Center for the Inland Bays
Scientific & Technical Advisory Committee Meeting

Wandendale Regional
Wastewater Treatment and
Disposal Facility

February 18, 2011
Regulated Wastewater Utility

- Design
- Build
- Own
- Operate
- Maintain
Governmental Agency Oversight

- PSC oversee us for:
  - Tariff
  - Franchise
  - Service

- DNREC – for environmental aspects
  - Coastal Zone permit
  - Construction permit
  - Operating permit

- Sussex County
  - Conditional use approval
Project Scope:

- Design, Build, Own, Operate a regional wastewater treatment and disposal facility that would do several things:
  - Serve proposed developments (essentially eliminating the need to build individual septics or multiple smaller community systems)
  - Provide the opportunity to eliminate existing septics
Type of Treatment

- Membrane Bio-reactor treatment facility.
  
  - Produces high quality effluent that is clear and odorless.
  
  - Provides enhanced nutrient removal with discharges of:
    
    - Total Nitrogen of 5 mg/l (in accordance with PCS)
    
    - Total phosphorus will be 0.5 mg/l
  
  - Followed by Ultra Violet disinfection
Nearby MBR’s

- Cecil County, MD
- Baltimore County, MD
- Hart’s Landing, Lewes, DE
- Marsh Property
- Bayfront, Lewes, DE
- Glen Riddle Development – Ocean City, MD.
Hart’s Landing Wastewater Facility
Type of Disposal

RIBS

• Shallow basins (18-24” deep) that accept the treated water

• 15.4 acres area approved for RIBs

• Six (6) basins

• Dose one basin per day, then let it rest for five days and rotate the basins.
Bay Front RIBS Facility
Spray Irrigation

- Berm landscaping
- Cropland
- Similar to the County’s Wolf Neck, Piney Neck and Inland Bays
- Future lined storage pond
- 150 acres of spray land
Extensive Soils Work Has Been Done

- Soils reconnaissance and report
- Detailed Soils investigation report for the RIB area
  - Depth to Ground water is 19-22ft. in RIB area
  - Double Ring Infiltrometer testing has been done in RIB area to test the permeability and the results are favorable.
Extensive Hydro-geological Work Completed

- Continuous wet season monitoring
- Deep borings
- A hydro-geological ground water model
  - Long Travel Times
  - Significant depth to groundwater
  - No adverse affects to wells or water bodies
- Significant depth to groundwater
Figure 2: Test Boring and Well Locations
Figure 21: Calculated Flow Paths and Travel Times
Phased Construction and Operation of the Facility

- Ultimate Design Capacity is for 1.45 MGD.
- The phases will be for 150,000 gpd each; the last increment will be for 100,000 gpd.
- Pump and haul for the first 15-20,000.
- At 15 - 20,000 gpd, place plant into operation.
- At 145,000 gpd (10% of overall permit), we’ll start to spray on landscaping on berms of RIBs as needed.
- At 300,000 gpd we’ll start to spray on field closest to RIBs using co-mingled water drawn out of a well downgradient of the RIBs, because the discharge itself will not be enough.
- At 600,000 gpd we’ll build first lagoon and start spraying near RIBs; will use well as needed.
- We’ll continue with RIB disposal during the phases as well, when crops do not need the water.
- Treatment systems will be in designed and constructed in parallel.
Approvals for Project

• Sussex County Conditional Use Approval.
• Coastal Zone permit approval.
• Detailed Soils Investigation report approval.
• Received Ground Water Impact Assessment approval.
• The Construction permit was submitted to DNREC on December 20, 2010.
Summary

 ✓ Design, Build, own, operate a state of the art wastewater treatment and disposal facility.

 ✓ Reduce nutrients (meet PCS requirements)

 ✓ Recharge groundwater

 ✓ No adverse effects on wells or water bodies

 ✓ Preserves open space, farmland and forest land.

 ✓ Serve new developments eliminating need for multiple community systems or individual septics.

 ✓ Opportunity to serve existing individual septics
Treatment & Disposal Evolution
Treatment & Disposal Evolution
Treatment & Disposal Evolution

Spray Irrigation of Domestic Wastewater was Banned in Delaware in the 1970’s

Spray Irrigation of Domestic Wastewater was Back in Action in the mid-80’s Using Lagoon Treatment Technology for BOD Reduction and Crops for Nutrient Removal
Disposal Evolution

149 → 65

0 → 16

0 → 12
Treatment Evolution

WASTEWATER TREATMENT WITH ACTIVATED SLUDGE

PERIOD
1970 - 1985

SECONDARY TREATMENT
AERATION TANK
Q
MLSS
RAS
Q + Q\text{R}
SECONDARY CLARIFIER
WAS

EFFLUENT QUALITY
(mg/l)
BOD 30
TSS 30

ADVANCED WASTE TREATMENT (BNR)

1985 - 1995

NITRATE RECYCLE
ANOXIC ZONE
AEROBIC ZONE
Q
RAS
Q
SECONDARY CLARIFIER
WAS

BOD 10
TSS 10
T NITROGEN 10
Membrane Overview

- Semi-Permeable Membrane
- Pores
Treatment Evolution
Treatment & Disposal Evolution

- Technology has finally caught up.
- Regulatory requirements can all be met.
- Crops no longer necessary to provide nutrient reduction function.