Source Reduction Flow Targets

Roundtable Discussion Overview

Presentation Outline

- 3 Rivers Flow Target / Source Reduction Sub-committee update
- Definitions
- Federal Regulator Perspective
- State Regulator Perspective
- Municipal Perspective
- Flow Target Metrics
- Where are we now?

3WG Source Reduction and Flow Target Subcommittee

- June 2015
- Mission Statement
  - *Recognizing the regulatory requirement to achieve water quality standards, the Source Flow Reduction and Flow Target Subcommittee will develop goals and implementation strategies to reduce groundwater infiltration and stormwater inflow to optimize local and regional sewer service. The goals and strategies are intended to be technically achievable, economically affordable, reasonably quantified, and enforceable. The Subcommittee will work to develop regional, consensus-based recommendations for cooperative implementation of the goals and strategies by ALCOSAN Customer Municipalities and Authorities, ALCOSAN, DEP, ACHD, and others.*

3WG Source Reduction and Flow Target Subcommittee

- 70+ Municipalities, ALCOSAN, PWSA,Other Stakeholders
- 24 Meetings to Date
- Pen is in our hands
- Subcommittee efforts ongoing,
  - Sanitary Systems: a draft two phase metric for sanitary sewers has been suggested
  - Combined system metrics still under development

3WG Source Reduction and Flow Target Subcommittee

- Intent is to establish consensus between Municipalities, PWSA, and ALCOSAN on Source Reduction and flow target metric(s),
- Primary impediment to establishing targets by January 2017 is a lack of local data addressing;
  - What is achievable
  - What is required to eliminate wet weather issues
  - What is cost-effective
    - What is cost-effective may not achieve flow target
  - What is affordable

3WG Source Reduction and Flow Target Subcommittee

- <u>Implementation Policy Issues:</u>
  - Flow Target /Source Reduction Parameter(s)should be directly measurable in sewer system as flow so as to provide direct indication of compliance
  - Measurement should be reliable and easily replicable
    - Long term flow volume (i.e. 365 day sustained) quantification is preferred to instantaneous peak flow
  - On-going compliance monitoring methodology should be simple and cost-effective
  - Combined/Separate system equity important for consensus

What is a Flow Target

- Flow Target: a directly measurable flow metric(s)
  - A metric is a unitized flow parameter, e.g.:
    - Gpcd
    - Gpad
    - gpimd

What do we mean by Source Reduction

- Reduce the volume of groundwater and/or stormwater (RDI/I) entering a sewer system at the source.
- Intent is to remove non-sanitary flow so as to eliminate SSO's and minimize CSO's, conveyance and treatment costs
- In contrast in Combined Systems, the LTCP goal to achieve 85% capture to reduce overflows and meet water quality goals. Very often means keeping more water in the pipe system.

Federal Regulator Perspective

- Source Reduction: Directive by US EPA at the June 2014 Public Forum that Source Reduction will be a required element of any approved wet weather plan.

- Flow Targets: US EPA June 3, 2015 Act 308 Letter requirement
  - ALCOSAN to submit to US EPA by January 2017 Flow Targets by Municipality and/or Point of Connection
  - Requested Metrics (Maximum Day and Annual Average):
    - Gallons per Day (gpd)
    - Gallons per capita per day (gpcd)
    - Gallons per inch-mile per day (gpimd)

State Regulator Perspective

- PaDEP Interim COA's
  - Prepare and Submit by December 1, 2017 a **Source Reduction Study** that identifies the types of projects…that would most effectively reduce flows within areas of (Municipality) with high flows, eliminate (Municipality) SSO's, and reduce flows downstream…"
    - Identify areas with high Inflow and infiltration rates and probable causes of "excess" flow
    - Identify streams connected and estimated flow reduction achievable via elimination of streams
    - Identify areas that benefit from sewer relining or replacement and estimated flow reduction achievable via relining and replacement
    - Identification of areas that might benefit from lateral inspection and repair and estimated flow reduction achievable via lateral inspection and repair
    - Identification of priority source reduction strategies and projects that may be implemented to reduce flows
    - "The ability to modify the Source Reduction Study to incorporate flow targets once they are established by ALCOSAN in consultation with the Municipalities."

