of their impervious surface areas.

"For stormwater, we want to clean it up and slow it down," said Dan Cockerham, Baltimore District ecologist. "Through streambank stabilization and stream restoration, we are also cleaning up the waterways and bolstering the streams' ability to support life."

A concurrent \$235,000 pilot program is underway to reduce runoff through stormwater best management practices, or BMPs, in select areas of concern on base. The final design is anticipated in summer 2019.

"We will choose a site that will be most impactful to meet TMDL requirements," said Karanikolis. "The aim is to temporarily store the stormwater and have it eventually flow in an efficient route and manner."

BMPs can include maintenance or construction activities for stormwater retrofits; bio-retention and filtration ponds; stormwater wetlands; swales; stream restoration; stormwater outfall stabilization; or alternatives like replacing impervious areas with pervious areas.

In order to comply with the MS4 requirements, BMPs must be inspected every three years and routinely maintained. The Corps also recommends an annual visual inspection.



Vaso Karanikolis, U.S. Army Corps of Engineers, Baltimore District, program manager, at right, attends a site visit with representatives from Joint Base Andrews, Maryland Department of the Environment and AECOM on JBA in Prince George's County, Maryland, Feb. 19, 2019. (U.S. Army photo by Sarah Lazo)

In addition to in-the-ground projects, the Corps has created and handed over several tools to assist in meeting the environmental standards on base.

Tools include a BMP database that maps and tracks all of the existing stormwater infrastructure on base; a maintenance plan and schedule; and inspection guidance, procedures and pass/fail criteria. The Corps has held several trainings with JBA team members on how to successfully use and leverage these instruments.

"We have worked closely with the Corps of Engineers on several projects to ensure mission readiness, while responding to environmental challenges," said Steve Richards, JBA environmental quality chief. "Our aim is to improve and protect the environment that the Air Force has entrusted us with as good stewards of the land, air and water that we serve and protect every day."

JBA is providing the Corps with direct funding for these efforts.

For the past decade, the Corps has provided stormwater management planning support to many installations throughout the Chesapeake Bay watershed, including Forts Belvoir, Detrick and Meade, to help them address MS4 and the EPA's TMDL compliance requirements.

"We have leveraged our experiences and established relationships to create a team of subject matter experts who are capable of providing full-service support from the planning of a stormwater management project, through to the design, construction and down to the monitoring," said Karanikolis. ■



# Ocean City Inlet Projects

Infographic by Sarah Lazo



## Navigation Improvement Project

### What is the Problem?

Shoaling, or sediment accumulation, in the federal channels within the Ocean City Inlet occurs at a rate that challenges the ability of the Army Corps to perform maintenance dredging (currently two or more times per year). Dredging more often would not be cost effective. Shoaling creates navigation restrictions and hazards for vessels.

### What is the Project?

The Corps is evaluating sediment transport in the inlet and will recommend options for managing the shoaling to include structural solutions like jetties or channel modifications like deepening the channel in the inlet.



**Make a recommendation by early 2020; complete plans by end of 2020. Start construction in 2021.**



Partnership agreement signed in 2019 with Maryland Department of Natural Resources & Worcester County.



90 percent federal funding and 10 percent non-federal funding; federal funding through Continuing Authorities Program, Section 107, Navigation Improvements.



## Scour Hole Study

### What is the Problem?

A scour hole, estimated to be at least 50 feet deep near Homer Gudelsky Park, is growing and threatening shoreline stability, foundations and nearby homes (rip rap at Harbor Lights Condominium is failing). Sediment movement may also influence shoaling in adjacent channels.

### What is the Project?

The Corps Engineer Research and Development Center (ERDC) began work in 2017 to gather field data to better understand the scour hole, including collecting sediment samples, deploying instruments, and mapping the region to obtain information about the movement of sediment in and around the scour hole. Data gathered on sediment transport is expected to benefit long-term efforts to address navigation issues at Ocean City Inlet. The team will develop a plan to address the hole.



