

**FINAL REPORT**  
INNOVATIVE AND BENEFICIAL USE  
REGULATORY INTERAGENCY WORKGROUP  
JUNE 15, 2016

AS APPROVED BY THE MARYLAND  
DREDGED MATERIAL MANAGEMENT PROGRAM  
EXECUTIVE COMMITTEE

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## **Executive Summary**

Regulatory certainty is needed on the innovative and beneficial reuse of dredged material to ensure progress on a key goal in Maryland's Dredged Material Management Program. The ability to recycle some portion of the material from maintenance dredging has long been desired. In 2001 the General Assembly codified innovative and beneficial reuse as the top management priority when it passed the Dredged Material Management Act and established the Executive Committee.

This report presents the findings and recommendations of a workgroup charged by the DMMP Executive Committee to review current statutory authority and regulatory programs and to recommend policy revisions to promote the reuse of dredged material. The workgroup<sup>1</sup> built upon the experience of MPA over the past decade as it studied options, tested several technologies, and engaged with communities, environmental organizations, businesses, local governments, elected officials, academic and science experts and sister state agencies. The workgroup believes that the findings summarized below clearly capture the principal impediments, and the five recommendations express our best judgment on what the DMMP partners need to do to address those impediments to advance the innovative and beneficial reuse goal. The findings and recommendations reflect detailed analysis of how other states have addressed similar challenges with dredged material. They also reflect investigation of Maryland's recently developed regulatory programs to manage disposal and beneficial use of coal combustion by-products and composting facilities.

Central problems repeatedly raised by stakeholders and workgroup members are: 1) lack of clarity in the current law; and 2) absence of corresponding regulations applicable to innovative reuse projects. Dredged material management and land application requirements are located across various statutes and regulations, and implemented by different agencies and divisions within agencies, making it difficult for prospective users of dredged material to determine and satisfy regulatory requirements. In addition, the water quality law that applies to dredging operations, containment facilities and beneficial use projects does not differentiate between in-water and on-land uses of dredged material, nor does it account for different environmental and public health risks associated with various end uses. The workgroup carefully reviewed approaches developed by a number of other states, which became models for the recommendations which follow.

### **Key Findings:**

1. A comprehensive review of the MD Department of the Environment's existing statutory authority and potentially applicable regulatory frameworks noted a lack of clarity regarding legal and appropriate end uses of dredged material, creating uncertainty for the regulated community.
2. Other state regulatory programs include clear statutory authority to regulate and implement acceptable uses of dredged material established in flexible but explicit definitions of key terms. A regulatory program model that is successful in other states involves authorizing specific uses by regulation along with a tiered permit approach for other uses.

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<sup>1</sup> See Appendix 1 for detailed Membership list of Workgroup

3. Other state programs have a separate office or agency dedicated to beneficial reuse, and often a clear joint programmatic effort among water, land and waste regulatory departments.
4. All state programs reviewed by the workgroup have required minimum technical screening criteria or standards.
5. Other state programs have strong support expressed by their legislatures for state agencies to be a leader in the reuse of dredged material in publicly funded infrastructure and remediation projects when appropriate.
6. The physical and chemical characteristics of material dredged from Baltimore Harbor shipping channels present difficult technical challenges as well as public perception challenges.
7. Stakeholder engagement and a coordinated outreach and education strategy is needed.

### **Recommendations:**

1. MPA, with input from the Workgroup, should develop and recommend technical screening criteria and guidance protective of human health and the environment by spring of 2017, for MDE review and approval that addresses the appropriateness of dredged material, including material from Harbor shipping channels, for various potential beneficial and innovative uses. MDE and MPA should stay in close coordination to facilitate the implementation of beneficial and innovative reuse in the interim while technical criteria and guidance are being developed
2. After MPA develops technical screening criteria and guidance and MDE approves them, consideration should be given to accommodating innovative and beneficial use applications through existing MDE approvals such as NPDES permits or Water Quality Certificates.
3. The Governor should issue an Executive Order calling on State agencies to use dredged material in State projects, where economically reasonable and consistent with technical criteria approved by MDE, including but not limited to; transportation, climate change adaptation and publicly-funded site remediation projects.
4. MPA should build upon existing outreach and education efforts to encourage public support for appropriate beneficial and innovative uses of dredged material and to encourage the private sector to pursue business opportunities related to appropriate reuse of dredged material. By the fall of 2016, MPA should have produced materials including a fact sheet, a video, a marketing tag line and graphics explaining dredging and appropriate reuses of dredged material.
5. After development of the technical criteria and guidance, the Innovative and Beneficial Reuse Work Group will make recommendation(s) as to whether or not the General Assembly should be asked to pass legislation amending the Environment Article to explicitly state that dredged material from the Bay and its tributaries may be reused, providing that the use is consistent with state and federal law and any rule or regulation adopted by MDE. If legislation is recommended, it should direct MDE to develop regulations to ensure that the use of dredged material will not present adverse effects to public health and the environment. In promulgating such regulations, consideration should be given to a regulatory approach that includes certain uses authorized by regulation accompanied by a tiered permitting approach.

**Timeline of Deliverables:**

Upon approval of this report, the Workgroup will meet regularly to coordinate necessary actions for the implementation of the recommendations. The Workgroup will develop a detailed Work Plan identifying specific action items, roles, resource needs, responsibilities and timeframes for implementing each recommendation. The Work Plan will identify near, intermediate and long term actions that are needed to implement each recommendation. As the recommendations are being implemented, MDE should identify points of contact within each relevant regulatory program with approval authority for innovative and beneficial use projects to clarify for those organizations or individuals seeking guidance/approval from MDE for project implementation. The Work Plan will be presented to the Management Committee at its August 17, 2016 meeting. A detailed status update on the Work Plan, and outreach efforts will be presented to the Executive Committee at its December 1, 2016 meeting.

## Introduction

The Maryland Port Administration (MPA) has explored various methods for recycling dredged material from Baltimore Harbor channels for a number of years. With the conclusion of several demonstration projects in conjunction with extensive input and feedback from key stakeholders, including the state's Dredged Material Management Program (DMMP) advisory committees as well as the Innovative Reuse Committee (IRC) and Innovative Reuse Technical Team (IRTT), the MPA determined a need to revise its overall approach to implementing innovative reuse and beneficial use projects.

It has proven extremely difficult to find a single large-scale solution for innovatively reusing dredged material that is technically sound, financially affordable and environmentally acceptable to regulatory agencies. In addition, this objective has never been a more critical task as it is becoming increasingly challenging to identify management solutions and placement capacity options for Harbor dredged material. Opportunities for expanded applications of beneficial use and innovative reuse projects are mutually beneficial: for the Port, in terms of capacity recovery at dredged material containment facilities, as well as for the State, local governments and the citizens of Maryland, when looking at utilizing this naturally occurring resource in place of or in combination with other construction materials, wildlife and aquatic habitat restoration or development projects, and for shoreline stabilization as part of climate change resiliency efforts.

In updating the innovative and beneficial use strategy, MPA incorporated lessons learned from the demonstration projects that it conducted over the past several years and the lessons learned from the recent Request for Information (RFI) for a proposed public-private partnership (P3) project to recover dredged material placement capacity in the Cox Creek Dredged Material Containment Facility (DMCF).

A key component of the Revised Innovative and Beneficial Use Strategy, which was approved by Maryland's DMMP Executive Committee in June 2014, is a comprehensive review of current regulatory policies. With the formation of an inter-agency Workgroup, the goal is to (1) determine if opportunities exist to better facilitate innovative and beneficial reuse of dredged material in Maryland and (2) better understand current regulatory requirements and whether changes to that process could create a more predictable regulatory environment.

Members of the interagency Workgroup include representatives from the U.S. Army Corps (Corps) of Engineers - Baltimore District, the U.S. Environmental Protection Agency (EPA), the Maryland Department of Environment (MDE), the Maryland Department of Natural Resources (DNR), the Maryland Geological Survey (MGS), the Maryland Environmental Service (MES), the Maryland State Highway Administration (SHA), and the Maryland Port Administration (MPA). Various DMMP stakeholder committees have been briefed on the progress of the Workgroup. Input from those committee members has been very useful and continues to inform the regulatory review efforts.

To conduct a comprehensive regulatory review, MPA, with stakeholder input, identified the following core tasks as the basis of the Workgroup's Regulatory Action Plan:

- Review policies in Massachusetts, Pennsylvania and New Jersey to assess how they might apply in Maryland;

- Review the recent MDE/industry process for development of streamlined regulations for Composting Facilities as a potential process model for developing a regulatory framework for dredged material; and
- Based on this review consider drafting a new statewide policy, regulations or legislation as appropriate for the innovative and beneficial reuse of dredged material from Baltimore Harbor.

The Regulatory Action Plan established an expeditious timeline for development of a Final Report with policy recommendations due to the DMMP Executive Committee in spring 2016.

## **Discussion**

In order to ensure the success of this effort, the Workgroup, which began monthly meetings in July 2015, set out to refine its purpose and goals by first developing a Mission Statement, list of Objectives, and corresponding Strategies for accomplishing them.

### ***Mission Statement***

Our mission is to identify any scientific, regulatory or policy gaps that are creating uncertainty as to how the innovative or beneficial reuse of dredged material is regulated in Maryland and recommend strategies to streamline the regulatory framework in order to provide predictability and better facilitate dredged material management alternatives. Our scientific, regulatory, operational, and policy expertise will allow us to comprehensively review, analyze, problem-solve and ultimately recommend changes that will have a direct and positive impact on the Port of Baltimore and the State of Maryland.

### ***Objectives and Strategies***

1. (A) Develop a portfolio of end uses of dredged material.

*See Table 1 – Table of Uses for Dredged Material*

(B) Identify technological advances to help minimize environmental and public health impacts.

- Ensure other efforts and work that is already underway is shared with this Workgroup.

(C) Address any gaps in the scientific characterizations of sediment from the Baltimore Harbor to ensure a thorough synthesis of environmental and public health risks and corresponding regulations that may need to be developed or simply clarified.

- Conduct a review of the sediment studies.
- Conduct a review of the Residential Soil Standards.
- Conduct a review of the quality or composition process in other states.
- Compile existing information and determine what gaps exist.
- In particular, review past and present sediment characterization data from the DMCFs.

*See Table 2 – State Comparison Matrix, Technical Screening Criteria*

(D) Identify “Best Practices” from other successful innovative and beneficial use programs including differences in regulatory or technical parameters that enabled the project’s success.

- Conduct a review of other states and synthesize what is applicable to Maryland.

*See Table 3 – State Comparison Matrix, Definitions/Permitting Structure*

2. Apply past lessons learned as well as re-assess past rejections of ideas or potential projects in order to facilitate an ongoing discussion of future viable project proposals.

- Conduct a review of lessons learned from previous innovative and beneficial use projects in Maryland.

*See Appendix 2 – Lessons Learned PowerPoint Presentation*

3. Address the question “when is it no longer regulated as dredged material?”

- Compile the group’s work as they move through the process and toward the final goal.

*See Table 4 – Draft Guidance Document for identification of when and how dredged material is acceptable for reuse.*

4. Establish a well-defined regulatory pathway or flow chart that clearly shows the environmental/public health permits and/or other approvals necessary should one wish to enter the market of innovative and beneficial reuse of dredged material in Maryland.

- Create a flow chart of the current MDE regulatory process as it pertains to dredged material.
- Compile the group’s work as they move through the process and toward the final goal.

*See Table 5 – MDE Flow Chart – Regulatory Process*

5. Inform the public about the current science available regarding dredged material and specifically in the context of innovative and beneficial reuse projects.

- Use positive and understandable language during the review process.
- Coordinate with partners on possible outreach opportunities.
- Conduct presentations at public outreach/committee meetings.

In addition to a review of the Beneficial Use programs in Pennsylvania, Massachusetts and New Jersey, the Workgroup determined that the following state programs should be added to the list for review: Ohio, Virginia, Oregon, Washington, and California. Further, the Workgroup conducted more frequent, in-depth meetings on specific issues within the framework of three separate Sub-Committees: Technical Criteria; Statutory/Policy Issues; and Outreach/Education Opportunities.

With these administrative and organizational tools in place, the Workgroup explored how Maryland could build upon its current regulations, statutory language, experience with comparable programs and lessons learned from its own best practices as well as those identified in other states.

## ***Key Findings***

Throughout this comprehensive review, seven key findings and themes began to emerge:

### **I. A comprehensive review of the MD Department of the Environment’s existing statutory authority and potentially applicable regulatory frameworks identified a number of gaps for end uses of dredged material, creating uncertainty for the regulated community.**

Through the comprehensive review process of the interagency regulatory workgroup, several clear gaps in the regulatory framework were identified which could create liability concerns for the generator of the dredged material as well as the ultimate end user of the dredged material.<sup>2</sup> Although there are several programs in place at MDE that would regulate certain end uses of dredged material (both unprocessed and processed or amended), the development of a Flow Chart and draft Guidance Document identified several “new” dredged material use or placement scenarios for MDE. In these scenarios the permit or approval requirements are unprecedented. Similarly, without clear statutory parameters, regulatory framework and/or implementation guidance the regulated community is left without a predictable environment in which to operate.

For example, there is a current gap in the existing regulatory framework for scenarios that involve removing dewatered dredged material from a DMCF and then placing the material on land for a purpose that does not trigger any other type of existing permit or approval (i.e. Wetlands License, Mining Permit, VCP program, NPDES Permit, Stormwater Permit or Landfill permit). More specifically, the following end use scenarios were identified as needing further regulatory clarification:

- Land amendment for agricultural use with unprocessed dredged material directly from the DMCF; consultation with MDA also necessary (*Note*: This proposed end use is targeted at dredged material from the Port’s federal navigation shipping channels located in the Bay and/or material dredged from lakes. The Workgroup does not intend that material dredged from the Port’s federal navigation shipping channel within the Baltimore Harbor would be reutilized as a land amendment for agricultural purposes based on scientific analyses from previous conducted studies and pilot project);
- Upland use without containment using unprocessed/un-amended<sup>3</sup> dredged material of a suitable chemical quality;
- Fill for upland use with containment using unprocessed/un-amended dredged material;
- Upland reclamation with processed or amended dredged material;
- Manufactured topsoil for landscaping with processed or amended dredged material, unless mixed with a solid waste; consultation with MDA also necessary;
- Building materials with processed dredged material from a DMCF; or
- Engineering fill with processed or amended dredged material unless mixed with a solid waste.

### **II. Other state regulatory programs include clear statutory authority to regulate and implement acceptable uses of dredged material established in flexible but explicit definitions of key terms.**

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<sup>2</sup> See Table 5 – MDE Flow Chart – Regulatory Process and Table 4 – Draft Guidance Document for Maryland

<sup>3</sup> The workgroup defines unprocessed or un-amended dredged material as that material that has been dewatered and removed from a DMCF only. The dredged material has not been processed or mixed with any additives.

No one state beneficial use program is exactly identical to another. However, in looking at the most relevant and successful examples, the Workgroup identified New Jersey, Virginia, Pennsylvania and Ohio as programs with key statutory components that should be taken into consideration by MDE. In each of these states, the beneficial use regulatory framework is rooted in strong and clear statutory authority that is accompanied by specific regulations providing further details.

New Jersey's beneficial use, or "Acceptable Use", program, established in 1997, is rooted in the policy determination, and statutory definition that dredged material will not be regulated under the state's solid waste management laws or regulations. To that end, the state adopted legislation explicitly exempting dredging and dredged material management operations, including processing or staging/transfer facilities, from its Solid Waste Management Act. Further, the New Jersey Department of Environmental Protection (NJDEP) defined in its Technical Guidance Manual a detailed permitting application and approval process for obtaining an "Acceptable Use Determination" for all persons producing structural fill or nonstructural fill, manufactured soil or using, processing or transferring dredged materials, in New Jersey, from the tidal waters of the State of New Jersey and adjacent interstate waters. Although the NJDEP recognized that dredging activities should continue to be regulated under its water pollution control laws and regulations, and the Acceptable Use Determination permit is issued in conjunction with the New Jersey Waterfront Development Permit, the Acceptable Use Determination program is administered by the NJDEP's Land Use Regulation program.

In Virginia, dredged material is categorized as a waste. However, the state recognized in statute that reuse of dredged material for beach nourishment is a priority policy. To accomplish that objective, the state established a broadly applicable Beneficial Use Demonstration and Determination program and a corresponding regulatory framework. Virginia regulations clearly state that there is a precise point during a beneficial use project when the solid waste under review ceases to be a solid waste: "...Unless otherwise determined for the particular solid waste under review, that point occurs when it is used in a manufacturing process to make a product or used as an effective substitute for a commercial product or a fuel. As a part of its request, the generator or proposed user may request that such point occur elsewhere..."<sup>4</sup>

Pennsylvania has a similar regulatory approach to Virginia in that it also categorizes dredged material as a residual waste and recognizes that point in time in a beneficial use project when the waste ceases to be a waste. However, Pennsylvania's determination that a material is no longer a waste and thus falls within the definition of beneficial use is outlined in statute.<sup>5</sup> Further, Pennsylvania's beneficial use program specific to dredged material involves a series of General Permits for various types of end uses of the material. For example, GP WMGR 046 is for the processing and beneficial uses of marine dredged material use as manufactured soil or soil amendments; GP WMGR 072 is for beneficial use of dewatered dredged waste for use as roadbed material.

Ohio adopted legislation in 2015 governing dredged material management, banning open water placement by 2020 and promoting the increased upland beneficial use of dredged material. Ohio

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<sup>4</sup> 9VAC20-81-97. Beneficial Use Demonstrations.

<sup>5</sup> Pennsylvania definition of Beneficial Use and Waste Determination § 287.7 (a) – (c)

classifies dredged material as a type of waste and will define beneficial use as “The use of a beneficial use byproduct as an ingredient, product, or in a manner that contributes to a manufacturing process or product that does not constitute disposal or cause pollution of any waters of the state. A beneficial use may include but is not limited to use for agronomic benefit; as a replacement of a raw material; as a soil amendment, fertilizer, or structural fill; or as a fuel.”<sup>6</sup> For the past few years Ohio Environmental Protection Agency (Ohio EPA) has been working with stakeholders to adopt broad beneficial use regulations for a variety of select wastes, including dredged material. The revised 2015 draft rules establish three types of regulation for beneficial use projects: Authorization by Rule; a General Permit; and Individual Permits.

While Maryland’s statute defines both beneficial use of dredged material and innovative reuse of dredged material, the statute and regulations are silent as to how to implement innovative reuse projects. Specifically, there are no programmatic or regulatory frameworks or screening criteria in place to guide the application, approvals or permitting process for initiating innovative reuse projects in Maryland. Amending the statute to promote innovative reuse by expressly stating that any dredged material removed from the Chesapeake Bay or its tributaries may be reutilized provided that such use is consistent with provisions of federal and State law or any rule or regulation adopted by MDE would be a significant opportunity to facilitate innovative reuse.<sup>7</sup>

As directed by the DMMP Executive Committee, the Workgroup evaluated MDE’s recently developed regulations and General Permit for composting facilities for comparisons that may be applicable to policies and programs for regulating reutilization of dredged material. Maryland’s policies on the regulation and management of composting facilities are guided by state statute<sup>8</sup> that was adopted by the Maryland General Assembly in 2013<sup>9</sup>. The departmental legislation, which was the product of an extensive stakeholder workgroup, clearly exempted these facilities from MDE’s solid waste management regulations and instead places them within the recycling program. The amended statute now provides clear direction to promote the use of compost, provides MDE clear authorization to promulgate regulations to fulfill these policies, and creates certainty and predictability for the operator/owners of facilities looking to maintain regulatory compliance. Over the course of several years, MDE led an extensive and effective stakeholder engagement effort focused on research, analysis and drafting of the regulations. With clearly established statutory authority along with a coordinated outreach strategy with key stakeholders to develop implementing regulations, this model should be considered by MDE in the development and implementation of policies for the safe and economic reuse of dredged material.

Similarly, MDE is in the process of proposing regulations for the beneficial use of Coal Combustion Byproducts (CCBs) to facilitate alternative and proper uses of the material that are protective of public health and the environment. These regulations and the review/comment/approval process will be monitored closely in order to identify further lessons

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<sup>6</sup> Ohio Draft Rule 3745-599-02 Definitions 2015

<sup>7</sup> See Table 3 – State Comparison Matrix; Definitions/Permitting Structures

<sup>8</sup> MD Code Ann., Environment Art. §§ 9-101, 9-1701, 9-1705, 9-1721, 9-1725, 9-1726

<sup>9</sup> HB 1440, Ch. 686, Acts of 2013 *Recycling – Composting Facilities*

learned that may be applicable to the adoption of innovative and beneficial use policies promoting the use of dredged material.

Maryland's definition of Beneficial Use is exclusive to the following five in-water purposes:

1. restoration of underwater grasses;
2. restoration of islands;
3. stabilization of eroding shorelines;
4. creation or restoration of wetlands; and
5. creation, restoration, or enhancement of fish or shellfish habitats

There is no catch-all category or opportunity for "other" environmentally beneficial use purpose projects. Innovative Reuse (as defined in the same section of the statute as beneficial use, pertaining to the regulation of water quality) "includes the use of dredged material in the development or manufacturing of commercial, industrial, horticultural, agricultural or other products." Although the current definition of IR appears to be broad and expansive, the Workgroup identified some applications of dredged material that potentially fall outside the scope of its definition as well as that of beneficial use in Maryland.

Maryland is the only state examined that utilizes a separate and distinct definition for innovative reuse of dredged material. All other states reviewed, including the U.S. Army Corps of Engineers definition, instead provides an expansive definition of beneficial use, including those uses that Maryland otherwise defines as innovative reuse. As discussed later in this report, unlike the other programs reviewed, Maryland's statutory constraints on uses of dredged material are not based on specific, technical screening criteria for evaluation of the sediment.

Further, the definition of innovative reuse in Maryland law exists in a section of the Environment Article dedicated to activities in the Chesapeake Bay and waterways as it pertains to regulating water quality. The vast majority of innovative reuse end uses in Maryland are going to be on land, given that the in-water uses are covered by and governed by the definition of beneficial use. Maryland's statutory delineation of what constitutes Baltimore Harbor dredged material, and the management constraints placed on Harbor material by statute, potentially inhibit further economic growth of beneficial and innovative uses of Harbor material outside of the Harbor.

In addition, several other states explicitly exclude the definition of dredged material from their definition of Solid Waste. Most notable is New Jersey's successful beneficial use program, which has been growing since the late 1990's when the state actively removed dredged material from the regulatory definition of solid waste. Although Maryland does not regulate dredged material as a solid waste unless it is mixed with solid waste material, it also does not specifically exclude dredged material from the solid waste definition.

### **III. Other state programs have a separate office or agency dedicated to beneficial reuse, and often a clear joint programmatic effort among water, land and waste regulatory departments.**

Six of the eight states reviewed had an established office or agency program dedicated to administration of their Beneficial Use program and its permit application or "determination" process. This clear organizational structure allows for several different approaches to streamlined

programs permitting a multitude of end uses of Baltimore Harbor dredged material. Some of the programs included specific approvals such as:

- *New Jersey*: Acceptable Use Determinations (AUD), AUD permits, and AUD sites
- *Pennsylvania*: Determination of Applicability and a series of end use General Permits
- *Virginia*: Beneficial Use Demonstrations (BUD); Contaminated Media Variance determination and 3-tier permitting structure
- *Oregon*: Beneficial Use Determinations (BUD)
- *Washington*: Beneficial Use Determinations (BUD)

With extensive input and feedback from the various regulatory administrations within MDE, the Workgroup learned that there are several existing regulatory frameworks currently in place that would regulate certain end uses of dredged material in Maryland<sup>10</sup>. For example:

- Wetlands and Waterways program within Water Management Administration for in-water uses.
- Mining Program within Land Management for the upland reclamation of mines with processed or amended dredged material.
- Voluntary Cleanup Program (VCP) within Land Management Administration for the upland reclamation of brownfield sites with processed or amended dredged material.
- The Solid Waste program within Land Management Administration for any landfill-related uses (i.e. Daily Cover, Intermediate Cover or Fill for Closure Cap) with unprocessed or processed/amended dredged material.
- Air and Radiation Management Administration (ARMA) for any proposed processing facilities for processed dredged material that could generate air emissions (i.e. kilns, etc.).
- Maryland Department of Agriculture (MDA) for use of unprocessed dredged material as a land amendment for agricultural purposes.
- MDA for use of processed or amended dredged material as manufactured topsoil for landscaping.
- Solid Waste program for any proposed end uses of dredged material that are mixed with either a solid waste or industrial waste.
- Sediment and Stormwater Plan review for upland use that is not contained and does not involve a wetland.
- National Pollutant Discharge Elimination System (NPDES) permit for upland use with containment or leachate collection system that includes a discharge.

#### **IV. All state programs reviewed by the workgroup have required minimum technical screening criteria or standards.**

Each of the regulatory frameworks reviewed require some type of testing or chemical analysis of the dredged material as part of the permit application process. Technical screening criteria range from residential and non-residential soil standards to U.S. EPA screening levels.<sup>11</sup> However, several other state residential and non-residential soil standards are not as rigorous as those in Maryland.

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<sup>10</sup> See Table 4 – Draft Guidance Document for Maryland

<sup>11</sup> See Table 2 – State Comparison Matrix – Technical Screening Criteria

In addition, in Maryland, the natural (geological) background levels of some metals are higher than the Maryland soil standards, which was also noted in the Independent Technical Review Team (ITRT) Report, “*Sediment in Baltimore Harbor, 2009*”. These limits make it difficult to meet the criteria, therefore restricting innovative or beneficial use options. The successful state programs for beneficial use of dredged material that were evaluated had metal criteria that were more cognizant of the natural concentrations. The applicability of existing MDE criteria or standards for the application of dredged material innovative uses should be reviewed.

Maryland law defines Baltimore Harbor as the area of the Patapsco River and its tributaries lying westward of a line extending from Rock Point in Anne Arundel County to North Point in Baltimore County. As such, Baltimore Harbor dredged material is restricted from use outside of the Harbor unless it is placed in a contained area as approved by MDE. This constraint could significantly impede economic opportunities for the growth of innovative and beneficial use of Harbor material, by prohibiting its use in places around Maryland outside of this statutory geographic boundary and demonstrates the need for Maryland’s program to be rooted in appropriate technical screening criteria for acceptable end uses.

