

Maryland Environmental Service

STAC BIOCHAR CONFERENCE MAY 25, 2023

**ENVIRONMENTAL
SOLUTIONS
FOR A BETTER
TOMORROW**



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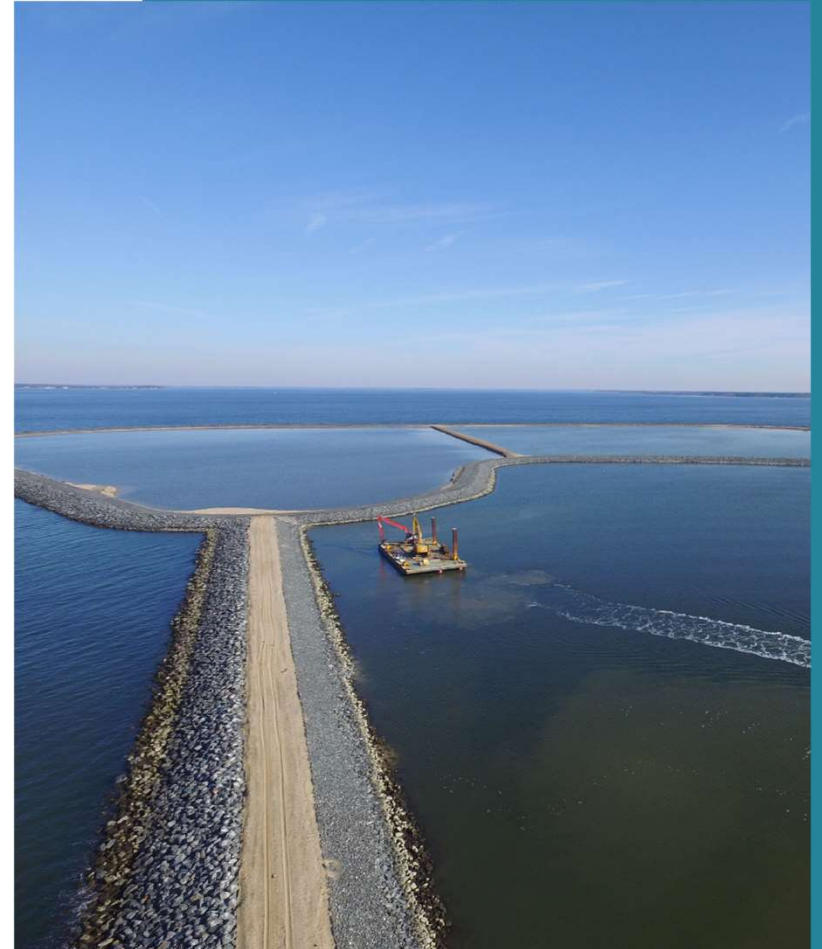
WHAT IS MES?

AN INDEPENDENT AGENCY OF THE STATE

- MES is a not-for-profit business unit of the State of Maryland
- MES provides multi-disciplinary environmental compliance services to:
 - State and local governments in Maryland
 - Federal government
 - Industry
 - Private sector partners

ABOUT MARYLAND ENVIRONMENTAL SERVICE

- MES combines public sector commitment to environmental protection with the efficiencies, flexibility, and quick response of the private sector
- MES' unique governmental status allows it to:
 - Streamline and assist with permitting processes
 - Provide fast procurement
 - Respond nimbly to the needs of partners and clients