**Develop options in 2019; public review of draft report in summer 2020.**



Stakeholders include Maryland Department of Natural Resources and Worcester County.



100 percent federal funding; funding through Continuing Authorities Program, Section 204, Regional Sediment Management.

## Scour Hole History & Study Timeline

**1916** First automobile bridge constructed at Worcester Street  
**1948** Old bridge (Route 707) removed after Route 50 bridge constructed  
**1978** Survey shows scour hole (47 feet deep) in Isle of Wight channel in line with old bridge  
**1986-1987** Scour protection placed at Route 50 bridge  
**1997** Shorelines adjacent to

Homer Gudelsky Park armored with stone  
**2002** Riprap extended north by 145 feet through footprint of old bridge  
**2019** Complete modeling and develop project alternatives  
**2020** Complete draft report and submit for public review  
**2021** Approve study document

1933	1934-1935	1936	1985	1998	2017	2019	2020	2021
Inlet forms during hurricane	Construction of north and south jetties to stabilize inlet; repairs made in late 30s, 50s and early 60s (south jetty extended)	Construction of inlet, harbor federal channels to 10 feet deep, 200 feet wide	Construction of 3 breakwaters at north end of Assateague	Ocean City Water Resources Study recommends deepening inlet to 16 feet, harbor to 14 feet. Lack of funding stopped further action	Non-federal partner sends letter to Corps to reaffirm interest in a project to prevent shoaling	Field data collection and modeling; public meeting	Recommend project; complete environmental assessment; complete design	Start construction

## Ocean City Inlet & Navigation Improvement Project Timeline



# Latest technology tackles WWI cleanup in DC



Advanced Geophysical Classification technology is used during a pilot study to determine whether buried metal is cultural debris or a munition item at a private property within the Spring Valley Formerly Used Defense Site in Washington, D.C., Sept. 8, 2016. (U.S. Army photo by Chris Gardner)

By Chris Gardner

**Crews searching for buried explosives in the northwest Washington, D.C., Spring Valley neighborhood** are using the latest in advanced technology to reduce unnecessary impacts to private property and to improve efficiency.

Historically, crews doing this sort of work end up digging hundreds if not thousands of pieces of scrap metal and other items referred to as cultural debris, rather than buried munitions. These “false digs” are pretty common at Formerly Used Defense Sites (FUDS) across the country — and Spring Valley is no exception.

During World War I, the Spring Valley site was known as the American University Experiment Station (AUES) and was the site of America’s initial research into chemical warfare. Part of that included storing, testing and firing explosive rounds in an area that has since developed into a community of more than 1,000 private homes.

This is why crews are using the latest technology to reduce the amount of false digs.

“It’s been over 100 years since the Army finished its research and training in what is now the Spring Valley Formerly Used Defense Site, and that’s a lot of time for all kinds of metallic objects to have shown up and become buried in addition to any munition items that may remain from past military use,” said U.S. Army Corps of Engineers, Baltimore District, Project Manager Alex Zahl. “Our teams in the field are now using the latest in mapping technology to classify subsurface metallic anomalies to say ‘yes, that’s a munitions item’ or ‘no, that’s construction debris or a horseshoe.’”

The process, known as Advanced Geophysical Classification, or AGC, was recently accredited by the Department of Defense and the U.S. Environmental Protection

Agency to be deployed during munitions investigations. While the geophysical principle involved is not necessarily new, the use of the recently developed smaller equipment and the AGC process provides clear improvements for a site like Spring Valley. Previously, the technology was larger and less maneuverable, and primarily used at FUDS with more open spaces.

With these advancements, Baltimore District collaborated with Naval Research Laboratories to conduct a pilot study at three Spring Valley properties to determine how this technology might work in a residential setting. This meant not only working with different topography and surfaces like decks and driveways, but also addressing greater signal interference from things like buried utilities and foundations.