**V. Other state programs have strong support expressed by their legislatures for state agencies to be a leader in the reuse of dredged material in publicly funded infrastructure and remediation projects when appropriate.**

The legislature in New Jersey enacted language expressly calling for the consideration of the reuse of dredged material in state-funded projects, where appropriate, including but not limited to road construction and other publicly funded remediation projects. New Jersey’s robust beneficial use program is supported by the strong signal and tone set by the General Assembly with regard to the expectation of reusing New Jersey Harbor dredged material.

In 2015 Ohio enacted legislation which requires the state to work with the Army Corps of Engineers on developing a long-term plan for dredged material management including beneficial use, habitat restoration, beach nourishment, and other small-scale projects using dewatered dredged material. Massachusetts statute requires all relevant state agencies to adopt a policy calling for the use of dredged material for barrier beach nourishment purposes, if economically feasible. *Note:* Maintenance sediments dredged from fresh water, as is the case in Ohio, or largely consisting of sand, as in Massachusetts, potentially have fewer constraints on successful reuse than the fine grained brackish water sediments dredged from the Port of Baltimore shipping channels.

With regard to using recycled materials in state highway projects in Maryland, in 2014 the Maryland General Assembly sent a strong signal promoting the use of compost and compost-based products in certain elements of highway projects by passing HB 878 – State Highway Administration – Compost and Compost-Based Products – Specification. Following the development of MDE’s regulatory framework for composting facilities the previous year, the Maryland legislature then adopted this new requirement establishing the use of compost and compost-based products in highway construction projects in the State as a best management practice for erosion and sediment control, as well as post-construction stormwater management

projects<sup>12</sup>. The legislation required SHA by December 30, 2014 to establish a specification for acquiring and using compost and compost-based products for (1) erosion and sediment control practices identified in the most recent Maryland Standards and Specifications for Soil Erosion and Sediment Control developed by the MDE and (2) post-construction stormwater management practices identified in MDE's most recent Maryland Stormwater Design Manual.

As for dredged material management solutions, Maryland's statute provides a similarly strong signal of support in stating that the DMMP Executive Committee shall recommend long-term management plans with innovative reuse and beneficial use of dredged material as the highest ranked placement options. However, due to the fact that the current definition of innovative reuse is placed in a section of statute pertaining to regulating water quality, and in conjunction with the absence of corresponding regulations or detailed Guidance Documents, *there is remaining uncertainty and unpredictability with regard to implementation of innovative reuse in Maryland.*

#### **VI. The physical and chemical characteristics of material dredged from Baltimore Harbor shipping channels present difficult technical challenges as well as public perception challenges.**

Maryland's dredged material is primarily fine grained estuarine sediments consisting of silts and clays with relatively high salt and sulphate content. The presence of salt potentially inhibits the growth of upland vegetation, and the sulphate, when exposed to air, often produces low pH levels (acidification) which creates an environmental concern and results in the leaching of metals. This acidification can potentially be addressed by adding material, such as lime, to increase the pH, by keeping the dredged material continually wet, or by other means. Appropriate control plans for leaching and pH would need to be proposed to and approved by MDE for the fine grained dredged material.

As discussed above, Maryland state statute does not distinguish between the types of dredged material found within Baltimore Harbor. Not all material from within the Harbor is fine grained estuarine sediment. Some material dredged from Baltimore is high quality sand, which has little or no contaminants and is well suited as a construction fill, or for use in projects such as restoration of wetlands, shoreline stabilization, and beach nourishment. Some fine grained sediment was deposited prior to the industrialization of Baltimore Harbor and may contain relatively low levels of organic or inorganic contaminants.

#### **VII. Stakeholder engagement and a coordinated outreach and education strategy is needed.**

Forty years after the delineation of the Baltimore Harbor as set in statute, there remains the potential for a strong negative public perception surrounding the degree of contamination of Harbor material. Given the history of industrial activity in and around the Port of Baltimore there is no doubt that there are elevated levels of contaminants including metals and organics in areas of the Harbor. However, because of years of maintenance dredging in the federal navigation channels, coupled with greater environmental controls on land implemented over time, not all Harbor dredged material has the same potential for a high degree of contamination.

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<sup>12</sup> HB878, Ch. 430, Acts of 2014 *State Highway Administration – Compost and Compost-Based Products – Specification*. MD Code Ann., Transportation Art. § 8-609.3

Statutory constraints currently in place treat all Harbor dredged material in a similar manner, regardless of the physical or chemical characteristics. As demonstrated in the Workgroup's review of Maryland's recent process of developing regulations for composting facilities, and as shown in Ohio's multi-year effort to pass beneficial use regulations for dredged material, it is imperative that strong stakeholder engagement be an early and frequent component of advancing Maryland's innovative and beneficial use program. Other states such as Ohio have implemented a variety of outreach approaches to educate stakeholders on the value of dredged material, including relevant policies or programs that facilitate its use.

This review, in conjunction with an understanding of "best practices" from successful beneficial use programs around the country, has helped identify areas where new, clear environmental policies or regulations in Maryland would better facilitate innovative reuse projects.

## **Recommendations**

1. MPA, with input from the Workgroup, should develop and recommend technical screening criteria and guidance protective of human health and the environment by spring of 2017, for MDE review and approval that addresses the appropriateness of dredged material, including material from Harbor shipping channels, for various potential beneficial and innovative uses. MDE and MPA should stay in close coordination to facilitate the implementation of beneficial and innovative reuse in the interim while technical criteria and guidance are being developed
2. After MPA develops technical screening criteria and guidance and MDE approves them , consideration should be given to accommodating innovative and beneficial use applications through existing MDE approvals such as NPDES permits or Water Quality Certificates.
3. The Governor should issue an Executive Order calling on State agencies to use dredged material in State projects, where economically reasonable and consistent with technical criteria approved by MDE, including but not limited to; transportation, climate change adaptation and publicly-funded site remediation projects.
4. MPA should build upon existing outreach and education efforts to encourage public support for appropriate beneficial and innovative uses of dredged material and to encourage the private sector to pursue business opportunities related to appropriate reuse of dredged material. By the fall of 2016, MPA should have produced materials including a fact sheet, a video, a marketing tag line and graphics explaining dredging and appropriate reuses of dredged material.
5. After development of the technical criteria and guidance, the Innovative and Beneficial Reuse Work Group will make recommendation(s) as to whether or not the General Assembly should be asked to pass legislation amending the Environment Article to explicitly state that dredged material from the Bay and its tributaries may be reused, providing that the use is consistent with state and federal law and any rule or regulation adopted by MDE. If legislation is recommended, it should direct MDE to develop regulations to ensure that the use of dredged material will not present adverse effects to public health and the environment. In promulgating such regulations, consideration should be given to a regulatory approach that includes certain uses authorized by regulation accompanied by a tiered permitting approach.

## **Conclusion**

This report represents the initial phase of recommendations for advancing a clearer and more predictable framework for regulating the innovative and beneficial uses of dredged material in Maryland. The interagency Workgroup and its three sub-committees have met regularly, in a spirit of cooperation and collaboration, to discuss regulatory and non-regulatory barriers to the facilitation of a robust and growing innovative and beneficial use program in Maryland. Recent discussions with MDE and its various regulatory administrations, including development of the draft Guidance Document and review of statutory authority, have not only been instructive but also demonstrate that MDE acknowledges regulatory gaps and resulting uncertainty associated with several important potential uses of dredged material.

The Workgroup looks forward to continued cooperation and resolution with State agency staff, the DMMP committees and stakeholders, throughout the ongoing process of developing and implementing final policy recommendations and public education/outreach materials. The MPA will continue to work together with MDE and other State agencies where needed and appropriate in drafting technical screening criteria, a Regulatory Guidance Document, educational materials, and, if appropriate, legislation and regulations. Furthermore, the Workgroup remains committed to engaging with the public and all relevant stakeholders throughout every step of this process in order to ensure a most successful future for the innovative and beneficial use of dredged material in Maryland.

## **Tables**

Table 1 – Table of Uses of Dredged Material

Table 2 - State Comparison Matrix; Technical Screening Criteria

Table 3 – State Comparison Matrix; Definitions/Permitting Structures

Table 4 – Draft Guidance Document for Maryland

Table 5 – MDE Flow Chart – Regulatory Process

## **Appendices**

**Appendix 1** – Membership List – Interagency Regulatory Workgroup

**Appendix 2** - Lessons Learned from Past Innovative Reuse Pilot Projects in Maryland – PowerPoint Presentation

**Appendix 3** – MDE PowerPoint Presentation – Existing Regulatory Process

**Appendix 4** - Legislative History of Dredged Material Management in Maryland – PowerPoint Presentation

**Appendix 5** – Coal Combustion By-Product (CCB) Regulation Process in Maryland – PowerPoint Presentation

**Appendix 6** – Overview of Process for Development of Regulations for Composting Facilities – Summary Document

**Appendix 7** – Overview of the Independent Technical Review Team (ITRT) Sediment Quality in Baltimore Harbor Report, 2009 – PowerPoint Presentation

**Appendix 8** – Maryland Environmental Service (MES) Sediment Quality Database – Overview – PowerPoint Presentation

**Appendix 9** – New Jersey Beneficial Use Policies Overview – PowerPoint Presentation

**Appendix 10** – Pennsylvania Beneficial Use Policies Overview – PowerPoint Presentation

- Appendix 11** – Virginia Beneficial Use Policies Overview – PowerPoint Presentation
- Appendix 12** – Massachusetts Beneficial Use Policies Overview – PowerPoint Presentation
- Appendix 13** – Ohio Beneficial Use Policies Overview – PowerPoint Presentation and Early Stakeholder Outreach Materials (Infographic; Workshop Agenda; ESO Policy Concepts; Beneficial Use Program Goals)

# **Final Report**

## **Innovative and Beneficial Reuse Regulatory Workgroup**

### **Report Tables**

1. Table of Uses of Dredged Material
2. State Comparison Matrix; Technical Screening Criteria
3. State Comparison Matrix; Definitions/Permitting Structures
4. Draft Guidance Document for Maryland
5. MDE Flow Chart – Regulatory Process

<p><b>Uses of Unprocessed Dredged Material</b></p>	<p><b>Technical Criteria</b></p>	<p><b>Approval(s) Needed</b>  <b>Note: Some applications could occur at a DMCF Facility. Would those applications be handled under the facility's operating permit (NPDES or WQC)?</b></p>
<p>Land amendment for agricultural use</p> <p>Example:                      Adding fine grained materials with high organic content to sandy soils for general grading and additional nutrients</p> <p style="text-align: center;"><b>A</b></p> <p><b>(Red letters correspond to Red Letters on the MDE FlowChart, labeled Table 5)</b></p>	<p>Assume criteria that would apply would require a plan for preventing pollution to waters of the state (surface and groundwater), similar to Landfills (see below). Necessitates proof of ability to support vegetation (saline consideration for Bay material). Assume needs to show that agricultural vegetation will not bio-accumulate contaminants. May require adherence to Maryland's Voluntary Clean-up Program (VCP)...see note 1.</p>	<p><b>Lead Program(s): MDE Wetland and Waterways Program, Wastewater Discharge (NPDES) Program, and/or MDA.</b></p> <p>This table may need to be further broken down into sections depending on where the dredged material is coming from. Specifically, if you are transporting the dredged material directly from the dredging site to the agricultural amendment site, then a Wetlands License is necessary for that dredging and placement. Also, if there is a discharge to surface waters from the agricultural site, the wetlands license would contain conditions for that. <u>However, if the material for land amendment is coming from a contained disposal facility where it has already been dewatered, then there is currently no formal approval process for that (i.e., this could be considered a regulatory gap) as it was already permitted when it was dredged and there are no more surface water discharges associated with dried material.</u> <b>There are two ways to close this regulatory gap – (1) we can either start to put conditions in wetlands licenses/WQCs or NPDES permits that when dredged material is removed from those facilities, Departmental approval is required; or, (2) we could propose specific regulations to cover this gap similar to what has been done in other states.</b></p> <p>Consult with MDA on approvals and process?                      Guidance, links to MDA's regulations, MDA contact information, and application forms are available here:  <a href="http://mda.maryland.gov/plants-pests/Pages/state_chemist.aspx">http://mda.maryland.gov/plants-pests/Pages/state_chemist.aspx</a></p>
<p>Aquatic habitat creation, restoration or enhancement</p> <p>Example: restoration of underwater grasses,</p>	<p>COMAR 26.24.03.05                      Covers requirements for both open water and beneficial use of dredged material.                      Section B of the regulation requires for open water placement that chemical and physical parameters be analyzed and submitted (note that</p>	<p><b>Lead Program: MDE Wetlands &amp; Waterways (potential challenge; Rock Pt./North Pt. Line)</b></p> <p>Wetlands License/WQC will likely also require turbidity limits outside the mixing zone (50 NTU avg./150 max.); and, a detailed WQ monitoring plan for during and post construction.</p>

<p>creation or restoration of wetlands</p> <p style="text-align: center;"><b>B</b></p>	<p>open water placement is currently not allowed). For beach nourishment or marsh creation (i.e. beneficial uses) chemical testing is not required, but no adverse impacts to navigation, oyster bars, or fisheries are allowed, thus may assume some requirement for chemical testing. For these projects, the dredged material sediment size must be equal to or larger than sediments at the placement location, unless measures are taken to control sediment movement; and the dredged material must be relatively free of organic material. In addition, the dredged material may not contain more than 10 percent silts and clays unless measures are taken to control the material's movement. There are no specifics on chemical constituent analyses.</p>	
<p>Upland placement associated with tidal water habitat creation or beach nourishment</p> <p>Example: restoration of islands</p> <p style="text-align: center;"><b>C</b></p>	<p>See previous (Aquatic Habitat): assume Aquatic habitat criteria would apply because placement to restore islands would be in the waters of the state. Upland placement, considered as beach restoration above Mean High Tide, would necessarily encroach on State waters (below MHT).</p>	<p><b>Lead Program: MDE Wetlands &amp; Waterways (potential challenge; Rock Pt./North Pt. Line)</b>          Since you are discharging dredged material back into the water, a wetlands license and/or WQC is required. Typical conditions for these types of wetlands licenses/WQCs include: limits for TSS in discharge (400 avg./800 max.) and turbidity outside the mixing zone (50 NTU avg./150 max.), and a detailed WQ monitoring plan for both construction and operation. If the island restoration is in the Harbor and with Harbor material, it would be regulated under a state discharge permit.</p>
<p>Fill for landfill daily cover with containment</p> <p style="text-align: center;"><b>D</b></p>	<p>(Municipal Landfills)COMAR 26.04.07.10          Must be at least 6 inches in depth. Must not contain free liquids, putrescibles, or toxic materials, must not create dust, must not impede compaction (i.e. be slippery or thixotropic). Regarding toxics, MDE appears to require an analysis for total concentrations of metals, VOCs, SVOCs, pesticides and herbicides....but no specifics are indicated.</p> <p>(Sanitary and Rubble Landfills)COMAR</p>	<p><b>Lead Program: MDE Solid Waste</b>          MDE would need a request from the landfill that wanted to use it; revised operations manual; and physical and chemical characterization of the material. If acceptable this would result in a minor permit amendment. <b>Depending on the chemistry of the material, there might be limitations on its use, e.g., restrictions on placing it on the out slopes where it could erode off or leach out contaminants into surface water.</b> Additionally, limitations may exist for storage outside the lined footprint of the facility prior to application. Time for review and approval is a few weeks, depending on the nature of the</p>

	<p>26.04.07.16          Requires submitting a plan for volume and type of cover material, and the volume for “periodic” cover.          Requires a plan for preventing or mitigating pollution of the waters of the State, including a monitoring system from which samples are to be collected periodically....but no specific limits are indicated. See Note 2.</p>	<p>request and completeness of the information provided.</p> <p>MDE would require both TCLP and total analyses for a suite of metals and other parameters. Note that for landfill use the TCLP is the appropriate test – it was designed to model the behavior of a material in the environment of a sanitary landfill, where weak organic acids are present in the leachate. The SPLP is an attempt to model the behavior of materials by themselves, where they encounter the inorganic acids usually present in rainfall and is more applicable to final cover.</p> <p>MDE has the authority to specify the number and location of monitoring points, the parameters monitored, and the methods and frequency of monitoring that is required. See COMAR 26.04.07.09F:</p> <p>“F. Additional Monitoring Requirements. If the Department determines that contamination of waters of this State has occurred or is liable to occur as a result of operation of the landfill, the Approving Authority may require the permit holder to periodically collect and analyze ground water or surface water at the permitted site and to submit the results to the Approving Authority. The Approving Authority may furthermore specify the following:</p> <ul style="list-style-type: none"> <li>(1) Number and location of the sampling stations;</li> <li>(2) Frequency of the analyses;</li> <li>(3) Sampling and analyses procedures;</li> <li>(4) Pollutants to be monitored; and</li> <li>(5) Reporting period.”</li> </ul>
Fill for Landfill Intermediate	(Municipal Landfills)COMAR 26.04.07.10 Intermediate: Must be not less than 1 foot in	<b>Lead Program: MDE Solid Waste</b> We would need a request from the landfill that wanted to use

<p>and Closure cap</p> <p style="text-align: center;"><b>E</b></p>	<p>depth. Final: Must be not less than 2 feet in depth. No specifications regarding liquids or toxics, but assume that the daily cover requirements apply. These covers need to be able to support vegetation.</p> <p>(Sanitary and Rubble Landfills)COMAR 26.04.07.16 Requires submitting a plan for volume and type of cover material, and the volume for “intermediate and final” cover. Requires a plan for preventing or mitigating pollution of the waters of the State, including a monitoring system from which samples are to be collected periodically. ....but no specific limits are indicated. See Note 2.</p>	<p>it; revised operations manual; and physical and chemical characterization of the material. If acceptable this would result in a minor permit amendment. <b>Depending on the chemistry of the material, there might be limitations on its use, e.g., restrictions on placing it on the outcrops where it could erode off or leach out contaminants into surface water.</b> Time for review and approval is a few weeks, depending on the nature of the request and completeness of the information provided.</p> <p>We would require both TCLP and total analyses for a suite of metals and other parameters. Note that for landfill use the TCLP is the appropriate test – it was designed to model the behavior of a material in the environment of a sanitary landfill, where weak organic acids are present in the leachate. The SPLP is an attempt to model the behavior of materials by themselves, where they encounter the inorganic acids usually present in rainfall and is more applicable to final cover.</p> <p>ALSO, for intermediate and final, they will need to prove that the material can support vegetative stabilization, or develop procedures that render it capable of doing so.</p>
<p>Fill for upland use with containment (ex. of containment is leachate collection)</p> <p>Example: Placement in abandoned mines or quarries. Cover for industrial site with site controls (slurry walls and other collection systems)</p> <p style="text-align: center;"><b>F</b></p>	<p>Assume criteria that would apply would require a plan for preventing pollution to waters of the state (surface and groundwater), similar to Landfills. See Note 2. MDE Voluntary Cleanup Program constituent limits may apply (e.g. metals and organics). See Note 1.</p>	<p><b>Lead Program: NPDES Program?</b></p> <p>It is not a solid waste. <b>Currently a regulatory gap, unless it is coming right from the dredge site and there is a discharge back to surface waters.</b> However, placement that impacts surface or groundwater quality would represent a release of pollutants to the Waters of the State - a violation of Maryland law that would be subject to enforcement action once discovered.</p>
<p>Upland Use, without</p>	<p><b>Assume requirements to meet Maryland</b></p>	<p><b>Lead Program: Stormwater Program?</b></p>

<p>containment, (physical and chemical quality deemed suitable)</p> <p>Example: dredged sand used for construction, fill or soil amendment purposes. Potentially used for DMCF dike construction</p> <p style="text-align: center;"><b>Z</b></p>	<p><b>Cleanup Standards for Soil residential or non-residential criteria depending on final use</b></p>	<p>Amendment to existing DMCF permit if going to be used or placed elsewhere within DMCF property which already has a permit to operate. Stormwater permit?</p>
<p><b>Use of Amended (or Processed) Dredged Material</b></p>	<p><b>Technical Criteria</b></p>	<p><b>Approval(s) Needed</b></p> <p><b>Note: Some applications could occur at a DMCF Facility. Would those applications be handled under the facility's operating permit (NPDES or WQC)?</b></p>
<p>Upland reclamation</p> <p>Example: fill or soil cover for residential sites</p> <p style="text-align: center;"><b>G</b></p>	<p>Given the trace metal contents of Baltimore Channel dredged sediments it is not likely that residential soil amendment would be a viable option. However, dredging from other locations such as fresh water lakes, or from tidal where the majority of the material is sand, could be used in this manner provided chemical testing indicates that the material meets the MDE Residential Soil Standard.</p>	<p><b>Lead Program: Solid Waste Program (if mixed w/solid waste)?</b></p> <p>It is not a solid waste. <b>Currently a regulatory gap, unless it is coming right from the dredge site and there is a discharge back to surface waters.</b> However, placement that impacts surface or groundwater quality would represent a release of pollutants to the Waters of the State - a violation of Maryland law that would be subject to enforcement action once discovered.</p>
<p>Manufactured topsoil for landscaping</p> <p>Example: mixed with an additive that binds the contaminants</p> <p style="text-align: center;"><b>H</b></p>	<p>See previous entry. Depending on end use, may need to meet either Residential or Non-Residential Standards.</p>	<p><b>Lead Program: MDA and MDE Solid Waste Program (if mixed w/solid waste)?</b></p> <p>If mixed with Solid or Industrial Waste as the binder, MDE/LMA would regulate. <b>If not you are also probably taking dried material out of a facility which creates a regulatory gap (i.e., no wetlands license/WQC or state discharge permit required) as described above in other responses.</b> Should consult MDA.</p>
	<p>Technical Criteria likely highly variable depending</p>	<p><b>Lead Program: Solid Waste Program (if mixed w/solid</b></p>

<p>Building materials</p> <p>Example: aggregate; processed to a high temperature which binds the contaminants</p> <p style="text-align: center;">I</p>	<p>on the process utilized and the end use. In any case, would be necessary to show that there is no violation of state pollution criteria's.</p>	<p><b>waste)?</b>  MDE/ARMA would regulate air emissions associated with processing equipment (kilns, etc.). If wet material is used and there will be a discharge of water from that material back to wetlands or waters of the State (or even groundwater), then a water permit will be required. <b>If using dried materials from a dredged material placement facility, no wetlands license/WQC or state discharge permit required as described above in other responses.</b> If mixing with solid or industrial waste, MDE/LMA would also need to approve use. <b>If no air emissions or mixing with waste, this would create a regulatory gap.</b></p>
<p>Upland reclamation</p> <p>Example: cover for industrial sites such as mines, gravel pits, brownfields</p> <p style="text-align: center;">J</p>	<p>Would be required to meet MDE Non-Residential Use criteria.</p>	<p><b>Lead Programs: MDE Voluntary Cleanup Program (LMA) for brownfields uses</b>  <b>MDE Mining Program (WMA) for mine reclamation</b> (<i>Need Ed Larrimore's input, potentially Dr. Tien also</i>)  <b>What about applications not involving mines or brownfields sites—which Program has authority?</b>  Note that placement that impacts surface or groundwater quality would represent a release of pollutants to the Waters of the State - a violation of Maryland law that would be subject to enforcement action once discovered.</p> <p>How approvals are issued; letter approval, specific permit or permit amendment?  For mine reclamation, the use would have to be authorized in the Mining Permit. An analysis of the material would be required and the material would not be allowed to exceed original elevation at the site. Note that placement that impacts surface or groundwater quality would represent a release of pollutants to the Waters of the State - a violation of Maryland law that would be subject to enforcement action once discovered.</p> <p>For Brownfield clean ups you would need to meet the appropriate residential or nonresidential clean-up standards and then MDE issues a No Further Requirements</p>

		Determination or Certificate of Completion
<p>Engineering fill</p> <p>Example: base material for Highway Construction</p> <p style="text-align: center;"><b>K</b></p>	<p>In addition to meeting MDE pollution requirements, would need to be acceptable for the intended use in a Mechanical (or GeoTechnical) perspective.</p>	<p><b>Lead Program: MDE Solid Waste (if mixed with solid waste)?</b></p> <p>What approvals are needed if it is not mixed with solid waste and from which MDE Program are those approvals issued?</p> <p>As described above, this is currently a regulatory gap If not mixed with solid or other defined waste and using already dried material from an existing dredge facility.</p>
<p>Fill for landfill daily cover with containment</p> <p style="text-align: center;"><b>L</b></p>	<p>See criteria for Landfills above.</p>	<p><b>Lead Program: MDE Solid Waste</b></p> <p>What specific approvals are necessary; permit amendment, approval letter to MDE?</p> <p>See responses regarding landfills, above.</p>
<p>Fill for Landfill Intermediate and Closure cap</p> <p style="text-align: center;"><b>M</b></p>	<p>See criteria for Landfills above.</p>	<p><b>Lead Program: MDE Solid Waste</b></p> <p>What specific approvals are necessary; permit amendment, approval letter to MDE?</p> <p>See responses regarding landfills, above.</p>
<b>Other uses</b>	<b>Technical Criteria</b>	<b>Approval(s) Needed</b>
		<p><b>Note: Some applications could occur at a DMCF Facility. Would those applications be handled under the facility's operating permit (NPDES or WQC)?</b></p>

Based on Table 5, Page 21 *Sediment in Baltimore Harbor – Quality and Suitability for Innovative Reuse*, An Independent Technical Review, October 2009 [http://www.mdsg.umd.edu/sites/default/files/files/Dredge\\_Report\\_and\\_Appendices\\_Web.pdf](http://www.mdsg.umd.edu/sites/default/files/files/Dredge_Report_and_Appendices_Web.pdf)

Notes:

- 1- Voluntary Cleanup Program (VCP) – the specific levels for metals and organics associated with this program are utilized for industrial sites and brownfields ,related to residential and non-residential uses post “clean-up” [We have seen these in the 2009 Sediment in Baltimore Harbor report]
- 2- MD groundwater standards for various contaminants fall into three categories, based on federal guidelines:
  - a. Primary Standards are legally enforceable standards that apply to public water supplies

- b. Secondary standards are non-enforceable guidelines related to cosmetic or aesthetic effects but are not considered a risk to public health
- c. Health Advisory Standards apply to non-cancerous health effects that may occur over specific durations (e.g. one-day, ten-day, lifetime) to assist in determining the potential for risk to public health.

