

# Peirce Island Wastewater Treatment Facility

Portsmouth City Council  
August 3, 2015



# Introductions

- Terry Desmarais, City Engineer
- Mark Laquidara, PhD, P.E., AECOM



# AECOM Technical Advisor

- Mark Laquidara, PhD, P.E., AECOM
  - Doctorate in Environmental Engineering
  - Highest Grade Licensed Wastewater Operator
  - Deputy Director of Process Control, MWRA Deer Island WWTF (Boston, MA)
  - 40 Years of Experience with Emphasis on Cost Optimization
  - Technology Leader for AECOM and Project Advisor
- AECOM
  - Global Firm Specializing in Wastewater and Water Treatment
  - Ranked #1 Engineering Design Firm in World (ENR, 2009-current)
  - Focus on Innovative/Alternative Nutrient Removal Systems



# Biological Aerated Filter Selection

- Wastewater Treatment Technology Selection
  - 5 Year Process
  - Continuous Review of Best Technology by Multiple Experts
  - Evaluations Focused to Optimize for City's Needs
- Biological Aerated Filter
  - High Rate Treatment Systems
  - Considered New and Innovative
  - 21<sup>st</sup> Century Technology
  - Proven Operational Track Record

***Biological Aerated Filter Selected Based on a Cost and Criteria Matrix as the Technology that Best Met the City's Needs***

