



Department of the Environment

Bay Restoration Fund OSDS Program

Awards, Technology, Performance,
Maintenance and Tracking

By

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Water Management Administration



BRF Program, Technology Selection and Effluent Data (Part -1)

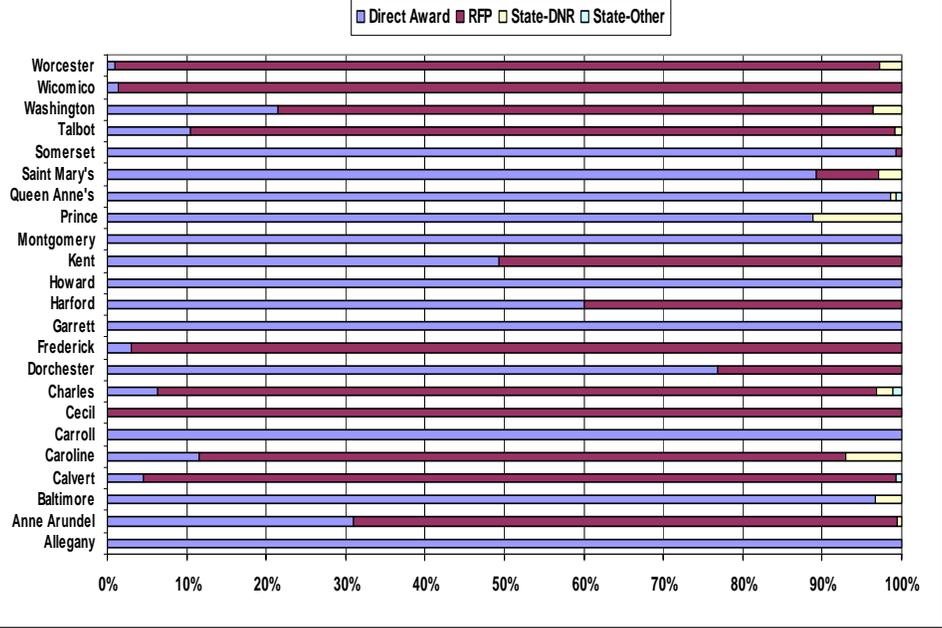
- BRF Awards and distribution analysis
- Technology selection
- Technology effluent data and analysis

BRF Program, Operation and Maintenance, Tracking and Auditing (Part -2)

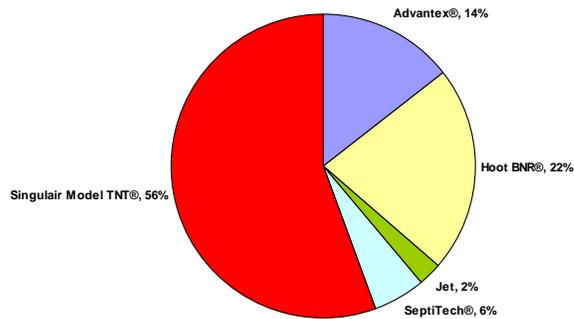
- BRF Requirements
- O&M findings
- Tracking and auditing installations and servicing