State Regulator Perspective

- PADEP Letter (April 11, 2016) to PWSA
  - Letter cites 40 to 50% of flow from private sewer laterals
  - "Agencies believe that a comprehensive and complete system evaluation of these projects is prudent and therefore expect that the number of projects in this classification will increase."
    - "… PWSA and jurisdictions should consider developing a Demonstration Project to assess the effectiveness of repairing and replacing private lateral up to foundation versus repairing and replacing the entire private lateral, including under the basement."
    - "Agencies encourage … implementing Demonstration Projects within high-yield sub-catchments where existing flow data can be utilized to support the evaluation of the reduction projects efficacy."
    - Focus on single smaller sheds with insufficient capacity to convey the 2 year 24 hour storm

State Regulator Perspective

- A Westmoreland County COA (2016)
  - "…excess I/I shall be determined by wet weather flows greater than five (5) times the average dry weather flows or flows greater than 1,500 gallons per day per inch mile diameter of sewer. If costs to eliminate or reduce I/I is less than the cost to convey it to a sewage facility to be constructed as part of the … Remedial Project … the applicable Municipal Entity shall remove the excessive I/I."
- Johnstown COA (July 2014)
  - "… (municipality) shall reduce its flows to JRA sanitary sewer system to a level of 625 Gallons per Day/Equivalent Dwelling Unit ("GPD/EDU") on a **peak hour basis**."
    - (100 gpcd x 2.5pph x 2.5 = 625 gpd/EDU)

Municipal Perspective

- Concern with compliance with current Order
- Uncertainty as to future Orders
- Unfunded Mandate
  - Source Reduction program must be funded by local municipalities individually
  - ALCOSAN rate increases putting increased pressure on local rates
- Z Agreements
  - No flow limits
- Equity concerns
- Penalties for non-compliance with targets
  - Fines
  - Surcharges
    - Other ALCOSAN Agreements
      - South Fayette: 600 gpimd 90 day volumetric I/I allowance
      - Robinson Run: 300 gpimd 90 day volumetric I/I allowance

Where are we?

- How do we assess source reduction?
- How to set flow target metrics?
  - 1970's EPA Construction Grants Program 201 Facilities Planning I/I Study metric
    - < 2,500 gpimd non-excessive
    - > 2,500 perform cost-effectiveness analysis to determine excessive/non-excessive based on long term cost to treat vs remove
  - 1980's EPA Guidance
    - Non-excessive infiltration < 120 gpcd… or the quantity of infiltration which cannot be economically and effectively eliminated."
    - Non-excessive inflow < 275 gpcd or when the inflow rate does not result in chronic operational problems relating to hydraulic overload of the treatment works during storm events.
  - Metcalf &Eddy: "infiltration rate for the whole collection system including laterals is less than 1,500 gpimd is usually not excessive
  - Massachusetts Rule of Thumb: 4,000 gpimd for subsystems of about 20,000 l.f. as basis for more investigation for potentially excessive infiltration.

What programs have been implemented that can inform our analysis?

- Metropolitan Milwaukee Sanitary District
  - I/I reduction efforts with Goal of 5% reduction
  - Based on I/I Peak Hourly Flow Rate Gallons Per Acre Day (GPAD)
  - Stepped Metric:
    - 22,000 GPAD (< 250 acres)
    - 21,000 GPAD (250 to 499 ac)
    - 19,000 GPAD (500 to 999 ac)
    - 15,500 GPAD(1,000 to 2,400 ac)
    - 11,000 GPAD (2,500 to 5,000 ac)
    - 4,000 GPAD (> 5,000 ac)

