



# Carroll County Environmental Advisory Council

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Karen Leatherwood, Chair  
David Hynes, Vice Chair

Brenda Dinne, Staff Liaison  
Department of Land  
& Resource Management

## Meeting Summary for July 20, 2016

### Members

Karen Leatherwood, Chair  
David Hynes, Vice Chair  
Curtis Barret  
Ellen Cutsail  
Amy Krebs – absent  
Frank Vleck  
Sandy Zebal

### County Government

Brenda Dinne, Special Projects Coordinator / EAC Staff  
Liaison  
Cindy Myers-Crumbacker, Recording Secretary

### Other Attendees

Jeff Otto, Harbor Rock  
Bruce Michael, MD Dept. of Natural Resources

#### 1. CALL TO ORDER –

Ms. Leatherwood, Chair, officially called the July 20, 2016, meeting to order at 3:00 p.m. in Room 311 of the County Office Building.

#### 2. PUBLIC COMMENTS AND CONCERNS –

No public comments were offered.

#### 3. APPROVAL OF MEETING MINUTES –

Approval of the April, May, and June minutes was discussed. A correction was noted to be made to the April minutes on the last page in the Adjournment Motion No. 251-16 - "Motion was made to adjourn the April meeting" to change "March" to "April."

**APPROVAL OF MINUTES – Motion 252-16:** Motion was made by Ellen Cutsail and seconded by Curtis Barrett to collectively approve the April 20, 2016 (with correction mentioned above), the May 18, 2016, and the June 15, 2016, meeting minutes. Motion carried.

#### 4. CHAIR AND COMMITTEE REPORTS –

##### *a. Solid Waste Subcommittee:*

Ms. Leatherwood reported that the Solid Waste Advisory Council (SWAC) adjourned for the summer. She noted that there may be resistance to some of the options because people want a choice for their hauler. However, she felt that the Board of County Commissioners seemed to be open to discussions on what might need to be done if it would save the County money. The next SWAC meeting will be on Thursday, September 1, at 4:00.

## 5. **STAFF LIASION REPORT**

Ms. Dinne reported that the August meeting has been moved to 3:00 pm in Room 105 instead of an evening meeting to accommodate the speaker for the meeting. Ms. Leatherwood indicated that she will not be at that meeting.

The August agenda will include a speaker from the Maryland Port Administration (MPA), who will speak about MPA's experience with lightweight aggregate; a quick status on the residential solar recommendations process; and discussion on the format of the public MS4 workshop/event.

Mr. Barrett said that he will not be available for the meeting with the County Planning Commission on Wednesday, August 3, to discuss the EAC's decision on amending its solar recommendations.

## 6. **OLD BUSINESS** –

### ***a. General Public Workshop – Approval of Draft Scope; Assign Committees***

Ms. Dinne indicated that the draft scope has been discussed at prior meetings, but there was not a quorum to vote to approve it at the last two meetings. The scope is flexible enough to allow the EAC to pursue alternate formats to a workshop if desired.

**MOTION REGARDING SCOPE OF PUBLIC MS4 WORKSHOP – Motion 253-16:** Motion was made by Ellen Cutsail and seconded by Sandra Zebal to approve the scope of the public workshop. Motion carried.

Committee assignments were made as follows:

- Marketing – Karen Leatherwood and Frank Vleck
- Materials/Registration – Ellen Cutsail and Amy Krebs
- Refreshments – Curtis Barrett, David Hynes, and Karen Leatherwood

The date of the Workshop has not been decided. However, it will be held in March or April 2017. Ms. Leatherwood noted that she wanted the EAC to do a radio spot again with WTTR to help get the word out.

See attached “NPDES MS4 PUBLIC OUTREACH: Public Workshop or Event, Scope of Work.”

### ***b. Residential Solar Size Requirements – Discussion***

The Planning Commission requested a follow-up meeting with the EAC to discuss issues raised during the June 29 meeting. This follow-up will occur at the Wednesday, August 3, 2016, Planning Commission meeting, where the EAC will share the results of their discussion and decision whether to amend its original recommendations as a result. These issues were primarily as follows:

- Are the setbacks for ground-mounted systems sufficient to help protect the neighbors?
- Should requirements be added to address aesthetics of ground-mounted systems?

Ms. Leatherwood suggested two items that EAC may want to entertain as a result of the issues raised on June 29: 1) a change in recommended setbacks and 2) addition of a recommendation for screening.

In regard to setbacks, the EAC felt that most homeowners will opt for roof-mounted systems in residential districts where possible. The members were concerned that adding to

the existing, fixed setback could make it impossible for some property owners to install solar panels. They also agreed that they did not want to make the requirements more complicated than they are by adding a variable component to the setback requirements. The County has had experience with neighbors requesting the panels be located closer to their house and to the side yard, as this obstructed their view less.

This discussion was followed by one related to aesthetics. The Code currently requires a maximum height of 10 feet from grade for ground-mounted systems. The EAC has not recommended a change to this requirement. The Code currently allows many other items and structures, such as sheds and fences, to be higher than 10 feet. The EAC did not feel that the solar panels were any more visually intrusive than many of these other structures. In addition, members were concerned that screening requirements might interfere with solar access.

The EAC discussed for consideration these issues and potential amendments to the EAC's existing recommendations. The EAC members elected not to amend their existing recommendations. Ms. Dinne will prepare a summary of the EAC's discussion and decision on these two issues to use as a handout at the Planning Commission meeting on August 3.

**MOTION REGARDING SOLAR RECOMMENDATIONS – Motion 254-16:** Motion was made by Ellen Cutsail and seconded by Curtis Barrett to keep the previous recommendations. Motion carried.

Following this Planning Commission meeting, the EAC will request that the Board of County Commissioners approve moving forward to public hearing.

**c. *Lightweight Aggregate – Harbor Rock Product – Jeff Otto, Harbor Rock***

The Board of County Commissioners asked the EAC to complete some research on the use of lightweight aggregate (LWA) as one tool to reduce the sediment behind the Conowingo Dam. A project to complete a brief fact sheet on LWA, including what it is, how it might be used in this context, and cost/benefit information that can be found. The Board's interest in LWA as an option for addressing the dredge materials is in identifying options to clean up the Chesapeake Bay that might have more "bang for the buck" than money spent locally on Bay restoration.

To provide the EAC members with more information, Mr. Jeff Otto, founder and president of Harbor Rock, was invited to speak to the EAC. Mr. Otto is a Consulting Engineer. His interest in LWA product started when the New York harbor was a hot bed for discussion regarding beneficial reuse of dredge materials. He formed a strategic partnership with FL Schmidt, a leading supplier of equipment and services to the global cement and minerals industry. A patent is pending for this LWA manufacturing process.

Mr. Otto provided a copy of the PowerPoint presentation for the EAC members ahead of the meeting. He, therefore, highlighted the process, touched on a few other main topics, and answered questions regarding the potential manufacture of LWA from the dredge materials behind the Conowingo Dam as an alternative to finding a location to dispose of the dredge materials.

Mr. Otto indicated that LWA is valuable as a stone, being 4 to 5 times more valuable than regular stone. It "pops" in the heating process, so it is lighter and more fire resistant than typical stone. The pellets are porous like lava, but uniform, although it maintains a high skid resistance.

He said that during the dredging process a containment “box” is built next to the dredge site for deposit of dredged materials. With LWA, the dredged materials would be pumped from this box to Harbor Rock’s site (if such a project were to move forward), where it is screened of debris, dewatered, and heated in a kiln (see the attached PowerPoint for more detail on the process). The containment box would continually be emptied to allow space for more dredge materials.

In response to questions from EAC members, Mr. Otto mentioned that, although it is not why they do this, some decontamination of pollutants in the dredge material would result from the process. He also offered that the manufacturing is very expensive, but it would still be profitable. Mr. Otto went on to discuss cost and revenues and why it is profitable. Harbor Rock would fully fund the project, but would charge a fee for the services. If a public/private partnership were developed with the State, the fee could be lower, as the State can borrow money much cheaper than a private company. The closer to the source of the raw materials, the less expensive it would be. There are options for locating relatively close.

Mr. Bruce Michael, Director, Resource Assessment Service, with the Maryland Department of Natural Resources, was present in the audience and clarified a question related to study results regarding the cost of dredging. The Lower Susquehanna River Watershed Association study looked at all different types of dredging and identified a large range in costs. This range is owed to several factors, among which are the various disposal options for the dredge material.