These standards may be applied by MDE in determining if contamination of the state's waters has occurred, but cannot be applied *a priori* to placement of dredged sediments because of uncertainty regarding the dissolution, mobilization and movement of any specific constituent. The potential for contamination of groundwater may be arrived at from a leaching test such as the Toxicity Characterization Leaching Test (TCLP) or the Synthetic Precipitation Leaching Test (SPLP).

COMPARISON OF STANDARDS

	Metals Standards (mg/kg)																																
	Al	Sb	As	Ba	Be	B	Cd	Ca	Cl-	Cr			Co	Cu	Fe	Pb	K	Mg	Mn	Hg			Mo	Ni	Se	Ag	Sulfate	Sulfide	Tl	Sn	V	Zn	
											III	VI	Total								Inorganic	Hg	Methylmercury										
MD Residential Clean up	7800	3.1	0.43	1600	16		3.9					23		310	5500	400			160		2.3			160	39	39			0.55	4700	7.8	2300	
MD Non- Residential Clean up	100000	41	1.9	20000	200		51					310		4100	72000	1000			2000		31			2000	510	510			7.2	61000	100	31000	
ITRT Criteria - Residential		3.1	20		16		3.9					70		8.0	310		400					2.3			160	39	39			0.55	4700	90	2300
ITRT Criteria - Non-Residential		41	20		200		51					310		8.0	4100		1000					31			2000	510	510			7.2	61000	100	31000
NJ Residential Soil Clean up	NA	14	20	700	1.0		1.0					NA		600	NA	400			NA		14			250	63	110			2.0		370	1500	
NJ Residential Direct Contact Soil Remediation	78000	31	19	16000	16		78					1600		3100		400			11000		23			1600	390	390			5.0		78	23000	
NJ Non- Residential Soil Clean up		340	20	47000	1.0		100					NA		NA	600	NA	600			NA		270			2400	3100	4100			2.0		7100	1500
NJ Non-Residential Direct Contact Soil Remediation	NA	450	19	59000	140		78					590		45000		800			5900		65			23000	5700	5700			79		1100	110000	
EPA Region 3 Industrial Soil RBC's		40.9	1.91		204.4		51.1					306.6		4088	30600	1000			2044		30.66			2044	511	511			7.15	61320		30660	
MA Beach Nourishment			0.5				0.1					1		1			1.0					0.02		1								1.0	
MA Surface Water Quality																																	
MA Lined Landfill Reuse			40				80					1000				2000						10											
VA Protection of GWand Ecological Receptors - Beneficial Fill Ecological Screening		0.27	18	330	21		0.36					26		13	28		11		4400	220	0.1	0.058	0.00158		38	0.52	4.2		0.001		7.8	46	
VA Protection of GWand Ecological Receptors - Beneficial Fill GW Screening	24000	2.71	2.91	822	32		3.75					19.1		21.2	5750	276	135			20.8		1.04		19.5	2.55	59.6			1.42		78	292	
PA Soil: Residential and Other High frequency Receptors	7700	3.1	0.39	15000	16		7					12000	0.29	2.3	310	5500	400			180	2.3	1.0	0.78	150	39	39			0.08		39	2300	
VA Soil: Restricted (Commercial/Industrial)	99000	41	1.6	19000	200		80					150000	5.6	30	4100	72000	800			2300	31	4.3	10	2000	510	510			1.0		520	31000	
PA Manufactured Soil or Soil Amendment		6.75	29	15000	440	20000	47	NEL	NEL		1200	94		4400	1500	66000	500			31000		66		18	420	1100	1100	NEL	500	15	1500	2800	
PA Manufactured Soil or Soil Amendment Leachate	5.0	0.15	0.25	50	0.1	7.0	0.125	NEL	NEL		NEL	NEL	2.5	17.5	25	7.5	0.375			2.5		0.05		2.5	1.0	2.5	500	NEL	0.0125		6.5	50	
PA Roadway Construction Concrete Aggregate		30	41	5000	2.0		20					1000			700		200					20		200	60	5.0			6.0			1000	
PA Mine Reclamation	NEL	30	41	5000	6.0	60.0	39	NEL	NEL		30	2500		NEL	1500	NEL	200	NEL	NEL			20		NEL	420	60	5.0	NEL	500	6.0		72	2800
PA Mine Reclamation Processed Waste	NEL	30	41	5000	6.0	60.0	39	NEL	NEL		30	2500		NEL	1500	NEL	200	NEL	NEL			20		NEL	420	60	5.0	NEL	500	6.0		72	2800
PA Processing Beneficial Use of Residential Waste	190000	27	53	8200	320	6.7	38				190000	190		22	36000	190000	450			190000		10		650	26	84			14	680	72000	12000	
PA Regulated Fill Concentrations Limits (WMGR096)	190000	27	53	8200	320	6.7	38				190000	190		22	36000	190000	450			190000		10		650	26	84			14	680	72000	12000	
WA DMMP - Screening Level (Marine)		150	57				5.1					260			390		450					0.41										410	
WA DMMP - Bioaccumulation Trigger (Marine)			507.1				11.3					260			1027		975					1.5										2783	
WA DMMP - Maximum Level (Marine)		200	700				14								1300		1200					2.3										3800	
WA DMMP - Screening Level 1 (Freshwater)			14				2.1					72			400		360					0.66		38	11	0.57						3200	
WA DMMP - Screening Level 2 (Freshwater)			120				5.4					88			1200		>1300					0.8		110	>20	1.7						>4200	
CA Wetland Cover (Bay Area)			15.3				0.33					112			68.1		43.2					0.43		112	0.64	0.58						158	
CA Wetland Foundation/Non-Cover (Bay Area)			70				9.6					370			270		218					1.3		200	1.4	3.7						410	
CA Wetland Levee Maintenance/Construction Fill (Bay Area)			40				12					750			225		200					10		150	10	40						600	
CA CAD ERL (So Cal)			8.2				1.2					81			34		46.7					0.15		20.9		1						150	
CA CAD ERM (So Cal)			70				9.6					370			270		218					0.71		51.6		3.7						410	

	Organics (mg/kg)			
	benzo(a)pyrene	dibenz(a,h)anthracene	CN-	
			Total	Free
MD Residential Clean up	0.022	0.022		160
MD Non- Residential Clean up	0.39	0.39		2000
ITRT Criteria - Residential	0.022	0.022		
ITRT Criteria - Non-Residential	0.39	0.39		
NJ Residential Soil Clean up	0.66	0.66		1100
NJ Residential Direct Contact Soil Remediation				
NJ Non- Residential Soil Clean up	0.66	0.66		21000
NJ Non-Residential Direct Contact Soil Remediation				
EPA Region 3 Industrial Soil RBC's				
MA Beach Nourishment				
MA Surface Water Quality Standards				
MA Lined Landfill Reuse (BWP)				
VA Protection of Groundwater and Ecological Receptors - Beneficial Fill Ecological Screening	1.1	1.1		0.005
VA Protection of Groundwater and Ecological Receptors - Beneficial Fill Groundwater Screening	8.87	42.7		20
VA Soil: Residential and Other High frequency Receptors	0.02	0.02		4.7
VA Soil: Restricted (Commercial/Industrial)	0.21	0.21		61
PA Manufactured Soil or Soil Amendment Standards	2.5	2.5		4400
PA Manufactured Soil or Soil Amendment Leachate Standards	0.0002	0.00009		0.2
PA Roadway Construction Concrete Aggregate Standards	1.8	0.6	20	
PA Mine Reclamation Standards	1.8	0.6		20
PA Mine Reclamation Processed Waste Standards	1.8	0.6		20
PA Processing Beneficial Use of Residential Waste	11	11		200
PA Regulated Fill Concentrations Limits (WMGR096)	11	11		200

- KEY:**
- ITRT - Independent Technical Review Committee (Sediment in Baltimore Harbor 2009 Report)
  - RBC - Risk Based Concentration
  - NEL - No Effects Level
  - GW - Groundwater
  - DMMP - Dredged Material Management Program
  - CAD - Confined Aquatic Disposal
  - ERL - Effects Range Low
  - ERM - Effects Range Median
  - So Cal - Southern California

STATE MATRIX FOR INNOVATIVE AND BENEFICIAL REUSE REGULATORY WORKGROUP

State	Definition of Innovative Reuse	Definition of Beneficial Use	Other Relevant Definitions	Regulatory Agencies	Supporting Agencies	Agency/Dept. dedicated to IR or BU?	Applicable Permits / Approvals	Permit/Approval Timeframe	Screening Criteria	Material Type	Dredged Material Totals	Possible End Uses
Maryland	Includes the use of dredged material in the development or manufacturing of commercial, industrial, horticultural, agricultural or other products. <b>MD Env Code § 5-1101 (6)</b>	Any of the following uses of dredged material from the Bay and its tributary waters placed into waters or onto bottomland of the Bay or its tidal tributaries, including Baltimore Harbor: 1. Restoration of underwater grasses 2. Restoration of islands 3. Stabilization of eroding shorelines 4. Creation or restoration of wetlands; and 5. Creation, restoration or enhancement of fish or shellfish habitats <b>MD Env Code § 5-1101 (3)</b>	<b>Reuse</b> - The recycling of dredged material for its use in another product, including but not limited to, commercial and industrial uses. <b>MD Econ Dev Code § 5-901</b>	• Maryland Department of the Environment (MDE) for defined Beneficial Uses	TBD	TBD	MDE Wetland and Waterways Program • Wetlands License • Water Quality Certification (WQC) • Water Quality Monitoring Plan  MDE Wastewater Discharge Program • State Discharge Permit  MDE Solid Waste Program • Minor Permit Amendment • Landfill Request  MDE Mining Program • Mining Permit  MDE Land Restoration Program (Voluntary Cleanup)		• Maryland Residential Cleanup Standards • Maryland Non-Residential Cleanup Standards • Turbidity and TSS Limits (Per WQC) • Chemical Analysis (Per License/WQC/Permit) • TCLP (COMAR 26.13.02.14 - Table 1)	Baltimore Harbor - majority fines (silt/clay) and estuarine (saline sediment)	Approximately 1.5 million Cubic Yards Annually	• Land amendment for agricultural use • Aquatic habitat creation, restoration or enhancement • Upland habitat restoration • Fill for landfill daily cover • Fill for Landfill Intermediate and Closure Cap • Fill for upland use • Upland reclamation • Manufactured topsoil for landscaping • Building materials • Fill for upland use
New Jersey	N/A	<b>Regulation</b> The use or reuse of a contaminated soil or non-soil material, exhibiting contaminant concentrations above the most restrictive soil standard or guidance value, for fill and/or capping material, as an effective alternative for a commercial product ( <a href="http://www.nj.gov/dep/srp/guidance/alternative_fill/afp_guide.pdf">http://www.nj.gov/dep/srp/guidance/alternative_fill/afp_guide.pdf</a> )  <b>Statute</b> 1. a. Any dredged materials removed from the New York and New Jersey harbor area may be reused for a beneficial purpose, including, but not limited to, landfill cover for a sanitary landfill facility, contaminated site remediation, or construction fill, provided that the use of the dredged materials is otherwise consistent with provisions of federal and State law, or any rule or regulation adopted pursuant thereto.  b. The Department of Transportation and the Department of Environmental Protection, and any other State department or agency, as appropriate, shall consider the beneficial use of dredged materials in any State-funded project, where appropriate, including, but not limited to, road construction projects and publicly funded site remediation projects. <b>2003; C.12-68-9</b>	<b>Acceptable Use</b> - The use that is determined by the Department of Environmental Protection as appropriate for the dredged material, admixture (materials that are blended with dredged material to produce a product) or product that will be protective of human health and the environment.  <b>Acceptable Use Site</b> - The site at which the dredged material, admixture or product is used directly as a replacement for a generally-accepted and similarly-manufactured product, or as raw material to make such a product.  <b>Acceptable Use Project</b> - The Acceptable Use Site of dredged material, admixture or product, or a dredged material processing facility as authorized pursuant to an AUD. <a href="http://www.nj.gov/dep/passaicdocs/docs/NJDOTSupportingCosts/DREDGING-NJK20MANUAL-1997.pdf">http://www.nj.gov/dep/passaicdocs/docs/NJDOTSupportingCosts/DREDGING-NJK20MANUAL-1997.pdf</a> (Appendix E)  NJ Regulatory definition of Solid Waste <u>specifically excludes</u> dredged material:  TITLE 7. ENVIRONMENTAL PROTECTION CHAPTER 26. SOLID WASTE SUBCHAPTER 1. GENERAL PROVISIONS N.J.A.C. 7:26-1.6 (2015) § 7:26-1.6 Definition of solid waste	• New Jersey Department of Environmental Protection (NJ DEP)	• New Jersey Department of Transportation's Office of Maritime Resources (OMR)	Yes	• <b>Waterfront Development Permit</b> • <b>Coastal General Permit #20 for dredging project</b> • <b>Acceptable Use Determination (AUD)</b>	90 days for AUD approval	• NJ Residential Soil Clean up • NJ Residential Direct Contact Soil Remediation • NJ Non-Residential Soil Clean up • NJ Non-Residential Direct Contact Soil Remediation • AUD site specific criteria (case by case)	Depends on area dredged; projects range from majority sand to areas of majority fines (silt/clays)	Currently the NJ database does not contain DM or BU totals  Beneficial Use Projects: Bayonne Golf Course - 2 Million Cubic Yards (CY)  Harrison Avenue Landfill - 180,000 cy  River Winds Golf Course - 160,000 cy  Tweeter Center - 220,000 cy  NJ Turnpike, Exit 1 - 180,000 cy	• Structural & Engineering fill • Brownfields/Remediation • Backfill • Landfill Final Cover/Cap • Landfill Daily Cover • Parking lot base material • Road bases • Roadway construction and concrete aggregate • Habitat development/beach • Mine reclamation - NJ uses 'processed' dredged material
Pennsylvania	N/A	The use or reuse of residual waste or residual material derived from residual waste for commercial, industrial or governmental purposes, where the use does not harm or threaten public health, safety, welfare or the environment, or the use or reuse of processed municipal waste for any purpose, where the use does not harm or threaten public health, safety, welfare or the environment.	<b>Residual waste</b> - A nonhazardous industrial waste. It includes waste material (solid, liquid or gas) produced by industrial, mining and agricultural operations. It excludes certain coal mining wastes and wastes from normal farming activities. <u>Dredged material is classified as "Residual Waste"</u> . <b>Clean Fill</b> - Uncontaminated inert solid material. Includes soil, rock, stone, <u>dredged material</u> , used asphalt, and brick, block or concrete from construction and demolition (C&D) activities. <b>Uncontaminated</b> - Unaffected by spill or release, or if affected, levels are below residential Statewide Health Standards (SHS). <b>Regulated Fill</b> - Soil, rock, stone, <u>dredged material</u> , used asphalt, historic fill, and brick, block or concrete from C&D activities affected by a spill or release. Concentrations of regulated substances exceed residential SHS, but meet nonresidential SHS. <b>Solid waste</b> - Waste, including, but not limited to, municipal, residual or hazardous waste, including solid, liquid, semisolid or contained gaseous materials. The term does not include coal ash that is beneficially used under Chapter 290 (relating to beneficial use of coal ash) or drill cuttings.	• Pennsylvania Department of Environmental Protection (PA DEP) • Bureau of Waste Management (BWM) • Bureau of Resource Protection • Bureau of Waste Prevention (BWP)	N/A	Yes	• GP WMGR 046 -- Processing and BU of marine dredged material use as manufactured soil or soil amendments • GP WMGR 072 -- BU of dewatered dredged waste for use as a roadbed material • GP WMGR 085 -- Processing and BU of freshwater, brackish and marine dredged material by screening, mechanical blending and compaction in mine • GP WMGR 093 -- Processing of dewatered dredged waste for BU in roadway construction and concrete aggregate • GP WMGR 096 -- BU of "regulated fill" when moved offsite or received onsite in accordance with DEP Management of Fill Policy  General Permits (GP) coverage applied for by completing Determination of Applicability or Registration. • Additional Permit Forms Required (i.e. Form 20, Form D, Form R1, etc.)	Approximately 90 days for all GPs	Chemical analyses requirements and levels listed in each permit. Chemical analyses includes total and leachable levels of: • Inorganics • VOCs • Pesticides/Aroclors • SVOCs	Mostly freshwater/river material	PA currently has no way to track dredged material generated  Beneficial Use Projects: Bark Camp Mine Reclamation - 550,000	End use equates to current GP: • Roadbed material • Mine reclamation • Roadway construction and concrete aggregate • Fill material • Manufactured soil or soil amendments
Massachusetts	N/A	The use of a material as an effective substitute for a commercial product or commodity.	N/A	• Office of Energy and Environmental Affairs (EEA) • MA Department of Environmental Protection	• Department of Conservation and Recreation (DCR) • Conservation Commission	No	• Chapter 91 Waterways License • Order of Conditions • 401 Water Quality Certification • DEP Material Shipping Record (MSR) • Bill of Lading (BOL) • Landfill Minor Modification (BWP SW 22)	Less Than 276 Days Less Than 500 Days Less Than 120 Days	• Beach Nourishment Standards • MA Surface Water Standards • MA BWP Landfill Reuse Standards	Sand	In 2008 - 583,724 cubic yards  28% was reused in non-landfill projects i.e. Beach Nourishment 1% was reused as landfill daily cover	• Beach Nourishment • Daily Landfill Cover • Commercial Products
Virginia	N/A	Both instream and offstream uses. Instream beneficial uses include but are not limited to protection of fish and wildlife habitat, maintenance of waste assimilation, recreation, navigation, and cultural and aesthetic values.	<b>High Exposure Receptors</b> - Includes residential housing, schools, day cares, parks, playgrounds, and long-term health facilities. Does not include hotels and motels.  <b>"Contained-In"</b> - Soil/sediment determined to contain hazardous waste under 40 CFR Part 261, Subpart D  <b>Contaminated Media</b> - Includes soil, sediment, and dredged material that as a result of a release or human usage, has absorbed or adsorbed physical, chemical, or radiological substances at concentrations above those consistent with nearby undisturbed soil or natural earth materials.	• Virginia Department of Environmental Quality (VA DEQ)	N/A	No	• Solid Waste Management (SWM) Permit • Beneficial Use Demonstration (BUD) (case-by-case) • VA Pollution Abatement Permit • Option used for prior dm land applications • Contaminated Media Variance - VA DEQ Preferred Option - 3 Tiers for Material Contamination Tier 1: Sensitive Ecosystem/Groundwater Resource Tier 2: Residential & High Exposure Receptors Tier 3: Commercial/Industrial	90 days for BUD approval	• VA Protection of Groundwater and Ecological Receptors • VA Soil: Residential and Other High Frequency Receptors • VA Soil: Restricted (Commercial/Industrial)		VA does not track DM quantities  Beneficial Use Projects: Woodrow Wilson Bridge Project - 340,000 cubic yards  US Navy Earle Naval Weapon Station - 205,000 cy  Appomattox River Sediments (Pilot Study) - 24 cy	• Land Application • Habitat Development • Fill Material

\*\* = Tentative  
Georgia, Louisiana, and Mississippi were investigated but pertinent information was not found.

STATE MATRIX FOR INNOVATIVE AND BENEFICIAL REUSE REGULATORY WORKGROUP

State	Definition of Innovative Reuse	Definition of Beneficial Use	Other Relevant Definitions	Regulatory Agencies	Supporting Agencies	Agency/Dept. dedicated to IR or BU?	Applicable Permits / Approvals	Permit/Approval Timeframe	Screening Criteria	Material Type	Dredged Material Totals	Possible End Uses
Oregon	N/A	The productive use of solid waste (including dredged material) in a manner that will not create an adverse impact to public health, safety, welfare, or the environment. If the Beneficial Use Determination (BUD) is approved, Oregon Department of Environmental Quality (DEQ) no longer regulates the waste as a solid waste as long as it is used in accordance with the BUD.	N/A	• Oregon Department of Environmental Quality	N/A	Yes	#####		• No prescriptive screening level concentrations. Case-by-case only. • Does not significantly exceed the concentration in a comparable raw material or commercial product • Does not exceed naturally occurring background concentrations • Does not exceed acceptable risk levels when the material is managed according to BUD • Not a hazardous waste under OAR 466.005		OR does not track dredged material totals	Mostly fill material with some concrete or soil additive and agricultural land application
Ohio	N/A	*The use of a beneficial use byproduct as an ingredient, product, or in a manner that contributes to a manufacturing process or product that does not constitute disposal or cause pollution of any waters of the state. A beneficial use may include but is not limited to use for agronomic benefit; as a replacement of a raw material; as a soil amendment, fertilizer, or structural fill; or as a fuel.	<b>Other wastes</b> - garbage, refuse, decayed wood, sawdust, shavings, bark, and other wood debris, lime, sand, ashes, offal, night soil, oil, tar, coal dust, <b>dredged or fill material</b> , or silt, other substances that are not sewage, sludge, sludge materials, or industrial waste, and any other "pollutants" or "toxic pollutants" as defined in the Federal Water Pollution Control Act that are not sewage, sludge, sludge materials, or industrial waste. <b>Solid Wastes</b> - Such unwanted residual solid or semisolid material as results from industrial, commercial, agricultural, and community operations, excluding earth or material from construction, mining, or demolition operations, or other waste materials of the type that normally would be included in demolition debris, nontoxic fly ash and bottom ash, including at least ash that results from the combustion of coal and ash that results from the combustion of coal in combination with scrap tires where scrap tires comprise not more than fifty per cent of heat input in any month, spent nontoxic foundry sand, nontoxic, nonhazardous, unwanted fired and unfired, glazed and unglazed, structural products made from shale and clay products, and slag and other substances that are not harmful or inimical to public health, and includes, but is not limited to, garbage, scrap tires, combustible and noncombustible material, street dirt, and debris. "Solid wastes" does not include any material that is an infectious waste or a hazardous waste. <b>Beneficial Use Byproduct</b> - A solid waste, industrial waste, or other waste having properties necessary or preferred for beneficial use.	• Ohio Environmental Protection Agency (Ohio EPA) • Division of Material and Waste Management • Ohio Environmental Protection Agency (Ohio EPA) • Division of Material and Waste Management • Division of Surface Water	N/A	Yes	• Land Application Management Plan (LAMP): - Form A - Form A-C1 - Chemical Testing of Material  • Authorization Rule: - Asphalt concrete - Cement concrete - Chip and seal pavement - Controlled low-strength material (flowable concrete fill) when not used within waters of the state - Grout - Glass - Masonry unit • Individual Beneficial Use Permits • General Beneficial Use Permits	Approximately 90 days for LAMP approval	• Chemical Testing of Material: Uses U.S. EPA Screening Levels	Freshwater river and lake material; ranges from sand to fines	Annually approximately 1.8 million cubic yards of material is dredged.  A backlog of approximately 8.2 cubic yards of material needs to be dredged.  June 2015 Kurtz Bros., Inc. LAMP allowed the reuse of 26, 000 cy of DM.  2% is reused near shore  2% is reused in upland uses	• Structural fill • Engineering fill • Backfill • Landfill cap soil • Parking lot base material • Roadside projects • Earthen mounds • Noise barrier mounds  • Use for agronomic benefit • Replacement of raw material • Soil amendment • Fertilizer • Structural fill • Fuel
Washington	N/A	Beneficial Use is the placement or use of dredged material for some productive purpose. While the term "beneficial" indicates some benefit is gained by a particular use, the term has come to generally mean any "reuse" of dredged material.	<b>Solid waste</b> - or "wastes" means all putrescible and nonputrescible solid and semisolid wastes including, but not limited to, garbage, rubbish, ashes, industrial wastes, swill, sewage sludge, demolition and construction wastes, abandoned vehicles or parts thereof, contaminated soils and contaminated dredged material, and recyclable materials. <b>Clean soils and clean dredged material</b> - means soils and dredged material which are not dangerous wastes, contaminated soils, or contaminated dredged material as defined in this section (WAC 173-350-100). <b>Contaminated dredged material</b> - means dredged material resulting from the dredging of surface waters of the state where contaminants are present in the dredged material at concentrations not suitable for open water disposal and the dredged material is not dangerous waste and is not regulated by section 404 of the Federal Clean Water Act (P.L. 95-217). <b>Soil amendment</b> - any substance that is intended to improve the physical characteristics of the soil, except composted material, commercial fertilizers, agricultural liming agents, unmanipulated animal manures, unmanipulated vegetable manures, food wastes, food processing wastes, and materials exempted by rule of the department, such as biosolids as defined in chapter 70.95J RCW and wastewater as regulated in chapter 90.48 RCW.	• U.S. Army Corps of Engineers Seattle District (lead agency)	• U.S. Environmental Protection Agency (Region 10) • Department of Ecology • Department of Natural Resources	Yes	General Application for Beneficial Use Exemption - Washington Administrative Code (WAC) 173-350-2003	45 day review period	Dredged Material Management Plan (DMMP) guidelines: • Screening Level (Marine) • Bioaccumulation Trigger (Marine) • Maximum Level (Marine) • Screening Level 1 (Freshwater) • Screening Level 2 (Freshwater)		WA and the USACE do not track dredged material totals in WA	Soil amendment or agricultural land application
California	N/A	For Northern CA, defined by San Francisco Bay Long Term Management Strategy (LTMS) for Dredging: <a href="http://www.sfn.usace.army.mil/Portals/68/docs/Dredging/LTMS/entire%20LTMS.pdf">www.sfn.usace.army.mil/Portals/68/docs/Dredging/LTMS/entire%20LTMS.pdf</a>  Beneficial reuse criteria include a need for the reuse project and confirmation that project benefits clearly outweigh any environmental impacts or tradeoffs. LTMS has a goal to maximize beneficial reuse.  For Southern CA, Defined by the Contaminated Sediments Task Force/Dredged Material Management Team (CSTF/DMMT): <a href="http://www.coastal.ca.gov/sediment/long-term-mgmt-strategy-5-2005.pdf">www.coastal.ca.gov/sediment/long-term-mgmt-strategy-5-2005.pdf</a> (pp. 194)  Beneficial reuse of dredged materials can only result when these materials are not discharged in the aquatic environment for the purpose of disposal. Beneficial reuse involves the use of these materials for a purpose determined to have a value beyond the practical benefit of disposing of unwanted dredged material.	<b>Solid Waste</b> - In general terms, solid waste refers to garbage, refuse, sludges, and other discarded solid materials resulting from residential activities, and industrial and commercial operations. This term generally includes used oil. <u>This term generally does not include solids or dissolved material in domestic sewage or other significant pollutants in water such as silt, dissolved or suspended solids in industrial wastewater effluents, dissolved materials in irrigation return flows or other common water pollutants. However, if any of these materials are separated from the water that carries them, then they generally are considered solid waste.</u> For regulatory purposes, hazardous waste is a subset of solid waste.	• US Army Corps of Engineers San Francisco District (Dredged Material Management Office (DMMO) - Northern California) • US Army Corps of Engineers Los Angeles District (DMMT - Southern California)	• US EPA Region 9 • California Coastal Commission (where applicable) • San Francisco Bay Conservation and Development Commission (BCDC) • Regional Water Quality Control Board (RWQCB) (appropriate to project location)	Yes	Multiple/various depending on locality	6-9 months unless covered by an existing RGP/PGP	For SF Bay guidelines from the RWQCB: <a href="http://www.waterboards.ca.gov/rwqcb2/water_issues/available_documents/benreuse.pdf">http://www.waterboards.ca.gov/rwqcb2/water_issues/available_documents/benreuse.pdf</a>  Wetland • Wetland Cover Material Criteria (equivalent to ambient in-Bay sediment concentrations) • Wetland Foundation Criteria Upland • Testing and acceptability criteria specific to each landfill • Basin Plan Water Quality Objectives (WQO) for effluent discharge  For SoCal DMMT: Aquatic: • ERL • ERM Upland: • Testing and acceptability criteria specific to each landfill • Basin Plan WQO for effluent discharge			Upland beneficial reuse at permitted sites; wetland restoration, CDF, CAD, soil amendment, levee stabilization, beach nourishment, construction fill, landfill daily cover.
Army Corps of Engineers	Definition of Beneficial Use	<p><b>Beneficial Use:</b> Placement or use of dredged material for some productive purpose. (Source: The Role of the Federal Standard in the Beneficial Use of Dredged Material from U.S. Army Corps of Engineers New and Maintenance Navigation Projects - Beneficial Uses of Dredged Materials)</p> <p><b>Beneficial Uses:</b> Placement or use of dredged material for some productive purpose. May involve either the use of the dredged material or the placement site as the integral component of the use. (Source: Glossary ERDC, Corps website).</p> <p><b>Beneficial Use:</b> Utilizing dredged sediments as resource materials in productive ways. Dredged material can be used beneficially for engineered, agricultural and product, and environmental enhancement purposes, as described on the beneficial uses website and in the seven categories described below (Source: USACE 2006 <a href="http://el.erc.usace.army.mil/dots/budm/budm.cfm">http://el.erc.usace.army.mil/dots/budm/budm.cfm</a>):</p> <ol style="list-style-type: none"> <li>Habitat Restoration and Development: using dredged material to build and restore wildlife habitat, especially wetlands or other waterbased habitat (e.g., nesting islands and offshore reefs).</li> <li>Beach Nourishment: using dredged material (primarily sandy material) to restore beaches subject to erosion.</li> <li>Parks and Recreation: using dredged material as the foundation for parks and recreational facilities; for example, waterside parks providing such amenities as swimming, picnicking, camping, or boating.</li> <li>Agriculture, Forestry, Horticulture, and Aquaculture: using dredged material to replace eroded topsoil, elevate the soil surface, or improve the physical and chemical characteristics of soils.</li> <li>Strip-Mine Reclamation and Solid Waste Management: using dredged material to reclaim strip mines, to cap solid waste landfills, or to protect landfills.</li> <li>Construction/Industrial Development: using dredged material to support commercial or industrial activities (including brownfields redevelopment), primarily near waterways; for example, expanding or raising the height of the land base, or providing bank stabilization. In addition, dredged material may be used in construction material.</li> <li>Multiple-Purpose Activities: using dredged material to meet a series of needs simultaneously, such as habitat development, recreation, and beach nourishment, which might all be supported by a single beneficial use project.</li> </ol>										

