Bypass and Blending: Wet Weather Impacts at Treatment Plants

November 2017

Internal, Deliberative

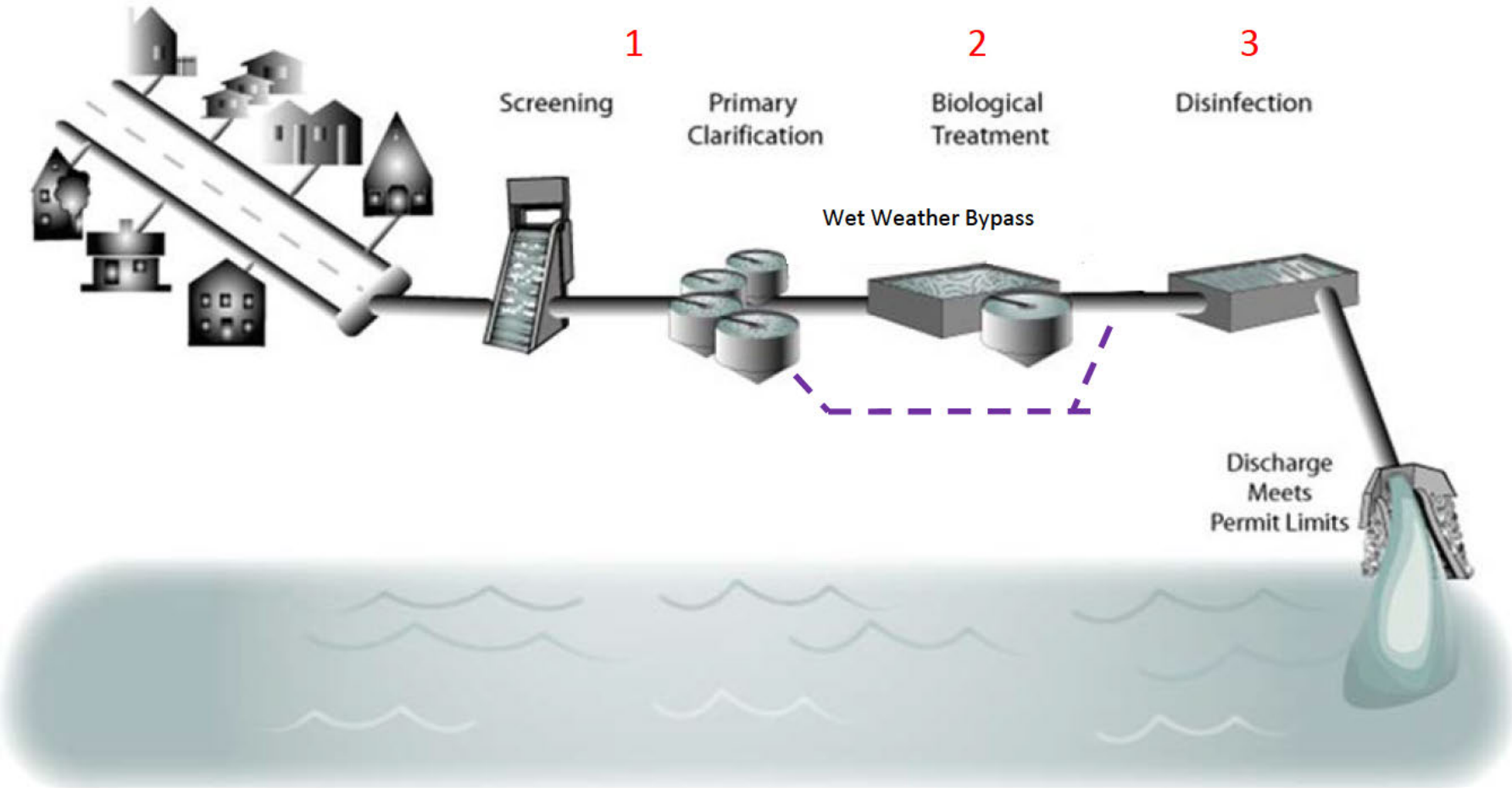
Purpose of Briefing

- Review critical infrastructure – collection systems and treatment plants
- Why blending occurs, benefits, and potential risks
- Review of statutory provisions, regulations, and court decisions
- Discuss potential next steps.

Collection Systems

- Combined Sewers (CSS)
  - Designed to collect wastewater and stormwater in a single pipe for treatment at a POTW.
  - Wet weather events (rain or snowmelt) may exceed the capacity of the collection system causing combined sewer overflows (CSOs), overflowing street drains, or sewage backups into basements.
  - 5% of POTWs nationally are CSSs.
- Separate Sanitary Sewers (SSS)
  - Designed to collect only wastewater for treatment at a POTW.
  - Rainwater and groundwater also enter SSS (especially during wet weather events) through damaged or leaking sewer pipes. This is know as infiltration and inflow (I/I). Poor maintenance can worsen problems (e.g., preventable leaks, reduced pipe capacity due to sediment build up).
  - 95% of POTWs nationally are SSSs.