Mr. Michael also clarified that, on average, there are more nutrients and sediments passing by the dam and onto the Bay than there were, but the amount hasn’t increased significantly. However, since the reservoir behind the Conowingo Dam is currently full, any new nutrients and sediment arriving at the dam go over. Large events tend to scour what is stored behind the dam and which makes more space behind the dam, sending the average numbers downward until it fills up again. Mr. Otto said the dredging process would reduce nutrients and sediment behind the dam, and should help to achieve the total maximum daily load (TMDL) for the Chesapeake Bay. Mr. Michael added that, if nutrients and sediments were addressed behind the Conowingo, this effort alone would not address the Bay TMDL. There are over 90 river segments in the Chesapeake Bay watershed that make up the TMDL, and this is just one. The others still would need to be addressed.

Mr. Michael shared that the impacts of the Conowingo Dam and potential mitigation efforts will be incorporated to the Chesapeake Bay Watershed Model for the 2017 Midpoint Assessment (to determine progress toward achieving the Bay TMDL). Climate change factors will be incorporated as well.

One of the main challenges to the process is to determine how to address air pollution from the manufacturing process. He added that a demonstration project was completed at the Baltimore Harbor, as a result of which he indicated that MDE felt the air pollution limits could be met. Mr. Otto further discussed the Cox Creek demonstration project, referring to slide 12 in the presentation. Mr. Otto felt that there is already a market for LWA product from this project.

Mr. Barrett noted that this process is somewhat theoretical at this point, as no facilities have actually been built yet. Mr. Otto added that this is true in the U.S.; however, FL Schmidt is operating several plants around the globe.

See attached “Harbor Rock and the Port of Baltimore & Chesapeake Bay Clean-Up Initiative.”

7. **NEW BUSINESS –**

None

8. **OTHER –**

Nothing

9. **ADJOURN REGULAR MEETING –**

**ADJOURNMENT OF MEETING – Motion 255-16:** Motion was made by Sandra Zebal and seconded by Ellen Cutsail to adjourn the July 20, 2016, meeting. Motion carried.

The meeting adjourned at 5:14 p.m. The next regular monthly meeting is scheduled for Wednesday, August 17, 2016, at 3:00 p.m. in Room 105 of the County Office Building.



# NPDES MS4 PUBLIC OUTREACH: PUBLIC WORKSHOP OR EVENT

## *Scope of Work*



## PURPOSE

Carroll County's National Pollutant Discharge Elimination System (NPDES) Phase I Municipal Separate Storm Sewer System (MS4) permit requires the County to implement a public education and outreach program to reduce stormwater pollutants. The permit requires the County to provide information to inform the general public about the benefits of:

- ◆ Increasing water conservation;
- ◆ Residential and community stormwater management implementation and facility maintenance;
- ◆ Proper erosion and sediment control practices;
- ◆ Increasing proper disposal of household hazardous waste;
- ◆ Improving lawn care and landscape management (i.e., the proper use of herbicides, pesticides, and fertilizers, ice control and snow removal, care for clippers, etc.);
- ◆ Residential car care and washing; and
- ◆ Proper pet waste management.

Water quality and stormwater pollution is everyone's responsibility. All Carroll County residents and property owners contribute in some way to stormwater pollution. Whether it be lawn fertilizer, auto fluids that wash off of driveways when it rains, pet waste, to name a few, each person can do his or her part to contribute to improving the water quality of Carroll's streams and water bodies. Common practices, generally referred to as "good housekeeping" measures, can be implemented by individual homeowners to do their share to reduce the amount of stormwater runoff that reaches streams and other waterways and to improve our local water quality of the water. Just as the combined actions of many can have a significant negative impact, the same is true for significantly improving water quality as well.

## TASKS & LOGISTICS

The Environmental Advisory Council (EAC) members will work closely with the County's EAC Staff Liaison, NPDES Compliance Specialist, and other staff to plan and implement an educational workshop or other type of educational event. The event will be geared toward the general public, primarily residents and homeowner associations, similar to the workshop held in 2016 geared toward the business community. All participants will be provided with information about good housekeeping measures for protecting Carroll's waterways from stormwater pollution. The preliminary target date for holding this event will be March 2017 (may be subject to change). Materials will be developed as appropriate to accompany the effort.

The general steps that will be taken to implement this project are grouped below by subject or task type. The tasks are not specific and are not listed chronologically. Some tasks may occur simultaneously.

### **Location:**

A location will be chosen that is somewhat central to the county, that has the capacity to accommodate the anticipated number of participants, and for which the County will not be charged for use. The location must have a room large enough to accommodate all participants, as well as several smaller rooms available for breakout sessions.

### **Educational Topics:**

Educational topics may include any of the items outlined in the permit under Part IV. D. 6. Public Education, Section b, but may include additional topics that impact water quality as well. The topics for the event may be addressed in a variety of ways, from presentations to demonstrations to public information materials available to hand out.

1. Water conservation;
2. Residential and community “good housekeeping” practices to improve stormwater management;
3. Reduction, reuse, and recycling of household waste and disposal of household hazardous waste;
4. Lawn care and landscape management (i.e., herbicides, pesticides, and fertilizers, ice control and snow removal, etc.);
5. Residential car care and washing;
6. Septic maintenance; and
7. Pet waste management.

### **Target Audience / Participants:**

**Mailing List:** If the County currently has the information available, a mailing list of homeowners associations (HOAs) will be developed. In addition, a query of State property data, along with the County’s Geographic Information Systems (GIS) data of existing land uses, will be used to create a mailing list to a sample of residential property owners. The mailing lists will be used for an interest survey as well as to provide notice of the upcoming event.

### **Advertising / Publicity:**



The EAC and staff will employ numerous opportunities to get the word out about the event and advertise to encourage as much participation as possible:

- ♦ The EAC/staff liaison will work with the County’s Public Information staff to post a link to event information on Facebook and Twitter. The EAC will look into the feasibility of a Facebook Boost Post to reach more people.

- ◆ Staff liaison will work with the County's Public Information staff to prepare and distribute a news release. The EAC will follow up by contacting the Carroll County Times to encourage an article.
- ◆ Information will be included in relevant and time-appropriate newsletters, such as the County Connection, municipal newsletters, *Down to Earth* newsletter (Bureau of Resource Management), etc.
- ◆ The EAC/staff will also work with the municipalities through the Water Resource Coordination Council and local groups to generate participation at the event.
- ◆ The EAC will arrange an interview on WTTR to help get the word out.
- ◆ A webpage will be created for this event. Information about and registration for the event will be available, as well as links to materials and presentations provided at the event and other relevant resources.
- ◆ Flyers will be developed to post and to distribute.
- ◆ Invitations will be emailed to prior award winners and nominees (for whom email addresses are available), as well as property management companies that manage property in Carroll County.
- ◆ If information is available to create an HOA mailing list, the HOAs will be sent an invitation to the event.
- ◆ Other as available

### **Speakers:**

EAC members will work with the EAC staff liaison, NPDES Compliance Specialist, and BRM staff to solicit appropriate speakers with the background knowledge and experience to address the chosen event topics.

### **Materials:**

Depending on the final format decided upon for the event, speakers will prepare slide shows (i.e., PowerPoint) to present their topic for the opening session, and possibly for any breakout sessions where appropriate. EAC members, the EAC staff liaison, and the NPDES Compliance Specialist will work with the speakers to identify additional educational and outreach materials and resources that they may bring and share to provide additional reference materials for the participants. Staff will also prepare associated public outreach materials appropriate to the topics to be addressed.

A means of identifying participants' topics of interest for subsequent events will be incorporated to the event. In addition, an evaluation form will be developed for participants to complete at the end of the event. The evaluation form will solicit feedback on the event content and format, as well as suggestions for reaching non-participants from the target audience.