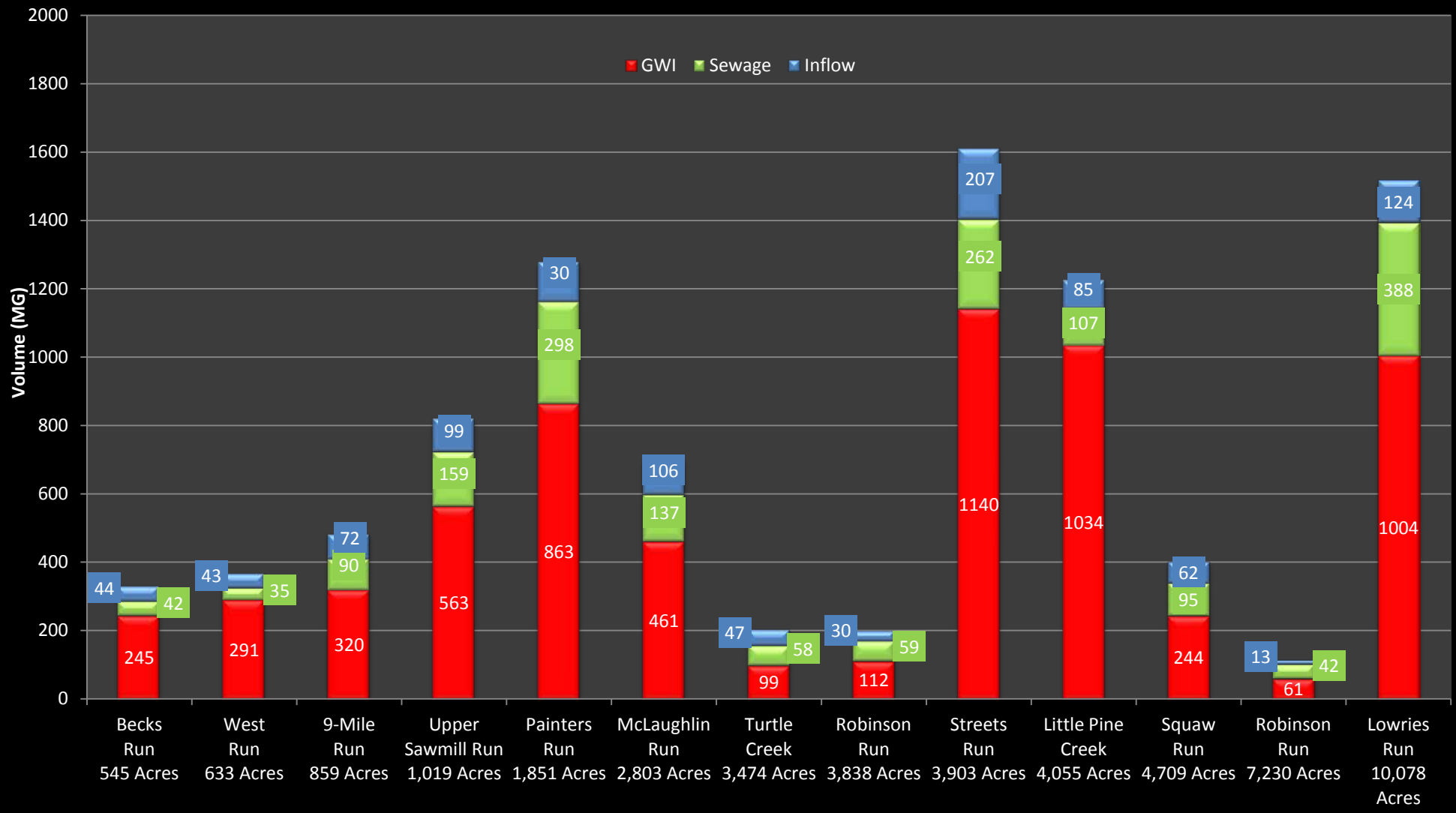
Size Matters

What programs have been implemented that can inform our analysis?

