Sanitary Sewer Exfiltration: Optional Reporting

Wastewater Treatment Workgroup

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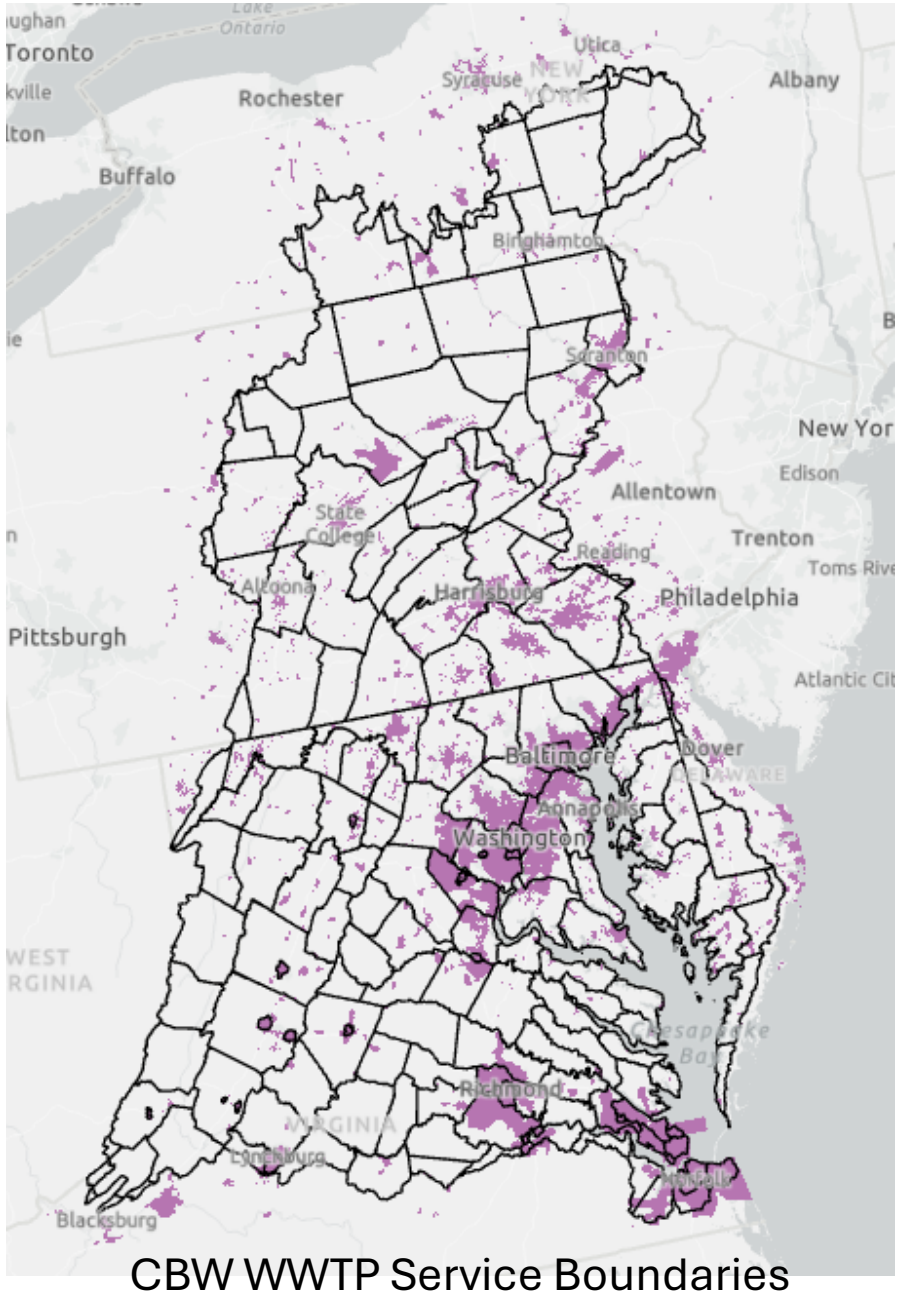
01/22/2026



CBW WWTP Service Boundaries

Agenda

- Background
  - Model structure and optional reporting
  - Spatial representation
- Scale of reporting
  - Standardization
- Historical record
  - Backcasting
- Defining Rehabilitation
- Reporting process

Model structure

Exfiltration Vol. = Fraction exfiltration * Annual system treatment volume (dry-weather) * Geologic coef. * Fraction gravity line * (Fraction new or rehabbed*Rehabbed coef.)

EOS nutrient load = Exfiltration Vol. * concentration in raw WW (33 mg/L TN, 6 mg/L TP)[1]*Soil Treatment*GW Transmission

Workgroup Defined, Required State Provided Input, Optional State Provided Input

[1]Chesapeake Bay Program, (2014). "Final Expert Panel Report on Removal Rates for the Elimination of Discovered Nutrient Discharges from Grey Infrastructure"

- An initial default exfiltration value as a percent of treated volume will be defined by expert judgement and literature
- Spatially exfiltration will be mediated soils, geology, and by optional factors identified as drivers of exfiltration and transmission by expert judgement and literature.
  - Geologic basin as a metric of water table depth driving exfiltration vs infiltration
  - The proportion of the system which is gravity fed
  - The proportion of the system which is new or recently rehabilitated
  - Soil and groundwater transmission attenuation