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State	Definition of Innovative Reuse	Definition of Beneficial Use	Other Relevant Definitions	Regulatory Agencies	Supporting Agencies	Agency/Dept. dedicated to IR or BU?	Applicable Permits / Approvals	Permit/Approval Timeframe	Screening Criteria	Material Type	Dredged Material Totals	Possible End Uses
Maryland Coal Combustion Products	COMAR – Management of Coal Combustion Products 26.04.10.02(B)(2)	(2) Beneficial Use. (a) "Beneficial use" means the use of coal combustion byproducts in a manufacturing process to make a product, or as a substitute for a raw material or commercial product, which, in either case, does not create an unreasonable risk to public health or the environment as determined by the Department. (b) "Beneficial use" does not include the use of coal combustion byproducts in a mining operation or in mine reclamation activities										

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Georgia, Louisiana, and Mississippi were investigated but pertinent information was not found.

## DRAFT GUIDANCE DOCUMENT

1. **Proposed Use:** Land Amendment for Agricultural Use with Unprocessed dredged material directly from dredging site. *(Use A1 on Corresponding Flow Chart)*
  - **Approvals Needed:** MDE Wetland and Waterways Program, Wastewater Discharge Program and/or MDA.
    - The Wetlands License will be necessary for both the dredging and placement.
      - If there is a discharge to surface waters from the agricultural site, the Wetlands License contain conditions for that as well.
    - MDA office of the Chemist should also be consulted. Regulations/permits likely also apply.
2. **Proposed Use:** Aquatic habitat creation, restoration or enhancement with Unprocessed dredged material (currently within scope of definition of Beneficial Use). *(Use B on Corresponding Flow Chart)*
  - **Approvals Needed:** MDE Wetlands and Waterways
    - Wetlands License/WQC will likely also require turbidity limits outside the mixing zone (50 NTU avg./150 max); and a detailed water quality monitoring plan for during and post construction.
3. **Proposed Use:** Upland habitat creation with Unprocessed dredged material (currently within scope of definition of Beneficial Use). *(Use C on Corresponding Flow Chart)*
  - **Approvals Needed:** MDE Wetlands and Waterways.
    - Since you are discharging dredged material back in to the water, a wetlands license and/or WQC is required. Typical conditions include: limits for TSS (400 avg/800 max) and turbidity outside the mixing zone (50 NTU avg/150 max) and a detailed water quality monitoring plan for both construction and operation.
      - If island is restoration is in the Harbor and with Harbor material, it would be regulated under a state discharge permit.
4. **Proposed Use:** Fill for Landfills (daily, intermediate, final closure cap) with Unprocessed or Amended/Processed dredged material. *(Uses D, E, L, and M on Corresponding Flow Chart)*
  - **Approvals Needed:** MDE Solid Waste
    - DAILY COVER: MDE would need a request from the landfill that wanted to use it; revised operations manual; and physical and chemical characterization of the material.
      - If acceptable this would result in a minor permit amendment.
      - Depending on the chemistry of the material, there might be limitations on its use, e.g., restrictions on placing it on the out slopes where it could erode off or leach out contaminants into surface water.

- Time for review and approval is a few weeks, depending on the nature of the request and completeness of the information provided.
- MDE would require both TCLP and total analyses for a suite of metals and other parameters. (Note that for landfill use the TCLP is the appropriate test – it was designed to model the behavior of a material in the environment of a sanitary landfill, where weak organic acids are present in the leachate. The SPLP is an attempt to model the behavior of materials by themselves, where they encounter the inorganic acids usually present in rainfall.)
- MDE has the authority to specify the number and location of monitoring points, the parameters monitored, and the methods and frequency of monitoring that is required. See COMAR 26.04.07.09(F):

“F. Additional Monitoring Requirements. If the Department determines that contamination of waters of this State has occurred or is liable to occur as a result of operation of the landfill, the Approving Authority may require the permit holder to periodically collect and analyze ground water or surface water at the permitted site and to submit the results to the Approving Authority. The Approving Authority may furthermore specify the following:

- (1) Number and location of the sampling stations;
- (2) Frequency of the analyses;
- (3) Sampling and analyses procedures;
- (4) Pollutants to be monitored; and
- (5) Reporting period.”

- INTERMEDIATE AND CLOSURE CAP: same as above plus for intermediate and final the landfill will need to prove that the material can support vegetative stabilization, or develop procedures that render it capable of doing so.

**5. Proposed Use:** Upland **mine** reclamation with Amended or Processed Dredged Material. *(Use J on Corresponding Flow Chart)*

- **Approvals Needed:** MDE Mining Program (LMA); Mining Permit
  - For mine reclamation, the use would have to be authorized in the Mining Permit. An analysis of the material would be required and the material would not be allowed to exceed original elevation at the site.
  - Note that placement that impacts surface or groundwater quality would represent a release of pollutants to the Waters of the State - a violation of Maryland law that would be subject to enforcement action once discovered.

6. **Proposed Use:** Upland **brownfield** reclamation with Amended or Processed Dredged Material. *(Use J on Corresponding Flow Chart)*

- **Approvals Needed:** MDE Voluntary Cleanup Program (VCP)(LMA) for brownfield uses.
  - For Brownfield clean ups you would need to meet the appropriate residential or nonresidential clean-up standards. Then MDE issues a No Further Requirements Determination or Certificate of Completion.
  - With regard to brownfield sites, or any other site where the sediment is going to be placed on the land, it is important to know in advance whether the presence of hazardous substances in the dredged material is (1) greater than naturally occurring background concentrations; or (2) present an exposure risk to populations using the property where the material is placed

## NEED FOR GUIDANCE / IDENTIFIED REGULATORY GAP

7. **Proposed Use:** Land Amendment for Agricultural Use with Unprocessed dredged material directly from the DMCF. *(Use A2 on Corresponding Flow Chart)*

- **Notes:** if the material for land amendment is coming from a contained disposal facility where it has already been dewatered, then there is currently no formal approval process for that (i.e., this could be considered a regulatory gap) as it was already permitted when it was dredged and there are no more surface water discharges associated with dried material.
  - There are three ways to close this regulatory gap –
    - (1) Put conditions in a DMCFs wetlands licenses/WQCs or NPDES permits that when dredged material is removed from those facilities, Departmental approval is required;
    - (2) An NPDES Permit or Stormwater Permit could be issued at the location the material is to be used; or,
    - (2) Propose specific regulations to cover this gap similar to what has been done in other states.

8. **Proposed Use:** Upland use without containment with Unprocessed dredged material of a suitable physical and chemical quality. *(Use Z on Corresponding Flow Chart)*

- **Notes:** if material was removed from a DMCF and then used in an upland area, for construction, fill or soil amendment purposes, assuming suitable quality, there should be no additional need for containment, leachate, or otherwise. Meeting appropriate criteria, this material should be considered the same as any other soil.
  - Potentially a Stormwater Permit could be issued at the location the material is to be used;
  - Potentially amend the DMCF operations permit to capture this expanded use of the material elsewhere on location at the DMCF site.

9. **Proposed Use:** Fill for upland use with containment (i.e. leachate collection system) with Unprocessed dredged material. Placement that impacts surface or groundwater quality would represent a release of pollutants to the Waters of the State - a violation of Maryland law that would be subject to enforcement action once discovered. *(Use F on Corresponding Flow Chart)*
- **Notes:** The dredged material, which is unprocessed and un-amended, even if it is Harbor dredged material, is not considered a solid waste.
    - This regulatory gap could be addressed by-
      - (1) Requiring an NPDES Permit for the upland containment facility (this assumes that no non-tidal wetland impacts would occur). This assumes the containment facility would have a discharge since it has a leachate collection system.
10. **Proposed Use:** Upland reclamation with Processed or Amended dredged material (example: fill or soil cover for residential sites). Placement that impacts surface or groundwater quality would represent a release of pollutants to the Waters of the State - a violation of Maryland law that would be subject to enforcement action once discovered. *(Use G on Corresponding Flow Chart)*
- **Notes:** this dredged material would be processed or amended with some type of binder.
    - This regulatory gap could be addressed by:
      - Issuance of a stormwater permit.
11. **Proposed Use:** Manufactured topsoil for landscaping with Processed or Amended dredged material (example: mixed with an additive that binds the contaminants). Taking the dredged material out of a DMCF and not directly from the dredging site creates a regulatory gap (i.e. no wetlands license or WQC or state discharge permit required). *(Use H on Corresponding Flow Chart)*
- **Notes:** if mixed with solid or industrial waste as the binder then Land Management Administration's Solid Waste Program would regulate.
    - This regulatory gap could be addressed by:
      - New Solid Waste Program regulations/guidance (similar to composting, sewage sludge and other existing regulatory programs)
      - Consultation with MDA?
12. **Proposed Use:** Building materials with processed dredged material (example: aggregate is created when the dredged material is processed to a high temperature which binds the contaminants). *(Use I on Corresponding Flow Chart)*
- **Notes:** Lead office within MDE unclear. This could be identified as an "authorized use" in Solid Waste Program regulations (similar to what is expected to be proposed in the CCB Beneficial Use regulations).
    - MDE/ARMA would regulate air emissions associated with processing equipment (kilns, etc)

- Likely using dried dredged material removed from a DMCF, so no wetlands license or WQC or state discharge permit is required so this creates a regulatory gap.
  - There is no regulatory gap if there is no discharge from the application or use.
- If mixing with a solid or industrial waste, MDE/LMA would need to approve.
- If no mixing with waste and no air emissions, this would be a regulatory gap.

**13. Proposed Use:** Engineering fill with Processed or Amended dredged material (example: base material). This could be identified as an “authorized use” in Solid Waste Program regulations (similar to what is expected to be proposed in the CCB Beneficial Use regulations). *(Use K on Corresponding Flow Chart)*

- **Notes:** MDE Solid waste Program would be lead office only if mixing the dredged material with a solid or industrial waste.
  - Regulatory gap if not mixed with a waste.

DRAFT

**TABLE 5**

**Existing MDE Regulatory Process**

Green = known regulatory process involved.

Yellow box = area of regulatory uncertainty

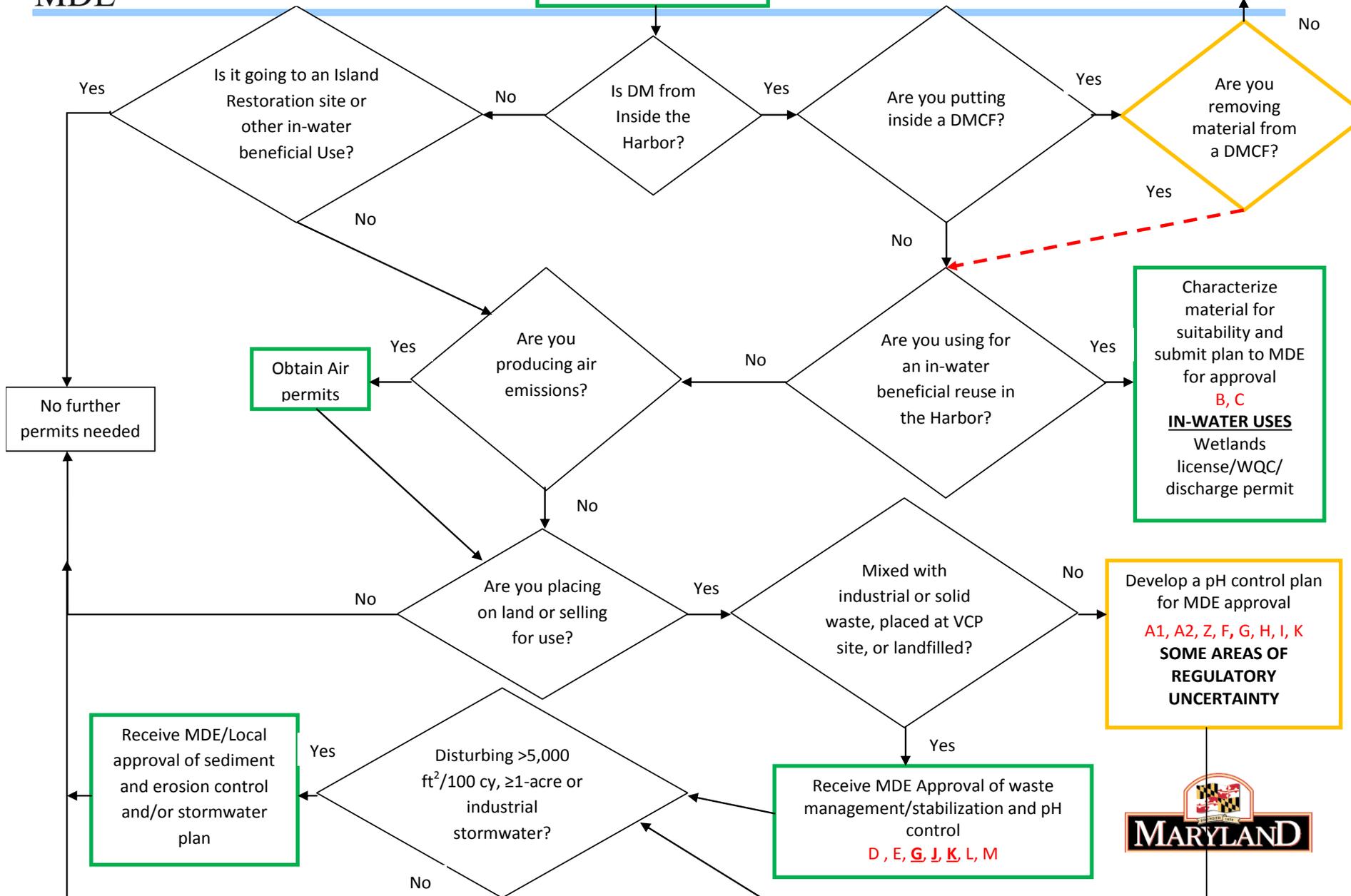
Red dotted line = current regulatory gap



Obtain a Tidal wetlands License and WQC before Dredging/Placement

**Bolded/Underlined letters** indicates the material is mixed with industrial or solid waste.

Obtain State discharge permit or appropriate MDE approval.



# **Final Report**

## **Innovative and Beneficial Reuse Regulatory Workgroup**

**Appendix 1:** Innovative and Beneficial Reuse Regulatory  
Workgroup Membership List

## **Innovative and Beneficial Reuse Regulatory Workgroup**

### **Membership**

**Membership includes:**

1. U.S. Environmental Protection Agency (U.S. EPA)
2. U.S. Army Corps of Engineers, Baltimore (USACE)
3. Maryland Department of the Environment (MDE)
4. Maryland Department of Natural Resources (DNR)
5. Maryland Geological Survey (MGS)
6. Maryland State Highway Administration (SHA)
7. Maryland Port Administration (MPA)
8. Maryland Environmental Service (MES)

# **Final Report**

## **Innovative and Beneficial Reuse Regulatory Workgroup**

**Appendix 2:** Lessons Learned from Past Innovative Reuse Pilot  
Projects in Maryland – PowerPoint Presentation



# Some Lessons Learned

Innovative & Beneficial Reuse Regulatory Workgroup  
September 24, 2015

# Overview

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- **Demonstration projects lessons learned**
  - ▶ Engineered Fill
  - ▶ Mine/Quarry Reclamation
  - ▶ Lightweight Aggregate
  - ▶ Manufactured Topsoil Processing
  - ▶ Agricultural Amendments
- **Some lessons learned**
- **Thoughts for the future**

# Engineered Fill

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- ▶ Sediment that is amended with other materials to create a substrate that is easily compacted.
- ▶ Dredged material mixed with other materials (such as steel slag fines) can make very good engineered fill.
- ▶ Leaching of metals severely limits potential applications and therefore volumes of dredged material that could be used.
- ▶ Market demand is intermittent.



# Surface Mine/Quarry Reclamation

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- ▶ Using dredged material as fill to reclaim previous topography of surface mines or quarries.
  - ▶ Hauling distances and methods greatly impact costs.
  - ▶ Investigation of several quarries demonstrated transportation challenges, environmental and regulatory concerns.
  - ▶ There may be structural and geotechnical considerations.
  - ▶ Number of sites in MD with acceptable environmental and distance characteristics is still unknown.



# Lightweight Aggregate (LWA)

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- ▶ LWA is a coarse aggregate used in the creation of lightweight products such as concrete block or pavement.
- ▶ Thermal processing technology proven to meet industry standards for a marketable product on a demonstration scale.
- ▶ Market and market sustainability difficult to predict.
- ▶ Reliable volume and quality of available dredged material key to project economics.



# Manufactured Topsoil

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- ▶ **Manufactured topsoil is created with a mineral base material and organic residuals.**
  - ▶ Amended dredged material can be manufactured into topsoil from select dredged material.
  - ▶ Market is questionable due to the perception of the source of the material.
  - ▶ Manufactured topsoil may not be able to obtain a permit from MDE for use in projects.



# Agricultural Amendment

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- ▶ Agricultural amendment is improved soils or additions that are designed to increase crop yield.
- ▶ Dredged material blended with biosolids, cellulose and other amendments can make a viable land amendment based on pilot studies.
- ▶ Harbor dredged material is highly unlikely to receive approval for application to agricultural land due to potential contamination



# Lessons Learned

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- ▶ It's difficult to process dredged material that is not in a state that is somewhat dry and workable.
- ▶ Transporting wet material is also challenging.
- ▶ Dredged material can be the only or one of several raw materials for many potential uses, and processing the material is often needed.
- ▶ Suitable amount of material in a suitable form that is easy to store and easy to transport appears to improve the likelihood of reuse.

# Lessons Learned

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- ▶ Commercialization of any IR technology requires a viable business plan and standard “due diligence”.
- ▶ Supply and demand in markets for recycled dredged material can be highly variable and the sustainability of markets is hard to predict.
- ▶ Confirmation of economic and technical findings is valuable.

# Lessons Learned

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- ▶ All IR options studied to date have costs per cy that are significantly higher than those associated with traditional dredged material placement options.
- ▶ **HOWEVER**
  - ▶ Most cost per cy estimates do not take account of all future costs or the full suite of benefits.
  - ▶ There are fewer and fewer options for long-term placement, and costs for placement and management are expected to increase over time.
  - ▶ Cost estimates have not been “apples to apples”.

# Thoughts for the Future

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- ▶ **Stay focused on Harbor material**
  - ▶ Our biggest placement capacity challenges are for Harbor material
  - ▶ Harbor material is the most difficult material to innovatively re-use and success there will make it easier to implement for the Bay channels down the road
- ▶ **Implement the revised strategy.**
  - ▶ ID and implement Small to medium quantity projects over the next 3-5 years.
  - ▶ Establish economic value of reclaimed capacity.
  - ▶ Review sediment quality data to ID “better” material for use.

# MY Thoughts for the Future

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- ▶ Don't just focus on the “product” – also focus on the “end use”.
  - ▶ For example - engineered fill is a product that can be used for several purposes.
  - ▶ Part of the key would be ensuring that the end uses for this fill (landfill capping, daily cover, mine reclamation) are safe and permissible.
- ▶ There may not be a single “silver bullet”...
  - ▶ Several appropriate Innovative and Beneficial Reuse options may be needed to help achieve the long-term goals.

# Your Views

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- ▶ What do the Group think have been the lessons learned?



**Final Report**  
**Innovative and Beneficial Reuse**  
**Regulatory Workgroup**

**Appendix 3:** Maryland Department of the Environment  
PowerPoint Presentation – Existing Regulatory Process



**MDE** Maryland Department of the Environment

# Overview of MDE's Regulatory Framework for Dredged Material Management

**Matthew Rowe**

**MDE Science Services Administration**





# Broad Water Regulatory Context

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1. Wastewater discharges from dredged material are exempt from Federal NPDES permits (40 CFR 122.3);
2. Regulated under CWA §404 - wetlands license and WQC (COMAR 26.24.02.01 and 26.08.02.10) always required to dredge state waterways because involves Waters of the State.
3. MDE regulations (COMAR 26.08.03.01) suggest broad discretion to permit dredged material discharges.





# Historical Precedents

## Hart-Miller Island (circa '83)

- Controversial Facility for **Harbor** Material
- Wetlands License required exterior monitoring, treatment works, and an advisory board.
- Established a Policy of Issuing a State Discharge Permit to Set Discharge Limits
- Acid sulfurization process





# Current Permit

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1. Expires March 31, 2019;
2. Limits for pH, TSS, Ammonia, Copper, Lead, Zinc, Selenium, Arsenic, Cadmium, Chromium VI, Nickel and Silver; and,
3. Uses mixing zone calculations to set dilution factors.





# Other Harbor Material Facilities

1. Cox Creek; and,
2. Masonville





# Non-Harbor Material Facilities

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i.e. - Poplar Island and Pearce Creek

1. Wetlands License for the dredging;
2. Federal 404 discharges require a state 401 Water Quality Certification; and,
3. WQC can require discharge/exterior monitoring and/or limits.





# Examples WQC Conditions

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1. Expires August 14, 2026;
2. Limits for TSS in discharge (400 avg./800 max.) and turbidity outside the mixing zone (50 NTU avg./150 max.); and,
3. A detailed WQ monitoring plan for both construction and operation.





# Other Possible Water Permits

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1. Sediment and Erosion Control Plan if disturbing more than 5,000 sq-feet or 100 cy of soil;
2. General stormwater construction permit if disturbing more than 1-acre; or
3. General permit for industrial stormwater discharges.





# Land Regs. & Dredged Material(DM)

Land Management Administration (LMA) does not issue permits for the land application or beneficial use of dredged material. The only instances in which LMA would be involved with dredged material is where:

- 1) Dredged material is mixed with a regulated solid waste material (ie. industrial waste) and beneficially used on land or as a product. The mixed material would be considered solid waste and LMA-SWP would review the proposal and issue a letter of approval. Any use of dredged material on agricultural land may also need approval from MDA's State Chemist.
- 2) Dredged material is likely to have been contaminated by a known industrial or commercial point source located nearby. LMA would review analysis of the material and authorize the use.
- 3) Dredged material is to be disposed of or used as cover material at a permitted solid waste landfill. LMA-SWP would review analysis of the material and authorize the use.
- 4) Dredged material is to be used as fill material at a Voluntary Cleanup site or a mine site. LMA-LRP or LMA-MP would review analysis and authorize the use.





