



The Art and Science of  
**DREDGING WATER TREATMENT**

CLEAN WATER SOLUTIONS

# ABOUT IAI

- Small business, employee-owned
- Approx. 100 employees
- Founded in 2000
- Based in Rockford, Michigan
- Water & wastewater treatment
- Dredging & Sediment Dewatering Division

# KEY TOPICS

- When dredging projects require water treatment
- Overview of treatment processes & equipment
- Comparison of treatment system installations
- Treated water discharge
- Case studies

# WATER TREATMENT MAY BE REQUIRED IF:

- There are contaminant(s) of concern present in the dredged material
- Chemicals will be utilized in a dredged material dewatering process
- Dredged material contact water will be discharged to a sensitive water body

# SOURCES OF WATER FOR TREATMENT

- Dredged material drainage, top water
- Storm water
- Dewatering process



# WATER TREATMENT PROCESSES

## *Processes to remove solids:*

- Clarification
- Filtration
- Coagulation/flocculation

## *Processes to remove dissolved chemical contaminants:*

- pH adjustment with precipitation
- Adsorption
- Ion exchange

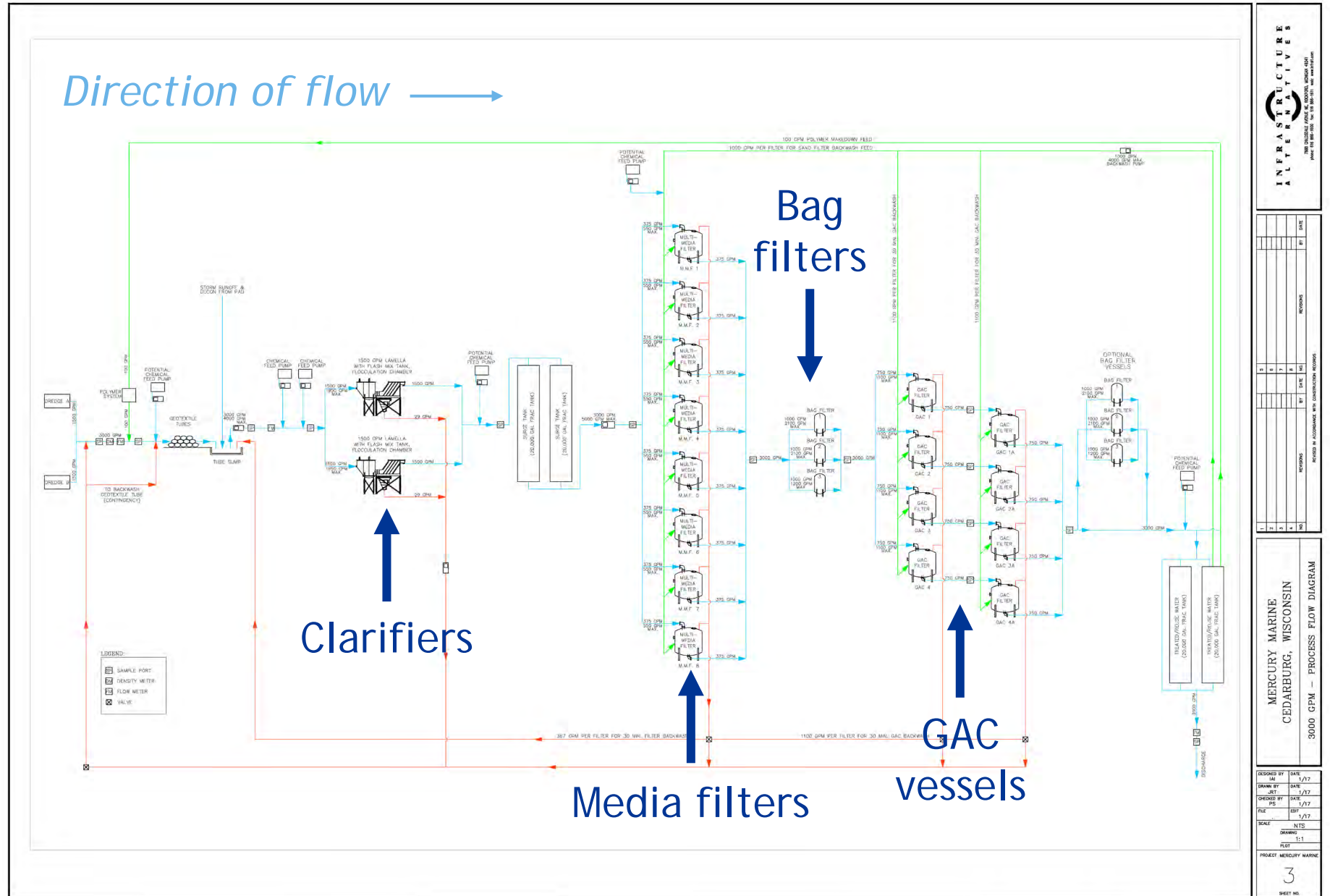


# EXAMPLES OF TREATMENT COMPONENTS





# PROCESS FLOW EXAMPLE





# TYPES OF TREATMENT INSTALLATIONS

## *Consider:*

- Project length
- Construction, maintenance costs
- Modification, expansion
- Decommissioning, waste



*Semi-permanent treatment plant with building and dedicated utilities*



*Temporary treatment system, installed outdoors*

# DISCHARGE MODES

- Batch
  - Treat
  - Store effluent
  - Test, prove permit compliance
  - Then, discharge
- Continuous
  - Treat and discharge effluent continuously
  - Test, prove permit compliance (on-going basis)



# DISCHARGE PERMITS

- NPDES (National Pollutant Discharge Elimination System) - General or Individual
- IPP (Industrial Pretreatment Permit)
- Discharge monitoring
- Reporting requirements
- Outfall type
- Operator of Record requirement