### **Event Format:**

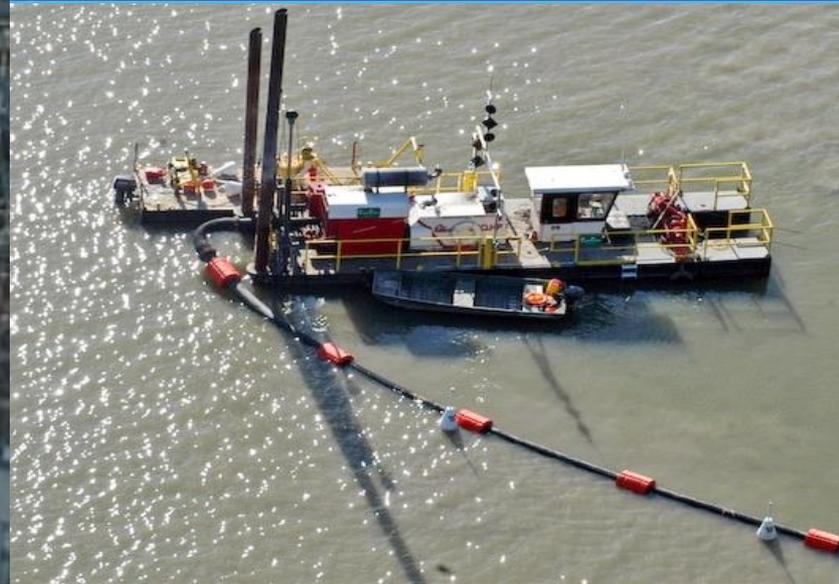
The event will be a two- to four-hour event. The format initially considered started with an opening session for all, followed by break-out sessions that allow participants to choose which topics interested them most. In this case, an opening session would address general good housekeeping best management practices (BMPs) that all homeowners should implement. The

opening session would then be followed by breakout sessions related to specific topics and designed to give the participant more detailed information on that topic. The participant should take away from the event information that will help to make decisions and/or take the next step. However, other potential formats may be considered. The EAC may partner with other groups for the event, which may result in a different format that is better suited to the associated activities.

## ESTIMATED COSTS

Costs will be absorbed by normal staff responsibilities and operations or the NPDES Compliance budget for public education.

- ◆ *Materials*: The cost to create or copy any materials will be absorbed by the normal operating costs of the relevant County agency or the NPDES compliance budget.
- ◆ *Postage*: Postage will be covered by the normal operating costs of the County's office of Production and Distribution Services.
- ◆ *Refreshments*: The EAC will try to secure sponsors to provide or cover the cost of refreshments (coffee, juice, and light refreshments) to be provided at the break.



## HarborRock and the Port of Baltimore & Chesapeake Bay Clean-up Initiative

**A Sustainable - Affordable - Mandatory  
Component of Long-Term Bay Health**

# **Briefing to Carroll County Environmental Advisory Council**

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**Purpose & Objectives of this Briefing**

**Proposed Approach**

**Summation of Environmental Benefits**

**Port of Baltimore Project**

**Conowingo Dam Project**

**Next Steps**

**Who is HarborRock**

**Overview of Light Weight Aggregate (LWA)**

**HarborRock Test Locations and Technology Validation**

# Purpose & Objectives of Today's Meeting

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## Purpose:

1. To Discuss Lightweight Aggregate (LWA) Reuse as the Best Method to Solve Two Sediment Management Needs in Maryland
2. Compare LWA Reuse to Current Methods Used to Address these Same Needs:

## Objectives:

1. To identify if there are any regulatory issues with implementation of LWA Reuse at the Cox Creek Dredged Material Containment Facility.
2. Identify the steps needed to use HarborRock as a management method at Conowingo Dam for the Chesapeake Bay TMDL:
  - Include HarborRock in Maryland's WIP
  - Establish nutrient trading with Pennsylvania and New York

# HarborRock's Sediment Reuse Approach

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- 1. Install a Hydraulic Dredge in the Cox Creek Dredged Material Containment Facility (DMCF) & Conowingo Reservoir**
- 2. Dredge the Sediments & Pump the Slurried Material Via Pipeline to the LWA Reuse Manufacturing Plant**
- 3. Produce LWA Using Natural Gas Fired Kiln(s)**
- 4. Return the Pumping Water to the Susquehanna River or DMCF**
- 5. Sell the ASTM grade LWA to Local Users**

***“Instead of mining, DREDGING for LWA is more cost effective; more efficient; and is symbiotic with a healthier Bay”***

# Environmental Benefits

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1. Removal of the sediment and associated contaminants from the Chesapeake Bay Watershed (Cox Creek DMCF & Conowingo Reservoir) will help Maryland exceed the EPA's Bay TMDL goals.
2. The sediment is fired in the kiln for 40 minutes at over 2,200° F.
  - Proven to destroy organic contaminants & immobilize metals
3. The LWA produced is an ASTM certified, recycled aggregate,  
eligible for LEED credits
4. The manufacturing process improves the water quality

***“The environmental benefits are measurable & verifiable in real time”***

# Process Attributes & Environmental Controls

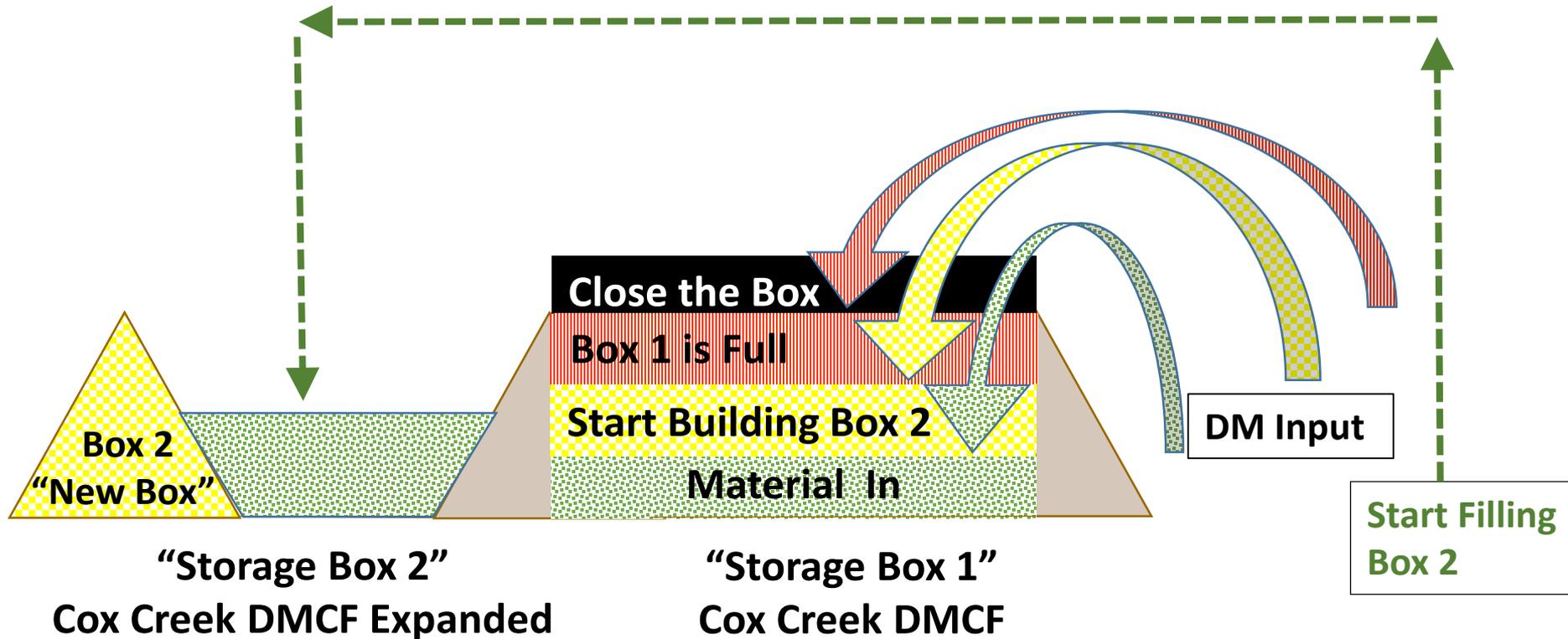
1. No chemicals are added to the dredged sediments
2. All components of the dredged material are reused:
  - Cobbles, Sand, Silt/Clay
3. The cobbles & sand are washed, screened & sold
4. The silt/clay is fired into LWA & tested to ASTM standards
5. All wash/process water is sent to WWT for pH control
6. Air emissions are controlled by the Best Available Technologies

*“Every emission point and product sold is controlled and routinely tested in the HarborRock process”*