MORE ABOUT MARYLAND ENVIRONMENTAL SERVICE

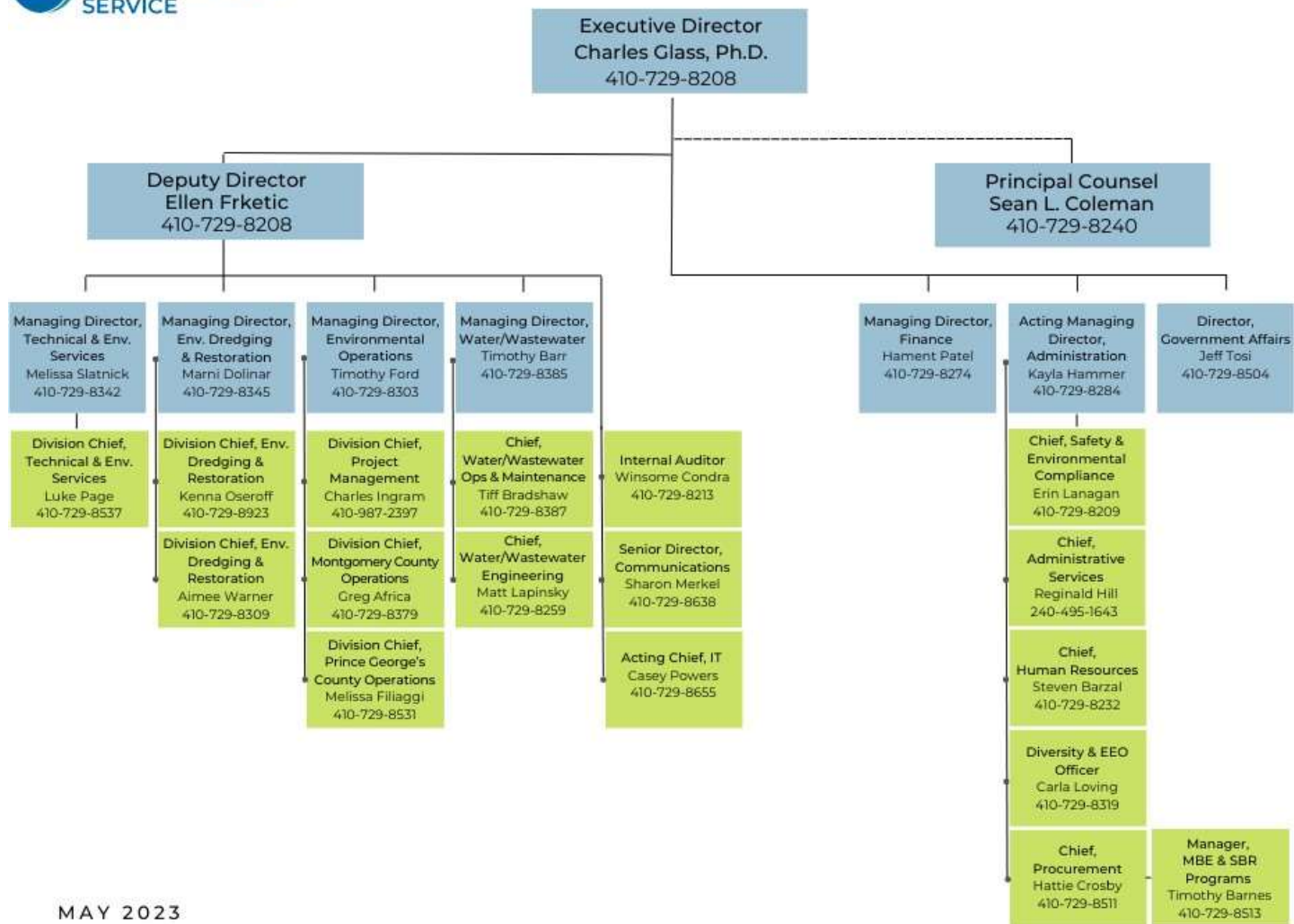
- 1,000 projects in every county across MD
- Operating revenues exceeded \$180 million last fiscal year
- Two-thirds of revenue flows back to the private sector
- More than 29% of contracts are awarded to Minority Business Enterprises
- 700+ employees, including project managers, technical specialists, engineers, and operations and maintenance staff
- Voted one of the Baltimore Sun's Top Workplaces of 2022
- Tremendous team diversity and a great work culture

**TOP
WORK
PLACES**
2022

BALTIMORE SUN
— MEDIA —



ORGANIZATION CHART



MAY 2023

ENVIRONMENTAL DREDGING & RESTORATION

MAJOR SERVICE AREAS

- Design and Construction Contract Management
- Dredged Material Innovative Reuse
- Engineering and Survey Services
- Environmental Management Systems and Remediation
- Habitat Restoration and Mitigation Services
- NEPA Planning and Documentation
- Remediation and Development Services