# RESIDUALS MANAGEMENT

- Settled solids
- Backwash waste
- Spent bag filters
- Spent media





# OPERATIONS

- Balancing flow through the system
- Jar testing for appropriate chemical addition
- Process control monitoring
- Permit required monitoring
- Equipment maintenance, including backwashing and bag filter change-out



# COMMUNICATION

- Coordination between dredging and water treatment contractors
- Regulatory agency notifications and reporting
- Laboratory



# CASE STUDY 1: WATER TREATMENT FOR HYDRAULIC DREDGING PROJECT

- Lead-impacted sediments in brackish water
- NPDES permitted discharge to surface water body
- CT DEEP was the regulatory authority
- 3,500 gpm max flow
- Geotextile tube dewatering of dredge slurry
- Coagulation and clarification
- Multi-media filtration
- Bag filtration







# CASE STUDY 2: WATER PRETREATMENT FOR MECHANICAL DREDGING PROJECT

- PCBs-impacted sediments
- Discharge to downstream industrial treatment facility
- Geotextile tubes for rough polishing of dredge material contact water prior to mechanical treatment processes
- Coagulation and clarification
- Multi-media filtration
- Bag filtration
- Carbon adsorption



# CASE STUDY 3: WATER TREATMENT FOR DREDGING PROJECT WITH BOTH MECHANICAL & HYDRAULIC PHASES

- PCBs-impacted sediments
- Geotextile tubes dewatering of hydraulically dredged material only
- Same treatment schemes used for both phases, scaled up to treat higher flow for hydraulic
- WPDES Permit Equivalency
- Coagulation and clarification
- Multi-media filtration
- Bag filtration
- Carbon adsorption







# SUMMARY

- There is both art and science to water treatment
- The ability to quickly and easily adapt a treatment scheme is important to success on environmental dredging projects
- Solids removal processes are key
- Knowing the requirements of the discharge permit are crucial to achieving and maintaining compliance

# QUESTIONS?

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