# **Port of Baltimore Project Overview**

# Dredged Material Management the Old Way

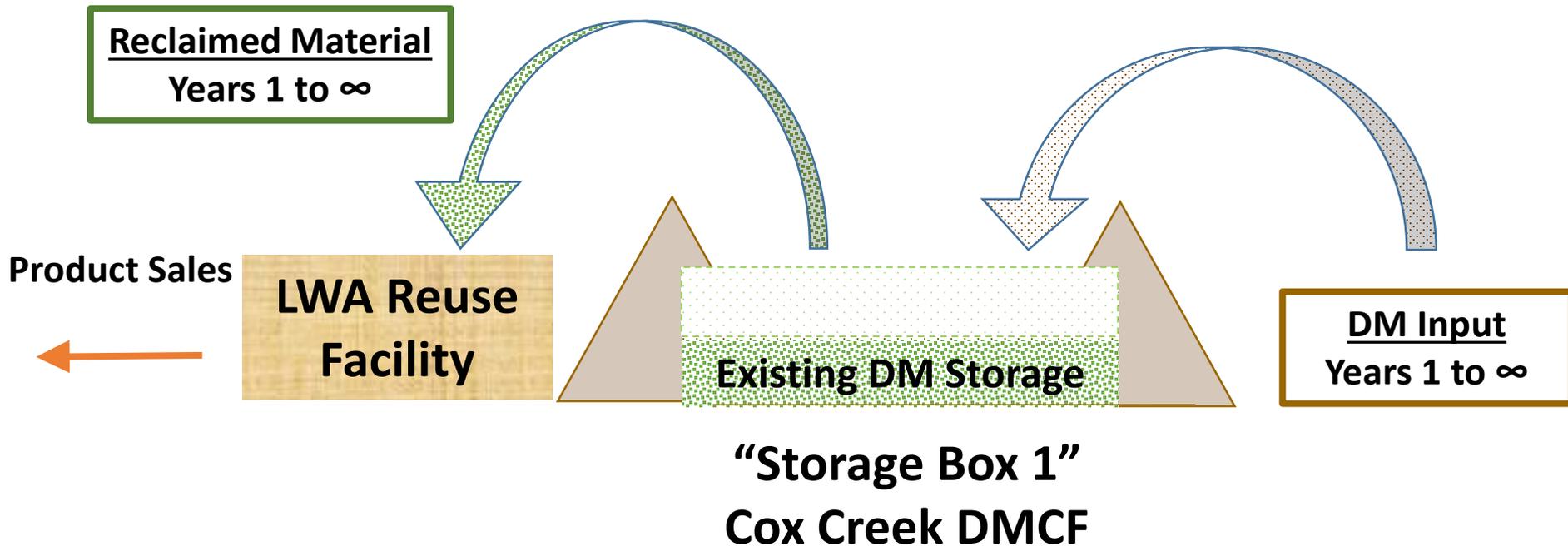
Buy a Box, Fill the Box, Buy a New Box, Close & Manage the Old Box....



- The repetitive "Box" cycle only works when land is available to build more boxes
- "Box" economics depend on the: 1) cost of new land, 2) opportunity cost of the lost land, 3) on-going closure costs of retired boxes 8

# Dredged Material Management the New Way

Use an Existing Box, Put Raw Material In, Take Raw Material Out, Sell a Product...



LWA Reuse creates “renewable capacity” - the Box never fills up

LWA Reuse: 1) has defined economics, 2) eliminates risk of finding more sites, 3) creates family wage jobs, 4) preserves land for higher value uses

# Dredged Material Management the Old Way

The MPA's plan is to:

- 1) raise the dikes at the existing disposal area;
- 2) build dikes around the 100 upland acres.

This plan will provide disposal capacity for ~5 years, then another site is needed.



# Dredged Material Management the New Way

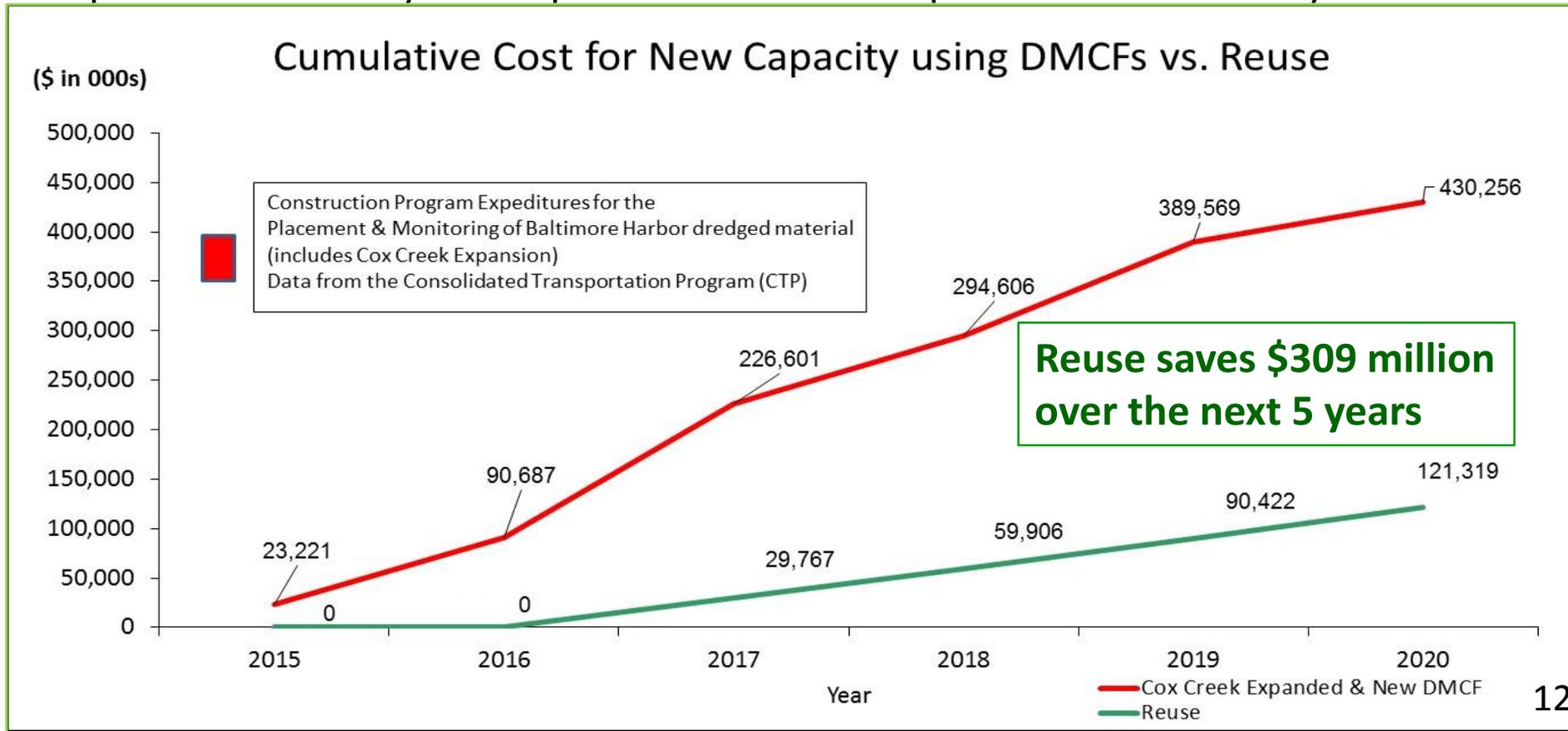
LWA Reuse will:

- 1) Extend the life of the current DMCF indefinitely;
- 2) Preserve all 100 acres for productive use;
- 3) Avoid building a landfill that will require perpetual service & cost



# LWA Reuse Costs Less with Better Cash Flow

1. Avoids MD spending ~ \$200 million over the next 2 years to expand Cox Creek
2. Eliminates the need spend over \$430 million by 2020 to build additional DMCFs – on sites not guaranteed to be available - to meet on-going disposal needs.
3. LWA Reuse requires no public capital, its reuse fee is guaranteed & the plant will operate indefinitely – this provides cost and disposal means certainty.



# LWA Reuse At Cox Creek

*Good for the Environment, the Economy & Business*

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- 1. Does not require public capital investment – The \$100 million facility is financed by HarborRock.**
- 2. Does not require a guaranteed supply of dredged material;**
- 3. Saves Maryland more than \$309 million over the next 5 years**
- 4. Creates 65 family wage jobs & \$2 million annually in new taxes**
- 5. Does not have any regulatory impediments other than normal permitting .**
- 6. The final products meet all environmental & product standards**

# **Conowingo Dam Project Overview**

# The 2025 Chesapeake Bay TMDL



[District of Columbia, Maryland, New York, Pennsylvania, Virginia, West Virginia and the District of Columbia](#) are to reduce water pollution in streams and rivers in connection with EPA's Total Maximum Daily Load to restore the Chesapeake Bay

[The Bay TMDL](#), a comprehensive "pollution diet," established in 2010 is based largely on [watershed implementation plans \(WIPs\)](#)

In 2012, the [7 jurisdictions submitted Phase II WIPs](#) designed to strengthen the initial cleanup strategies and reflect the involvement of local partners.