While the Army Corps has worked to address immediate hazards in Spring Valley over the past several years, the recently completed Spring Valley Site-Wide Decision Document identifies 92 private properties and 12 government-owned parcels where further investigation to remove potentially buried explosive hazards is recommended based on historical research and site investigation.

“We were lucky enough that as this technology was coming on the market, we were planning to conduct our investigation into these properties to remove any potential buried munitions,” said Zahl.

AGC involves state-of-the-art electromagnetic survey tools that not only locate buried metallic objects but also identify which anomalies are buried intact munitions.

These tools create an electromagnetic pulse over an anomaly and listen for the decay curve, which is based on things



Sod staples and nails, known as cultural debris, unearthed during a munitions investigation at a private property at the Spring Valley Formerly Used Defense Site in Washington, D.C., Dec. 1, 2009. (Courtesy photo)



Stokes mortar unearthed and safely removed from a private residential property in Spring Valley, Nov. 14, 2016. (Courtesy Photo)

like the size, shape and thickness of the buried item. Different items have unique decay curves. AGC files contain an extensive library of all the standard ordnance used by the Department of Defense, and specialty devices developed at AUES were added prior to work in Spring Valley.

The decay curves of detected buried metallic anomalies are compared with the files in the AGC library to identify the anomalies and help determine whether they are likely to be a munition item or cultural debris.

There are many benefits to reducing the amount of false digs during munitions cleanups.

It reduces the impacts to private properties, where crews are only able to work with the permission of homeowners.

It also reduces the amount of restoration needed since every hole dug in a yard, patio or driveway has to be restored whether munitions items are discovered or not. These restoration efforts take time and can be costly.

Reducing the amount of digs saves time, which in turn can save money.

“While we’re able to save time and money by conducting fewer digs, we will not compromise safety and are still digging if there’s uncertainty,” said Zahl.

The Army Corps expects to be done with this munitions investigation in 2020, pending permission from property owners. ■



# 2.6 million cubic yards dredged from Baltimore Harbor channels

By Chris Gardner

Crews finished dredging nearly 2.6 million cubic yards of material this April from shipping channels leading to the Port of Baltimore.

This work was executed by Norfolk Dredge through a \$24.6 million contract managed by the U.S. Army Corps of Engineers, Baltimore District. Dredging is part of regular maintenance required to ensure continued safe navigation for vessels going in and out of the Port of Baltimore — from the mouth of the Chesapeake Bay in Virginia to the Baltimore Harbor.

“The Port of Baltimore is one of the key economic engines for Baltimore, the state of Maryland and really the whole region,” said Baltimore District Commander Col. John Litz. “We coordinate closely with our partners at the Maryland Port Administration to maintain the depths of these vital shipping channels to ensure the Port of Baltimore can continue to serve the region. This is extremely important work.”

According to MPA, the state-owned public terminals at the port handled more containers, cars, construction equipment and other types of general cargo in 2018 than ever before. A record 10.9 million tons of general cargo was handled, which marked the third consecutive year exceeding the 10 million ton mark.

“There has been no better example of Maryland being open for business than the Port of Baltimore,” said Gov. Larry Hogan in an MPA statement. “As one of our leading economic engines, the Port generates good-paying, family-supporting jobs for tens of thousands of Marylanders and will continue to create more jobs and economic benefits for our state.”

The dredged material consisting primarily of mud, silt, sand and shell is being placed at two sites.

Approximately 500,000 cubic yards of material dredged from the Curtis Bay Channel is being placed at the Masonville Dredged Material Containment Facility located in Anne Arundel County, Maryland. Approximately 2.1 million cubic yards of material dredged from the Chesapeake Bay channels is being beneficially reused at the Paul S. Sarbanes Ecosystem Restoration and Expansion Project on Poplar Island, located in the eastern Chesapeake Bay near Tilghman Island in Talbot County, Maryland.