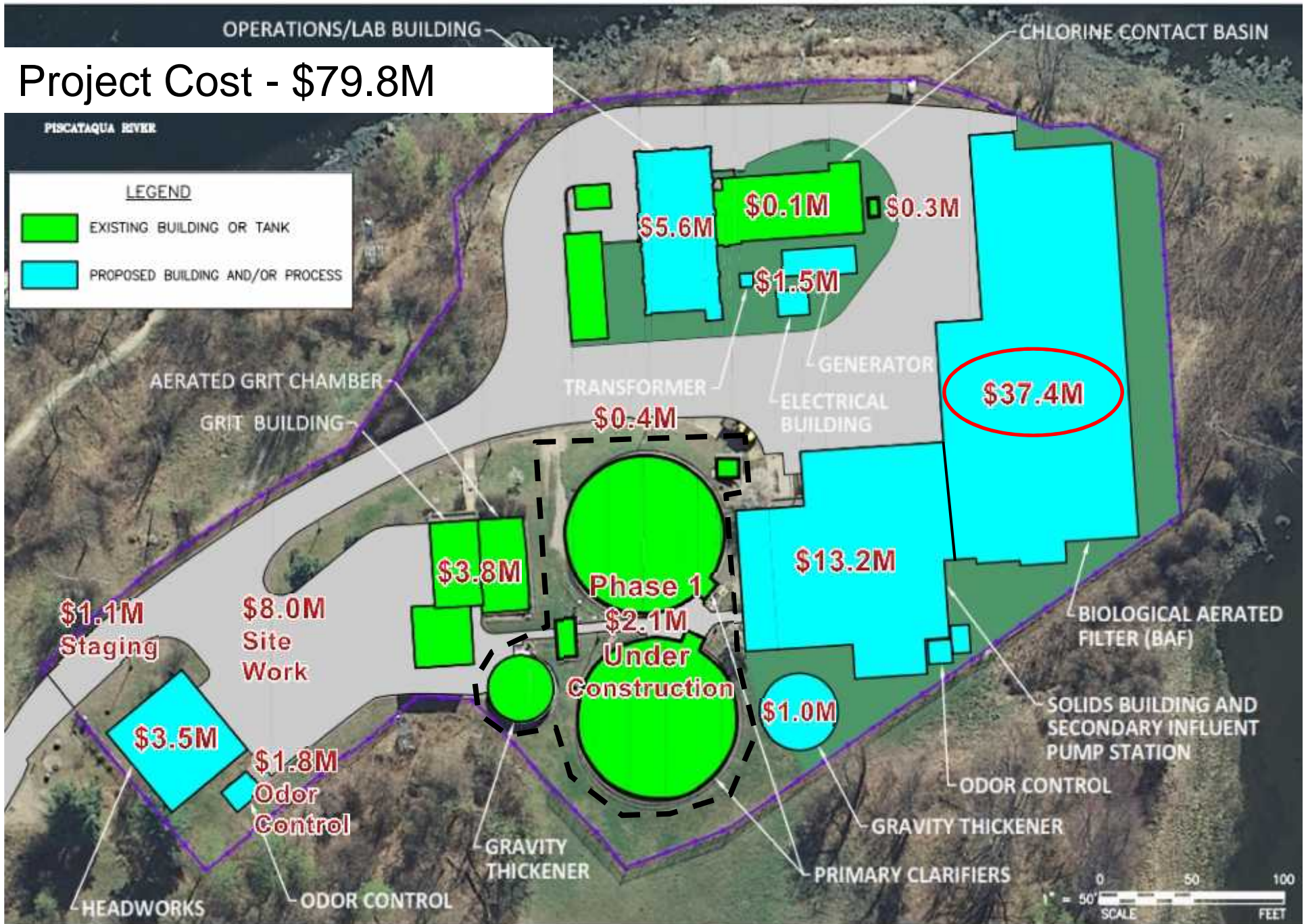


# Project Costs

- Overall Project Costs
  - Capital Replacement (“Maintenance”) Costs
  - Other Upgrade Items
- Upgrade Cost Saving Recommendations
- Roadways
- Peirce Island Road Bridge



# Project Cost - \$79.8M



# Capital Replacement (“Maintenance”) Items

- Replacement of Routinely Serviced Equipment and Other Materials That Have Exceeded Their Intended Useful Life
- Majority of Equipment and Materials from 1990 Upgrade (25 Years of Service)
- Upgrade Cost Components
  - Total Cost \$79.8M
  - Capital Replacement Costs \$25.3M
  - Other Upgrade Items \$54.5M



# Recommended Cost Reduction Items

Item	Estimated Cost Reduction (\$Million)
Close Island (at Four Tree Is.) During Const	(\$0.4)
Eliminate Odor Control	(\$1.8)
Increase Height of BAF to 33-feet	(\$2.2)
Use Gray Textured Façade on Portions of BAF	(\$0.2)
Use Overhead Electric from Pool to Facility	(\$0.7)
Use Exterior Finish Insulation System	(\$0.5)
<b>Subtotal Reduction Items</b>	<b>(\$5.6)</b>
Secondary Only Treatment	(\$6.5)
<b>Total Reduction Items</b>	<b>(\$12.3)</b>





# Close Island (at Four Tree Island) During Construction



State Fish Pier, Pool and Four Tree Island Remain Open

Area Closed to Public

Temporary Staging Areas

Construction Area



PRELIMINARY

25-FT – Brick Façade



PRELIMINARY

## 25-FT – Gray Textured Façade





PRELIMINARY

33-FT – Brick Façade



PRELIMINARY

33-FT – Gray Textured Façade



# Upgrade Scenarios

	Current Design	Alternative 1	Alternative 2	Staff Recommended
Treatment Technology	Biological Aerated Filter	Biological Aerated Filter	Conventional Activated Sludge	Biological Aerated Filter
Treatment Level	Nitrogen Removal	Secondary	Secondary	Nitrogen Removal
Site Limits	In Fence	In Fence	Outside Fence	In Fence
Cost	~\$79.8M	~\$73.3M	~\$70.0M	~\$77.0M
Cost Savings	-	~\$6.5M	~\$10.0M	~\$2.8M
Expansion Costs	-	>\$6.5M	>>\$10M (Further Outside Fence)	-



# Roadways

- Normal Wear and Tear Ongoing
  - Public Projects, Private Projects, Travelling Public, Business Use, and Weather
- Pavement Index and CIP Currently Sets Schedule
- Roadways
  - Focus on Proposed Haul Routes and Current Pavement Condition Index
  - Impact from Normal Wear and Tear and Other Construction Projects Needs to be Considered
  - Potential Paving Cost Range \$0.75M to \$0.95M



# Peirce Island Road Bridge

- Originally Constructed 1958 (57 Years Old in 2015)
- Typical Lifespan of Bridge in this Environment is 50 Years
- Consultant Evaluated Overall Bridge Condition
  - Bridge Can be Used for Construction Project with Limitations on Traffic
  - Rehabilitation of Bridge More Costly than Replacement
  - Recommend Replacement of Bridge Regardless of Construction Project in Next 5 to 10 Years
- Potential Replacement Cost Range \$5M to \$7M
- Could be Eligible for NHDOT Municipal Bridge Aid Program with 80% Grant Funding



# Questions