The Bay TMDL is a key part of an accountability framework [to ensure that all pollution control measures](#) needed to fully restore the Bay and its tidal rivers [are in place by 2025](#)

[Practices are to be in place by 2017 to meet 60% of the necessary pollution reductions](#)

# Current Status

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**After more than 4 decades and billions of dollars in direct and indirect efforts...**

**Chesapeake Bay Foundation rates the Chesapeake Bay Water Quality a “32” (D+) in its 2014 State of the Bay Report**

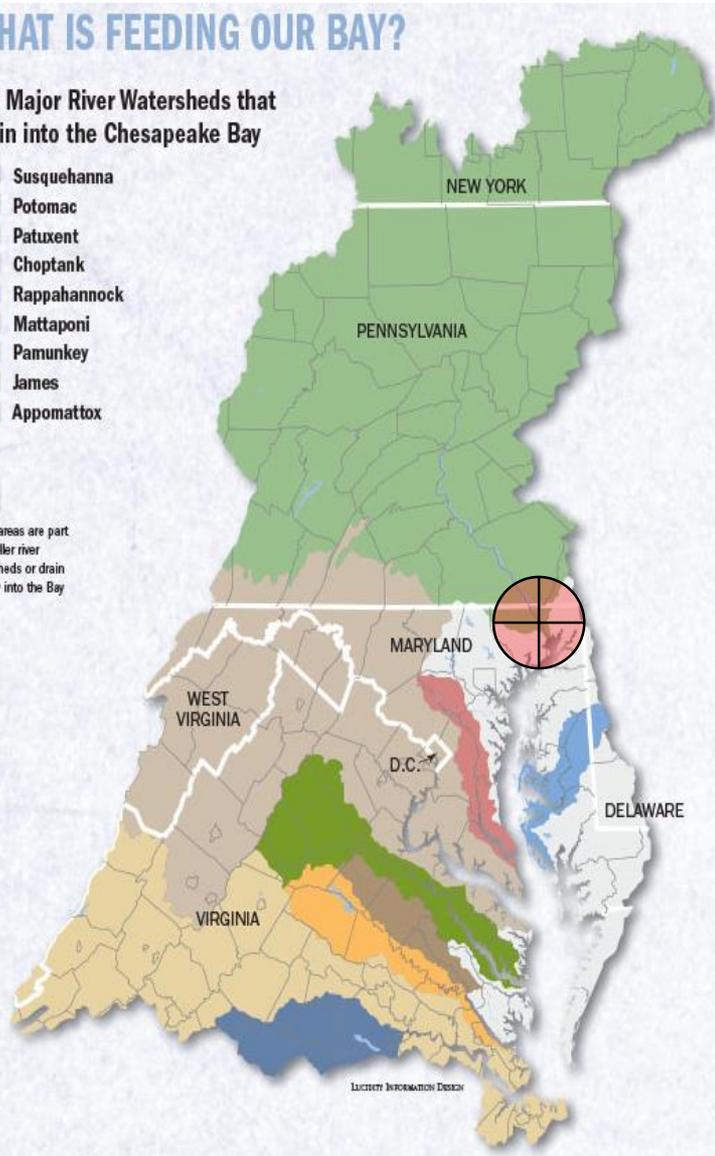
# The Susquehanna's Influence on the Bay

## WHAT IS FEEDING OUR BAY?

The Major River Watersheds that Drain into the Chesapeake Bay

- Susquehanna
- Potomac
- Patuxent
- Choptank
- Rappahannock
- Mattaponi
- Pamunkey
- James
- Appomattox

These areas are part of smaller river watersheds or drain directly into the Bay



## The Susquehanna River Drainage Basin:

- ✓ 6,275 sq. miles in New York (23%)
- ✓ 20,960 sq. miles in Pennsylvania (76%)
- ✓ 275 sq. miles in Maryland (1%)

## Supplies to the Chesapeake Bay:

47% of the freshwater; > 90% to upper Bay

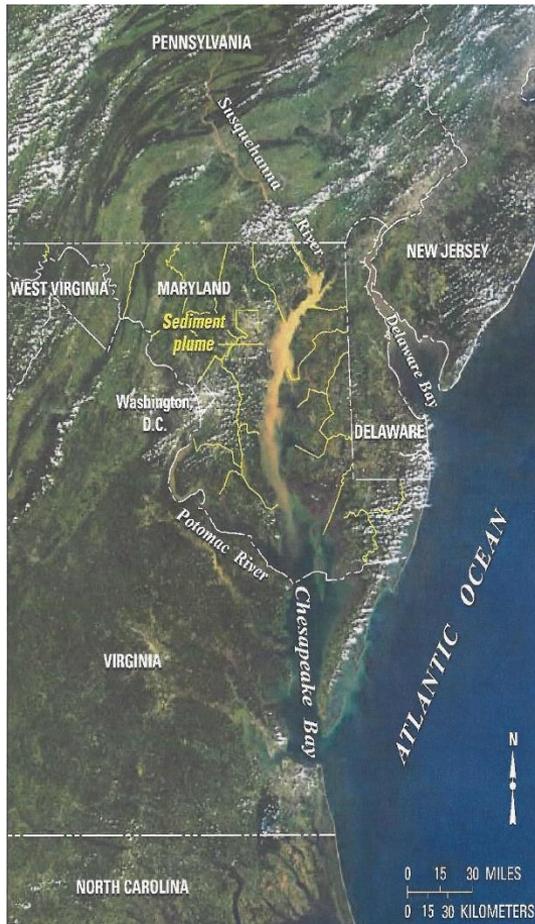
41% of the Nitrogen

25% of the Phosphorus

27% of the sediment

***“Due to sheer volume... There is concern all other actions related to the Bay WILL FAIL unless the Susquehanna River’s Conowingo Dam N-P-S outflows are mitigated. “***

# Tropical Storm Lee Dispelled any Doubts about the Relevance of the Susquehanna to the Bay



	Nitrogen	Phosphorus	Sediment
	(tons)	(tons)	(tons)
<b><u>Annual Reductions Needed to achieve the 2025 Susquehanna River TMDL</u></b>	18,210	702	320,116
<b>Tropical Storm Lee (over 9 days)</b>	<b>42,000</b>	<b>10,600</b>	<b>19,000,000</b>
	<b>&gt;2X</b>	<b>&gt;15X</b>	<b>&gt;59X</b>

***“In-rush damage from recurring tropical storms is disastrous to the Bay”***

# Quantities & Composition of Material Entering the Conowingo Reservoir & Overflowing the Dam

Sediment Inflow:

4,100 tons/day  
(1.5 million tons/year)

Sediment Overflow:

3,370 tons/day  
(1.2 million tons/year)

Nitrogen Overflow:

163 tons/day

Particulate Nitrogen with sediment: 69.3 tons/day

Phosphorus Overflow: 6.9 tons/day

Particulate Phosphorus with sediment: 5.7 tons/day

# Contaminant Reductions from Sediment Removal

To reduce net sediment into the Bay from the Dam....

- Dredging/Removal must exceed the inflow rate of 1.5 million tons/year
- Every 1,000 tons of sediment removed also removes:
  - 21 tons of particulate Nitrogen
  - 1.7 tons of particulate Phosphorous.