# Other Land Considerations

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1. Solid waste(organic debris, tires, trash, etc.) separated during DM handling and processing may need to be disposed of as solid waste;
2. Adherence to Residential and Non-Residential standards will be considered when DM marketed or sold for land application; and,
3. pH amendments to prevent leachate formation.





# Air Permits/Approvals May Apply

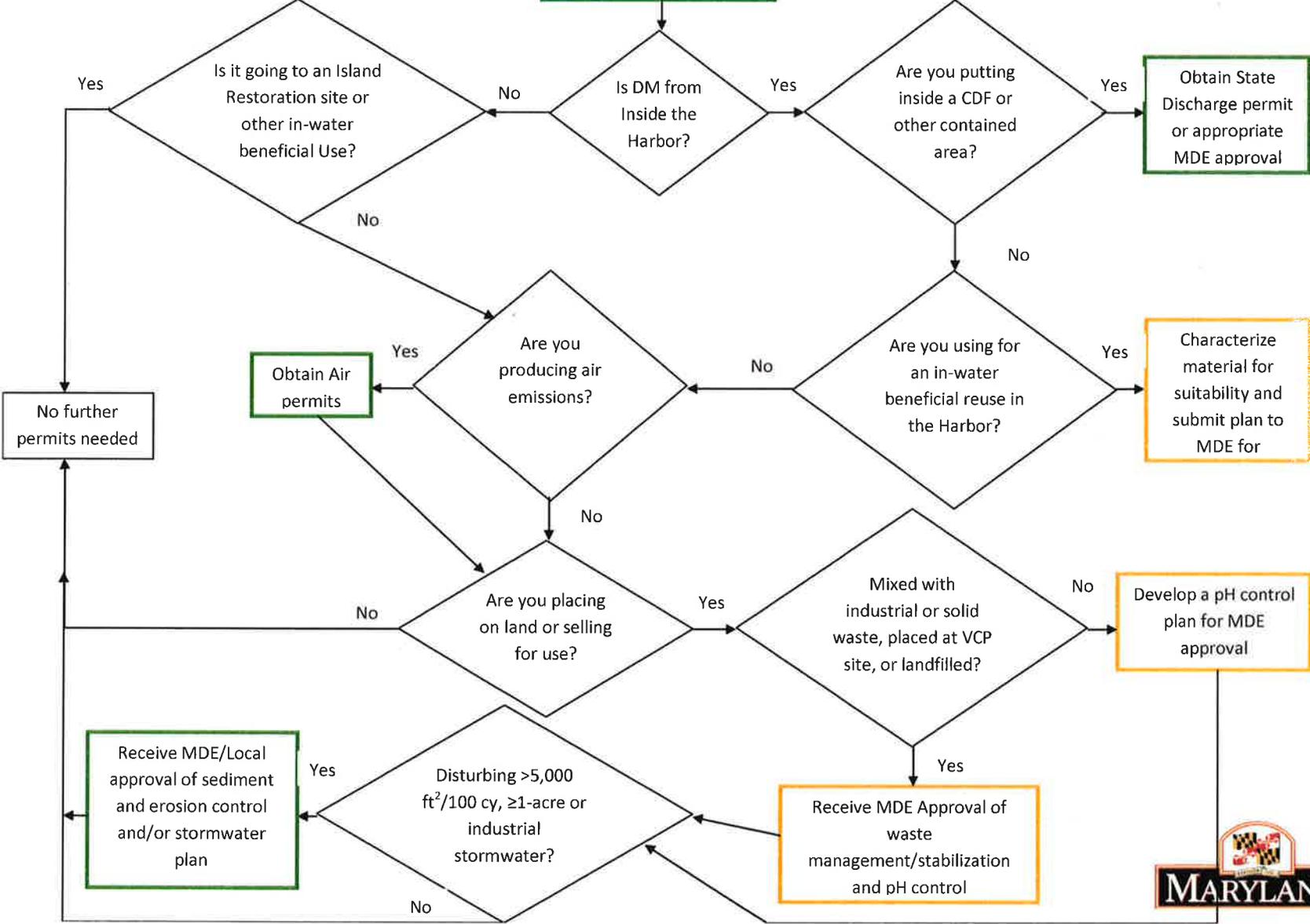
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1. Air Quality Permit to Construct;
2. For major new sources of ozone precursors (VOCs and NO<sub>x</sub>) in ozone non-attainment areas – Non-attainment New Source Review (NA-NSR) approval;
3. For major new sources of other criteria pollutants - Prevention of Significant Deterioration (PSD) approval; and,
4. Air Quality State Permit to Operate or Title V Permit to Operate.





Obtain a Tidal wetlands License and WQC before Dredging/Placement





# Permit Approval Process

- 1-3 months
  - Submit a completed application to the Department.
  - Department reviews the application for compliance with applicable regulations and requests any additional information.
  - If no public review, MDE issues a final determination. If public review, MDE prepares a notice of application in the local paper providing an opportunity to request a meeting or announcing meeting date/time/location.
- 2-12 months
  - The Department develops permit limits and publishes a notice of tentative determination.
  - The Department issues the permit if adverse comments are not received.
- 9-36 months
  - If adverse comments are received, the Department prepares a final determination and publishes additional notice providing 15 days to request a contested case hearing.
  - If contested, administrative procedures for the approval process are followed.
  - The Department issues the permit if the final determination is not contested.





# Possibilities?

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- Consolidated permitting process similar to Title 5
- Additional smaller pilot projects to establish permit precedents and associated processes





# Maryland Department of the Environment

**Insert Program Name Here**

1800 Washington Boulevard | Baltimore, MD 21230-1718  
410-537-3000 | TTY Users: 1-800-735-2258  
[www.mde.state.md.us](http://www.mde.state.md.us)

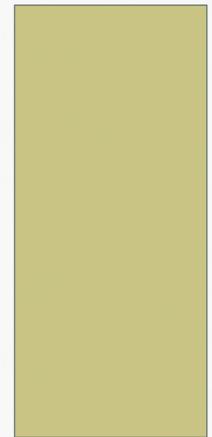


**Final Report**  
**Innovative and Beneficial Reuse**  
**Regulatory Workgroup**

**Appendix 4:** Legislative History of Dredged Material  
Management in Maryland – PowerPoint Presentation

**LEGISLATIVE HISTORY  
DREDGED MATERIAL  
MANAGEMENT  
IN MARYLAND**

INNOVATIVE & BENEFICIAL REUSE  
REGULATORY WORKGROUP 08.27.2015



# OVERVIEW

- **The Early Years:** 1969 / 1975 / 1981
  - Harbor Material
  - Hart Miller Island (HMI)
- **The '90's:** 1991 / 1997
  - The Deep Trough
  - Plan to Close HMI
- **2001 Dredge Material Management Act:** 2001
  - Site 104 Outcry
  - Open Water Placement
  - Defined Beneficial Use and Innovative Reuse
- **Closing Time:** 2009 / 2010
  - HMI and Poole's Island no longer receiving material
- **Where are we now?:** 2015

# THE EARLY YEARS

1969 / 1975 / 1981

## LEGISLATIVE HISTORY DREDGED MATERIAL MANAGEMENT IN MARYLAND

- **1969:** The MD legislature authorized the expenditure of \$13 M for design & construction of one or more containment areas to act as a receptacle for material dredged from the Baltimore Harbor and approach channels.
- **1975:** SB 28, Ch. 22, Acts of 1975: *Chesapeake Bay – Dumping Spoil from Dredging Operations within the Baltimore Harbor.*
  - **Legislative Declaration:** *The General Assembly declares that the Chesapeake Bay and its tributaries (within the tidewater portions thereof) are a great natural asset and resource to the state and its counties. Portions of these areas are threatened with inundation by the unconfined dumping of vast quantities of spoil from dredging operations within Baltimore Harbor. This inundation and unconfined dumping will pollute and despoil valuable portions of the bottomland in the Chesapeake Bay and its tidewater tributaries and be grossly harmful to fish and marine life in these and adjacent waters, to use for recreation, and to the economic and social life of the people of this state.*

## LEGISLATIVE HISTORY DREDGED MATERIAL MANAGEMENT IN MARYLAND

- **1975:** SB 28, Ch. 22, Acts of 1975: *Chesapeake Bay – Dumping Spoil from Dredging Operations within the Baltimore Harbor.*
  - **Defined Baltimore Harbor:** Baltimore Harbor: consists of the tidal portions of the Patapsco River and its tributaries lying westward of a line extending from Rock Point in Anne Arundel County to North Point in Baltimore County.
  - **Dumping Prohibited:** A person may not redeposit in an unconfined manner dredged material from Baltimore Harbor into or onto any portion of the water or bottomland of the Chesapeake Bay or of the tidewater portions of any of the Chesapeake Bay's tributaries outside of Baltimore Harbor. However, the dredged material may be redeposited in contained areas approved by the Department.
- **1981:** SB 977, Ch. 587, Acts of 1981: *Hart Miller Pleasure Island Chain – Redeposit of Spoil.*
  - **Baltimore County tributary spoil:** A person may not redeposit in an unconfined manner Baltimore County tributary dredged material into or onto any portion of the water or bottomland of the Chesapeake Bay or of the tidewater portions of any of the Chesapeake Bay's tributaries within 5 miles of the Hart-Miller-Pleasure Island chain in Baltimore County.
  - **Size of HMI:** May not exceed the approximately 1,100 acre size provided in the projects U.S. Army Corps of Engineers permit dated November 22, 1976.
  - **HMI Citizens Oversight Committee:** Membership and responsibilities established.
- Md. ENVIRONMENT Code Ann. § 5-1102
- Md. ENVIRONMENT Code Ann. § 5-1102 and § 5-1104

# THE '90'S

1991 / 1997

**LEGISLATIVE HISTORY  
DREDGED MATERIAL  
MANAGEMENT  
IN MARYLAND**

- **1991:** SB 152, Ch. 476, Acts of 1991: *Dredge Material – Chesapeake Bay.*
  - **The Deep Trough:** Means any region that:
    - **(I)** Is south of the Chesapeake Bay Bridge and north of a line extending westerly from Bloody Point; and
    - **(II)** Has a depth that exceeds 60 feet.
  - **Material excavated from the Bay:** A person may not dump, deposit, or scatter any earth, rock, soil, waste matter, muck or other material excavated or dredged from the Chesapeake Bay or its tidal tributaries into or onto the area of the bottomlands or waters of the Chesapeake Bay known as the Deep Trough.
- Md. ENVIRONMENT Code Ann. § 5-1102 (f)
- **1997:** SB 307, Acts of 1997: *Environment – Dredge Spoil – Hart Miller Pleasure Island.*
  - **Restriction on area for redeposit:** Subject to subparagraph (ii) of this paragraph, dredge spoil may not be deposited in the Hart-Miller Island Dredged Material Containment Facility after the first of the following to occur:
    1. The maximum height of dredge spoil deposited in the Hart-Miller Island Dredged Material Containment Facility reaches:
      - A. 44 feet above the mean low water mark in the north cell; and
      - B. 28 feet above the mean low water mark in the south cell; or
    2. January 1, 2010.
  - (ii) New dredge spoil dredged from a channel may not be deposited in the south cell.
- **Uncodified language:** MDOT and DNR in consultation with Baltimore County will host public meetings to receive input on the development of the HMI DMCF as a wildlife and passive recreation area.
- Md. ENVIRONMENT Code Ann. § 5-1103

# 2001 DREDGE MATERIAL MANAGEMENT ACT

SITE 104 / OPEN WATER PLACEMENT / BENEFICIAL USE &  
INNOVATIVE REUSE

**LEGISLATIVE HISTORY**  
**DREDGED MATERIAL**  
**MANAGEMENT**  
**IN MARYLAND**

- **Site 104 Outcry and Open Water Placement (1999/2000)**
- **2001 Dredge Material Management Act (DMMA)**
  - SB 830, Ch. 627, Acts of 2001: *Environment – Dredge Material Management Act of 2001*.
    - Replaces the word “spoil” with “dredged material”
    - **Definitions:**
      - **Beneficial Use of dredged material:** means any of the following uses of dredged material from the Chesapeake Bay and its tributary waters placed into waters or onto bottomland of the Chesapeake Bay or its tidal tributaries, including Baltimore Harbor:
        - (i) The restoration of underwater grasses;
        - (ii) The restoration of islands;
        - (iii) The stabilization of eroding shorelines;
        - (iv) The creation or restoration of wetlands; and
        - (v) The creation, restoration, or enhancement of fish or shellfish habitats.
- Md. ENVIRONMENT Code Ann. § 5-1101

LEGISLATIVE HISTORY  
DREDGED MATERIAL  
MANAGEMENT  
IN MARYLAND

- **2001 Dredge Material Management Act (DMMA)**
  - SB 830, Ch. 627, Acts of 2001: *Environment – Dredge Material Management Act of 2001*.
    - **Definitions:**
      - **Innovative reuse:** includes the use of dredged material in the development or manufacturing of commercial, industrial, horticultural, agricultural, or other products.
    - **Redeposit of dredged material:** A person may not redeposit in an unconfined manner dredged material into or onto any portion of the water or bottomland of the Chesapeake Bay or of the tidewater portion of any of the Chesapeake Bay's tributaries except when used for a beneficial use project undertaken in accordance with State and federal laws. However, the dredged material may be redeposited in contained areas approved by the Department. (*exception: phase out of Poole's Island*)
  - Md. ENVIRONMENT Code Ann. § 5-1102

**LEGISLATIVE HISTORY**  
**DREDGED MATERIAL**  
**MANAGEMENT**  
**IN MARYLAND**

- **2001 Dredge Material Management Act (DMMA)**
  - SB 830, Ch. 627, Acts of 2001: *Environment – Dredge Material Management Act of 2001*.
    - **Pooles Island phase out:** (1) Beginning October 1, 2001, subject to paragraph (2) of this subsection, and in accordance with State and federal law, a person may redeposit up to 7.4 million cubic yards of dredged material into or onto any portion of the water, bottomland, or the tidewater portions of the Chesapeake Bay collectively known as Pooles Island, including G-West and Site 92.
      - (2) The redeposit of dredged material authorized under this subsection may not occur after the sooner of:
        - (i) December 31, 2010; or
        - (ii) The initiation of the placement of dredged material in any site or sites approved pursuant to the process established in § 5-1104.2(d)(1) of this subtitle if the total capacity of the approved site or sites, when combined with the approved capacity of existing placement sites identified in the October 1, 2000 report to the Maryland General Assembly regarding the Governor's Strategic Plan for Dredged Material Management, provide 20 years of placement capacity for dredged material.

LEGISLATIVE HISTORY  
DREDGED MATERIAL  
MANAGEMENT  
IN MARYLAND

- **2001 Dredge Material Management Act (DMMA)**
  - SB 830, Ch. 627, Acts of 2001: *Environment – Dredge Material Management Act of 2001*.
  - **Prioritized placement options**
  - **Establishment of the DMMP Executive Committee**
    - Responsibilities: The Executive Committee shall:
      - Review and recommend to the Governor elements, as part of a continuous and long-term strategic plan for dredged material management, including changes to the plan; and
      - Review and recommend to the Governor dredged material disposal sites for long-term dredged material placement capacity **based on the following hierarchy**:
        - (i) Beneficial use and innovative reuse of dredged material;
        - (ii) Upland sites and other environmentally sound confined capacity;
        - (iii) Expansion of existing dredged material disposal capacity other than the Hart-Miller Island Dredged Material Containment Facility and areas collectively known as Pooles Island, including G-West and Site 92; and
        - (iv) Other dredged material placement options to meet long-term placement needs, except for redepositing dredged material in an unconfined manner.

# CLOSING TIME

2009 / 2010

LEGISLATIVE HISTORY  
DREDGED MATERIAL  
MANAGEMENT  
IN MARYLAND

- **2009**

- December 31, 2009:  
Closure date for **Hart  
Miller Island** (no  
longer receiving  
dredged material)

- **2010**

- December 31, 2010:  
Closure date for  
**Pooles Island** open  
water placement site  
(no longer receiving  
dredged material)

# WHERE ARE WE NOW?

2015

# DREDGED MATERIAL PLACEMENT IN MARYLAND

- Harbor material is defined as material dredged west of a line from North Point to Rock Point.
- Ban on Open Water placement of Dredged Material.
  - EXCEPTION: For Beneficial Use Projects.
    - *Specification:* Harbor material used for a Beneficial Use project must be within the Baltimore Harbor only.
      - Harbor material must be confined if placed outside of the Baltimore Harbor.
- ▶ No confined dredged material placement sites within 5 miles of Hart Miller Island (HMI) in Baltimore County.
- ▶ No dredged material from anywhere can be redeposited in the “Deep Trough”.
- ▶ Federal standard: least costly, environmentally acceptable alternatives.

# DREDGED MATERIAL MANAGEMENT IN MARYLAND: LOOKING AHEAD AND NEXT STEPS

- **2015:** Revised Innovative & Beneficial Reuse Strategy
  - **Regulatory Action Plan and Interagency Workgroup**
    - Working within the existing statutory limits, how can we better facilitate greater opportunities for the innovative reuse and beneficial use of material dredged from the Baltimore Harbor?
      - Planning ahead with the following in mind: capacity constraints, the time it takes to identify placement options and the recommendations of the DMMP Committees and stakeholders.
      - The need for regulatory clarity and a pathway forward is critical if we are going to ensure the long-term availability of socially, technically, economically and environmentally acceptable capacity options.

ANY QUESTIONS?

THANK YOU

**Final Report**  
**Innovative and Beneficial Reuse**  
**Regulatory Workgroup**

**Appendix 5: Coal Combustion By-Product (CCB) Regulation**  
Process in Maryland – PowerPoint Presentation

# Development of MDE Coal Combustion Byproduct (CCB) Regulations

DMMP Inter-Agency Regulatory Work Group Meeting

August 27, 2015

# Potential Applicability to Dredged Material Beneficial & Innovative Reuse Policies

- Why is the management of CCBs potentially similar to dredged material?
- Background on MDE CCB regulatory development process—what were the drivers?
- Regulatory model used in developing regulations
- Review of existing regulatory programs in other states
- Disposal versus beneficial use
- Stakeholder engagement important for understanding and buy-in

# CCB Regulatory Model

- Develop disposal regulations first, then beneficial use
- Disposal regulations final November 21, 2008
- Beneficial use regulations pending development
- Conceptual approach for beneficial use was “permit by rule”

# Stakeholder Engagement

- Need to develop approach/strategy for engaging stakeholders important
- Existing DMMP stakeholders can aid in engaging others
- New constituencies/stakeholders may arise
- Outreach and education on why beneficial use/innovative reuse is good and can be done in a manner protective of human health & the environment
- Seek input from industry on regulatory/policy challenges

## Risks/Benefits of Reviewing Policies

- Administration's Regulatory Reform Commission (Executive Order 01.01.2015.20)
- Maryland Climate Action Plan – Waste Management / Advanced Recycling
- Potential revisit of current “disposal” requirements
- Use the policy review effort to reinforce that the DMMP is at a critical juncture
- Potentially, policy changes could bring new supporters to beneficial use/innovative reuse

**Final Report**  
**Innovative and Beneficial Reuse**  
**Regulatory Workgroup**

**Appendix 6: Overview of Process for Development of**  
Regulations for Composting Facilities  
Summary Document

## Composting Workgroup: Stakeholder Engagement Process

### Background on Issue

- We're seeing increasing interest in composting, especially food composting.
- Significant yard waste composting has existed in Maryland for decades. Food composting has been much less common. Currently three facilities composting food, two of which are local government pilots of limited scale.
- Food is a large portion of the waste stream - local governments and businesses have started to look increasingly at ways to divert it from disposal.
- Composting has environmental benefits - reduces organic material going to landfills, reducing GHG emissions.
- Some past attempts at food composting unsuccessful due to environmental and nuisance problems. Primary issues have been odors and surface or groundwater pollution from runoff that has contacted raw or active material.
- Received feedback that existing laws and regulations potentially applicable to composting were confusing - spread across MDE's air, water, solid waste. MDA regulates the finished product and certifies operators.
- Composting potentially fell within refuse disposal permit and solid waste regulations. Not a good fit for composting facilities - few composting-specific requirements, lack of flexibility (no general permit must be in County's solid waste management plan prior to issuance of a permit).
- MDE's goal was to address environmental issues that led to past facility failures, while still supporting growth in the industry. Regulated community wanted more certainty about what is required for composting facilities.

### Legislation

- 2011 legislation required the Department, in consultation with MDA and MES, to study laws and regulations affecting composting and recommend ways to promote composting in the State. (HB 817)
- The bill did not specifically require a workgroup, but MDE sought to obtain broader stakeholder input.

### Workgroup

- Convened in May 2012.
- 33 external workgroup members: local governments; private composters; local and national solid waste trade associations; composting trade association; MES; MDA; composting experts from UMD, USDA, and private consulting firms; environmental organizations; EPA Region 3, etc.
- 8 MDE members (water, air, solid waste, recycling, AG's office)
- 15-20 interested parties who attended some meetings but were not official workgroup members.
- Held 8 meetings, one per month, May through December 2012.
  - Meeting 1: gathered list of topics workgroup members wanted to discuss, and put them into categories
  - Meeting 2: MDE presentations on existing law and regulations
  - Meeting 3: Other states' presentations (5 states presented by phone)
  - Rest of meetings: worked through discussion list, and had the two subgroups report out on their respective topics

- Broke out two subgroups to consider some of the issues more thoroughly:
  - Technical subgroup (regulatory issues) – 19 people
  - Education and outreach subgroup – 10 people
- Subgroups developed draft recommendations, and then sent back to the full workgroup for discussion.
- Detailed meeting minutes used to draft the discussion sections of final workgroup report.
- Draft was distributed by e-mail; we took written comments, and then reserved the last meeting to discuss remaining issues in person.

### **Technical Subgroup & Regulations Development**

- Technical subgroup (TS) met 4 times during the workgroup.
- After workgroup ended, the TS continued to meet to develop the regs - additional 7 times through September 2013. Internal meetings between the TS meetings.
- Full workgroup made regulatory recommendations - guided the process of regs development for the TS.
  - Legislation: exclude materials being properly composted from definition of “solid waste” and authorize MDE to adopt new composting-specific regs. (passed in 2013).
  - Adopt tiered standards for different facilities based on risks of different types of composting
  - Use U.S. Composting Council model rules as a starting point
- Process in the TS:
  - Drew off of other states’ regs (~ 20 states that had recently or were revising composting regs)
  - Reviewed studies about key issues (control of runoff, composting pad) to the extent available
  - Reviewed USCC model rules – had a person on the USCC task force participate in our TS
  - Sent out a revised draft before each meeting, and worked through any issues.
- The biggest issues were the standards that were intended to protect water quality but that were potentially the most expensive to the industry - impermeable pad and management of “contact water.”
- Used tiered requirements to come up with a system where only higher risk facilities require these things, and only for certain phases of the composting process that are most problematic (i.e. raw feedstock receiving and active composting).
- Could not completely prevent multiple requirements across different parts of MDE – stormwater permitting, for example, required under federal law. For clarity, referenced these other requirements in the new regs to put people on notice. Guidance document on website describes all MDE and MDA requirements applicable to composting facilities; will continue to improve it as questions arise.
- Finished draft regs in September 2013. Sent the draft back out to all former workgroup members for final input. Proposed regs in January 2014.
- Received comments from some nursery and other agricultural operators. Sought additional input, made changes to on-farm composting exemptions, and proposed a revised version in December 2014.
- Regs effective July 2015.

### **Lessons Learned**

- Things that worked well:
  - Starting with a larger workgroup, and then dividing into subgroups.
  - Full workgroup provided diversity of opinion ensured all stakeholders are represented. Also ensured we had the technical expertise we needed.
  - Subgroups allowed for self-selection of the people willing & able to devote more time and effort.

- Able to get consensus on broader recommendations in the workgroup report, and then hammer out the details in a smaller group. Would have been hard to get into the weeds with actual regs development in the full 40-person workgroup.
- Informal – no voting; allowed non-members to speak. More conducive to open discussion, but may be less possible where there are significant time constraints.
- Useful to review other states’ regs and USCC model.
- Detailed meeting minutes were crucial, also helped in justifying certain provisions after the regs were proposed.
- Useful to have the practical, industry perspective – people, who are actually doing composting, not just regulators. Also needed to have all the regulators present to get on the same page and avoid duplication. Active participation by MDE and MDA.
- Addressed some of the procedural issues. Industry wanted a general permit, faster, more streamlined process.
- Tried to include flexibility to account for the fact that we can’t predict everything people will want to do – list of feedstocks is open-ended; provisions for variances and pilot approvals.
- Challenges:
  - With smaller subgroup, harder to ensure that all relevant viewpoints are represented.
  - Ended up needing more input from agricultural sector after the regs were initially proposed.
  - Easier to edit draft regulations before they have been proposed than to change them after they have been proposed. Re-proposing the regulations with changes added significant time to the process.
  - Significant time commitment needed from MDE and stakeholders.
    - Did not come in with MDE draft regulations and then solicit feedback. Started from scratch and then essentially wrote the regulations as a group, as we went along.
    - Wanted to take the time to research and collect stakeholder input to get it right the first time.
    - Worked out because we had the staff to devote to it; stakeholders were willing to devote time and attention, remain engaged for 1.5 years.
    - Important to stay on topic when starting from open ended position – used agendas for each meeting.