ENVIRONMENTAL OPERATIONS

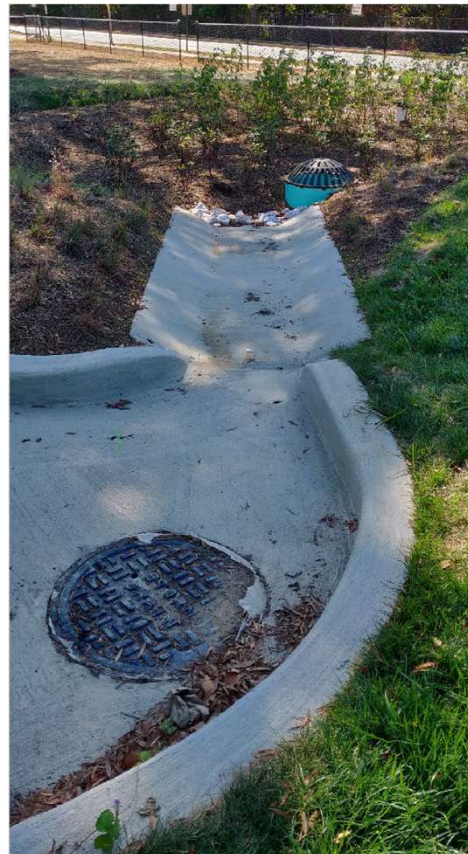
MAJOR SERVICE AREAS

- Design, Construction, and Operation of Composting Facilities, Landfills, and Recycling Facilities
- CFC Recovery
- Energy Plant Operations
- Environmental Monitoring
- Mobile Wood Grinding
- Recyclables Marketing
- Transfer Operations
- Used Oil and Antifreeze Recycling

TECHNICAL & ENVIRONMENTAL SERVICES

MAJOR SERVICE AREAS

- Environmental Monitoring and Reporting
- Geospatial and Engineering Services
- Renewable Energy
- Sample Collection and Analysis
- Stormwater Management





WATER/WASTEWATER **MAJOR SERVICE AREAS**

- Biosolids Management and Inspections
- Capital Improvements Planning
- Engineering, Design, and Construction
- Project Management
- Operations and Maintenance



**MES HAS THE
ENVIRONMENTAL
EXPERTISE TO SOLVE
COMPLEX
ENVIRONMENTAL
PROBLEMS**

- Sustainability and Resilience
- Focus on Innovative Solutions Every Day
- Regulatory Requirements Always Met or Exceeded
- Value Proposition with A/E Partners