**2.6 million** cubic yards of mud, silt, sand and shell removed

**Channels dredged:** Curtis Bay Channel, Craighill Entrance, Craighill Channel, Craighill Angle, Craighill Upper Range, and Cutoff Angle segments

**Dredged to a depth of 51 feet + 1 - 2 feet overdepth**

The Chesapeake Engineer - 10



In both 2016 and 2018, Ellicott City's historic Main Street was met with a deluge that left businesses and residents displaced for months.

By Sarah Lazo



Representatives from the U.S. Army Corps of Engineers, Howard County and McCormick Taylor discuss flood risk management options during a site visit to the flood-prone historic district of Ellicott City, Maryland, May 30, 2019. (U.S. Army photos by Sharon Sartor)



At the request of Howard County, the Corps is reviewing and evaluating various flood risk management alternatives proposed thus far through documents and reports worked on by several agencies. The Corps will provide pros, cons and considerations for key alternatives, as well as make suggestions for any alternatives that may have been overlooked. The Corps will supply this information to Howard County by fall 2019 to assist them in their decision.

## Past Efforts



Following the 2016 flood, the Corps provided immediate technical assistance to analyze damages and cleared obstructions from local waterways to reduce the risk of imminent flooding from more rain.



The Corps wrapped up a flood proofing study for Howard County in 2018. Flood proofing measures reduce flood damages and include elevation of buildings, flood insurance, flood warning systems, moving valuables to higher levels, raising utilities and waterproofing buildings (sealant, flood doors, stop log panels, interior flood gates and closures on doors and windows). As part of the study, the Corps assessed and recommended measures for 16 representative example structures.



# A facility for a dynamic future

By Becca Nappi

The U.S. Army Corps of Engineers, Baltimore District, is putting the finishing touches on a state-of-the-art 381,000-square-foot Secure Administrative/Operations Facility (SAOF) on Fort Belvoir, Virginia, that will provide the U.S. Army Intelligence and Security Command (INSCOM) a consolidated administrative facility to well-equip them for future operations.

“We’ve created a facility that consolidates INSCOM’s operations, which were previously dispersed throughout the national capital region,” said Baltimore District Commander Col. John Litz. “This project is a significant investment and reflects the Army’s commitment to supporting INSCOM’s important mission. The great partnership between the Army Corps and INSCOM was a significant factor in the success of this project, and I am proud of the teams that continue to collaborate on delivering INSCOM’s facilities program.”

With 17,500 Soldiers, Army civilians and contractors,

located at 180 locations in 45 countries, INSCOM executes mission command of operational intelligence and security forces; conducts and synchronizes worldwide multi-discipline and all-source intelligence and security operations; delivers linguist support and intelligence-related advanced skills training, acquisition support, logistics, communications, and other specialized capabilities in support of Army, Joint, and Coalition Commands and the U.S. Intelligence Community.

“This new SAOF will allow INSCOM to divest of commercial leased space and gain increased synergy from a consolidated headquarters complex,” said Col. Doug Henry, INSCOM chief of sustainment and facilities. “This facility will provide the foundation upon which INSCOM supports the Army, DOD and Intelligence Community operations for the next several decades.”

## A Facility for the Future

The six-floor SAOF consists of mostly Special Compartmentalized Information Facility (SCIF) space

required for INSCOM missions. SCIF areas are built to ensure sensitive information can be disseminated and discussed without risk of data leakage.

The facility also features a four-story atrium, roof garden, outdoor plaza, cutting-edge Operations Center and Data Management Center, cafeteria and fitness center. The facility is expected to meet LEED Silver ratings.

The design, contracting and construction of this facility were no easy feat. With a customer like INSCOM, which needs a facility that will consistently adapt to an ever-changing technology environment, designing and building an accommodating space for existing and future technology was a challenge.

“Delivering world-class facilities is our strength, and that requires the use of cutting-edge Information technology,” said Baltimore District Capital Area Program Manager William Tully. “So we have made sure to provide the building infrastructure to accommodate emerging technologies that will



certainly continue to evolve in the years ahead.”

