

# Old Orchard Beach, Maine Wastewater Facilities Planning

April 27, 2011



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## Presentation Overview

- Background
- Planning Process
- Needs Assessment
- Conclusions & Recommendations
- Project Costs & Schedule
- Funding & Financing
- Next Steps
- Questions & Discussion

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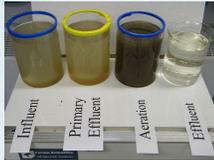
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## Wastewater Management

- Collection
- Treatment
  - Operates 24 hours per day
  - WWTFs remove 90% - 95% of pollutants that they are *designed to remove*, however, they remove only small amounts of pollutants that they are *not designed to remove*.
  - Effluent contains: Organic materials, Inorganic materials (e.g. metals), and Nutrients (e.g. nitrogen, phosphorus)
- Disposal
  - Treated effluent is disposed of into oceans, rivers and/or the land.



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## Wastewater Volume

- Sewer Users
  - Approx. 75,000 gallons per year to sewer system
  
- Non-sewer users
  - Approx. 75,000 gallons to leachfield every year
  - Approx. 1,000 gallons of septage every 3-4 years
  - Septage is brought to a WWTF for processing



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## Wastewater Treatment

- Preliminary
  - Removes debris, sticks, floatables, grit which cause problems with equipment
  
- Primary
  - Removes >50% of the particulate materials
  
- Secondary
  - Removes >90% of the organic materials
  - Removes some nutrients
  
- **Advanced**
  - Removes substantial nutrients
  
- Disinfection
  - Kills bacteria





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## Old Orchard Beach

- Population:
  - Approx. 9,250 year round
  - Approx. 70,000 on peak seasonal day use
  - Existing development is over 90% sewered
  
- Collection System
  - Sewers: 36 miles (approx. 193,000 feet)
  - Forcemains: 4.1 miles (approx. 22,000 feet)
  - Pump Stations: 9
  
- WWTF:
  - Average daily flows – 1,600,000 gallons per day
  - Peak daily flows > 6,400,000 gallons per day
  
- Effluent Disposal:
  - Saco Bay, in compliance with current NPDES permit



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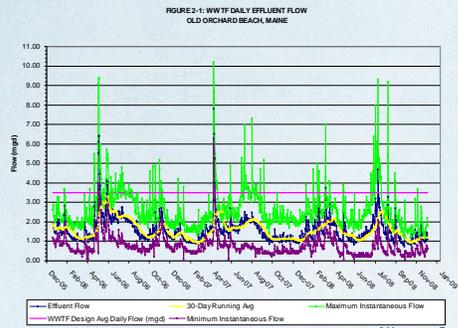
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## Impact of Population on Flow



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7

## What is a WW Facilities Plan?

- A comprehensive plan to:
  - identify water-quality-related needs
  - identify and analyze options
  - recommend capital improvements and expenses
  - recommend management options
  - identify funding and financing mechanisms

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8

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## Planning Process

Town hired Wright-Pierce in Summer 2008 to perform a comprehensive wastewater facilities evaluation.

1. Assess Needs
  - Current flows and loadings
  - Growth projections, future flows and loadings
  - Pump Station and WWTF existing conditions
2. Evaluate Alternatives
3. Develop the Recommended Plan & Costs

Wright-Pierce submitted a Draft Wastewater Facilities Plan to the Town in July 2009.

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9

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## Current & Future Flows

- Current flows (1,600,000 gallons per day) are within existing treatment capacity.
- Future flows were reviewed for “theoretical build-out” for 20-yr period:
  - Domestic/ Commercial sewer extensions
  - Industrial sewer extensions
  - Sewer system infill growth
  - Unsewered growth (seepage)
  - Calculated an additional 600,000 gallons per day

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## Factors Impacting Needs

- Need to provide reliable, effective & efficient treatment for
  - Current flows and loading
  - Future flows and loadings
- Need to maintain levels of treatment
  - Current NPDES permit
  - Future NPDES permit
- To maintain or reduce operating costs associated with:
  - Aeration blowers
  - Sludge processing & disposal
  - Chemical use
  - Electricity, fuel oil, etc.