# **Final Report**

## **Innovative and Beneficial Reuse Regulatory Workgroup**

**Appendix 7:** Overview of the Independent Technical Review  
Team (ITRT) Sediment Quality in Baltimore Harbor Report, 2009  
- PowerPoint Presentation

# 2009 Sediment in Baltimore Harbor Report and Current Regulations

Innovative and Beneficial Reuse Regulatory  
Workgroup

October 15, 2015

# OVERVIEW

- MDE regulations for soil clean-up
- 2009 Sediment in Baltimore Harbor report
  - Metals concentrations in soils relative to regulations
  - Recommended modification to criteria for some metals
- 2014 USGS report on metals in soils
- MDE “Anticipated Typical Concentrations”
- Sediment in Baltimore Harbor report recommendations for metals in sediment/soil

# Maryland Department of the Environment

## Cleanup Standards for Soil and Groundwater Interim Final Guidance June 2008

[http://www.mde.maryland.gov/assets/document/final%20update%20no%202.1%20dated%205-20-08\(1\).pdf](http://www.mde.maryland.gov/assets/document/final%20update%20no%202.1%20dated%205-20-08(1).pdf)

# MDE Interim Guidance

- Establishes Cleanup Standards for hazardous substances in soil and groundwater.
- Based on land use (e.g. Residential, Non-Residential)
- Considered as guidance
- Standards for various substances as concentration levels (e.g. mg/kg)

# SEDIMENT IN BALTIMORE HARBOR



## *Quality and Suitability for Innovative Reuse*

An Independent Technical Review

October 2009

# Metals Concentration in Sediments

“...the Maryland criteria for some of the metals ... for residential and non-residential soil clean-up are lower than the concentrations characteristic of natural materials, such as average soils. This may be overly restrictive in the context of innovative reuse...” (p. 33)

# Independent Technical Review Team (ITRT)

The ITRT developed a modified set of criteria which they recommended be used for the metals arsenic, chromium, cobalt, and vanadium.

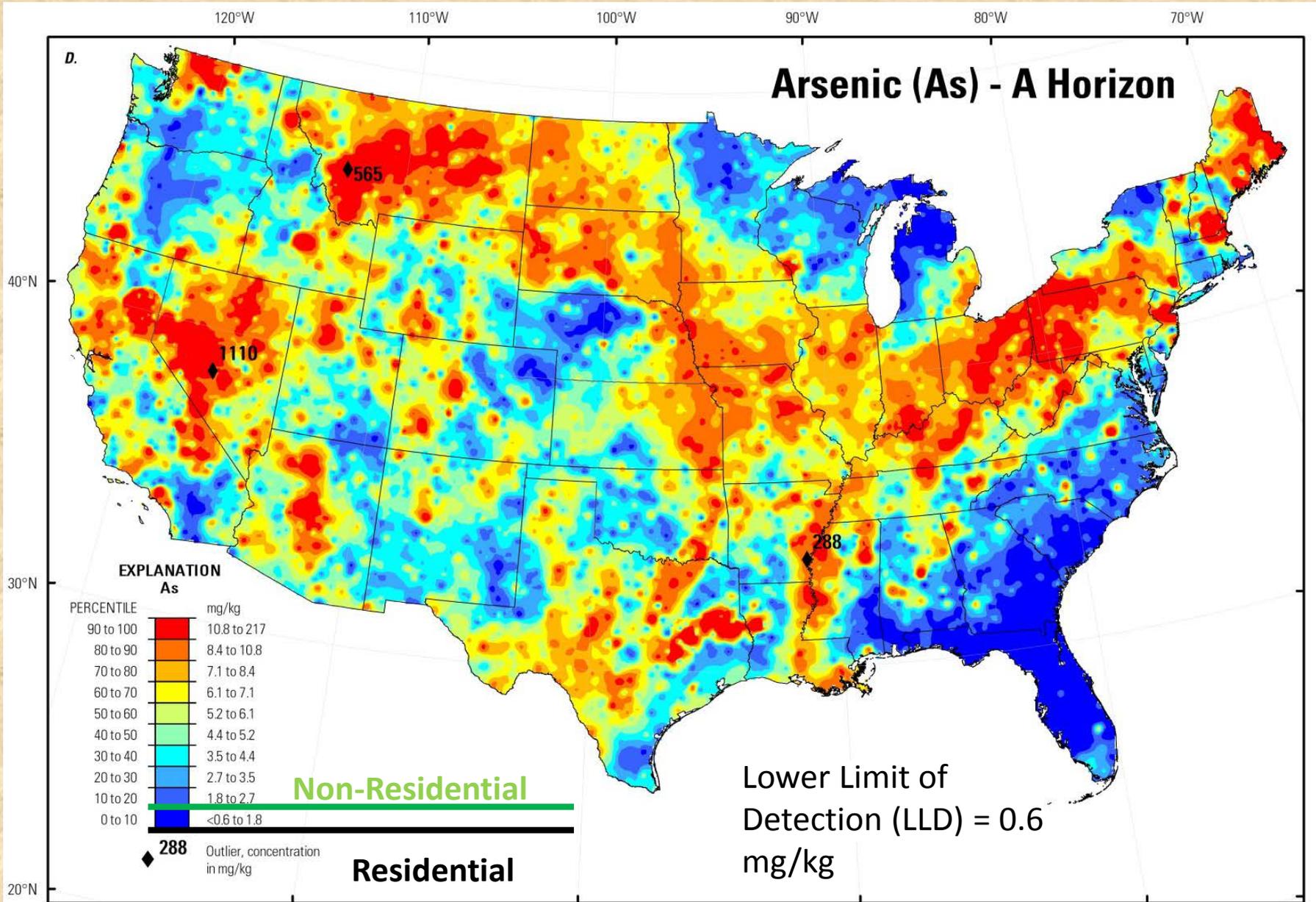
The modifications were based on natural abundances in soils, rocks and riverine sediments, and soil criteria in use in New Jersey and EPA region 3.

Shown on Table 6 (page 59), included here for reference

	Al	Sb	As	Ba	Be	Cd	Cr	Co	Cu	Fe	Pb	Mn	Hg	Ni	Se	Ag	Tl	Sn	V	Zn
<b>Standards</b>																				
MD Residential Clean up	7800	3.1	0.43	1600	16	3.9	23		310	5500	400	160	2.3	160	39	39	.55	4700	7.8	2300
MD Non-Residential Clean up	100000	41	1.9	20000	200	51	310		4100	72000	1000	2000	31	2000	510	510	7.2	61000	100	31000
NJ Residential Soil Clean up	NA	14	20	700	1	1	NA	NA	600	NA	400	NA	14	250	63	110	2		370	1500
NJ Residential Direct Contact Soil Rem.	78000	31	19	16000	16	78		1600	3100		400	11000	23	1600	390	390	5		78	23000
NJ Non-Residential Soil Clean up		340	20	47000	1	100	NA	NA	600	NA	600	NA	270	2400	3100	4100	2		7100	1500
NJ Non-Residential Direct Contact Soil Rem.	NA	450	19	59000	140	78		590	45000		800	5900	65	23000	5700	5700	79		1100	110000
EPA Region 3 Industrial Soil RBC's		40.9	1.91		204.4	51.1	306.6		4088	30600	1000	2044	30.66	2044	511	511	7.15	61320		30660
<b>Natural Abundances</b>																				
Continental Rocks	69300	0.96	7.9	455	1	0.2	71	13	32	35900	16	720		49	0.5	0.07	1	2	97	127
Soils	71000	1	6	500		0.35	70	8	30	40000	35	1000	.1	50		0.05			90	90
Riverine Suspended Sediments	94000	1	5	600		1	100	20	100	48000	100	1050	.1	90		0.07			170	250
<b>Marine Sed. Quality Standards</b>																				
TEL			7.24			.68	52.3		18.7		30.24		0.13	15.9		0.73				124
PEL			41.6			4.21	160.4		108.2		112.18		0.696	42.8		1.77				271
<b>ITRT Criteria</b>																				
<b>ITRT TEL</b>			<b>7.24</b>			<b>0.68</b>	<b>70</b>		<b>30</b>		<b>30</b>		<b>0.13</b>	<b>50</b>		<b>0.73</b>		<b>0.048</b>		<b>124</b>
Residential		3.1	20		16	3.9	70	8	310		400		2.3	160	39	39	0.55	4700	90	2300
Non Residential		41	20		200	51	310	8	4100		1000		31	2000	510	510	7.2	61000	100	31000
Exceeds Non-Residential Use		>41	>20		>200	>51	>310	>8	>4100		>1000		>31	>2000	>510	>510	>7.2	>61000	>100	>31000

<b>STANDARDS</b>	<b>Arsenic</b>	<b>Chromium</b>
MD Residential	0.43	23
MD Non-residential	1.9	310
<b>NATURAL ABUNDANCES</b>		
Continental Rocks	7.9	71
Soils	6	70
River Suspended sediments	5	100
<b>ITRT Criteria</b>		
Residential	20	70
Non-residential	20	310

From: Sediments in Baltimore Harbor, 2009; Table 6 (page 59)  
All values in mg/kg equivalent to ppm

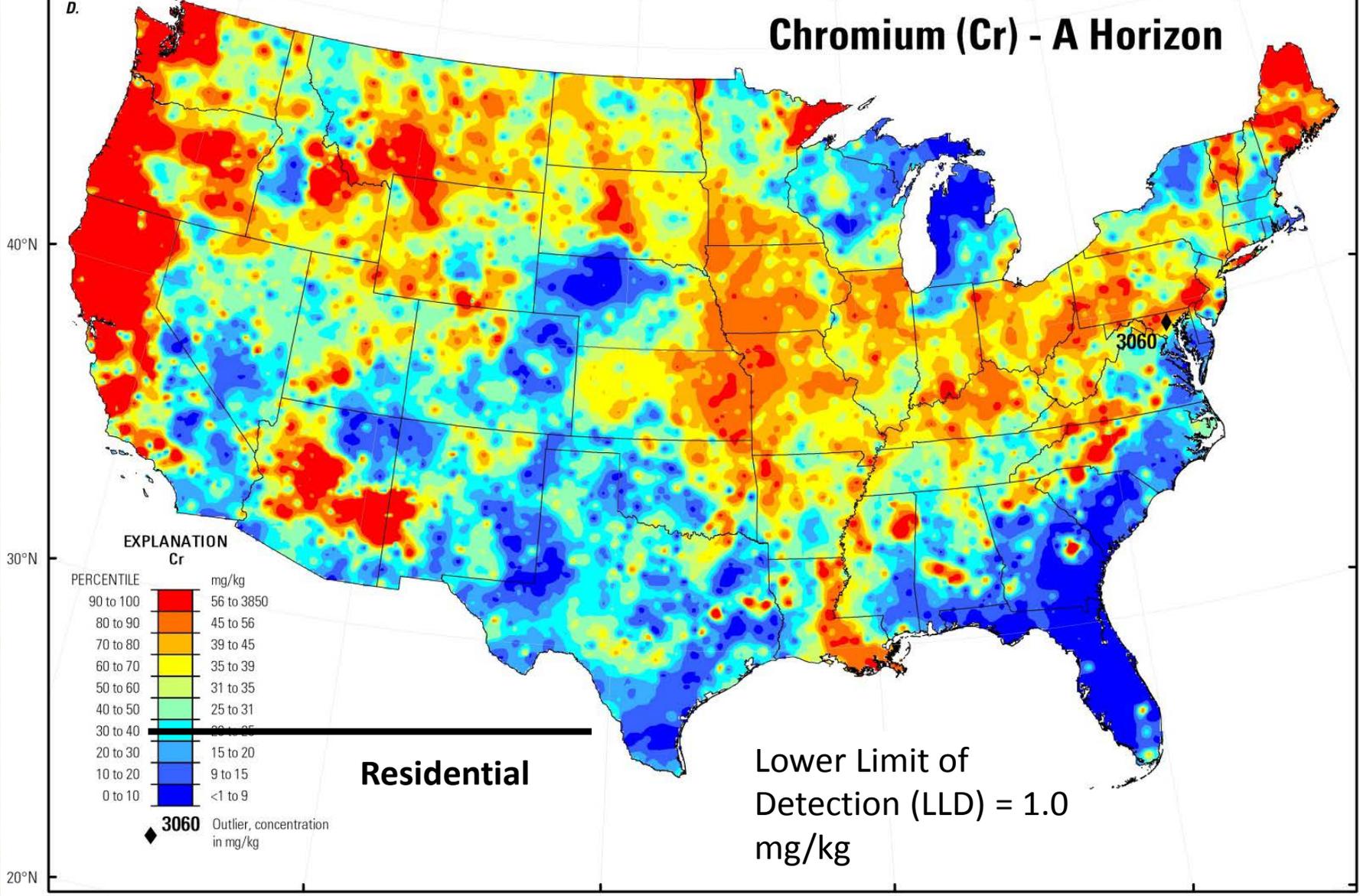


From: Smith, D.B., Cannon, W.F., Woodruff, L.G., Solano, Federico, and Ellefsen, K.J., 2014, Geochemical and mineralogical maps for soils of the conterminous United States: U.S. Geological Survey Open-File Report 2014-1082, 386 p., <http://dx.doi.org/10.3133/ofr20141082>

120°W 110°W 100°W 90°W 80°W 70°W

D.

# Chromium (Cr) - A Horizon



# MDE Interim Guidance Clean-up to Background

“One remediation approach commonly considered is clean up to “background.” Many regulatory agencies define “background” as the concentration of a hazardous substance, if any, existing in the environment at the site prior to the release of a hazardous substance. The establishment of “background” as a cleanup standard results in the necessity of determining the concentration of a chemical prior to any releases. This approach is particularly significant when cleanup standards are being developed for naturally occurring metals and trace elements that are present in the soil.” (p. 46)

Resulted in a MD study which identified “Anticipated Typical Concentration” values for various metals and trace elements. This is also a part of the Interim Final Guidance document.

<b>STANDARDS</b>	<b>Arsenic</b>	<b>Chromium</b>
MD Residential Anticipated Typical Concentration (ATC)	0.43	23
Eastern Region	3.6	28
Central Region	4.9	30
Western Region	1.1	42
MD Non-residential	1.9	310
<b>ITRT Criteria</b>		
Residential	20	70
Non-residential	20	310

ATC values from State of MD, Department of the Environment, clean-up standards for soil and groundwater; interim final guidance; June 2008; page 47  
All values in mg/kg

# Harbor Sediment Samples Below Reference Criteria

Standards	Arsenic	Chromium
MD Residential	0.0%	9.6%
MD Non-Residential	5.8%	87.5%
ITRT Recommended Residential	54.0%	32.0%
ITRT Recommended Non-Residential	54.0%	87.0%
MD ATC-Eastern	12.0%	8.1%
MD ATC-Central	15.7%	13.8%
MD ATC-Western	0.9%	43.1%

# ITRT Recommendation Regarding Metals

- Where the natural background level is higher than the MD soil standard: “the team felt that it was necessary to develop alternate criteria..” (p. 41)

# Alternate Criteria?

- Some Thoughts
- Change the MDE Cleanup Standards for Soil (2008)
  - Could specifically recommend the ITRT suggested criteria for some metals
- Develop new guidance specifically for dredged sediments only
- Other?

Questions?

**Final Report**  
**Innovative and Beneficial Reuse**  
**Regulatory Workgroup**

**Appendix 8:** Maryland Environmental Service (MES) Sediment  
Quality Database – PowerPoint Presentation

# Sediment Quality Database

Innovative and Beneficial Reuse Regulatory Workgroup  
December 10, 2015

# Overview

- What is the Sediment Quality Database?
- Overall physical and chemical characteristics of the Harbor sediment and the parameters of concern based on standards.
- “New Work” and Channel material comparison
- Quality of the existing material in Cox Creek DMCF
- Existing potential uses flowchart



# Sediment Quality Database

- Initially completed for “Sediment In Baltimore Harbor” report finalized in 2009
- Available ‘suitable’ Harbor sediment datasets for metals/organics compiled into database (Appendix A1 of Sediment Report lists datasets used)
  - USACE sampling, bulk sediment, DMCF exterior
- Most Harbor data is from the Federal navigation channel sampling; evaluation of the dredged material is required to ensure it is placed appropriately.
- Additional datasets were added to initial Sediment Quality Database, since 2009, to assist with classifying dredged material for future innovative reuse/beneficial use

K135

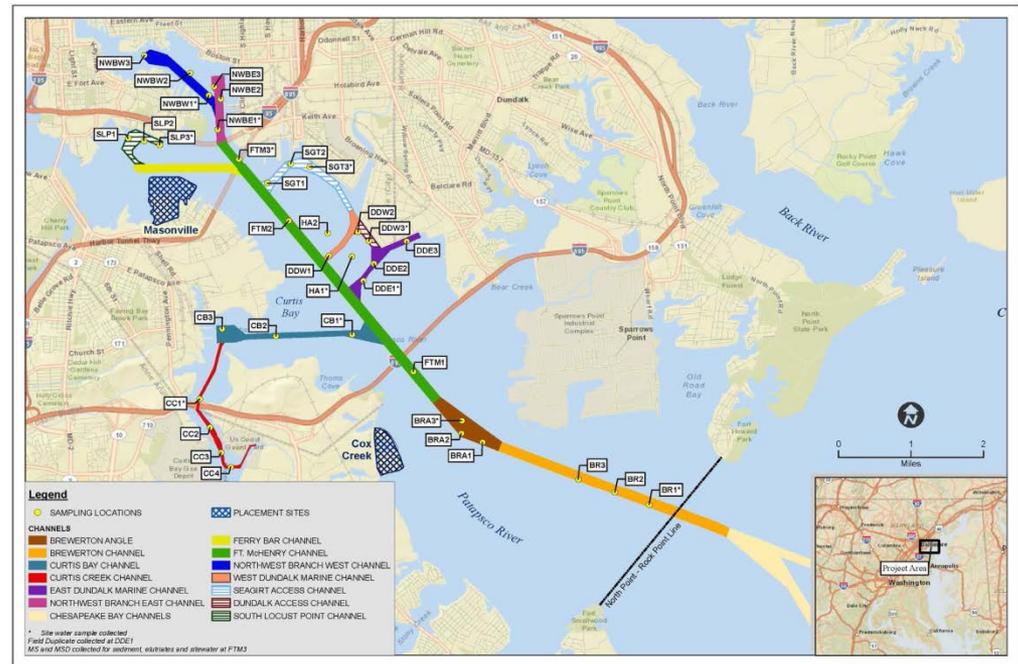
	C	D	E	F	G	H	I	K	L	M	N	O	P	Q	R	S	T	U	V	W
1				<b>Soil Standards:</b>	<b>Aluminum</b>	<b>Antimony</b>	<b>Arsenic</b>	<b>Beryllium</b>	<b>Cadmium</b>	<b>Chromium</b>	<b>Copper</b>	<b>Iron</b>	<b>Lead</b>	<b>Manganese</b>	<b>Mercury</b>	<b>Nickel</b>	<b>Selenium</b>	<b>Silver</b>	<b>Thallium</b>	<b>Tin</b>
2				<b>Threshold Effect Levels (TEL)</b>		1.0	7.2		0.7	70.0	30.0		30.0		0.13	50.0		0.7		0.048
3				<b>MD Residential Clean-up</b>	7800.0	3.1	0.4	16.0	3.9	23.0	310.0	5500.0	400.0	160.0	2.3	160.0	39.0	39.0	0.6	4700.0
4				<b>MD Non-Residential Clean-up</b>	100000.0	41.0	1.9	200.0	51.0	310.0	4100.0	72000.0	1000.0	2000.0	31.0	2000.0	510.0	510.0	7.2	61000.0
5				<b>Metals</b>	<b>(mg/kg)</b>															
6	<b>Easting</b>	<b>Year</b>	<b>Study</b>	<b>Station/Sample Number</b>	<b>Aluminum</b>	<b>Antimony</b>	<b>Arsenic</b>	<b>Beryllium</b>	<b>Cadmium</b>	<b>Chromium</b>	<b>Copper</b>	<b>Iron</b>	<b>Lead</b>	<b>Manganese</b>	<b>Mercury</b>	<b>Nickel</b>	<b>Selenium</b>	<b>Silver</b>	<b>Thallium</b>	<b>Tin</b>
78	445074.4		FED02	BR-COMP-SED		0.8	17.8		0.970	78.0	52.8		72.9		0.27	44.8	1.4	0.9	2.0	16.8
79	447518.1		FED02	BR-1		0.7	16.9		0.410	69.5	45.4		69.1		0.25	42.8	2.9	0.9	2.0	15.3
80	445074.4		FED02	BR-2		0.6	15.9		0.510	68.1	49.7		62.8		0.22	46.0	1.5	0.7	2.9	13.6
81	444031.7		FED02	BR-3*		0.8	17.2		0.490	93.6	55.6		77.3		0.32	39.3	1.8	0.8	2.9	19.2
82	442165.5		FED02	BRA-COMP-SED		0.7	18.4		0.210	99.7	58.8		77.0		0.30	36.6	1.6	0.9	2.9	21.4
83	442891.2		FED02	BRA-1		0.8	20.1		0.360	120.0	70.6		89.7		0.38	42.5	2.1	0.9	3.5	27.0
84	442165.5		FED02	BRA-2		0.7	20.4		0.170	107.0	63.6		83.7		0.30	40.0	2.4	1.0	3.6	21.7
85	442079.5		FED02	BRA-3*		0.8	19.6		0.250	98.9	61.7		81.5		0.27	40.3	2.1	1.0	1.9	20.9
86	438384.1		FED02	CB-COMP-SED		0.9	31.0		0.960	149.0	105.0		107.0		0.56	39.2	4.2	0.7	1.7	25.7
87	439972.5		FED02	CB-1		0.7	17.4		0.390	104.0	57.8		70.2		0.29	30.3	2.3	0.8	1.7	17.9
88	438384.1		FED02	CB-2		1.2	32.8		0.720	180.0	125.0		121.0		0.49	41.3	3.6	0.8	3.2	28.0
89	436939.1		FED02	CB-3*		0.6	26.2		0.540	73.9	73.6		62.7		0.41	23.9	2.9	0.1	1.9	11.8
90	436388.9		FED02	CC-COMP-SED		1.3	54.1		1.400	165.0	285.0		218.0		0.93	42.1	5.3	0.2	4.2	37.1
91	436722		FED02	CC-1		1.3	63.9		1.600	182.0	237.0		220.0		0.94	39.2	4.9	0.2	4.2	42.9
92	436388.9		FED02	CC-2*		1.2	67.5		0.083	195.0	268.0		225.0		1.10	42.6	5.2	0.1	4.7	39.8
93	436520.6		FED02	CC-3		1.3	47.7		1.200	153.0	304.0		219.0		0.93	41.2	3.9	0.3	4.2	35.4
94	437220.3		FED02	CC-4		1.0	37.7		1.200	94.1	303.0		161.0		0.67	31.9	3.9	0.3	2.8	21.3
95	435081		FED02	FB-COMP-SED		0.9	17.2		1.000	119.0	120.0		92.4		0.38	35.3	3.0	0.7	2.4	19.1
96	435940.3		FED02	FB-1		0.9	18.6		1.100	132.0	130.0		101.0		0.40	41.1	3.8	0.8	1.9	20.8
97	435081		FED02	FB-2*		0.8	18.4		1.000	112.0	132.0		95.6		0.38	33.4	2.9	0.8	3.8	17.2
98	438812.1		FED02	FTM-COMP-SED		0.7	16.9		0.640	97.4	63.0		61.3		0.31	30.5	2.3	0.6	2.5	16.8
99	440934.7		FED02	FTM-1		0.5	20.4		0.800	108.0	56.9		64.5		0.23	32.2	3.3	0.5	1.9	17.2
100	438812.1		FED02	FTM-2		0.8	23.0		1.400	151.0	98.5		101.0		0.42	40.9	3.8	0.9	1.9	25.4
101	437475.9		FED02	FTM-3*		0.7	20.9		1.100	125.0	81.6		82.8		0.31	34.1	3.5	0.7	1.2	22.2
102	437525.2		FED02	HA-COMP-SED		0.8	19.4		1.400	160.0	115.0		97.6		0.37	39.4	3.1	0.9	3.5	21.6
103	438671.8		FED02	HA-1*		0.9	20.7		1.700	176.0	138.0		111.0		0.43	39.3	2.9	1.0	1.8	24.9
104	437525.2		FED02	HA-2		0.9	22.8		1.600	181.0	129.0		108.0		0.38	43.6	4.2	0.9	3.1	24.1
105	436692.1		FED02	NWBE-COMP-SED		1.6	29.3		1.600	215.0	292.0		172.0		0.64	41.4	28.4	4.9	4.0	25.5
106	437140.8		FED02	NWBE-1		1.1	19.0		1.100	128.0	123.0		97.2		0.41	33.2	2.7	0.9	2.4	20.4
107	436692.1		FED02	NWBE-2		0.9	18.8		1.100	143.0	147.0		111.0		0.56	35.0	4.7	1.1	2.8	21.3
108	436793.8		FED02	NWBE-3*		3.2	57.0		0.125	412.0	730.0		344.0		1.20	51.3	93.5	18.1	2.8	28.6
109	435800.2		FED02	NWBW-COMP-SED		0.9	17.3		1.500	209.0	194.0		126.0		0.39	45.1	6.1	1.6	2.1	16.9
110	435026.8		FED02	NWBW-1																
111	435800.2		FED02	NWBW-2		0.7	5.5		0.330	68.3	43.0		21.7		0.24	40.0	2.0	0.1	1.5	7.5
112	435140.8		FED02	NWBW-3*		1.0	21.9		2.200	346.0	269.0		196.0		0.88	41.2	5.8	1.8	1.5	19.8

# Harbor Sediment Characteristics & Parameters of Concern

- Metals findings in 2009 Sediment Quality Report:
  - No sample set lower than threshold effects level (TEL)
  - Using modified set of criteria - 9% of samples for residential use; 43% for non-residential use; 48% exceeded non-residential use
- Metals findings in updated Sediment Quality Database:
  - No sample set lower than TEL
  - Using MD Soil Cleanup Standards - 0% of samples for residential use or non-residential (48% if use modified for non-residential)
  - Arsenic is the reason 0% met the standard, followed by chromium
    - As - Min – 5.5 mg/kg; Max – 76.4 mg/kg; Mean – 24.9 mg/kg
    - Cr - Min – 43.4 mg/kg; Max – 1060 mg/kg; Mean – 154 mg/kg
- Organics – Similar to Report findings: 43% met residential use, benzo(a)pyrene was the main reason non-residential not met

# Channel vs. New Work

- Metals had more exceedances for non-residential in new work than channel
  - Arsenic, Chromium, Manganese, Thallium, Lead, Cadmium, Copper
- Organics had more exceedances for non-residential in new work than channel
  - Benzo(a) pyrene