The Army Corps proved adaptable to technology upgrades that happened even during the design and construction of the facility. The team developed modifications that not only satisfied these new technology requirements but also made sure that minimal impacts occurred to the construction budget and schedule.

## Construction Challenges Yield Innovative Results

One of the biggest challenges of the SAOF’s construction was its location. While it’s common for an agency to occupy a “swing space” during construction to allow for a temporary workspace for employees during renovations or demolition of the old building space, INSCOM needed to occupy their current space in the Nolan Building throughout construction.

So how does a team build a new 381,000-square-foot facility on an existing agency site while still keeping the current facility operational?

The Army Corps designed an ideal solution to this challenge.

The SAOF was designed to wrap around INSCOM’s existing Nolan Building on three sides, like a horseshoe. The design ensured that INSCOM could access and occupy the Nolan Building during construction of the SAOF.

This wrap-around design placed

the construction of the SAOF within 9 to 20 inches from the Nolan Building, with additional entryways attached to the Nolan Building itself for future access.

While this close proximity proved to be complicated, not disturbing employees working in the Nolan Building during construction was set to be an even bigger challenge.

The Manhattan Construction Company, contracted by the Army Corps, began construction of the SAOF in spring 2016, carefully working to make sure there were no impacts to the operations in the Nolan Building. This included keeping construction noise levels as low as possible, not disturbing power-supply lines and keeping the main entrance of the Nolan Building clear of construction operations.

The Army Corps and Manhattan Construction Company effectively managed to not disturb INSCOM operations even when large tower cranes required for construction were swinging materials over the Nolan building.

“Working with the entire stakeholder team, construction sequencing of the SAOF has been executed safely and in a way that has minimized the impact to the ongoing operations of INSCOM personnel inside the Nolan Building,” Tully said. “It’s important to give credit to our construction team members and Manhattan Construction Company for managing safety on a construction effort spanning multiple years and incurring zero impact overall to INSCOM’s mission.”

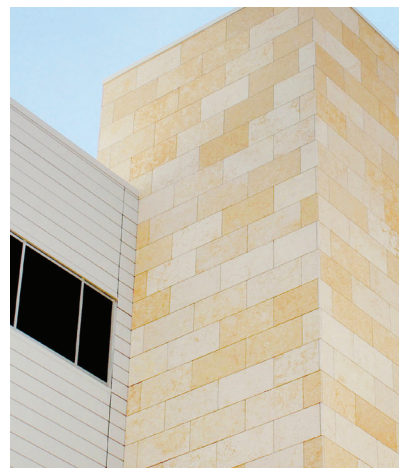
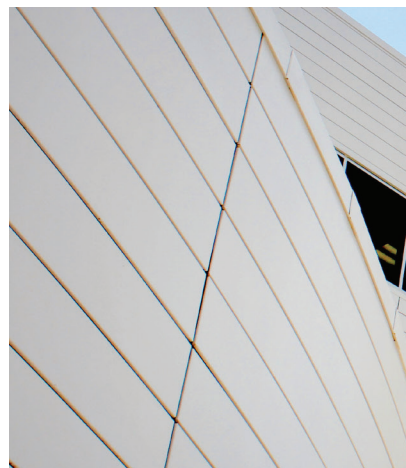
## A Phased Approach

More than 2 million construction man hours have gone into SAOF’s construction, which makes up just two phases of a larger project to provide INSCOM a new work campus.

The four-phase project consists of phase one, which was completed in 2014 to give the site a large parking garage; phases two and three entail the construction of the SAOF; and phase four, slated to begin in 2021, includes the renovation of the Nolan Building and its integration with the SAOF through the earlier built access points.

“We’ve had the pleasure of working with a team of extremely professional, motivated and technically competent individuals on all sides of the table, all focused on the same goal,” said Baltimore District Capital Area Office Area Engineer Wesley Wright. “That has been a primary contributing factor to this project being on track for a successful completion by any measure.”