Dredging 1,776,000 tons/year of sediment from Conowingo Reservoir will reduce year-over-year sediment delivery into the Bay by 276,000 tons every year

See next slide for details

# The Effectiveness of Dredging on Contaminant Flow

Required reductions from 2010 loads for Maryland to meet its 2025 Bay TMDL		
Nitrogen	Phosphorus	Sediment
(tons/year)	(tons/year)	(tons/year)
5,795	245	13,000

	Reductions Obtained from Excess Dredging (% of 2025 TMDL)		
Excess Dredging	Nitrogen	Phosphorus	Sediment
(tons/year)	(tons/year)	(tons/year)	(tons/year)
13,000	273 (5%)	22 (9%)	13,000 (100%)
<b>276,000</b>	<b>5,795 (100%)</b>	<b>469 (191%)</b>	<b>276,000 (2,123%)</b>

***“Dredging 1,776,000 tons/year of sediment from Conowingo Reservoir will help Maryland immediately exceed its 2025 Bay TMDL”***

# Costs<sup>1</sup> to Achieve the Maryland 2025 Bay TMDL

Source Sector	Reductions from 2010 Loads to be Obtained by Current WIP Methods	WIP Cost 2010-2025
	<b>Nitrogen</b>	
	(tons/year)	(\$ millions)
<b>Agriculture</b>	<b>2,365</b>	<b>\$928</b>
<b>Wastewater</b>	<b>1,895</b>	<b>\$2,368</b>
<b>Stormwater</b>	<b>965</b>	<b>\$7,388</b>
<b>Septic Systems</b>	<b>575</b>	<b>\$3,719</b>
<b>Total</b>	<b>5,795</b>	<b>\$14,403</b>

- Costs do not count costs associated with:
  - Controlling combined sewer and sanitary sewer overflows (CSOs and SSOs)
  - Maryland’s Healthy Air Act (HHA) implementation
  - Financing costs and inflation
  - System(s) O&M and replacement

# The Cost of LWA Reuse for the Susquehanna?

HarborRock's all-inclusive cost to remove and reuse sediments from Conowingo Reservoir is estimated to range from \$36 to \$48 per ton of sediment

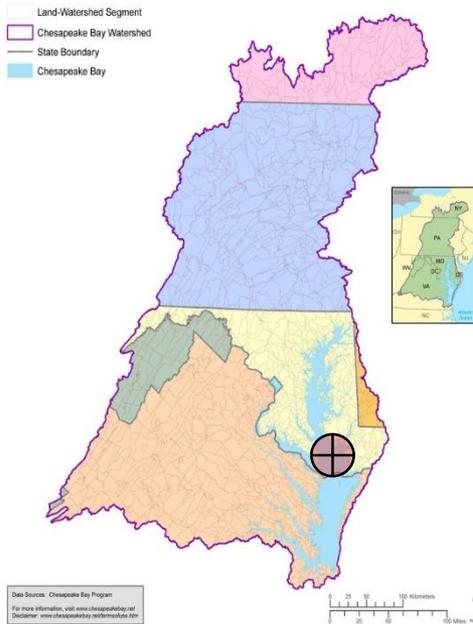
At these rates, **the cost to dredge and reuse 1,776,000 tons/year** of sediment from Conowingo Reservoir **would be \$64 to \$86 million per year**

**For perspective:**

***A Reuse plant could operate for 43 to 58 years for the same \$3.7 billion being spent over the next 10 years on MD's Septic program.***

**“The economics of dredging Conowingo for Reuse would enable the Administration to save MD Taxpayers billions of dollars”**

# Nutrient Trading with NY & Pennsylvania?



New York	Nitrogen	Phosphorus	Sediment
	(tons/year)	(tons/year)	(tons/year)
<b>Req't Reduction</b>	<b>205</b>	<b>78</b>	<b>13,670</b>

Pennsylvania	Nitrogen	Phosphorus	Sediment
	(tons/year)	(tons/year)	(tons/year)
<b>Req't Reduction</b>	<b>17,925</b>	<b>620</b>	<b>301,800</b>

Of the 1,776,000 tons/year of sediment that Maryland must remove from the Conowingo Reservoir to exceed its 2025 Bay TMDL, removal of:

**315,470 tons/year (18%)** would enable NY & PA to meet their sediment TMDLs

**863,333 tons/year (48%)** would enable NY & PA to meet their Susquehanna River TMDLs

**“Nutrient trading would get PA & NY into TMDL compliance, save those states time & money and help offset Maryland’s WIP costs”**

# LWA Reuse Can Begin Now

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The best sequence for implementation is to:

1. Start construction for Port of Baltimore Reuse project; and
2. Begin development activities for the Conowingo project

HarborRock has completed a comprehensive demonstration of its technology for the MPA using Baltimore Harbor sediments

- Engineering data exists to start the permitting process
- MDE has preliminarily evaluated the air emissions data & the air emissions control system and found it acceptable

***There are no regulatory, financial or public acceptance issues limiting Reuse at Cox Creek***

# Who is HarborRock?

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Established in 1996, HarborRock is a consortium of companies with the skills, track record and financial capability to:

- **Finance**
- **Build**
- **Own**
- **Operate**
- **Guarantee the performance of the LWA Reuse facilities**

# HarborRock Consortium Companies

- **FLSmidth (FLS)**: Global supplier to the minerals and cement industries. **[Engineering, equipment & process guarantee]**
- **Louis Berger Group, Inc. (LBG)**: a global engineering and environmental consulting firm **[Development, design & project management]**
- **Balfour Beatty Investments, Inc. (BBI)**: is the investment arm of Balfour Beatty plc headquartered in London. **[Finances]**

**Balfour Beatty**  
Investments, Inc.



*“HarborRock has resources and relationships with Internationally Respected Industry Leaders”*

# HarborRock Regional Affiliates

- **Cianbro:** Cianbro self-performs most project disciplines. Cianbro has a facility in Anne Arundel County, MD [**Constructor**]
- **TerranearPMC (TPMC):** Environmental services to clients nationally. TPMC has an office in Baltimore [**Operations**]
- **The Rasmussen Group:** Strategic planning and advisory services to clients nationally. Headquartered in Maryland [**Advisory**]

**Balfour Beatty**  
Investments, Inc.

**CIANBRO**

**FLSMIDTH**



Louis Berger

Terranear**PMC**

*“HarborRock has regional relationships  
with Respected Industry Leaders”*

# RECENT HarborRock SUCCESSES in Maryland

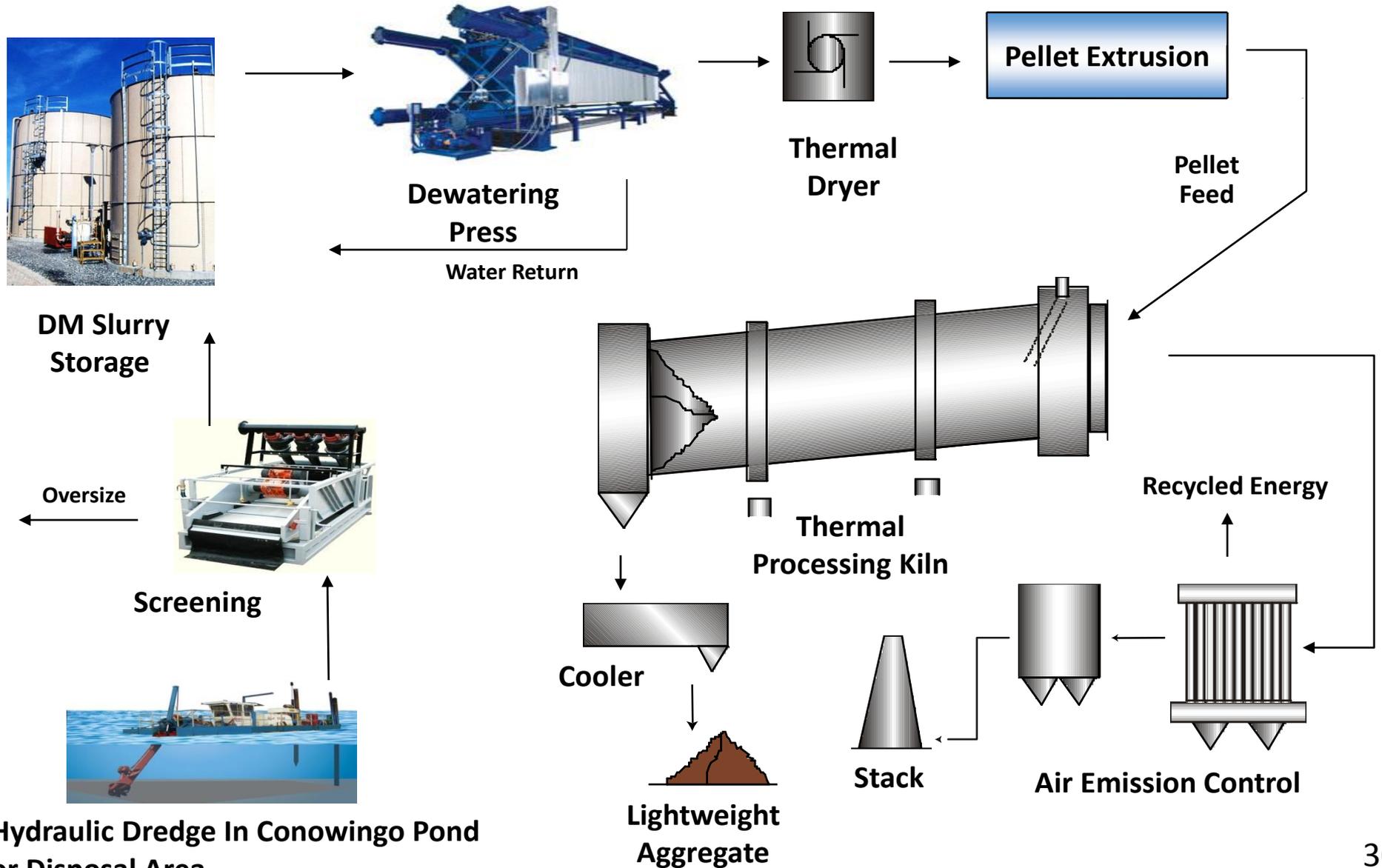
HarborRock has won **2 Maryland Port Administration (MPA)** request for proposals & **1** Request for information for the innovative reuse of dredged material