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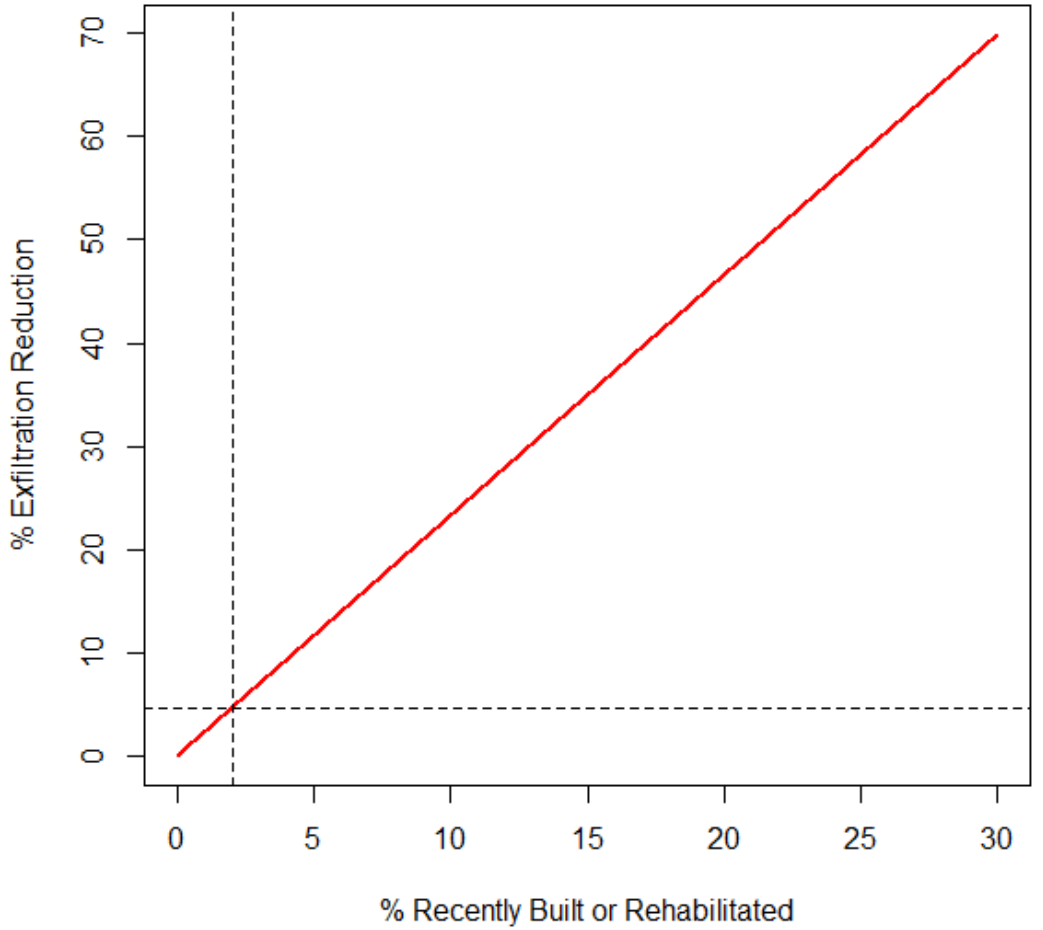
Force mains are designed to be watertight and are less susceptible to chronic leaks.

- Optional reporting
- E.g., Baltimore area gravity line is 98% gravity line, Coastal SE VA is 84%.

Exfiltration Vol. = Fraction exfiltration * Annual system treatment volume (dry-weather) * Geologic coef. * Fraction gravity line * (Fraction new or rehabbed*Rehabbed coef.)

- Exfiltration primarily occurs from a fraction of the total system, 20-50%.
- Rehabilitation reduces exfiltration by 50-90%.
- Central values were selected
- A 10-year timeframe is used to define new or newly rehabilitated
- Reporting of these values is intended to be optional, and therefore the impact should be conservative



Spatial representation

- The P7 Summary Units will be used as the fundamental unit for the model (combination of NHD+ catchment, P7 LRsegs, MS4s, federal facilities)
- Dry weather flow (DWF) will be defined by facility reporting and service areas (generally larger spatial scale than P7 Sum Units).
- Facilities are not always linked to their service areas.
  - Facilities are assigned to the service area they reside in.
  - If a facility is not in a service area, it is assigned to the service area it shares a model unit with (currently P6 LRseg, but will update to P7 units).
  - When there are multiple facilities within a single service area polygon, their DWF is summed for that polygon and distributed based on P7 Sum Unit sewer served population.
    - CSO and MS4 polygons are always separated

Scale of reporting - Standardization

- At what scale is the fraction gravity line and fraction new or rehabilitated optional data available?
- At what scale should standardized reporting take place?
  - Potential options include, but are not limited to, NPDES ID, model unit, or sewer service area.

Historical record - Backcasting

- Will historical records for optional inputs be available? (1985-2022)
- Does the percent gravity line change significantly over time?
  - Can it be backcasted as a constant value?
- Should the percent new or newly rehabilitated be backcasted?
  - What are the potential implications if historical records are not available and submitted data is not backcasted?

Defining rehabilitation

- It may be helpful to define rehabilitation for reporting and documentation.
- Is it necessary to define specific qualifying activities?

DRAFT:

For the purposes of estimating sanitary sewer exfiltration loads, rehabilitation is the systematic repair, renewal, or replacement of existing sanitary sewer pipes, joints, and laterals to restore hydraulic integrity and to prevent or reduce infiltration of groundwater into the system and unintended exchange of wastewater with surrounding soils, groundwater, or stormwater conveyances.

Reporting process

- For optional data submission to be considered in the calibration, the data need to be submitted by April 3rd to Joseph Delesantro and Alex Gunnerson.
  - All other inputs are required April 1st. The April 3rd date applies only to the optional inputs as described in this presentation.
- For optional reporting going forward, the data can be submitted with annual progress submissions through the Point Source App.
  - https://pointsource.chesapeakebay.net/