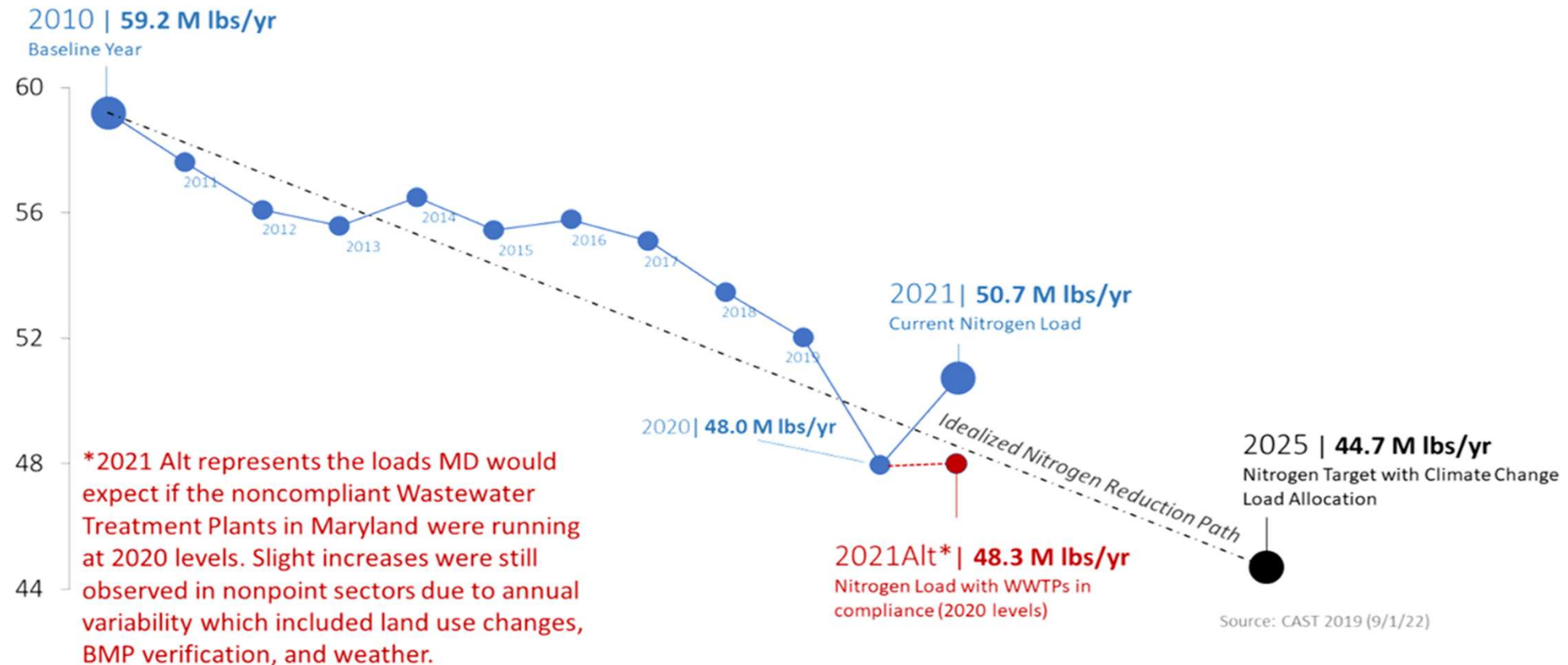
STREAMLINED PROCUREMENT

- Established internal procedures and external relationships that enable MES to streamline and shorten permitting processes, procure faster, and respond to our partner's needs
- Access to a variety of A/E Shortlists
- Cannot directly respond to RFP, but we can be a subcontractor on your proposal to help strengthen your capabilities
- Variety of procurement methods
- MBE and SBR Initiatives

WHERE WE ARE WITH WATER QUALITY

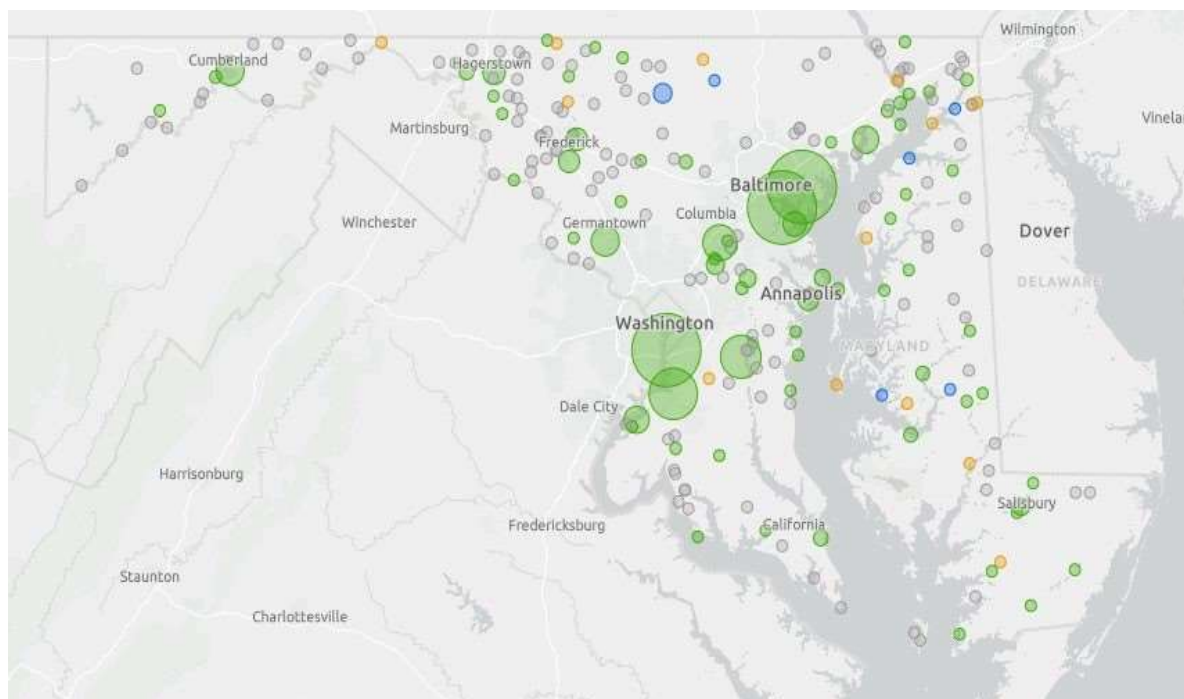
Nitrogen Progress Towards 2025 Chesapeake Bay Restoration Target | 2010 - 2021