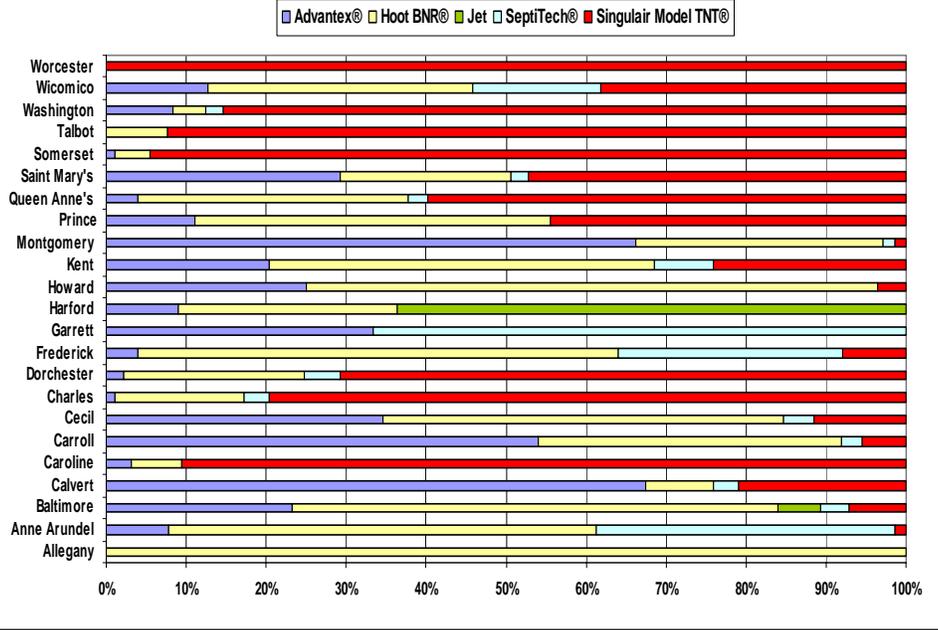
Distribution of Awards from BRF



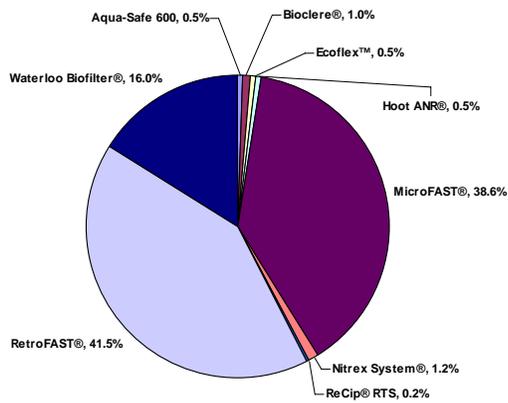
Distribution of field verified BATs



Distribution of Field verified BAT by county



Distribution of non-field verified BATs





Best Available Technology for Nitrogen Removal - Part1

- Initial criteria for technology selection for BRF Program was certification by EPA's Environmental Testing Verification Program
 - (1) Aquapoint, Inc.
Bioclere Model 16/12
 - (2) BioConcepts, Inc.
ReCip RTS ~500 System
 - (3) Bio-Microbics
RetroFAST 0.375 System
 - (4) F.R. Mahony & Associates, Inc.
Amphidrome Model Single-Family System
 - (5) SeptiTech, Inc.
SeptiTech Model 400 System
 - (6) Waterloo Biofilter Systems, Inc.
Waterloo Biofilter Model 4 Bedroom



Best Available Technology for Nitrogen Removal – Part 2

- Current criteria for selection is:
 - 75th percentile of effluent TN concentration should be 20 mg/l or less
 - 75th percentile of TN percent reduction should be 50% or greater
 - Data from certified testing program such as NSF 245
 - # of samples,
 - cold weather sampling
 - influent concentration





List of Field Verified BAT

* Does not include cost of pumping septage.
 ** Based on a rate of \$0.13 per kWh and unit size for 3 to 4 bedrooms.

Model	Contact Information	Certifications	MDE Field Performance Analysis for Total Nitrogen	Operation and Maintenance Cost per year*	Electricity cost and Usage**
Hoot BNR	Manufacturer Hoot Aerobic Systems, Inc. www.hootsystems.com Local Distributor Nancy Mayer Phone: (410) 796-1434 Email: mayerbro@connext.net	Other 3 rd Party	Percent Removal 52% And Effluent Concentration 29 mg/l Data & Analysis	\$250 to \$325	\$100/year or 2.1 kWh/day
Advantex®-AX	Manufacturer Oreco Systems®, Inc. www.oreco.com/ Local Distributor Robert Johnson Phone: 1-877-214-92837 Email: rjohnson@septicssystems.net	Other 3 rd Party	Percent Removal 69% And Effluent Concentration 19 mg/l Data & Analysis	\$175	\$23/year or 0.475 kWh/day
Singulair TNT	Manufacturer Norweco, Inc. www.norweco.com Local Distributors Eastern Shore - John Short Phone: (443) 786-0594 Email: btowers62@gmail.com Southern Region - Jeff Earnshaw Phone: (301) 274-3772 Email: superfortank@oloa.com Western Region - C.R. Semler (301) 824-2780 crsemler@crsemmler.com Back River Pre-Cast LLC 12200 Owings Mills Blvd, #B Relisterstown, MD 21156 410-833-3394 Contact: Tony Geckle, Matt Geckle	Other 3 rd Party And NSF 245	Percent Removal 50% And Effluent Concentration 35 mg/l Data & Analysis	\$180 to \$300	\$273/year or 5.75 kWh/day
SeptiTech®	Manufacturer SeptiTech, Inc. www.septitech.com Local Distributors Chris Wireman Phone: (443)-463-0637 Western MD, Scott Everhart Phone: (304) 676-3823	ETV And NSF 245	Percent Removal 59% And Effluent Concentration 24 mg/l Data & Analysis	\$180 to \$300	\$242/year or 5.1 kWh/day