Over the past 3-4 years, **at least 6 different engineering & consulting firms retained by the MPA** have evaluated and confirmed HarborRock's business model including:

- Plant capital & operating costs
- Size & commodity price of the LWA market
- The quantity & quality of Baltimore Harbor dredged material
- Savings obtained in Cox Creek DMCF O&M costs with HarborRock

***“HarborRock has been vetted by private industry and public authorities and is recognized as a practical, common sense solution”***

# HarborRock - Simplified Process Flowsheet

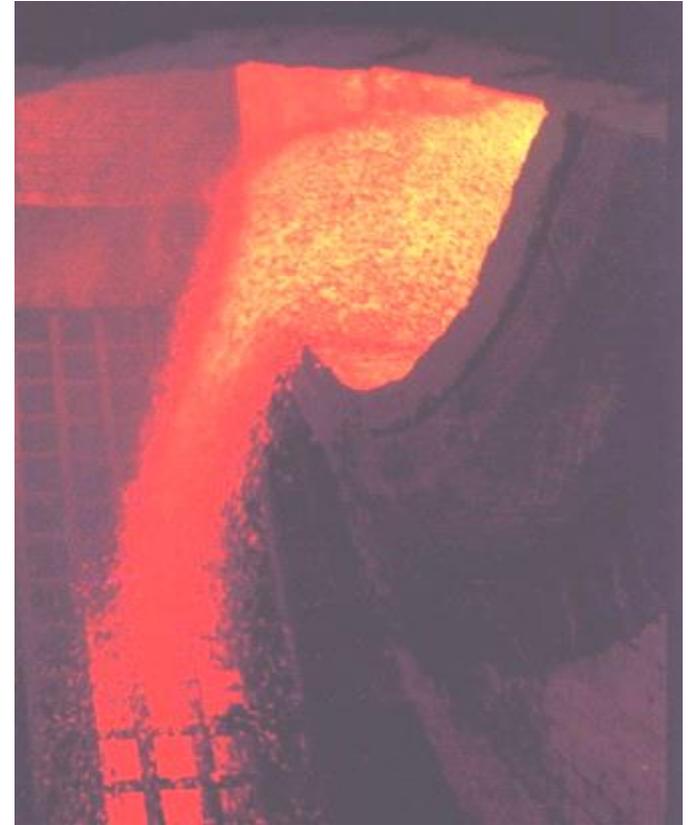


# What is Lightweight Aggregate?

Volcanic stone: pumice, lava

Shale, slate or clay expanded  
in rotary kilns that operate at  
temperatures over 2,000° F.

*Dredged material in Baltimore  
Harbor & Susquehanna River  
sediments are primarily clays/silts*



LWA exiting rotary kiln

# Why is Lightweight Aggregate Used?

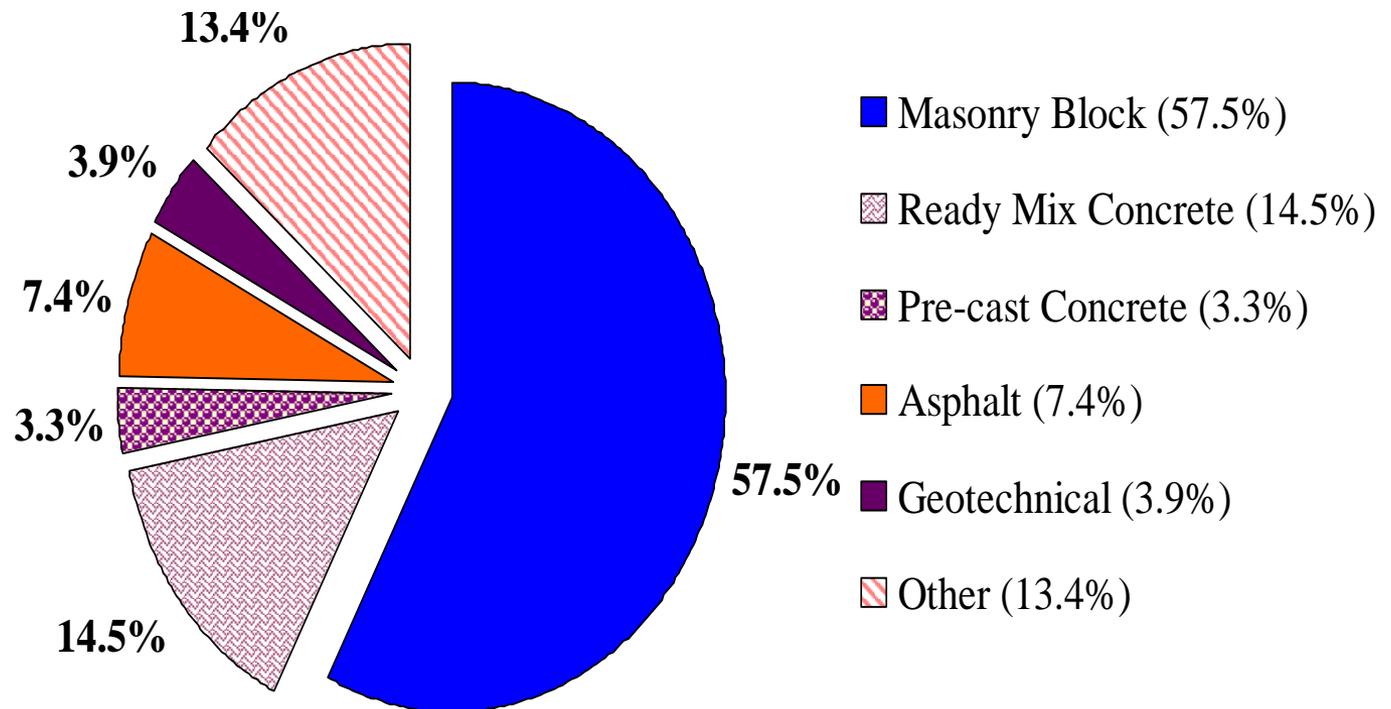
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1. Lowers structural dead load – this reduces building cost
2. Increases labor productivity
3. Better fire rating
4. Lower sound transmission
5. Higher skid resistance - improves road safety

***“Sediment is a GREAT RAW MATERIAL that should be used to benefit Maryland, rather than being an on-going economic drain and persistent detriment to the health of the Chesapeake Bay.”***

# LWA Uses & Applications

HarborRock has perfected using fine-grained dredged material to make ASTM certified LWA and has a patent pending for the process



***Multiple buyers are in place for 100% of the LWA produced***

# LWA provides more than twice the volume for the same weight as conventional aggregates



1 lb. Soil

1 lb. Lightweight  
Aggregate

1 lb. Sand

1 lb. Gravel

1 lb.  
Limestone

# Advantages of HarborRock's LWA

## 1. Is Extruded & Highly Engineered:

- Uniform and consistent properties

## 2. Meets ASTM standards

- C330 LWA for Structural Concrete
- C331 LWA for Concrete Masonry Units
- C90 for Concrete Masonry Units

## 3. Is Inert & Highly Marketable:

- Complete destruction of organic contaminants
- Metals immobilized magnitudes below RCRA TCLP limits
- Not blended or mixed with other products
- Eligible for LEED Certification



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# HarborRock Test Locations and Technology Validation

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# U.S. HarborRock Test Locations

Beginning in 1996, HarborRock has made structural grade LWA in bench and pilot scale tests using dredged materials obtained from the following U.S. locations



# Technology and Business Plan Verification

Recommended by NJDEP's consultant, Louis Berger Inc.,  
for disposal of PCB contaminated materials from the **Passaic River, NJ**

Business model was validated in \$500,000 Test Program  
funded in part by NJ Commission on Science & Technology  
using **Delaware River** dredged materials

"Best Alternative and Most Viable Business" for disposal of  
sediments from the **Puget Sound**, according to WA  
State Department of Natural Resources

Selected by Shaw Environmental Inc. as the preferred  
solution for the long term disposal of dredged material at  
**Naval Station Mayport (Jacksonville), Florida**

Executed \$400,000 contract with **Maryland Port Administration**  
that proved reuse is a viable long term sediment management  
solution.