Million Pounds per Year Entering Chesapeake Bay



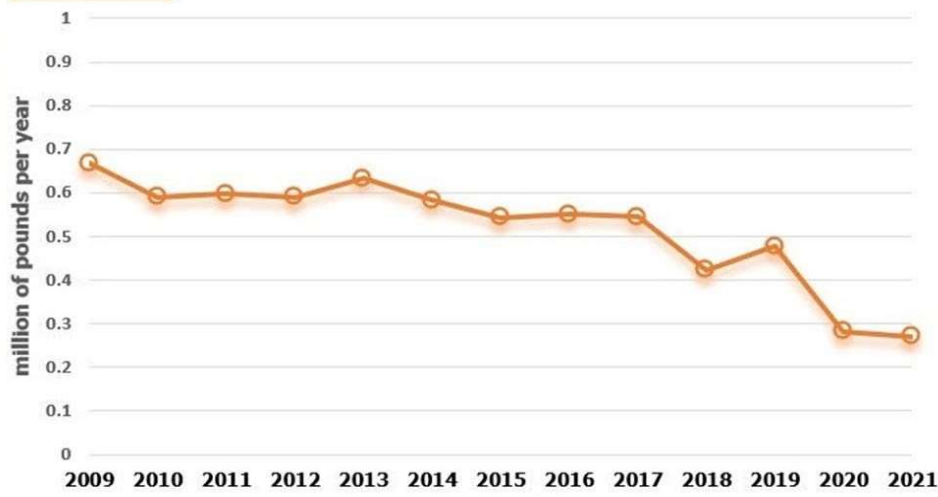
WASTEWATER TREATMENT PLANTS (WWTP)

Maryland's investments in wastewater technology have yielded the largest nutrient reductions of any pollution source. Having invested over \$1 Billion in enhanced nutrient removal (ENR) upgrades, the State achieved more than 50% reduction in WWTP nitrogen loads to the Bay.