BAT under field verification - Part 1

Model	Contact Information	Certifications	Comments
Bioclere™	Aquapoint, Inc. www.aquapoint.com Robbie Tippett Phone: (240) 298-7572 Email: rtipp4@aol.com	ETV	Under Field Verification
AA500-35NR And AS600+4NR w/EZ top	Ecological Tanks, Inc 2247 Highway Highway 151 North Downsille, LA 71234 800-277-8179 318-644-0397 www.etiaquasafe.com Bruce Melton Phone: (410) 878-2952 Email: rbrmelton@progressiveseplic.com	NSF 245	Under Field Verification
Amphidrome™	F.R. Mahony & Associates, Inc. www.frmahony.com Eric Smith Technical Sales F.R. Mahony & Associates ericsmith@frmahony.com Cell: 1-781-820-5808 Fax: 1-508-366-022	ETV	Under Field Verification
RetroFAST	Bio-Microbics, Inc. http://www.biomicrobics.com Freemire & Associates Phone: (410) 768-8500 Email: rsf@freemire.com	ETV	Under Field Verification Limited to households of 1 to 4 occupants and/or 3 bedroom or less
Hoot ANR	Hoot Aerobic Systems, Inc. www.hootsystems.com Nancy Mayer Phone: (410) 796-1434 Email: mayerbro@connext.net	NSF 245	Under Field Verification

BAT under field verification - Part 2

Model	Contact Information	Certifications	Comments
Hoot - H	Hoot Aerobic Systems, Inc. www.hootsystems.com Nancy Mayer Phone: (410) 796-1434 Email: mayerbro@connext.net	Other 3 rd Party	Under Field Verification
Nitrex	Lombardo Associates, Inc. www.lombardoassociates.com Pio Lombardo Phone: (617) 964-2924 Email: pio@lombardoassociates.com	Other 3 rd Party	Under Field Verification Add-on anoxic filter with carbon source, to be coupled with a nitrification unit.
Advantex®-RT	Orenco Systems®, Inc. www.orenco.com/ Robert Johnson Phone: 1-877-214-92837 Email: bjohnson@septicssystem.net	Other 3 rd Party	Under Field Verification