Once SAOF construction is complete in fall 2019, INSCOM will take the keys and outfit their new building with furniture and tech equipment over the course of the following year. The completion of all four phases will certify that INSCOM has plenty of modern, amenity-filled space and operational facilities to lead the charge for the future of intelligence and security operations. ■



The new Secure Administrative/Operations Facility for the U.S. Army Intelligence and Security Command, Fort Belvoir, Virginia, July 1, 2019. (U.S. Army photos by Becca Nappi)



# Need a life jacket? Borrow one of ours!

By Cynthia Mitchell

Baltimore District staff installed a life jacket loaner station at Jennings Randolph Lake in May 2016. JRL is a Baltimore District flood risk management project located between Garrett County, Maryland, and Mineral County, West Virginia. It also hosts an assortment of recreational activities. The loaner station holds life jackets in infant, child, youth and adult sizes, all of which are available to the public at no charge.



"We tell the kids that if they want to get on the boat, they have to wear a life jacket. They are used to wearing it all the time and associate it with having fun."

— Michael and Tyler Krug | Ashville, Pennsylvania

"I wear a life jacket so I can doggy paddle and not sink to the bottom!"

— Arianna Adkins | Rawlings, Maryland



"I can't swim well, so it helps me feel comfortable in the deep end."

— Domonick Jones | Baltimore City, Maryland

"You have to wear a life jacket, in case you drown."

— Conner Wilt | Keiser, West Virginia



*We recently spoke with several guests who borrowed life jackets from the Jennings Randolph Lake loaner station and asked them why they felt it was important to incorporate life jacket safety into their fun on the water.*



"It is very comfortable. I don't even know it's on. Thank you for making this available to us."

— Marsha and Braxton Carpenter | Elk Garden, West Virginia

"I wear a life jacket to have fun and be safe."

— Kamrin Robeson | Frostburg, Maryland



## Do you know how to properly fit a life jacket?

1

### Check the label

The label will indicate the appropriate size and weight of the intended user. Verify the label states it is "Coast Guard approved."

2

### Put it on

Inspect the jacket for wear and tear, including rips and missing buckles or straps.

3

### Buckle up

Buckle all straps and tighten all zippers, including the crotch strap if there is one on the jacket. If straps and zippers do not close, the jacket is too small.

4

### Test the fit

Have the wearer lift their arms over head and gently lift them by the top of the life jacket opening. If the jacket hits the chin or rides up above their ears, it's too big.



Baltimore District is teaming up with the University of Maryland, Baltimore County (UMBC), U.S. Geological Survey, the Army's Engineer and Research Development Center and other federal partners to learn more about how complex chemical contaminants behave in the environment to help inform future cleanup efforts.

These man-made chemicals, generally referred to as per- and polyfluoroalkyl substances, or PFAS, are commonly found in various products all over the world, particularly in products not meant to adhere to certain things or stain.

"They're compounds that are both hydrophobic and oleophobic, meaning they resist both water and oils. So, they're really useful, and they're in just about everything — probably coating this furniture we're sitting on, the carpets, car seats, adhesives, fast food containers — all of these things," said Baltimore District Geologist Brian Shedd, principal investigator for the research.

Even though they are prevalent in everyday products, there has been growing concern in recent years that PFAS, at high enough concentrations, may have adverse human health effects in people who ingest them through contaminated soil or groundwater.

The research team will be using a scaled aquifer model to learn more about how PFAS behave in soil and groundwater in a setting where chemistry and aquifer conditions can be controlled.

"To my knowledge, right now, no one else is doing this type of physical research on this scale," Shedd said. "There hasn't been as much study of these compounds in the dissolved phase, and how they behave in the environment at relatively low concentrations."

This type of information is important to designing future PFAS cleanup methodologies and measuring their effectiveness.