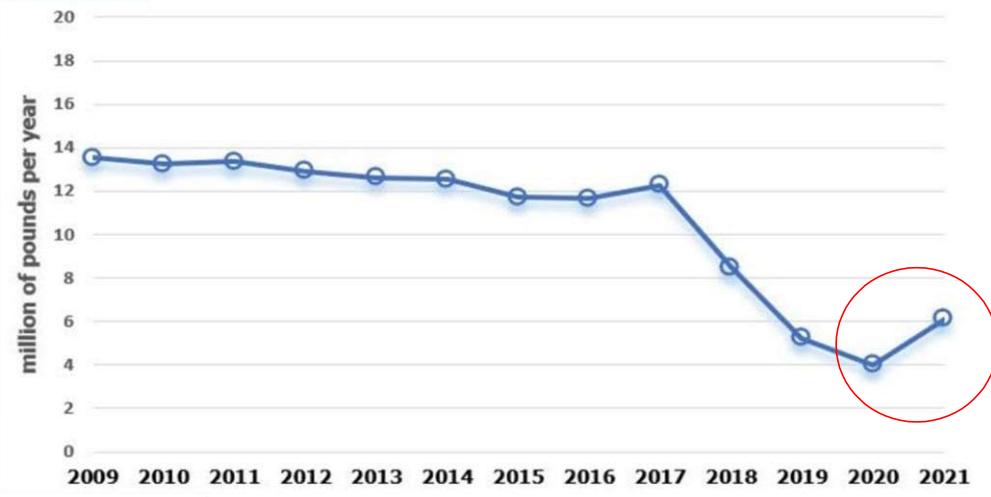


WASTEWATER TREATMENT PLANTS

Phosphorus



Nitrogen





MDOT STORMWATER MANAGEMENT PROGRAM OVERVIEW

- Transportation project process
- Stormwater management
- Chesapeake Bay Total Maximum Daily Load (Bay TMDL)
- Meeting National Pollutant Discharge Elimination System (NPDES) Municipal Separate Storm Sewer System (MS4) Permit Targets
- NPDES MS4 Permits issued to MDOT SHA (Phase I) and each TBU (Phase II)



ASSISTANT SECRETARY AT MDOT, JAN. 2016-DEC. 2019

- Charged with developing SMARTER IMPLEMENTATION OF STORMWATER MANAGEMENT
- ALTERNATIVE DELIVERY METHODS
- Biochar was introduced to me, along with the concept of making Biochar from horse manure for nitrogen credits
- Then use the capabilities of Biochar for pollutant removal throughout MDOT
- Focused on N, P, and Sediment



Pre-decisional, Draft

Last Updated 12/4/18



Internal Partners

MDOT SHA – Applied Research
MDOT MPA – Harbor Development
MDTA – Peter Mattejat



External Government

MDA – Susan Payne
MDE
DNR
USEPA R3
University System of MD
USDA – Dr. Lima



External Private

Biochar Community (McGolden)
Developers
Researchers
Technologists



Research/Application Ideas

1. Make Biochar / Buy It (Eddie)

2. Mix Biochar to Enhance Dredge Material (DM) (Eddie)

3. Add Biochar to GI for TMDL Credits (John)

4. Sell Enhanced DM to Developers for Const. Fill (Eddie)

5. Heavy Metal Adsorption Research (Eddie)

6. Applied Research for Parking Lots (catch basin inlets) (John)

7. Acid Mine Drainage Mixed with Dredge (Eddie)

8. First Trade (John)

9. Carbon Credits (Laura)

10. Brownfields Study (Eddie)

11. Aquaculture (Mercury and PCBs) (Eddie)

12. Applied Technology (Eddie)/(John)

13. DMCF Water Treatment (Eddie)

14. Biochar to Treat Patapsco River (sim. to Algal Flow) (John)

15. HM Island North Cell Project (Habitat Creation) (Eddie)

DEPARTMENT OF NATURAL RESOURCES, COVID, AND MARYLAND ENVIRONMENTAL SERVICE

- December 2019 – Promoted to Deputy Secretary of the Department of Natural Resources
- March 2020 – Everyone Went Home
- April 2020 – Joined the Covid Taskforce in Maryland
- June 2020 – Named Acting Director of Maryland Environmental Service





FREEDOM DISTRICT WWTP

BIOSOLIDS MASTERPLAN

- In July 2020, Hazen finished the production of a Biosolids Master Plan
- Focused on four MES operated WWTPs
 - Maryland Correctional Institution (MCI-H) WWTP Hagerstown
 - Dorsey Run WWTP
 - Freedom District WWTP
 - Eastern Correctional Institution (ECI) WWTP

BIOSOLIDS MASTERPLAN

- MCI-H, Dorsey Run, and Freedom District all produce a Class B Stabilized Product which is subsequently land applied
- ECI WWTP currently dewateres and landfills the final product
- Two technologies were recommended to produce a Class A product for further evaluation:
 - Autothermal thermophilic digestion (ATAD)
 - Gasification/Pyrolysis