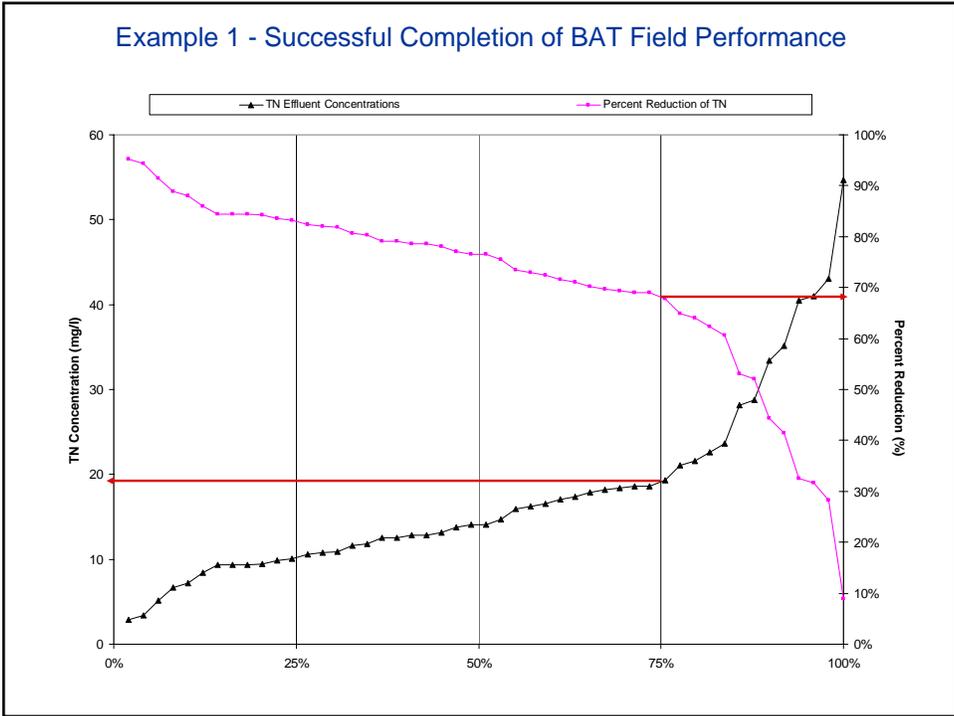


BAT Field Performance and Data

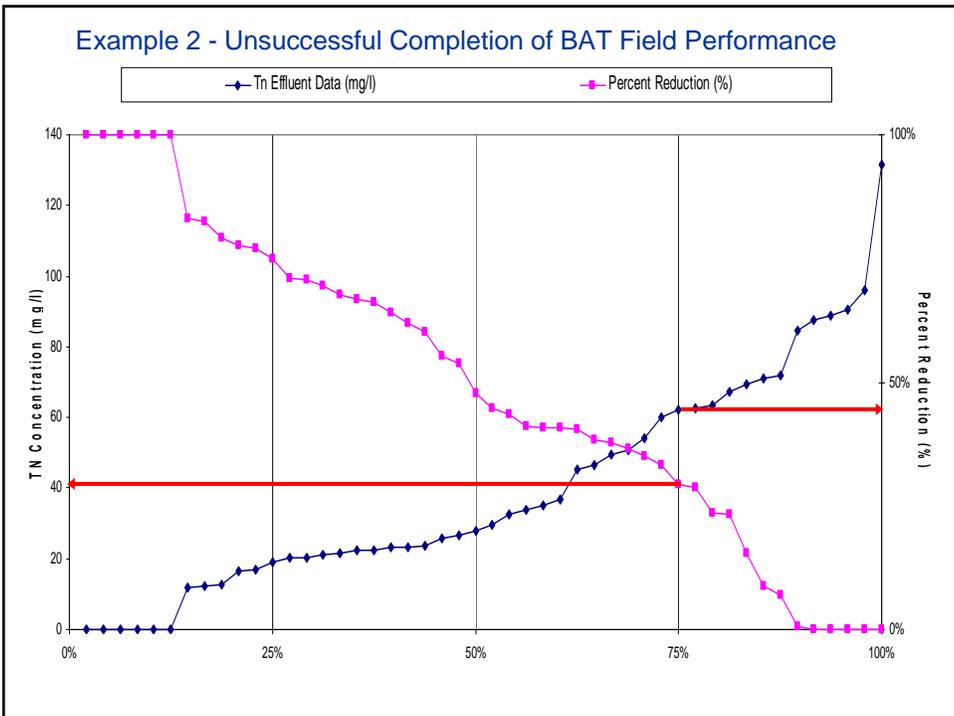
- Approval of BAT technology is conditional of successful completion of field performance.
 - Field performance monitoring consists of:
 - Seasonal Quarterly composite sampling of effluent for TN of 12 units of the technology
 - 75th percentile of effluent TN concentration should be 20 mg/l or less
 - 75th percentile of TN percent reduction should be 50% or greater



Example 1 - Successful Completion of BAT Field Performance



Example 2 - Unsuccessful Completion of BAT Field Performance





Performance Summary

- Currently collected 477 effluent TN composite datapoints:
 - Dataset includes all data including successful and unsuccessful field performance technology,
 - also includes additional data collected by counties and MDE
 - Average TN of 477 datapoints is 30.3 mg/l with std.dev of 22.2
 - Assuming an influent TN concentration of 60 mg/l it can be assumed that we are meeting 50% reduction