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## Needs in Collection System

- Sewered growth — capacity limitations



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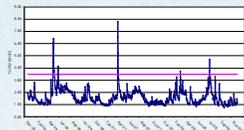
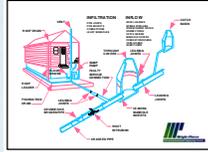
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## Needs in Collection System

- Reduce "Extraneous flows"
  - Groundwater infiltration
  - Rain-induced inflow
  - Catch basins
  - Roof leaders
  - Private properties (i.e. sewer cleanouts being used as area drains for surface water, etc.)



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13

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## Needs at Pump Stations

- Upgrades of pump control panels, telemetry & electrical service for all (completed 2009-2010).
- Replacement pump stations needed for:
  - Milliken Street Pump Station
  - Portland Avenue Pump Station
  - Ross Road Pump Station
- Comprehensive upgrades needed for:
  - Halfway Pump Station
  - Comfort Pump Station
  - East Grand Pump Station
  - Dunegrass 100 and 200

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14

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## Needs at WWTF

- Town constructed and upgraded the WWTF in numerous phases:
  - 1960s - original construction
  - 1972 - comprehensive upgrade
  - 1985 - comprehensive upgrade
  - 1994 - standalone component
  - 2000 - standalone component
- Approx. 70% of the WWTF equipment is 25+ years old
- Approx. 50% of the Town's electricity budget is from the WWTF



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15

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## Conclusions – Collection

- Sewers are not part of the Wastewater Department and sewer upgrades were not included in this study.
- Pump stations warrant significant investment in the mid-term and long-term due to capacity and age.
  - The SCADA for Remote Pump Stations project was recently completed (2010) and added reliability to these stations.
  - West Grand Pump Station project was recently completed (2010).
- Force mains warrant replacement in the long-term based on capacity and age.
- Sewered growth on the north side of Town will have a disproportionate cost impact due to existing age and capacity of collection system.

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## Conclusions - Treatment

- WWTF is well operated and meets current permit... however, significant portions are aging, inefficient and do not meet current codes and standards.
- WWTF will not meet future permit without significant upgrade.
- WWTF warrants investments to improve process reliability, operational flexibility and energy efficiency. WWTF warrants investments to address some safety and code related items.
- WWTF staffing levels appear reasonable based on "manpower calculations" and comparison to other Maine communities.

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## Conclusions - Disposal

- The existing wastewater disposal system (effluent pump station and ocean outfall) appears adequate for the planning period.

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## Recommendations

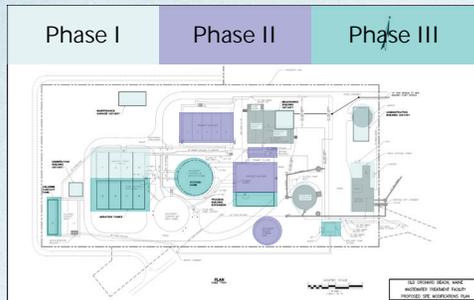
- Implement upgrades to wastewater facilities to improve reliability, efficiency, and safety for the Town. Phased upgrades are suggested to minimize cost impacts to residents.
- Monitor DEP Nitrogen Standards and rulemaking. Future upgrade will be required to address future treatment standards
- Perform Infiltration/ Inflow Study to reduce extraneous flows to the system. Develop Private I/I Removal Policy
- Consider technical and financial cost implications of sewer system expansion to the north. Consider "sewer limit line" and/or "supplemental sewer connection fees".
- Consider sewer user fee system to provide a dedicated revenue stream for wastewater needs.