MCI-H WWTP



ECI WWTP

REQUEST FOR INFORMATION

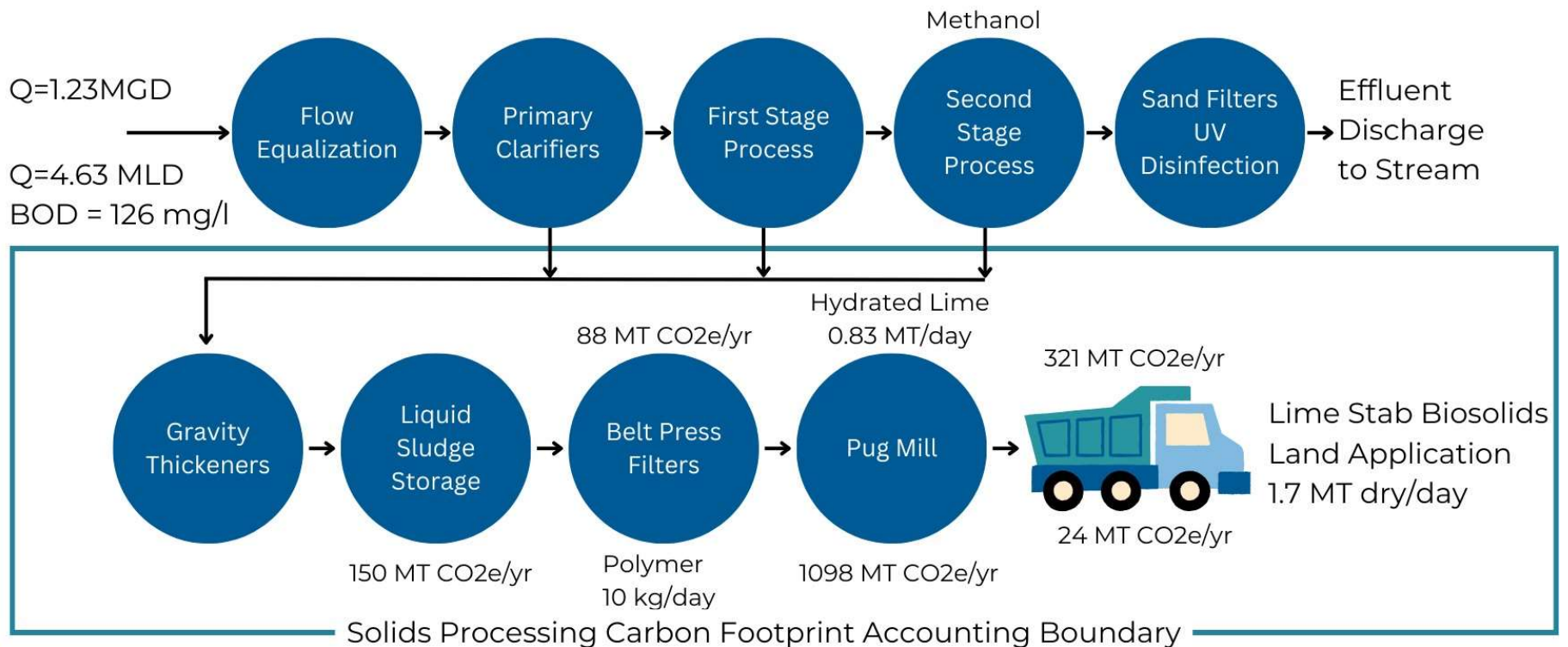
DESIGN, BUILD, AND OPERATE A BIOCHAR PRODUCTION FACILITY

- In February 2021, MES issued an RFI to DBO a Biochar Production Facility
- To process green waste, food waste, biosolids, forest waste, and other organic materials into biochar
- We had the goal to create a facility with the capacity to allow for partnership with other entities in the state
- We received four responses