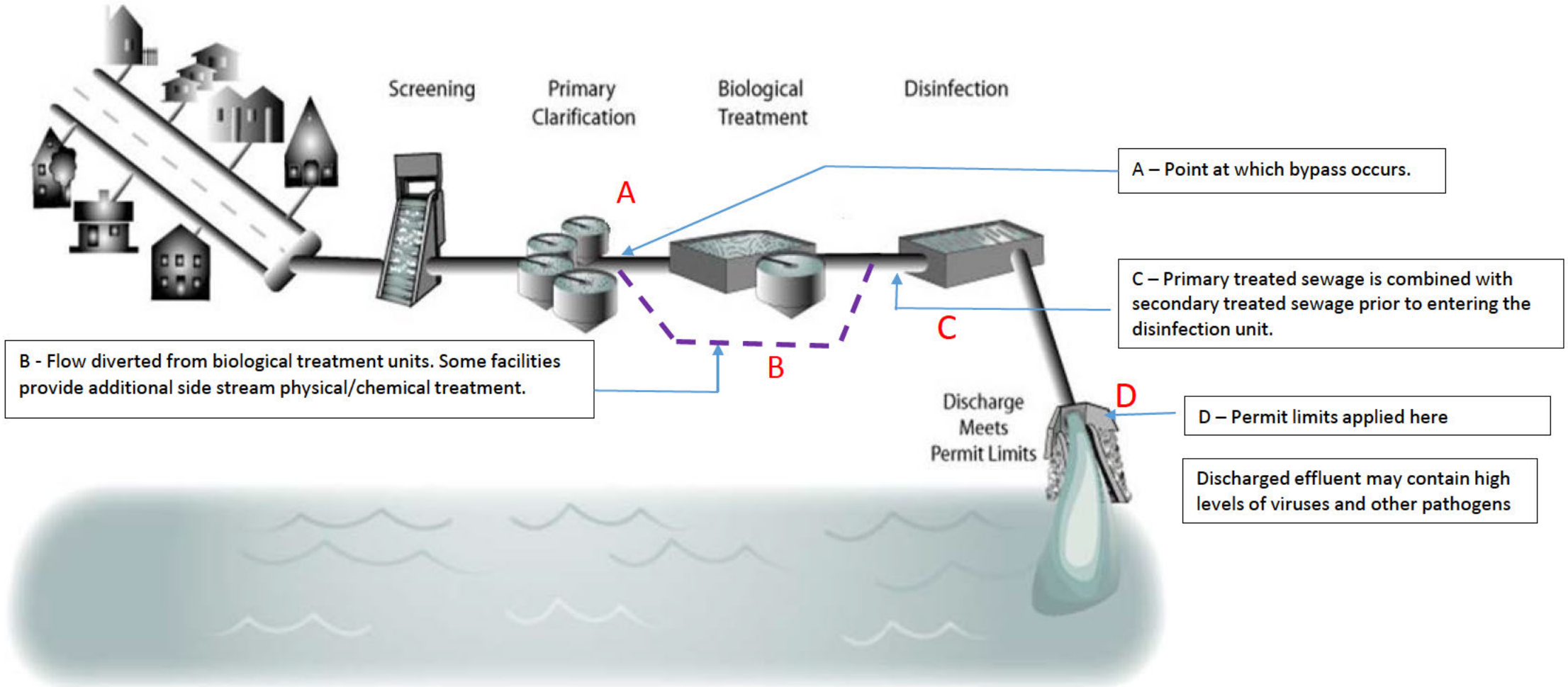
Typical Wastewater Treatment Process



Typical 3 step process:

1. Primary treatment (settling) to remove solids
2. Secondary (biological) treatment to remove organics, solids and pathogens
3. Disinfection to inactivate pathogens

Blending Scenario



Municipalities "blend" to manage peak wet weather flows by routing some peak flow around secondary (biological) treatment units, blending the re-routed flow with the flow receiving biological treatment and disinfecting before discharging.

(b) (5)

(b) (5)

CWA Sections 301(b) and 304(d) – Effluent Limitations Based Upon Secondary Treatment

Secondary Treatment Standards (40 CFR 133)

- The regulation applies to all POTWs and identifies the technology-based performance standards achievable based on secondary treatment for 5-day biochemical oxygen demand (BOD_5), total suspended solids (TSS) and pH.
- Secondary treatment standards for BOD_5 and TSS are in the form of 30-day average and 7-day average.

Parameter	30-day average	7 day average
BOD	30 mg/L	45 mg/L
TSS	30 mg/L	45 mg/L
BOD & TSS removal (concentration)	Not less than 85%	- - -

(b) (5)

(b) (5)

(b) (5)

(b) (5)

(b) (5)