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22

## Recommended WWTF Site Plan



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23

## Estimated Project Costs

DESCRIPTION	PHASE	ESTIMATED COST	PHASE 1	PHASE 2	PHASE 3
			2016-2017	2018-2019	2020-2021
HALFWAY PUMP STATION (Additional Cost in Backwash Slag)	1	\$252,000	\$252,000	\$0	\$0
PRIMARY TREATMENT	2	\$257,000	\$0	\$152,000	\$0
ACTIVATED SLUDGE	1	\$130,000	\$0	\$0	\$0
SECONDARY CLARIFICATION	1	\$130,000	\$0	\$0	\$0
CHLORINE CONTACT TANKS	1	\$250,000	\$0	\$0	\$0
SOLID STORAGE TANKS	2	\$472,000	\$0	\$175,000	\$0
FIELD PUMP STATION	3	\$25,000	\$0	\$0	\$25,000
PROCESS BUILDING	2	\$1,360,000	\$0	\$2,360,000	\$0
CONTROL BUILDING	1	\$80,000	\$0	\$0	\$0
NEW BUILDINGS (E-BUILDING) HALFWAY PUMP STATION	1	\$1,000,000	\$0	\$0	\$0
NEW INFILTRATION BUILDING	1	\$1,000,000	\$0	\$0	\$0
NEW MAINTENANCE BUILDING	1	\$1,000,000	\$0	\$0	\$0
ELECTRICAL & SCADA SYSTEM	1	\$1,000,000	\$0	\$0	\$0
FUTURE PROCESS BUILDING EXPANSION	3	\$1,000,000	\$0	\$0	\$1,000,000
FUTURE SOLID STORAGE TANKS	3	\$1,000,000	\$0	\$0	\$1,000,000
FUTURE CHLORINE CONTACT TANKS	3	\$1,000,000	\$0	\$0	\$1,000,000
PUMP STATION	-	\$1,000,000	\$1,000,000	\$0	\$0
<b>SUBTOTAL CONSTRUCTION</b>		<b>\$9,647,000</b>	<b>\$6,113,000</b>	<b>\$8,321,000</b>	<b>\$5,211,000</b>
GENERAL CONTRACTOR GROSS AND GENERAL CONDITIONS		\$1,000,000	\$1,000,000	\$1,300,000	\$750,000
ELECTRICAL RESPONSE SERVICE ALLOWANCE		\$30,000	\$30,000	\$0	\$30,000
BOND & INSURANCES		\$100,000	\$100,000	\$100,000	\$0
UNIT PRICE ITEMS		\$0	\$0	\$0	\$0
UNALLOCATED FORTIFIES		\$0	\$0	\$0	\$0
<b>SUBTOTAL CONSTRUCTION COSTS</b>		<b>\$11,777,000</b>	<b>\$8,243,000</b>	<b>\$10,721,000</b>	<b>\$6,001,000</b>
INGENIERS FEES (BASED ON CONSTRUCTION COST)		\$2,670,000	\$7,500,000	\$11,800,000	\$6,400,000
TECHNICAL SERVICE AND PROJECT CONTINGENCY		\$1,000,000	\$1,000,000	\$1,000,000	\$2,500,000
<b>TOTAL PROJECT COST IN CURRENT DOLLARS</b>		<b>\$15,447,000</b>	<b>\$16,743,000</b>	<b>\$22,521,000</b>	<b>\$14,901,000</b>
INFLATION TO MEET CONSTRUCTION (see 2.7b, per year)		\$0	\$0	\$0	\$0
<b>SUBTOTAL INCLUDING EFFECTS OF INFLATION</b>		<b>\$15,447,000</b>	<b>\$16,743,000</b>	<b>\$22,521,000</b>	<b>\$14,901,000</b>
TOTAL INCLUDING EFFECTS OF INFLATION INCREASE IN PROJECT COSTS		\$0	\$0	\$0	\$0

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24

## Project Costs & Schedule

	Dollars	Schedule
• Phase I	\$10.5M	2009 - 2012
• Phase II	\$14.3M	2015 - 2018
• Phase III	\$ 9.0M	2020 - 2023
• TOTAL	\$33.8M	

- Annual Operating Budget
  - Existing ~ \$1,080,000
  - Phase III ~ \$1,200,000
- Does not include Collection System sewer costs

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## Funding & Financing

- Loans
  - DEP CWSRF, 20-yr loan at 2% below MMBB
  - USDA/ Rural Development, 20 or 30-yr loans
  - General obligation bonds
- Grants
  - Efficiency Maine Grant
  - Community Development Block Grants
  - State and Tribal Assistance Grant
  - USDA/ Rural Development (only with user fee)
  - Maine DEP Grant (only with user fee)

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## Local Costs

- Local Property Taxation
  - No changes required
  - Simple system
  - Precludes eligibility from some grant funding sources
  - Lowest cost system under current situation
- Sewer User Fees
  - Significant changes required
  - More complex system
  - Costs are incurred proportional to use
  - Eligible for state & federal grant funding
  - Lowest cost system after the required capital improvement if grants are secured.

- Some communities combine these systems to balance costs ("partial sewer user fee")

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## Next Steps

- Address Town questions and comments on draft report. Provide supplemental material as requested.
- Finalize intended phasing plan, recognizing that each phase typically takes 3-4 years from planning through commissioning.
- When ready and approved by the Town, submit updated draft report to DEP. Address DEP comments in conjunction with the Town.
- Finalize Report

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## Questions & Discussion

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