Summary and Conclusions (PART 1)

- Recent changes in the management and procurement should change distribution of awards and technologies.
 - Local government has greater control over technology selection
- Technologies successfully completed field verification meet the required 50% TN reduction
 - Some of the technologies meet standards while others exceed standards
 - BAT selection protocol does not reward technologies that exceed performance standards





Department of the Environment

BAY RESTORATION FUND

Bay Restoration Fund

Joshua Flatley
Project Manager

Shanaka Abeywickrama
Project Manager



Bay Restoration Fund

- Voluntary Program
- SB 544 requirements
- Upgrading Onsite Sewage Disposal System
- Best available technology
- Reduce nitrogen





Numbers

- 420,000 Septic Systems in MD
- 52,000 in Critical Area
- Upgraded over 2,200 with Bay Restoration Funds
- Over half of upgrades are in the Critical Area



Operation and Maintenance

- Required at least once per year, or as many times as necessary to ensure a properly functioning system
- Each manufacturer is responsible for service on their respected systems
- 5 year O&M contract through state funds





MDE's Findings

- Homeowners turning them OFF
- Settling around the tanks
- Houses are being sold or abandoned
- Summer Homes
- Homeowner neglect







Service Records

- Moving towards online databases
- Keeping Service Records for MDE
- Audits / Visits to Manufacturers





Homeowners

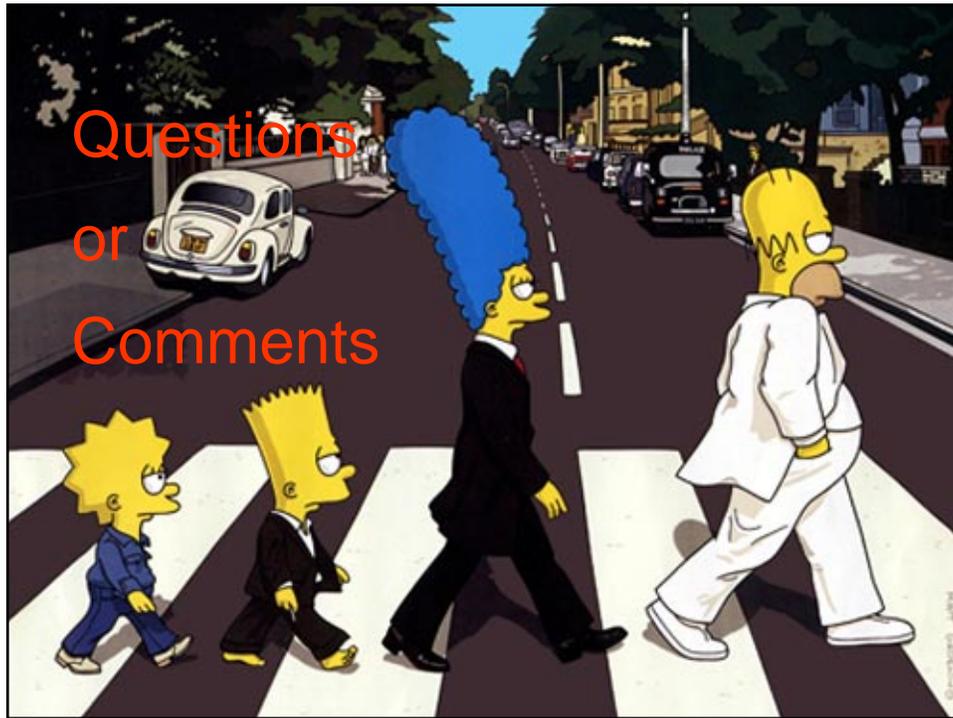
- Need better homeowner awareness
- Homeowners do not understand the workings
- Most don't care



Local Health

- Working with local health
- Doing Inspections
- Ensuring job is complete
- Managing the grant for their county





Maryland Department of the Environment

Bay Restoration Fund

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