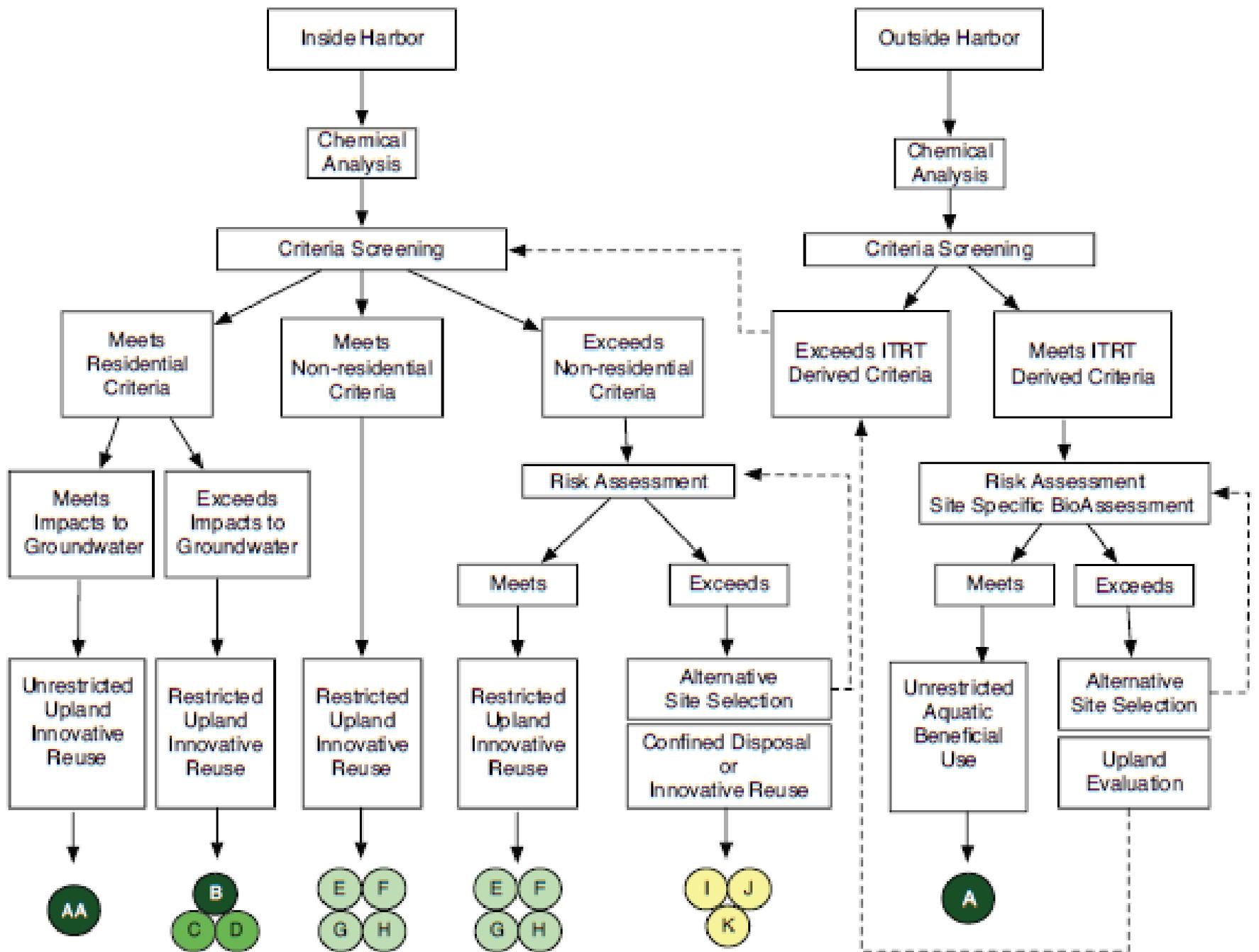


# Cox Creek DMCF Sediment Characteristics

- Samples collected from interior of DMCF
- Limited dataset (56 samples) for metals, however one 2008 sampling event met non-residential standards for 12 samples for arsenic, and no other metals exceeded non-residential
- Benzo(a)pyrene and dibenzo(a,h)anthracene had exceedances for organics. Organics sampling was a very limited dataset.

# Sediment Uses Flowchart

- Based on MD Soil Cleanup Standards, arsenic would send majority of samples to a risk assessment for exceeding non-residential standards, using Report flowchart
- Based on limited dataset, interior Cox Creek DMCF follows similar pattern.



# Moving Forward...

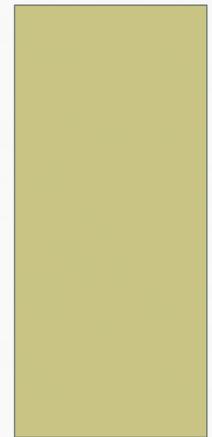
- The Sediment Quality Database provides a snapshot of what the chemical and physical characteristics will likely be in the Harbor material.
- Ranges for each of the metals and organics from the Harbor channel samples for use by the Technical Subcommittee for further discussion and narrowing in/focusing on suitable criteria, and knowing what metals and organics may be a concern.

**Final Report**  
**Innovative and Beneficial Reuse**  
**Regulatory Workgroup**

**Appendix 9: New Jersey Beneficial Use Policies Overview –**  
PowerPoint Presentation

**BENEFICIAL USE OF DREDGED MATERIAL  
POLICY AND PRACTICE  
IN NEW JERSEY**

INNOVATIVE & BENEFICIAL REUSE  
REGULATORY WORKGROUP 09/24/2015



# NJ BENEFICIAL USE OVERVIEW

- What Happens to Dredged Material in NJ?
- Office of Dredging & Sediment Technology (ODST)
- Permitting Requirements
- Acceptable Use Determination
- Contaminated Dredged Material
- Example Projects

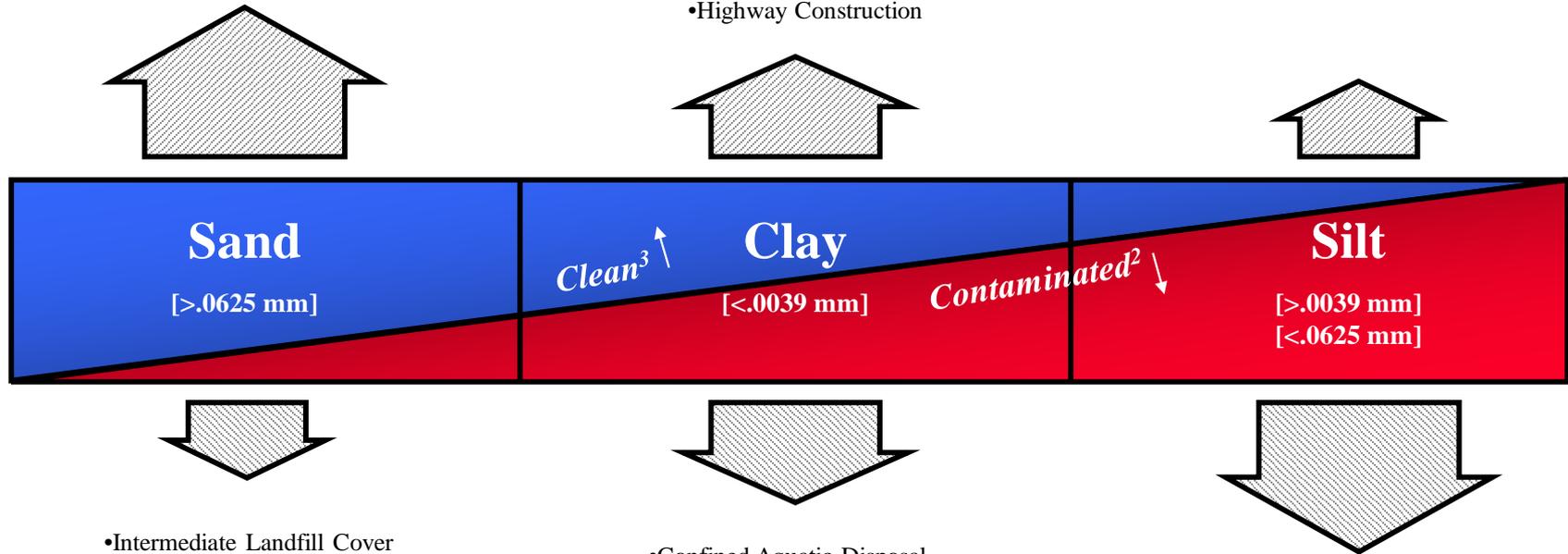
# What Happens to Dredged Material in New Jersey?



- Manufactured Soil
- Aggregate
- Intermediate Landfill Cover
- Ocean Disposal
- Beach Nourishment<sup>1</sup>
- Habitat Restoration/Creation
- Upland Fill
- Highway Construction

- Manufactured Soil
- Ocean Disposal
- Landfill Final Cap
- Landfill Liner
- Upland Fill
- Nearshore Fill
- Brownfield Cover
- Habitat Restoration/Creation
- Highway Construction

- Upland Fill
- Brownfield Cover
- Habitat Restoration/Creation
- Nearshore Fill
- Manufactured Soil
- Highway Construction



- Intermediate Landfill Cover
- Confined Aquatic Disposal
- Confined Upland Disposal
- Upland Fill
- Nearshore Fill (with Capping)

- Confined Aquatic Disposal
- Confined Upland Disposal
- Nearshore Fill (with Capping)
- Landfill Cap (with Clean Cover)
- Brownfield Cap (with Clean Cover)
- Mine Reclamation

- Confined Aquatic Disposal
- Confined Upland Disposal
- Nearshore Fill (with Capping)
- Landfill Intermediate Cover
- Mine Reclamation
- Brownfield Cap (with Clean Cover)
- Decontamination and Disposal

<sup>1</sup> 75% Sand; grainsize distribution must be equivalent to existing conditions

<sup>2</sup> Uses assume no decontamination

<sup>3</sup> Uses assume clean or decontaminated

# OFFICE OF DREDGING & SEDIMENT TECHNOLOGY

- Part of NJ Site Remediation Program (SRP)
  - SRP within NJ Department of Environmental Protection (NJDEP)
- Handles all permitting for dredging and dredged material management
  - Waterfront Development
  - Water Quality Certifications
  - Coastal Area Facility Review Act (CAFRA)
  - Federal Consistency
  - **Acceptable Use Determinations (Beneficial Use)**



**Office of Dredging &  
Sediment Technology  
(ODST)**

# PERMITTING REQUIREMENTS FOR BENEFICIAL USE

- Must obtain a Waterfront Development Permit or Coastal General Permit #20 for dredging project
- Acceptable Use Determination (AUD) filed in conjunction with dredging permit
  - Includes sediment sampling and analyses for ODST review
- NJDEP/ODST issues AUD for dredging project

# ACCEPTABLE USE DETERMINATION

- Requirements
  - Any proposed use, processing and transport of dredged material
  - Submitted to NJDEP/ODST in conjunction with Waterfront Development Permit
- Limitations
  - Only issued for dredged materials:
    - From NJ tidal waters (including adjacent interstate waters)
    - Not hazardous wastes (pursuant to NJAC 7:26 et seq.)
    - Not containing PCBs (pursuant to 15 USC 2601 et seq.)
- Standalone AUDs
  - Site can apply for standing AUD so they can receive Beneficial Use (BU) material from any dredging project that meets specific criteria

# CONTAMINATED DREDGED MATERIAL

- Policy not to create new “dirty” sites
- Contaminated dredged material must be placed at a site with other regulatory oversight within NJDEP
  - Brownfields and Active/Inactive Landfills
- Contamination determination made by NJDEP/ODST through AUD process

# EXAMPLE PROJECTS

- Harbison-Walker Site – 190,000 CY
  - Construction between 2001 – 2005
  - Material from Cap May Canal Dredge Disposal Facility
  - Used for planting soil amendment and site grading



# EXAMPLE PROJECTS

- Bayonne Golf Course – 2 MCY
  - Golf course opened in 2008
  - Dredged material from NY/NJ Harbor
  - Used for site grading and cap material



**Bayonne site during remediation**



**Bayonne golf course**

# EXAMPLE PROJECTS

- Harrison Avenue Landfill – 180,000 CY
  - Completed in 2010
  - Material from Palmyra CDF
- River Winds Golf Course – 160,000 CY
  - Completed in 2001
  - Material from adjacent Federal CDF and DE River
- Other projects using CDF material
  - Tweeter Center – 220,000 CY
  - NJ Turnpike, Exit 1 – 180,000 CY

ANY QUESTIONS?

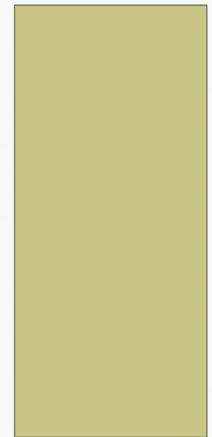
THANK YOU

**Final Report**  
**Innovative and Beneficial Reuse**  
**Regulatory Workgroup**

**Appendix 10:** Pennsylvania Beneficial Use Policies Overview –  
PowerPoint Presentation

**BENEFICIAL USE OF DREDGED MATERIAL  
POLICY AND PRACTICE  
IN PENNSYLVANIA**

INNOVATIVE & BENEFICIAL REUSE  
REGULATORY WORKGROUP 11/12/2015



# PA BENEFICIAL USE OVERVIEW

- **Responsible Agency**
  - Pennsylvania Department of Environmental Protection (PA DEP)
    - Bureau of Waste Management
      - Beneficial Use Program
- **How Beneficial Use is Permitted**
  - General Permits
- **Example Projects**



# PA AGENCY ORGANIZATION

- **Bureau of Waste Management**
  - Provides management oversight and support for the state through hazardous, municipal, and residual waste programs; municipal waste planning and recycling programs.
- **Beneficial Use Program**
  - Develops technical guidance, general permits, forms and publications to encourage environmentally sound beneficial use of municipal and residual waste.
  - Issues general permits for beneficial use of municipal and residual waste.
- **Beneficial Use**
  - Defined as “use or reuse of residual waste or residual material derived from residual waste for commercial, industrial or governmental purposes, where the use does not harm or threaten public health, safety, welfare or the environment, or the use or reuse of processed municipal waste for any purpose, where the use does not harm or threaten public health, safety, welfare or the environment.”

# MUNICIPAL VS. RESIDUAL WASTE

- **Municipal waste** is garbage, refuse, industrial lunchroom or office waste and other material from residential, municipal, commercial or institutional establishments and community activities.
- **Residual waste** is nonhazardous industrial waste. It includes waste material (solid, liquid or gas) produced by industrial, mining and agricultural operations. It excludes certain coal mining wastes and wastes from normal farming activities.
  - **Dredged material is classified as “Residual Waste”**

# GENERAL PERMITS

- **Issued on a regional and state-wide basis**
  - Many different materials and applications
- **Self-implementing**
  - Applicants apply under existing permits
    - Determination of Applicability or;
    - Registration - Less stringent BU applications (typically excludes dredged material)
  - Can apply for new general permit if none exist for current application
- **Costs**
  - New General Permit - \$2,000
  - Determination of Applicability - \$500
  - Registration - \$250

# EXISTING RESIDUAL WASTE GENERAL PERMITS SPECIFIC TO DREDGED MATERIAL

- **WMGR 046** – Processing and BU of marine dredged material use as manufactured soil or soil amendments
- **WMGR 072** – BU of dewatered dredged waste for use as a roadbed material
- **WMGR 085** – Processing and BU of freshwater, brackish and marine dredged material by screening, mechanical blending and compaction in mine reclamation
- **WMGR 093** – Processing of dewatered dredged waste for BU in roadway construction and concrete aggregate
- **WMGR 096** – BU of “regulated fill” for approved construction project when moved offsite or received onsite in accordance with DEP *Management of Fill Policy*

# CLEAN VS. REGULATED FILL

- **Clean fill** is uncontaminated, nonwater-soluble, nondecomposable inert solid material. The term includes soil, rock, stone, dredged material, used asphalt, and brick, block or concrete from construction and demolition activities. The term does not include materials placed in or on PA waters unless otherwise authorized.
- **Regulated fill** is soil, rock, stone, dredged material, used asphalt, historic fill, and brick, block or concrete from construction and demolition activities that has been affected by a spill or release of a regulated substance and the concentrations of regulated substances exceed the values in Table GP-1 (defined by General Permit WMGR 096).

# CLEAN VS. REGULATED FILL

**Table GP-1a  
Regulated Fill Concentration Limits For Organics**

PARAMETER	Regulated Fill	
		Total analysis
	CASRN	mg/kg
ACENAPHTHENE	83-32-9	4700
ACENAPHTHYLENE	208-96-8	6900
ACEPHATE	30560-19-1	3.6
ACETALDEHYDE	75-07-0	0.63
ACETONE	67-64-1	110

**Table GP-1b  
Regulated Fill Concentration Limits For Metals and Inorganics**

PARAMETER	Regulated Fill	
		Total analysis
	CASRN	mg/kg
ALUMINUM	7429-90-5	190000
ANTIMONY	7440-36-0	27
ARSENIC	7440-38-2	53
BARIUM AND COMPOUNDS	7440-39-3	8200
BERYLLIUM	7440-41-7	320

# KEY PERMIT FORMS

- **Form 20 – Application for Municipal or Residual Waste General Permit**
  - New permits and permit renewals
  - Permit modification under general permit
  - Determination of Applicability
  - Registration under general permit
- **Form D – Environmental Assessment for Municipal and Residual Waste Management Facilities**
  - Environmental assessment criteria includes impacts to wetlands, parks, fish & game resources, traffic, etc.
- **Form R1 – Waste Analysis and Classification Plan**
  - Sampling and Analytical Procedures
  - Screening of Incoming Wastes
  - Methodology for Waste Acceptance
- **Form 20RF – Application for a Regulated Fill General Permit**
  - Type of Beneficial Use Application
  - Receiving Site Information
  - Offsite Sources of Regulated Fill
  - Sampling and Analysis of Regulated Fill

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Recycling
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Water
Program Integration
Public Participation Center
Permits, Licensing & Certifications
Report an Incident
Regional Resources
Grants, Loans and Rebates
Environmental Education
Tools
Public Records

Home > Waste > Waste Management > Solid Waste > Residual Waste > Permitting2 > Residual Waste General Permits

## Residual Waste General Permits

Residual waste general permits may be issued on a regional or statewide basis for a category of processing and/or beneficial use of residual waste. Wastes must be similar physically and chemically and must be used and processed in a similar fashion. Persons may be authorized to operate under an existing general permit via a registration or determination of applicability. Fees include:

- general permit - \$2,000
- registration - \$250
- determination of applicability - \$500.

### Permit Forms for Beneficial Use

[\(eLibrary help\)](#)

- [Form 20 - Application for a Municipal or Residual Waste General Permit and Application Checklists 2540-PM-BWM0397](#)
- [General Information Form for a Residual or Municipal Waste General Permit 2540-PM-BWM0515](#)
- [General Information Form 1300-PM-BIT0001](#)
- [Form B - Professional Certification 2540-PM-BWM0358](#)
- [Form E GP - Contractual Consent of Landowner 2540-PM-BWM0217 \(not applicable for mobile units\)](#)
- [Form HW-C - Compliance History 2540-FM-BWM0058](#)
- [Form R1 - Waste Analysis and Classification 2540-PM-BWM0001](#)
- [Form 20RF - Application for Regulated Fill General Permit 2540-PM-BWM0403](#)
- [Form 25R - Source Reduction Strategy 2540-PM-BWM0349](#)
- [Form 27R - Acceptance of General Permit Conditions 2540-PM-BWM0145](#)

### Additional Permit Forms for Beneficial Use (if required)

- [Form D - Environmental Assessment 2540-PM-BWM0172](#)
- [Form G \(A\) - Air Resource Protection 2540-FM-BWM0391a](#)
- [Form G \(B\) - Non Methane Organic Compounds \(NMOC\) Emissions Estimate 2540-FM-BWM0391b](#)
- [Form L - Contingency Plan 2540-PM-BWM0384](#)
- [Form X - Radiation Protection Action Plan 2500-FM-BWM0430](#)
- [Form 5R - Map Requirements Residual Waste Facilities \(no applicable for mobile units\) 2540-PM-BWM0363](#)
- [Form 12R - Operation Plan \(Phase II\) 2540-PM-BWM0081](#)
- [Form 19R - Certification of Facility Construction Activities 2540-PM-BWM0377](#)
- [Form 23R - Control Plans 2540-PM-BWM0392](#)
- [Form 25R - Source Reduction Strategy 2540-PM-BWM0349](#)
- [Bonding Worksheets \(eLibrary\)](#)
  - [Bonding Worksheet Instructions 2540-FM-BWM0580](#)
  - [Processing Facilities 2540-FM-BWM0586](#)
  - [Financial Bond Forms \(eLibrary\)](#)

[List of Residual Waste Beneficial Use General Permits](#)

- [List Sorted by Common Residual Waste Types](#)

### Waste Management Topics

- ▼ Waste Management
  - ▶ Recycling
  - ▼ Solid Waste
    - ▶ Illegal Dumping
    - ▶ Hazardous Waste
    - ▶ Municipal and Residual Waste Transportation
  - ▼ Residual Waste
    - ▼ Permitting2
      - [List of Residual Waste Beneficial Use General Permits](#)
      - [Residual Waste General Permits](#)
      - [Residual Waste Permit Forms](#)
      - [Waste Oil Notification Requirement](#)
    - ▶ Beneficial Use
    - ▶ Waste Tire Program
    - ▶ Waste Oil Program
    - ▶ Municipal Waste

# EXAMPLE PROJECTS

- **Bark Camp Demonstration**
  - Mine Reclamation
- **Hyponex Corporation**
  - Manufactured Soil Production
- **Redevelopment Authority of Allegheny County**
  - Brownfield Redevelopment
- **Hazleton Reclamation Project**
  - Mine Reclamation/Brownfield Redevelopment

# BARK CAMP MINE RECLAMATION

- **Demonstration project**
  - 1995-2000
  - 550,000 CY
- **Permits**
  - WMGR 085 – Mine Reclamation
  - WMGR 096 – Regulated Fill
- **Navigational dredged material**
  - Port of NY/NJ Dredging
  - Containing metals and organic contaminants within regulatory limits
  - Processed with alkaline activated coal ash to form low permeability cementitious fill



# HYPONEX CORPORATION

- **Permits**
  - WMGR 046 – Manufactured Soil Production
  - WMGR 096 – Regulated Fill
- **Soil Blends**
  - Produces various soil blends, primarily bagged topsoil and potting soil products



# REDEVELOPMENT AUTHORITY OF ALLEGHENY COUNTY

- **Brownfield Development**
- **Former Steel Mill (Carrie Furnace)**
  - Contaminated with PCBs, Sulfates, Asbestos, Iron, Petroleum
- **Construction began in 2009**
- **Approved to receive regulated fill as construction material**



# HAZLETON RECLAMATION PROJECT

- **Brownfield Development/Mine Reclamation**
- **Former Mine**
  - 277 acres of un-reclaimed abandoned mine pits
  - Designated a Brownfield Action Team site (BAT) by the Governor of Pennsylvania giving the site priority attention for remediation
- **Permits**
  - WMGR 085 – Mine Reclamation
  - WMGR 096 – Regulated Fill



<http://hazletoncreekproperties.com>

ANY QUESTIONS?