The U.S. Environmental Protection Agency is currently assessing PFAS as emerging contaminants of concern and developing potential guidelines and maximum allowable concentrations, which would drive cleanup activities should high enough concentrations be found.

While efforts are ongoing at EPA, the DOD is being proactive and working to learn more about these chemicals and the potential for contamination from military activity.

Since the 1970s, PFAS has been commonly used in Aqueous Film Forming Foam (AFFF), which is a firefighting agent used to suppress fuel fires. The Army has ceased the use of AFFF except for emergencies and is collaborating with the Navy and the rest of the DOD in its assessments of substitutes. Training areas where AFFF was used is repeatedly a

main focus for assessment and potential remediation.

"This stuff just loves to spread, cover up the fire and extinguish it quickly," Shedd said. "While the compounds are found in all kinds of consumer products, the concentrations tend to be higher in an environment where you have repeated use of the product, like fire training areas."

According to the EPA, PFAS are persistent in the environment and human body — meaning they don't break down and can accumulate over time. This has led to challenges in designing cleanup activities.

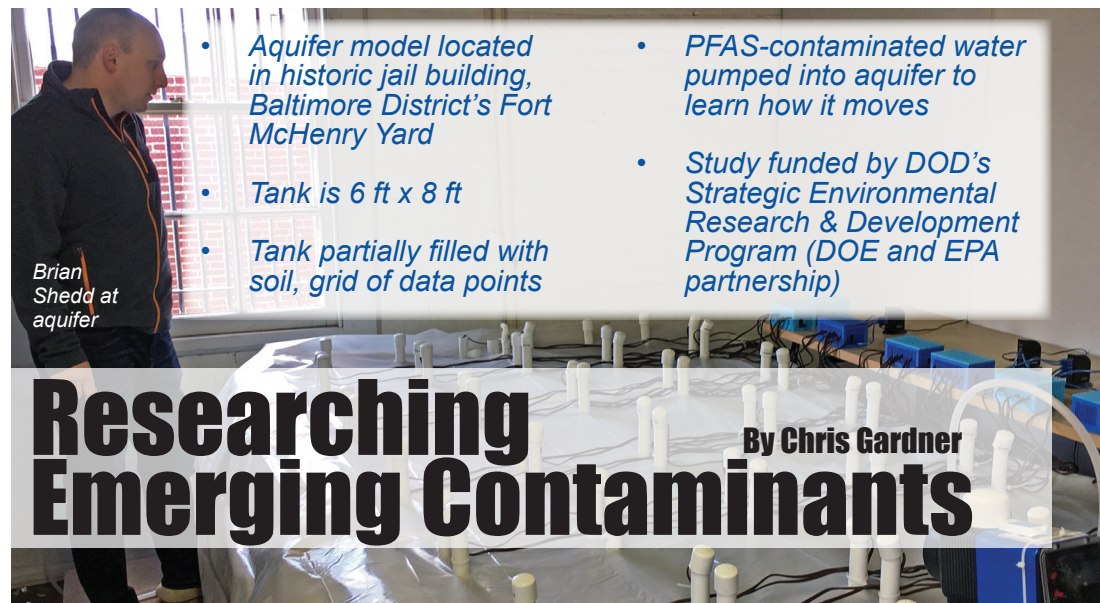
"Our hope is that the results of this study will be extremely valuable to the DOD and others in both evaluating the effectiveness of and designing cleanup efforts, as well as for further research regarding these compounds going forward," Shedd said.

Students are supporting the research at nearby UMBC, where they are already on the forefront of working with and studying PFAS. Dr. Lee Blaney, associate professor at UMBC and an environmental engineer, said working with PFAS provides his students with a unique learning opportunity.

"The environmental fate and transport of PFAS are quite different than other traditional and emerging contaminants," Blaney said. "As such, students working on this project will be forced to find novel solutions to understanding the fate and occurrence of PFAS during the soil and groundwater experiments. Students will also benefit from the multi-disciplinary team composed of academics and professionals from the U.S. Army Corps of Engineers and U.S. Geological Survey."