DORSEY RUN AWWTP - SEPTEMBER 2021

CARBON FOOTPRINT FOR SOLIDS MANAGEMENT – LIME STABILIZATION

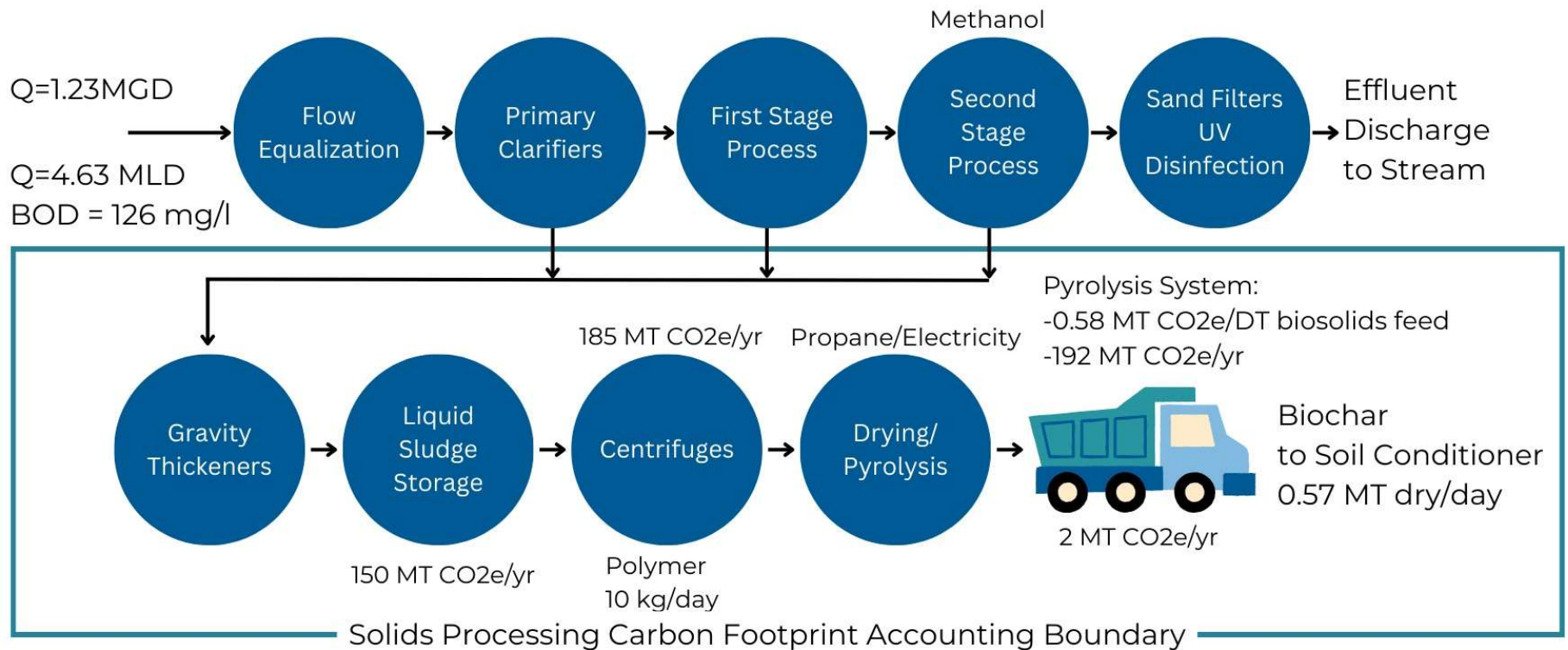
- Total Carbon Footprint for Lime Stabilization = 1681 MT CO₂e/yr
- Carbon Emissions Equivalent to Operating 365 Cars/Year



DORSEY RUN AWWTP - SEPTEMBER 2021

CARBON FOOTPRINT FOR SOLIDS MANAGEMENT – PYROLYSIS

- Total Carbon Footprint for Pyrolysis = 145 MT CO₂e/yr
- Carbon Emissions Equivalent to Operating 32 Cars/Year





DORSEY WWTP

CAPITAL FUNDING REQUEST

- After reviewing the results of the RFI, coordinating with other partners in the State, and calculating the greenhouse gas savings
- We moved forward with a capital request to build a drying and pyrolysis process at the Dorsey WWTP
- The request was denied, and we were told to proceed with ATAD
- We are still in discussions and hope to find a new path forward

GET IN TOUCH

Maryland Environmental Service

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