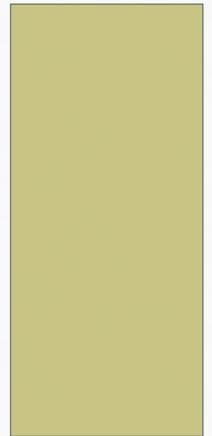
THANK YOU

**Final Report**  
**Innovative and Beneficial Reuse**  
**Regulatory Workgroup**

**Appendix 11: Virginia Beneficial Use Policies Overview –**  
PowerPoint Presentation

**BENEFICIAL USE OF DREDGED MATERIAL  
POLICY AND PRACTICE  
IN VIRGINIA**

INNOVATIVE & BENEFICIAL REUSE  
REGULATORY WORKGROUP 10/15/2015



# VA BENEFICIAL USE OVERVIEW

- **Methods of Permitting Beneficial Use**
  - Beneficial Use Demonstration
  - Contaminated Media Variance
  - Pollution Abatement Permit
- **Contaminated Media Variance**
  - Hierarchy of Contaminated Soils
- **Example Projects**

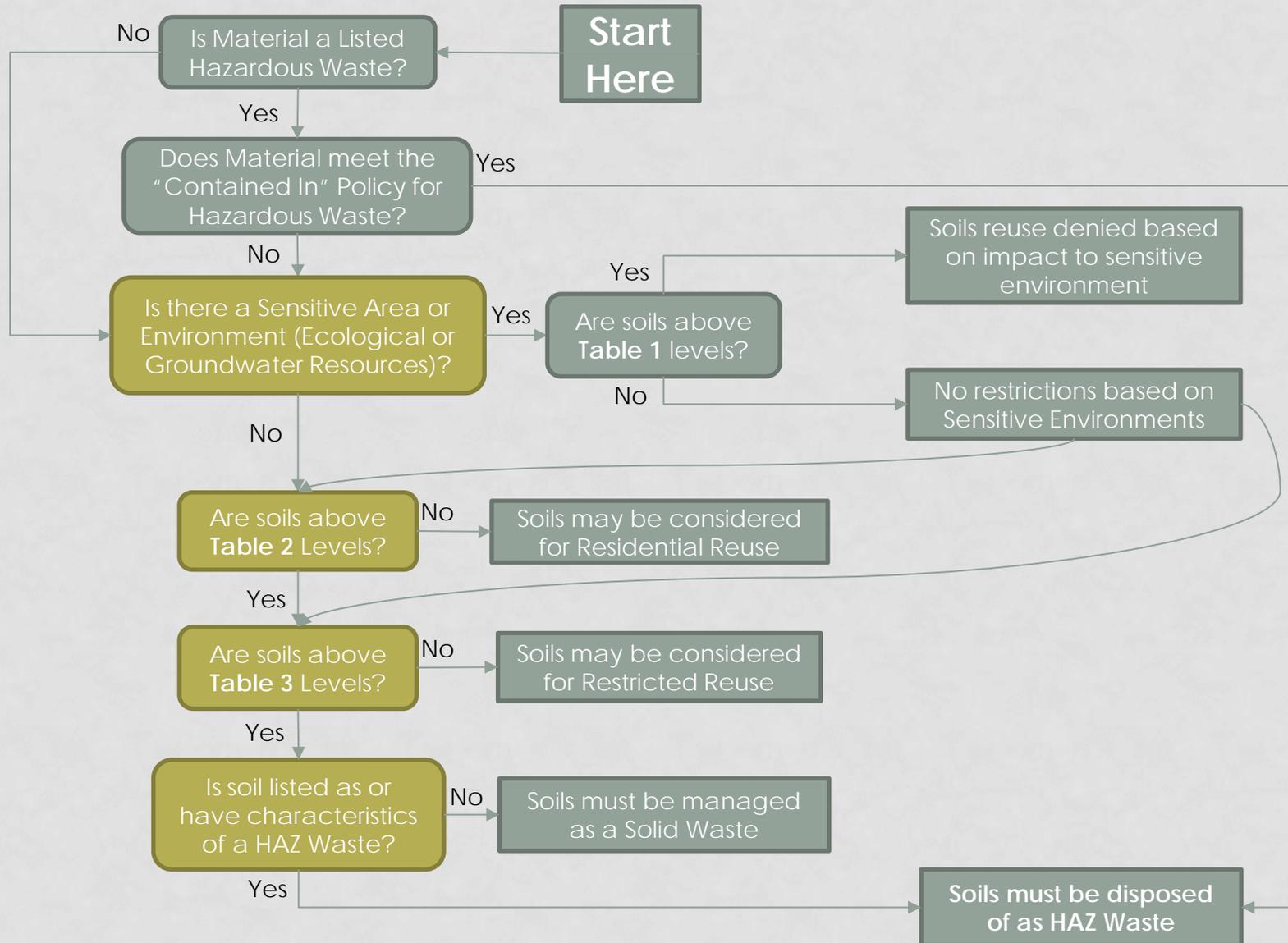
# METHODS FOR PERMITTING BENEFICIAL USE

- Solid Waste Management (SWM) Permit
  - Beneficial Use Demonstrations (BUD)
  - DEQ approval on case-by-case basis
- Virginia Pollution Abatement (VPA) Permit
  - Issued when any waste is handled other than discharge to WWTP or state waters (VPDES permit)
  - Land-application of biosolids and industrial waste
  - Has been used for land-application of dredged sediments
- Contaminated Media Variance
  - Upland application of dredged material
  - Preferred method for permitting BU of dredged material

# CONTAMINATED MEDIA VARIANCE

- Published in 2012
  - Division of Land Protection & Revitalization
- “Self-implementing” mechanism for Generators and Owner/Operators to reuse excess soils/sediments
  - Limited DEQ involvement
- Standard contaminant concentration tables (tiers) allow quick determination of where material may be used as fill
  - Tier 1 – Sensitive Ecosystem/Groundwater Resource
  - Tier 2 – Residential and High Exposure Receptors
  - Tier 3 – Commercial/Industrial

# Hierarchy of Contaminated Soils



**Table 1**  
**Protection of Ecological Receptors and Groundwater**

Analyte/Compound	Beneficial Fill Ecological Screening Level (mg/kg)	Beneficial Fill Groundwater Protection Screening Level (mg/kg)
Inorganics		
Aluminum	pH dependent	2.40E+04
Antimony	0.27	2.71E+00
Arsenic	18	2.91E+00
VOCs		
Acetone	2.5	1.25E+00
Benzene	0.05	2.46E-02
Bromochloromethane	3000	1.70E-02
Pesticides		
Aldrin	0.0025	3.36E-03
alpha-BHC	0.0025	4.61E-04
beta-BHC	0.001	1.58E-03

# EXAMPLE PROJECTS

- Weanack Land, LLLP (Shirley Plantation)
  - Started around 1999/2000 time frame
  - Holds VPA permit for beneficial reuse of dredged material
  - Dredged sediments received from multiple sources
    - Woodrow Wilson Bridge Project
      - Freshwater, silt-loam, no contaminants
    - U.S. Navy Earle Naval Weapons Station
      - Saline, silty, low levels of PAHs
    - Appomattox River Sediments (i.e. Landfarming)
      - Sandy, moderate to high PAHs

# WOODROW WILSON BRIDGE PROJECT

- Woodrow Wilson Bridge Project
  - Received 340,000 cy of dredged material winter of 2000 – 2001
  - Freshwater, silt-loam, no contaminants
  - The material was placed into a basin created from an old sand and gravel mining pit which had been reshaped using compacted clays left behind by mining to form a “bathtub” to receive the sediment



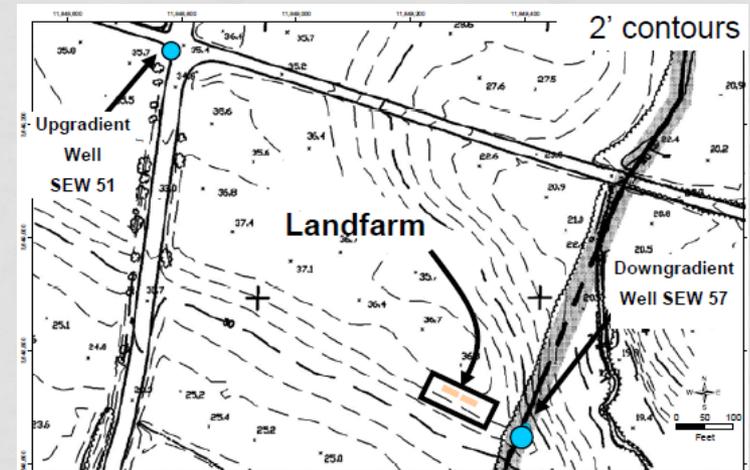
# U.S. NAVY EARLE NAVAL WEAPON STATION

- U.S. Navy Earle Naval Weapons Station
  - Received 205,000 cy of dredged material between 2004 – 2007
  - Saline, silty, low levels of PAHs
  - Dredged material went into it's own purpose-built basin and is separate from the freshwater sediments in the Woodrow Wilson Bridge basin



# APPOMATTOX RIVER SEDIMENTS (PILOT STUDY)

- Appomattox River Sediments (i.e. Landfarming)
  - Received 24 cy of dredged material July 2007
  - Saline, silty, low levels of PAHs
  - The pilot study design includes two landfarming cells each containing soil (dried sediment) over an area measuring 30 feet long, 11 feet wide, and 1.0 foot deep



ANY QUESTIONS?

THANK YOU

**Final Report**  
**Innovative and Beneficial Reuse**  
**Regulatory Workgroup**

**Appendix 12:** Massachusetts Beneficial Use Policies Overview –  
PowerPoint Presentation



# **Beneficial Use of Dredged Material Policy and Practice in Massachusetts**

**Innovative and Beneficial  
Reuse Regulatory Work-Group  
12/10/2015**

# Massachusetts Beneficial Use Overview

- Definition of Beneficial Use
- Regulating Agency
- Dredged Material Reuse / Disposal
- Beach Nourishment
- Landfill Reuse
- Example Project
  - Winthrop Beach Nourishment

# Beneficial Use



The use of a material as an effective substitute for a commercial product or commodity.

This definition is not specific to dredged material.

# Regulating Agency

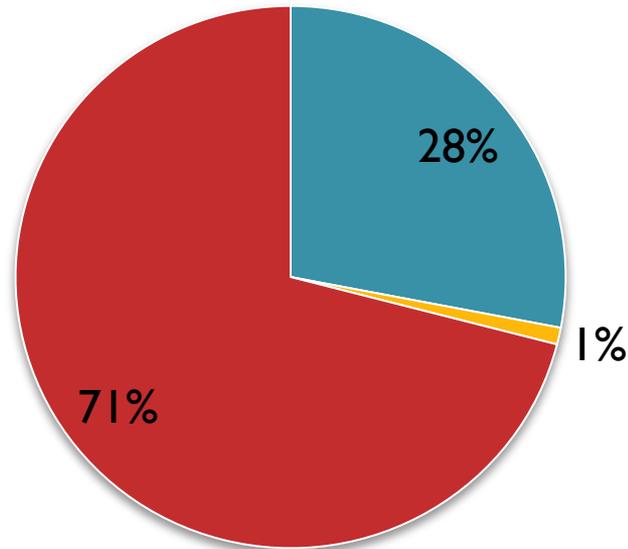
- Office of Energy and Environmental Affairs
  - Massachusetts Department of Environmental Protection (DEP)
    - The Bureau of Resource Protection – Waterways Regulation Program
    - The Bureau of Waste Prevention (BWVP)



# Dredged Material

## 2008 Dredged Material Reuse / Disposal

- Non-Landfill Projects (i.e. Beach Nourishment and Bank Stabilization)
- Landfill Daily Cover
- Off Shore Ocean / Landfill Disposal



# Beach Nourishment

## Executive Order No. 181

“Dredge material of a compatible grain size shall be used for barrier beach nourishment, if economically feasible.”

### Source Material Characterization

- Perform a “due diligence” review to determine the potential for the sediment to have concentrations of oil or hazardous materials
- Conduct a sieve test in accordance with ASTM Method D422 Standard Test Method for Particle-Size Analysis of Soils
- If the sediment to be dredged contains less than 10% by weight of particles passing the No. 200 U.S. Standard Series Testing Sieve, chemical testing shall not be required.

# Beach Nourishment

## Chemical Testing of Sediment for Beach Nourishment

Parameter <sup>1</sup>	Reporting Limit mg/kg (dry weight) – unless otherwise noted <sup>2</sup>
Arsenic	0.5
Cadmium	0.1
Chromium	1.0
Copper	1.0
Lead	1.0
Mercury	0.02
Nickel	1.0
Zinc	1.0
Polycyclic Aromatic Hydrocarbons (PAHs)	0.02
Polychlorinated Biphenyls (PCBs)-by NOAA Summation of Congeners	0.01
Extractable Petroleum Hydrocarbons <sup>3</sup>	25
Volatile Organic Compounds (VOC) <sup>4</sup>	0.1
Total Organic Carbon	0.1%
Percent Water	1.0%
Toxicity Characteristic Leaching Procedures	As applicable
Grain Size Distribution – wet sieve (ASTM D422)	Sieve Nos. 4, 10, 40, 60, 200

# Beach Nourishment Permitting

## Chapter 91 Waterways License

Time Period	MassDEP Action
	Application received at MassDEP
30 to 60 days	Public Comment Period (includes Public Hearing if needed)
Within 60 days	Administrative Completeness review
Within 90 days	Technical Review and Issue Written Determination
21 days	Appeal Period
-----	Issue License
<b>Maximum Application Time = 276 days</b>	

## Order of Conditions

Time Period	Action
	Notice of Intent application received at MassDEP
Within 21 days	Public Hearing (Hearing notice must be published in a public newspaper at least 5 days prior to hearing)
Within 21 days	Order of Conditions Permit
10 days	Appeal Period
Within 70 days	Superseding Order of Conditions if local Order is appealed.
10 days	Appeal Period
Within one year	Adjudicatory hearing and Final Agency Hearing
<b>Maximum application time = 500 days (if adjudicatory hearing required)</b>	

## 401 Water Quality Certification

*For Major projects (BRP WW07) and Minor projects (BRP WW08)*

Time Period		Action
BRP WW07	BRP WW08	
30 days	30 days	Review for Administrative Completeness
120 days	90 days	Technical Review
120 days	90 days	Second Technical Review*



# Landfill Reuse

## **Interim Policy #COMM-94-007:**

### **Sampling, Analysis, Handling & Tracking Requirements for Dredged Sediment Reused or Disposed at Massachusetts Permitted Landfills**

- Combines requirements for both the WQC and the BWP
- Exempts qualifying soils and sediments from Department review and approval based on contaminant concentrations

# TABLE I: MAXIMUM ALLOWABLE CONTAMINANT LEVELS FOR SEDIMENT REUSE AT LINED LANDFILLS

CONTAMINANT( <i>a</i> )	Reuse Levels
Total Arsenic	40
Total Cadmium	80
Total Chromium	1,000
Total Lead	2,000
Total Mercury	10
Total Petroleum Hydrocarbons (TPH)	5,000
Total PCBs( <i>b</i> )	<2
Total PAHs( <i>c</i> )	100
Total VOCs( <i>d</i> )	10
Listed or Characteristic Hazardous Waste (TCLP)( <i>e</i> )	none

Concentrations are in mg/kg

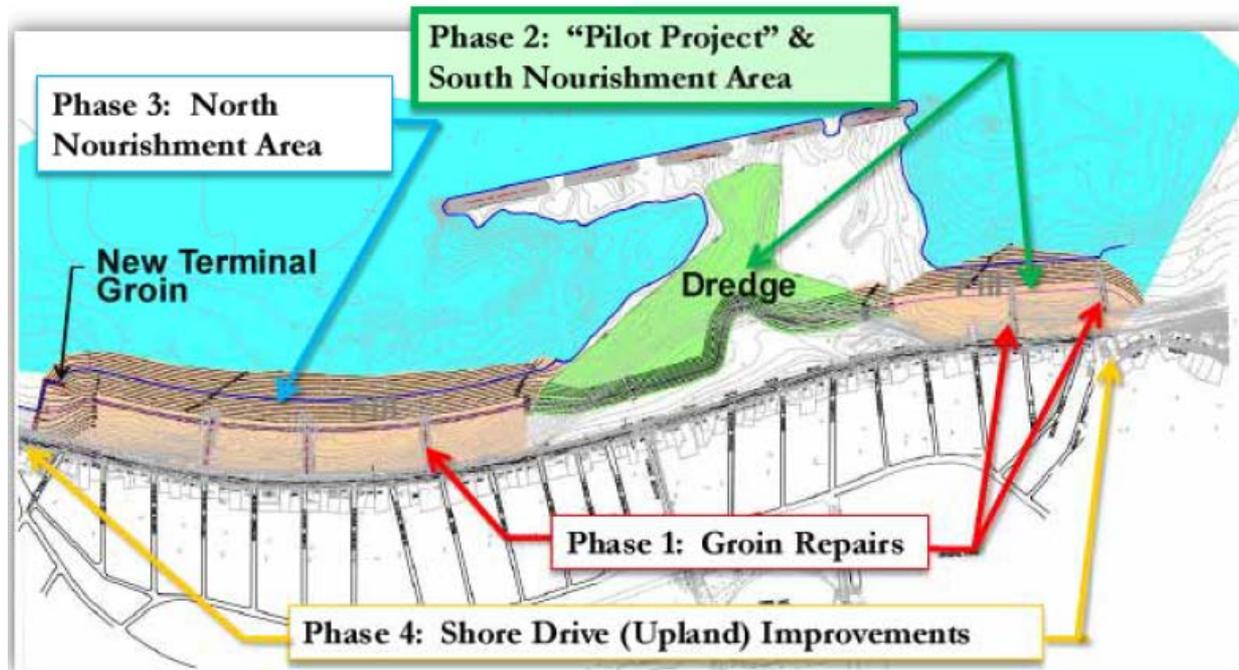
# Other Requirements

## Landfill Reuse

- DEP Material Shipping Record (MSR)
- Beneficial Use Determination (BUD)
- Bill of Lading (BOL)
- Landfill Minor Modification (BWV SW 22)
- Annual MSR Summary or 21E BOL Report

# Example

# Winthrop Beach Nourishment



- Dredging and Placement occurred from December 2012 to April 2013
- 90,000 cy of dredged material was obtained from the tombolo
- 19.9 acres
- All dredging was above MLW and conducted mechanically

# Winthrop Beach Nourishment

## Phase 2 – South Nourishment

Construction



Before



After



# Takeaways

- Executive Order.
- Process is based on end use.
- Each process requires testing (chemical or grain analysis)
- Can require multiple permits / approvals.
- Can require multiple DEP bureaus.
- Public opposition can be an issue.

**Questions?**

**Final Report**  
**Innovative and Beneficial Reuse**  
**Regulatory Workgroup**

**Appendix 13:** Ohio Beneficial Use Policies Overview –  
PowerPoint Presentation

# Beneficial Use of Dredged Material Policy and Practice in Ohio

Innovative and Beneficial  
Reuse Regulatory Work-Group

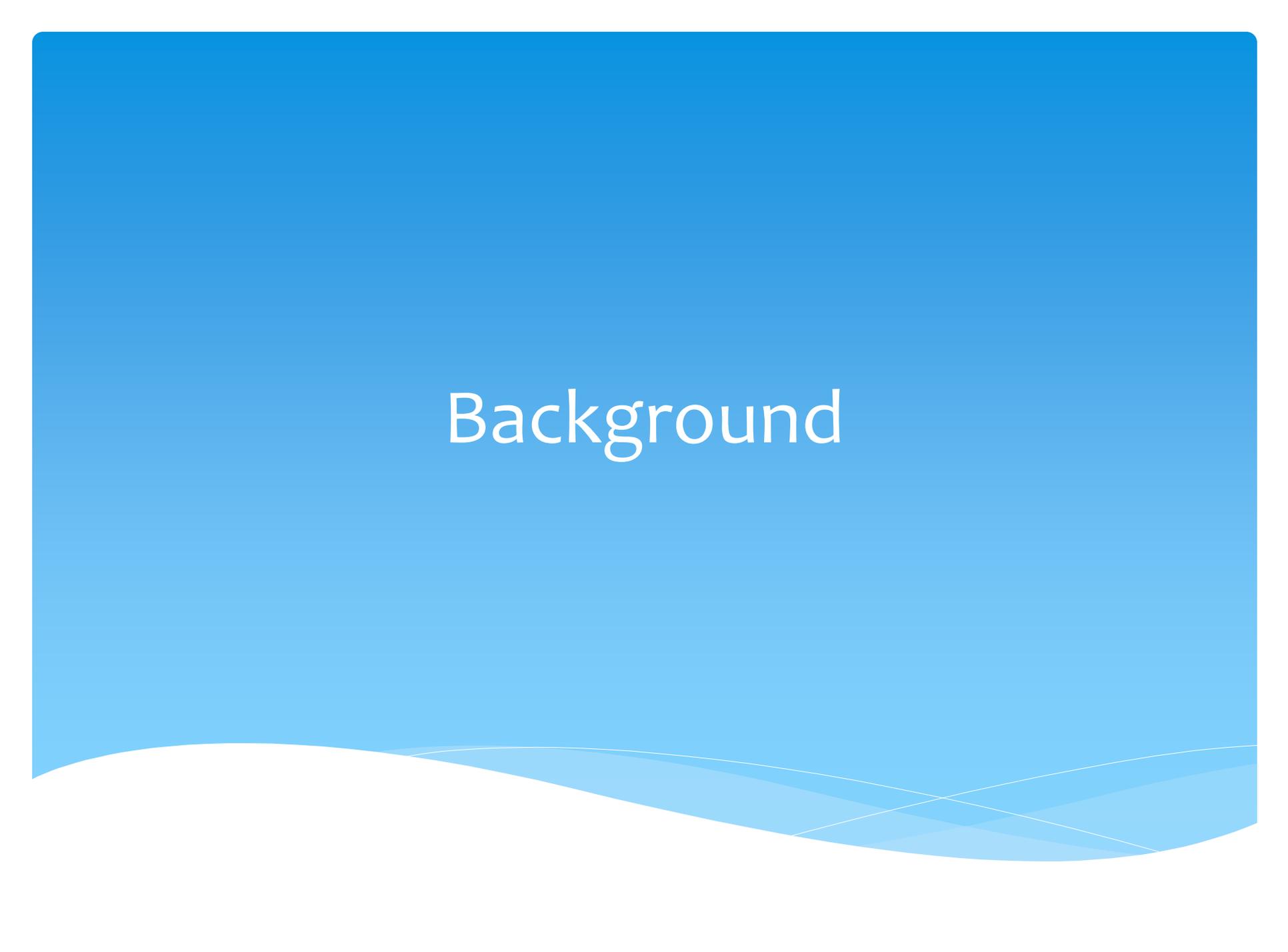
1/15/2015

# Ohio Beneficial Use Overview

- \* Background
- \* Current Process
- \* Draft Rules (Regulations)



# Background

The image features a solid blue background. At the bottom, there are several overlapping, wavy white lines that create a sense of depth and movement, resembling a stylized horizon or a decorative border.

# Ohio Ports & Dredged Material

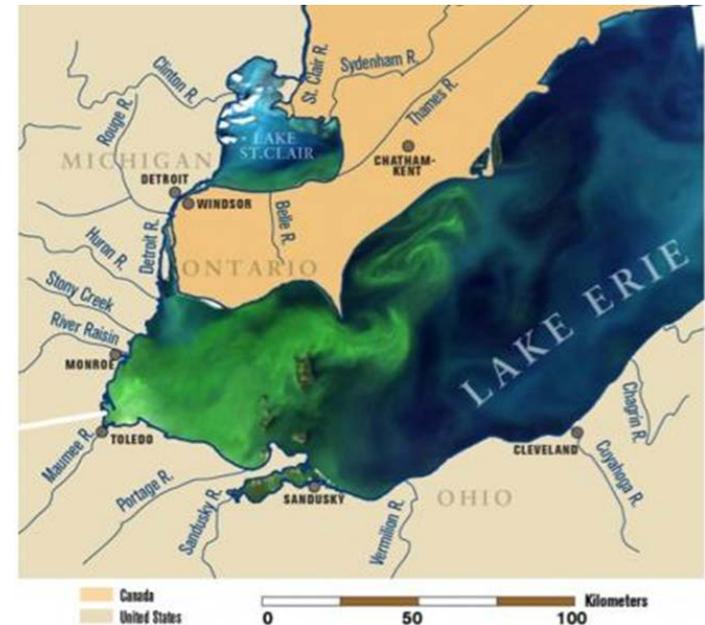
- \* Ohio Ports Annually Dredge >1.8 million cy of material to maintain current channel depths.
- \* A backlog of >8.2 million cy of material must be dredged in order to restore the original functional harbor dimensions.



Toledo Harbor

# Dredged Material Disposal

- \* Lake Erie
  - \* Preferred disposal site
  - \* Nutrient Issues
  - \* Large Algae Blooms
- \* OH EPA 401 WQC
  - \* 2014 OH EPA WQC for the dredging of Cuyahoga River by the USACE prohibited open water placement within Lake Erie and required the use of a CDF.
  - \* Caused legal dispute with USACE



# Policy

- \* DSW-0400.007 – Beneficial Use of Nontoxic Bottom Ash, Fly Ash and Spent Foundry Sand, and Other Exempt Waste.
  - \* OH EPA Division of Surface Water
  - \* In effect from 1994 – 2003
  - \* Popular due to flexibility and generous standards.
  - \* Allowed material less than 30X the drinking water standards to be reused without an OH EPA permit.
  - \* Revoked April 30, 2003

Note: Dredged Material is classified as “other waste.”

# Senate Bill 1

April 2015

- \* Enacted to establish requirements governing dredged material.

Section 6111.32

- \* The director of environmental protection shall endeavor to work with the United States Army Corps of Engineers on a dredging plan that focuses on long-term planning for the disposition of dredged material.
- \* On and after July 1, 2020, no person shall deposit dredged material in the portion of Lake Erie that is within the jurisdictional boundaries of Ohio.

# Current Process Of Authorizing Beneficial Use

# Authorizing Agency

- \* Ohio Environmental Protection Agency
  - \* Division of Material and Waste Management
    - \* Beneficial Use Program



# Current Process

## Beneficial Use Program

- \* Integrated Alternative Waste Management Program (IAWMP)<sup>1</sup>
- \* Land Application Management Plan (LAMP)
  - \* Form A
  - \* Form A-C1
  - \* Chemical Testing of Material
    - \* U.S. EPA Regional Screening Levels

<sup>1</sup> Not applicable to dredged material.

# LAMP

- \* June 2015
- \* Kurtz Bros., Inc.
- \* Approximately 26, 000 cy obtained from Cuyahoga County Port Confined Disposal Facility (CDF)
- \* Reused as structural fill and backfill
- \* November 2015
- \* Kurtz Bros., Inc.
- \* Obtained from Cuyahoga County Port Confined Disposal Facility (CDF)
- \* Approves reuse as engineered fill, structural fill, backfill, landfill cap soil, parking lot base material, sub base for basements of industrial buildings, roadside projects, earthen mounds, and noise barrier mounds.



**Kurtz Bros., Inc.**

*We make the good earth better!™*

# Draft Rules (Regulations)

# Draft Rules

## Drafts

- \* 2006 Draft Beneficial Use Rules
  - \* Highly controversial
  - \* Attempted to address the 30X drinking water standard
  - \* Debated over 6 years
- \* 2012 Draft Beneficial Use Rules
  - \* Included a preapproved list of uses
  - \* Required a general or individual permit
- \* 2013 Draft Beneficial Use Rules
  - \* Updated language/concepts

## Hurdles

- \* Developing reasonable standards.
- \* Establishing pragmatic sampling requirements.
- \* Overcoming industry objections.

# 2015 Draft Rules

Regulating Agency

- \* Ohio Environmental Protection Agency
  - \* Division of Material and Waste Management
  - \* Division of Surface Water



Environmental  
Protection Agency

# 2015 Draft Rules Definitions

## Beneficial Use

- \* The use of a beneficial use byproduct as an ingredient, product, or in a manner that contributes to a manufacturing process or product that does not constitute disposal or cause pollution of any waters of the state. A beneficial use may include but is not limited to use for agronomic benefit; as a replacement of a raw material; as a soil amendment, fertilizer, or structural fill; or as a fuel.

## Beneficial Use Byproduct

- \* A solid waste, industrial waste, or other waste having properties necessary or preferred for beneficial use.

# 2015 Draft Rule Permitting

- \* Authorization by Rule

- \* Asphalt concrete
- \* Cement concrete
- \* Chip and seal pavement
- \* Controlled low-strength material when not used within waters of the state
- \* Grout
- \* Glass
- \* Masonry unit

- \* Individual Beneficial Use Permits

- \* General Beneficial Use Permits



# Key Takeaways

- \* Senate Bill 1
- \* Industry Opposition
- \* Coordination between OH EPA Divisions
- \* Required multiples drafts of rules
- \* Authorization/Permit is dependent on end use