Introduction to Fairfax County
Introduction to Fairfax County

• Fairfax County’s Integrated Sewer System
  – Wastewater Management Program
    • One of our five major business areas in the Department of Environmental Services (DPWES)
    • Governed by the Fairfax County Board of Supervisors
Introduction to Fairfax County

• Fairfax County’s Integrated Sewer System
  – The system handles 99 MGD of wastewater generated by approximately 933,000 County residents and 60,000 residents in nearby counties, cities and towns.
Introduction to Fairfax County

• The System contains:
  – 3,400 miles of gravity sewers (8 to 72 inches)
  – 59 Pumping stations (0.1 to 37 MGD)
  – 234 square miles
  – 321 employees
Introduction to Fairfax County

- To treat the wastewater flows generated the County operates and maintains an advanced wastewater treatment plant.
  - 67 MGD Noman M. Cole, Jr. Pollution Control Plant
  - Located in Lorton, Virginia
Introduction to Fairfax County’s ENR Program
Introduction to Fairfax County’s ENR Program

• In August 2004, the Virginia Department of Environmental Quality (DEQ) proposed reduced nutrient waste load allocations for Virginia wastewater treatment facilities.

• These load allocations were then incorporated into the Virginia’s Phase I Watershed Implementation Plan for meeting the EPA Chesapeake Bay Total Maximum Daily Loads (TMDL).
Introduction to Fairfax County’s ENR Program

- To meet the load allocations, enhanced nutrient removal was required of all wastewater treatment plants serving Fairfax County to meet more stringent Chesapeake Bay water quality standards by January 1, 2011.

- Nitrogen effluent limit (3 mg/L) and Waste Load Allocation (WLA) of 611,900 pounds.
Introduction to Fairfax County’s ENR Program

• 2005 - To meet the load allocations, we needed a program that included:
  – choosing the best technology,
  – avoiding resource shortages generated by neighboring utilities also facing major nutrient removal programs at the same time,
  – spreading out capital needs,
  – maximizing federal and state funding,
  – and most importantly maintaining the facility’s permit performance through the needed upgrades.
Introduction to Fairfax County’s ENR Program

• 2005 - In response to these challenges, the team developed a ENR program that included numerous unique and innovative components:
  – Expansion of Equalization Basins
  – Upgrades to the Activated Sludge Basins
  – New Moving Bed Biofilm Reactor (MBBR)
    • (Other Presentation Today.)
  – New Water Reuse System
  – Nutrient Trading
Introduction to Fairfax County’s ENR Program

• 2006 – As part of the ENR Program we had Greeley and Hansen (G&H) develop a plan for water reuse within Fairfax County.

• The plan included:
  – Potential Users
  – Water Quality Analysis
  – Design Flow
  – Existing Infrastructure
  – Potential Nutrient Reduction
  – Recommendations
  – Costs / Payback Period
Introduction to Fairfax County’s Water Reuse Project
Introduction to Fairfax County’s Water Reuse project

• 2006 – The Development plan was complete,

• 2007 - The water reuse project was deferred and was scheduled to be developed near the end of the ENR program,

• 2008 - The project was still in concept stage and questionable if it would ever get started,

• 2008 - 2009 Global economic downturn

• 2008 - It wasn’t looking good for the water reuse project in Fairfax County.
Introduction to Fairfax County’s Water Reuse project

• Two items came along that provided stimulus for the water reuse project.
  – 2008, the State of Virginia implemented the newly created water reclamation and reuse regulations.
Introduction to Fairfax County’s Water Reuse project

• 2008, the State of Virginia implemented the newly created water reclamation and reuse regulations.
  – Clear Direction,
  – Easy to follow,
  – A Path Forward,
Introduction to Fairfax County’s Water Reuse project

  - Funding
  - The project needed to be shovel ready to receive funding,
  - Potential of 6.5-Million Funding Funds

- Construction Start 2 Months from NTP !!!
Introduction to Fairfax County’s Water Reuse project

• Construction Start 2 Months from NTP !!!
  – Design Build was the Only Way to Meet the ARRA requirement
Fairfax County’s Water Reuse Project
Introduction to Fairfax County’s Water Reuse project

• 2009 - We had Greely and Hansen (G&H) on staff for the ENR Program.
  • In 30 days they prepared a Request for Proposal (RFP) for a Design/Built Water Reuse Project
  • Two D/B teams responded to the RFP
  • Fairfax County held interviews and recommended a D/B team.
  • Within 30 more days a Contract was signed with the D/B team.
  • G&H staff continued on as a Bridging Engineer
Introduction to Fairfax County’s Water Reuse project

• 2009 – Fairfax County DPWES selected the D/B team which consisted of:
  • M.A. Bongiovanni, Inc.
  • Dewberry
  • Patriot Development Corporation
Fairfax County’s Water Reuse project

- 2009 - Construction Started within Two months of the NTP.
- $6.5-Million Funding from American Recovery and Reinvestment Act (ARRA) was received to support the project.
Fairfax County’s Water Reuse
Main components
AVERAGE DAILY DESIGN FLOWS

REUSE AVERAGE DAILY DESIGN FLOWS
COVANTA = 1,080 GPM
LAUREL HILL GOLF COURSE = 833 GPM
LOWER POTOMAC BALL FIELDS = 231 GPM
TOTAL = 2144 GPM

MAXIMUM DESIGN FLOW = 3816 GPM
REUSE PUMPS

• PURPOSE: MAINTAIN WATER LEVEL IN COVANTA ELEVATED TANK
• TWO NEW 450 HP VERTICAL TURBINE PUMPS
• EACH PUMP RATED AT 4,600 GPM @ 297 FT
• ONE PUMP IS A STANDBY UNIT
NCPCP REUSE PUMP STATION
36-inch Pipeline
0.5 MG “ELEVATED” WATER TANK
Laurel hill booster pump station
Switchgear, Flow meter, and Analyzers
Fairfax County’s Water Reuse Customers
Water Reuse Costumers

Covanta

Cooling Towers

1,000 GPM to Covanta FACILITY
Laurel hill golf course
South County Little League
Baseball Park

Booster Pump

Pump Station
Reuse water Bulkfill Station
FUTURE POSSIBLE REUSE CUSTOMERS

• FORT BELVOIR
• POHICK BAY GOLF COURSE
• NEWINGTON CONCRETE
• CARDINAL CONCRETE
• Various HOAs
• Other potentials
Reuse  FACILITIES COSTS

• Design Build Price $15,200,000
• Change Orders Total $112,760 (0.7%)
• Cost to Date $15,312,760
Thank you

• Questions?