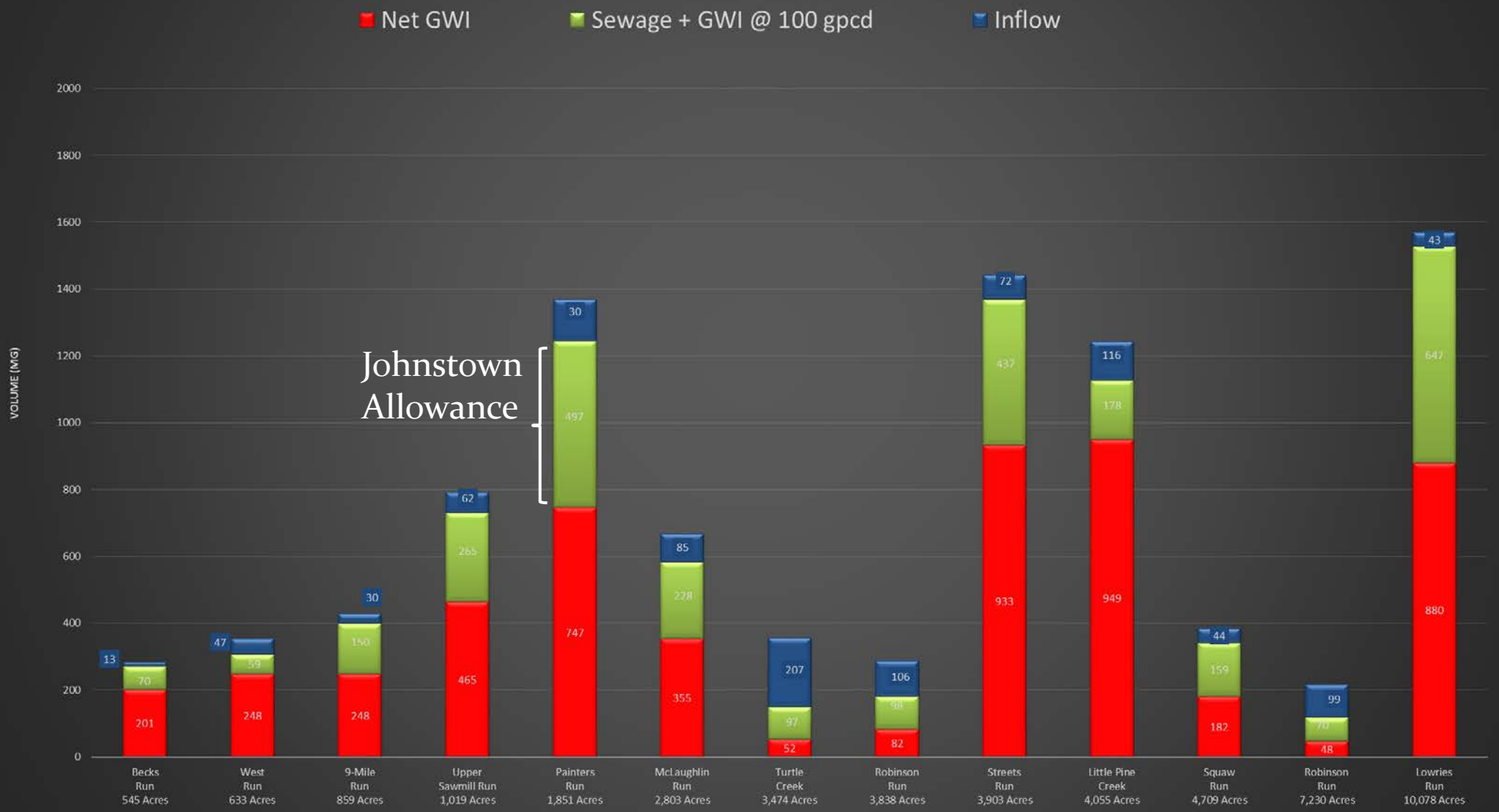
- Johnstown
  - To meet the 625 gpd/EDU; 80% of entire system to be replaced/relined including under basements
  - Regional Authority Treatment Charge :
    - $17/month/EDU if comply (NONE YET)
    - $27/month/EDU if Plan filed and being implemented
    - $175/month/EDU if no action taken.

    } Does Not Include Local Municipal Charges
  - Stipulated Penalties
    - Through 2021 $1,000 per month in which one of more SSO's occur
    - After 2022 $10,000 per month for an SSO.
- (100 gpcd x 2.5pph x 2.5 = 625 gpd/EDU)
- Historical Rule of Thumb 100 gpcd =60 gpcd sewage + 40 gpcd infiltration/inflow

Period of Record: 1/2008 through 4/2009
12 Month Totals
Ranked by Sewershed Area
Infiltration, Sewage and Inflow Volumes in Million Gallons



Period of Record: 1/2008 through 4/2009
12 Month Totals
Ranked by Linear Feet of Sewer Per Acre of Sewershed
Infiltration, Sewage and Inflow Volumes in Million Gallons



Where are we?

- Limited local data available to assess effectiveness and/or compliance?
- We don't know what is cost-effective or affordable
- ALCOSAN metrics due at EPA in January 2017
- Interim COA Municipal Source Reduction Study due December 1, 2017
- EPA Check-In points:
  - Every six years
- Start with Interim Metrics?