From Septics to Sewers

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Alternatives – Tetra Tech Report

- BAT upgrades to septic systems
- Cluster systems
  - Surface water discharges
  - Groundwater discharges
- Sewer connections
Surface Water Discharges

- Projects must address the impacts on:
  - Receiving water bodies
  - Local TMDLs
  - Tier II watersheds (high quality waters)

- **Nitrogen** – Projects might require N offsets or might generate nutrient credits

- **Phosphorus** – Projects will need P offsets
Objectives

- Address public health and water quality problems
- Reduce nutrient loads to meet the WIP
- Create nutrient credits for trading
- Increase the number of rate-payers to support wastewater treatment systems
- Accommodate development opportunities where appropriate
- Access BRF funds
The Idealized Process

1. Identify a septic problem area
2. Decide if State funding will be requested
3. Prepare a plan for the sewer service area and sewer lines
4. Amend the Comprehensive Plan
5. Amend the Water & Sewer Plan…
6. Request MDE funding

7. MDE requests a PFA exception

8. Apply for permits: NPDES

Groundwater

Construction
The Actual Process

• Simultaneously, analyze:
  
  - Problem areas
  - Alternative solutions
  - Citizen input
  - Comp plan issues
  - W&S amendments
  - Legal requirements
  - Affordability
  - Financing

• This is an iterative process - Drill down with more detail as alternatives are analyzed
1. Identify a septic problem area

- Local health department historical knowledge
- Sanitary survey
- Locations of septics in **impermeable soils**
- Locations of septics in **high groundwater areas**
- Locations of septics on **small lots**
How do septic systems work?

- Septic tank – solids sink to bottom; decomposed by bacteria
- Partially treated liquid effluent goes to trenches or drain fields
- Biomat forms at drainfield/soil interface – fine solids, dead bacteria, soil bacteria
- **Unsaturated soil with oxygen** required to allow aerobic bacteria to live and destroy pathogens
How do septic systems work? (cont.)

[Diagram of septic system with labeled parts: Commercial Building or Residence, Septic Tank, Dosing Tank, Trench, Distribution Box, Soil Absorption, Soil Layers, Treatment, Ground Water.]

Figure 1
What is a septic failure?

- Typical failing system:
  
  Visible as a surface discharge

- Non-conforming system:

  Inadequate treatment zone - less than 4 feet

  Inadequately-sized system
Soils with Poor Permeability
High Groundwater

Legend

- Service Area
- Depth to High Water Table:
  - 0 to 1 Foot
  - 1.5 to 4 Feet
  - 3.5 to 6 Feet

Scale: 0 to 2,000 Feet

0 500 1,000 2,000
High Groundwater and Septic Trenches

Illustration of Typical Water Table and Trench Depths in High Groundwater Areas
Replacement System Under Ideal Conditions

Minimum lot size approximation for the replacement of a sand-lined trench system

Area = 31,700 sq ft
0.73 acres
Public Health and Environmental Issues

- Failing septic systems and
- Systems penetrating groundwater

Result in

- Little or no treatment of pathogens (bacteria and viruses)
- High nitrogen loads to the Chesapeake Bay
Public Health and Environmental Issues

- High groundwater
- Soils with poor permeability
- Small lot sizes

3 Strikes and You’re Out!
2. Decide to seek State funding

- Analyze the density of the problem area
- Decide if the density should be increased to create a growth area
- Maryland law - Service must be provided to vacant lots adjacent to a sewer line
- Some infill needed for affordability
3. Prepare a plan for sewer service

- Scope of the project area
- Capacity of the WWTP to accept flows
- AG’s opinion – Service to vacant lots
- Locations and sizes of sewer lines
- Costs / affordability
- Financing package
- Outreach, outreach, outreach!
4. Amend the Comprehensive Plan

- If necessary, amend the Comprehensive Plan to include the proposed sewer service area
- If possible, revise the PFA to include the proposed sewer service area
- The Water & Sewer Plan should be consistent with the Comprehensive Plan
5. Amend the Water & Sewer Plan

- Number and percentage of failing systems
- Number and percentage of systems in high GW, impermeable soils, and on small lots
- Age of the community
- Efforts to replace the failing systems
- Description of the project and map of the proposed service area & sewer lines
Considerations

• Maryland law - Service must be provided to vacant lots adjacent to a sewer line

• Some infill needed for affordability

• State financial assistance ensures limited infill development

• **Strike a balance - Solve public health problem, allow limited infill, achieve affordable project**
6. Request MDE Financing

State Revolving Fund (SRF) Loan:

- 1.5% to 2.0% interest rate
- Up to 30-year loan term
- Assessment on all lots to pay back loan debt
- Vacant lots usually pay an economic premium
House Bill 11 of 2014 (BRF)

- **Expands Use of the BRF Fund**
  Provides grants for connecting septics to a WWTP at BNR or ENR; or to a community system at ENR

- **Helps Homeowners**
  Provides septic grants toward the cost to connect to public sewer ($20,000 max)

- **Provides Financial Flexibility**
  Provides for repayment of eligible debt principal over time, where grant funds are insufficient
House Bill 11 Requirements

- Documented environmental problem
- More cost-effective for nitrogen removal than upgrading septics or replacement not feasible
- Consistent with comp plan and W&S plan
- Septic systems installed as of October 1, 2008
- Granted a PFA exception by the SGCC
- Consistent with a public health area of concern
- Denied access for properties outside service area
Requires MDE to consider:

- Public health issues
- Potential infill development
- Measures taken to mitigate the potential impacts of new growth
- Net nitrogen reduction from the project, including loading from new growth
7. Request the PFA Exception

- MDE will request the PFA exception
- Denial of sewer access for any future connections not in service area
- County must conform to 2013 model MD Floodplain Ordinance – min. 2 ft. freeboard
- County must assess climate change vulnerability and outline strategies to enhance resilience
8. Apply for Permits

- NPDES Permits
- Groundwater Discharge Permits
- Construction Permits
Our Shared Mission

Improve water quality
and protect public health!