The research effort is expected to be completed in 2019. The study team plans to submit their findings to academic journals and hold a workshop for other agencies and environmental professionals from across the country.

"Baltimore District is proud to be on the leading edge of PFAS research," said Baltimore District Engineering Division Chief Ron Maj. "This important research should benefit a multitude of entities working to address potential PFAS contamination all over the country and beyond." ■



Brian Shedd at aquifer

## Researching Emerging Contaminants

By Chris Gardner

- *Aquifer model located in historic jail building, Baltimore District's Fort McHenry Yard*
- *Tank is 6 ft x 8 ft*
- *Tank partially filled with soil, grid of data points*
- *PFAS-contaminated water pumped into aquifer to learn how it moves*
- *Study funded by DOD's Strategic Environmental Research & Development Program (DOE and EPA partnership)*

# ROBIN ERNSTROM

- Project Manager
- Professional Engineer
- Lieutenant Colonel, U.S. Army Reserve

Ernststrom is the recipient of the **2019 Young Member Award** from the **Society of American Military Engineers (SAME), DC Post**, for outstanding leadership and accomplishments in support of the Society's mission to lead collaborative efforts to identify and resolve national security infrastructure-related challenges.

As part of her accomplishments, from 2017-2018, Ernststrom took an assignment as chief of future operations for U.S. Army Corps of Engineers, Headquarters. In this position, she led a five-person team of planners in the publication of more than 112 operations orders and spearheaded enterprise-wide recruitment to fill volunteer deployments to affected areas as a result of Hurricanes Harvey, Irma and Maria, and California wildfires. She helped maximize U.S. Army Reserve and National Guard expertise to deploy to Puerto Rico in support of Task Force Power, in coordination with the Department of Homeland Security, Federal Emergency Management Agency and other partners.



Ernststrom and husband Timothy Sheard, Castle Ball, 2017

## Q&A

### What most stood out to you during your emergency response support?

"What most stood out was the Hurricane Maria response. The duration of the recovery mission was long. The need for volunteers extended through the holiday season, resulting in hundreds of taskers to fill. It was great to see people step up throughout the Corps to support."

### What do you do for the Corps of Engineers, Baltimore District?

"I am a project manager at the Capital Area Office. I work on military construction projects on Fort Belvoir. Our customers include the Defense Logistics Agency, Directorate of Public Works, and Defense Threat Reduction Agency. This is meaningful civil service work that marries well with my Army Reservist career, as I feel like I understand both the program and end-user side of the organization. I may end up being a Soldier who uses the facilities I am helping to construct."

- Member of SAME since 2002 while at Norwich University, earned bachelor's and master's degrees in Civil Engineering
- Serves as K-12 STEM Camps Chair for DC Post
- 2018 graduate, Leadership and Mentor Program, SAME DC/ Northern Virginia posts

## Highlights

- **3** years federal engineering and project management experience, including time with USACE Fort Worth District, as project coordinator for AE/Design work for range & training facilities on Fort Bliss
- **14** years combined active duty and Reserve service, including 2 deployments to Iraq
- **6** years private sector engineering and construction experience, with a focus on water and wastewater pipeline projects in Dallas region
- Licensed civil engineer in State of Texas
- Commander of the 1398th Deployment and Distribution Support Battalion, Baltimore (Army Reserve), with the mission of providing global deployment and distribution capabilities to meet our Nation's objectives
- Started with Baltimore District November 2018





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## Looking Back...



Soldiers train at the American University Experiment Station during World War I. AUES was closed after World War I, and its historic boundaries are included within the Spring Valley Formerly Used Defense Site where the U.S. Army Corps of Engineers is carrying out cleanup efforts to remove potential hazards that may remain from past military activity. (File Photo)

Read more on page 8.