# Scope of Reuse Demonstration for Maryland

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*Evaluated & tested all key aspects of the HarborRock business model*

- 1) **Chemical & Physical Analysis of: DM, CDF Water, Effluent & LWA**
- 2) **Dredged Material Dewatering Effectiveness with Filter Presses**
- 3) **Dredged Material Drying Operation (natural gas )**
  - a) Mass & Energy Balance, b) Emissions Testing
- 4) **Pilot Scale LWA Production (approx. 5 tons )**
  - a) Mass & Energy Balance, b) Emissions Testing
- 5) **LWA and Concrete Masonry Block Testing per ASTM standards**
- 6) **Engineering**
  - a) Process Flow Sheet, b) Equipment Configuration, c) Air Pollution Control
- 7) **Financial**
  - a) Capital & Operating Costs, b) LWA market

# Independent Verification by Maryland

*The Maryland Port Administration's consultants also verified HarborRock's business model*

**Environ:** Due Diligence of Process, Design & Capital Expenditure (CAPEX)

*Findings: The design is excellent and the CAPEX is conservative*

**Gahagan Bryant Associates (GBA):** Characteristics of Dredged Material in the CDF & Federal channels

*Findings: DM has consistent and uniform chemical and physical properties*

**Towson State University:** Suitability of DMCF & channel DM to make LWA

*Finding: DM has perfect mineralogy to make an expanded clay LWA*

**McCormick & Taylor & OA Systems:** Baltimore region LWA market study

*Findings: HR's selling price is conservative, the market size and the market demand are both robust*

**OA Systems:** Mass & water balance within CDF

*Findings: HarborRock is a net water user & improves water quality within the DMCF*

**Maryland Environmental Service MES:** Operation & Maintenance costs in DMCF with/without LWA Reuse

*Finding: HR would lower O&M costs by 25% because crust management is not needed in the DMCF*

# Summary

➤ LWA Reuse is REAL— it has proven itself multiple times and, compared to others methods, provides many advantages and benefits for the State of Maryland:

- ✓ No capital investment by Maryland
- ✓ Less expensive
- ✓ Guaranteed costs
- ✓ Verifiable decontamination
- ✓ New tax generation
- ✓ Sustainable process
- ✓ No risks to the State
- ✓ Improves cash flow
- ✓ Guaranteed performance
- ✓ Job creation
- ✓ New manufacturing
- ✓ Positive Environmental Impact

*“LWA Reuse could serve as a national model for environmental sustainability & innovation”*

# Meeting Purpose & Objectives – A Recap

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## Purpose:

1. To Discuss Why LWA Reuse is the Best Solution for Two Sediment Management Needs in Maryland
2. Compare the Benefits & Cost of LWA Reuse to Current Methods Used to Address these Same Needs:

## Objectives:

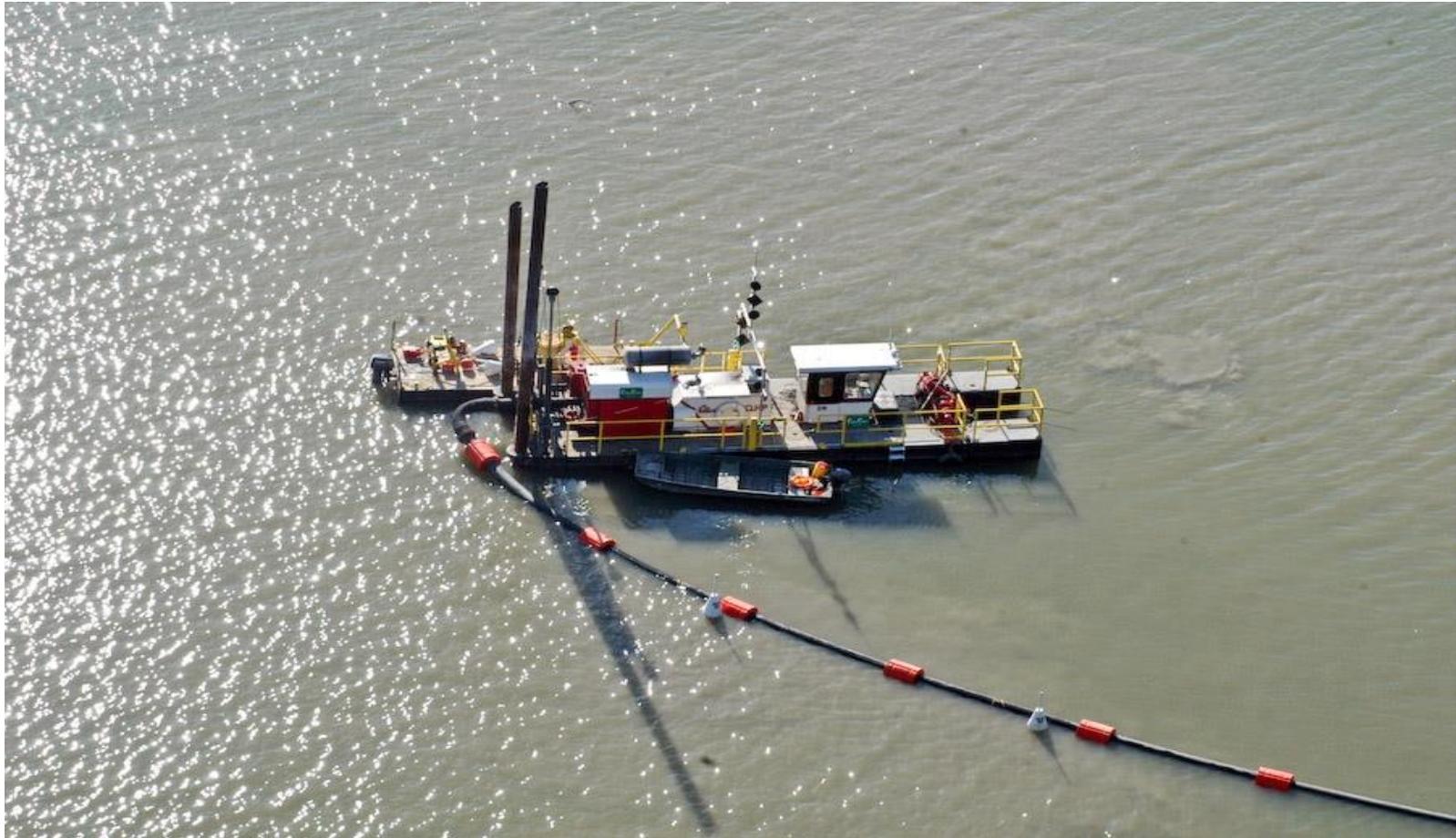
1. To identify if there are any regulatory issues with implementation of LWA reuse at the Cox Creek Dredged Material Containment Facility.
2. Identify the steps needed to use HarborRock as a management strategy at Conowingo Dam for the Chesapeake Bay TMDL:
  - Include HarborRock in Maryland's WIP
  - Establish nutrient trading with Pennsylvania and New York

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# Supporting Materials

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# Hydraulic Dredging



Over 125 years design/build experience in hydraulic dredges; two manufacturing plants in North America – one in Baltimore, MD



# Is Scour really a problem? Yes, it is and here's why:



## Suppose there is no disassociation of Nitrogen & Phosphorous?

1. Sediment alone is a serious problem and exceeds the Bay's assimilation abilities during major storms
2. *Even with a zero disassociation, the sediment smothers submerged aquatic vegetation and other lifeforms that are critical to the health of the Bay.*

## How about studies that suggest a scour rate of 14%?

1. These studies are based on assumed flow rates of 300,000 to 400,000 CFS.
2. However, during heavy storms, actual flow rates were reported at 770,000 CFS
3. Whereas kinetic energy is a function of the square of the velocity, the **actual kinetic energy of flows during tropical storms is likely as much as 4x higher.**

### Implications:

*The actual scour rate during heavy storms is likely 4x higher than current estimates - much greater damage to the Bay is occurring from scour.*

# Contact Information

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