



Indianapolis Use Attainability Analysis: A Critical Element of CSO Long-Term Control Planning

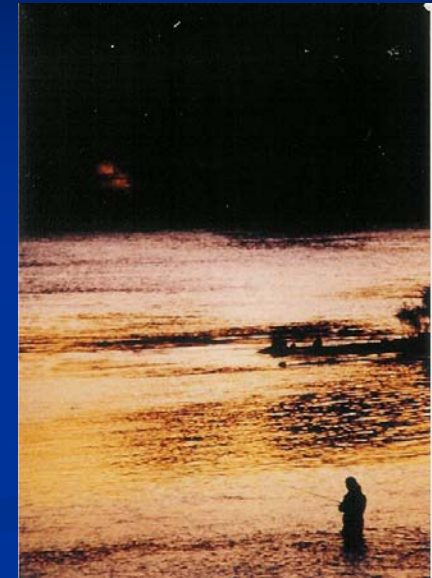
Presentation by
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NACWA Late-Breaking Legal Issues
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Agenda

- Background: Indiana's CSO Wet Weather Use Standard
- Indianapolis LTCP
- Factors Used in Indianapolis UAA
- Tips for Managing the UAA Process
- Questions

Indiana's Framework

- 2005: Indiana General Assembly passed legislation that created a CSO subcategory in Indiana's recreational standards
 - Must have approved LTCP
 - Must complete a Use Attainability Analysis (UAA)
 - Only applies during & after storms that will cause overflows after plan implementation
 - Federal requirements also must be met, including prohibition against removing an existing use



Indianapolis Approved LTCP

- Level of Control:
 - 97% capture along Fall Creek & 95% capture along White River & other waterways
 - 2 CSO events per typical year on Fall Creek & 4 events per year on other waterways
- Present Worth Cost (2005 dollars): \$1.76 billion
- 20-Year Schedule: Completed by Dec. 31, 2025.



Scope of Indianapolis UAA

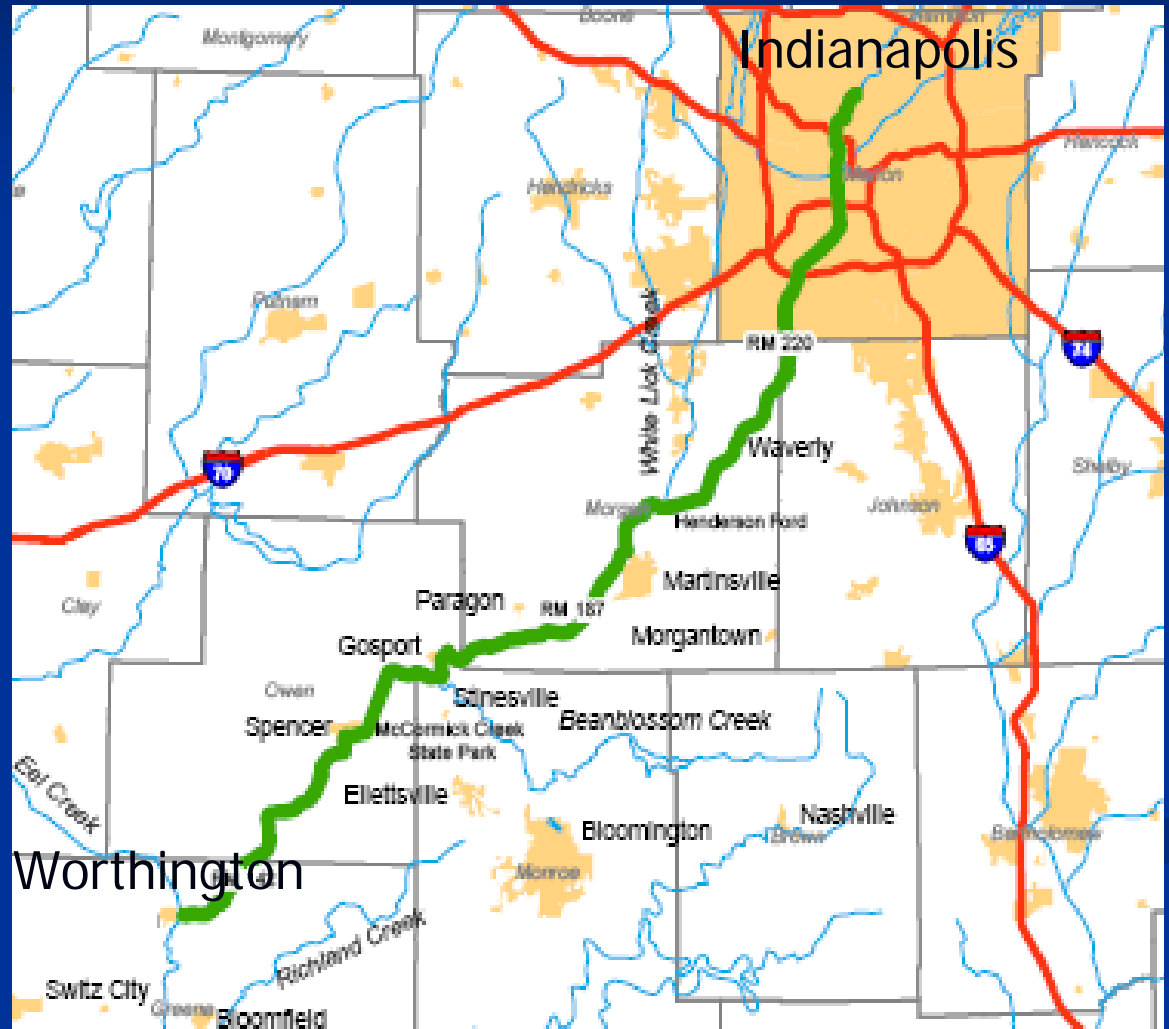
- Application covers:
 - What: Recreational designated use & WQS
 - Where: CSO-impacted waterways
 - When: Storms greater than the chosen LTCP level of control, after full LTCP implementation
 - Duration: Up to 4 days following CSO discharge
- Not Addressed: WQS exceedances caused by non-CSO sources or outside CSO events



Fall Creek

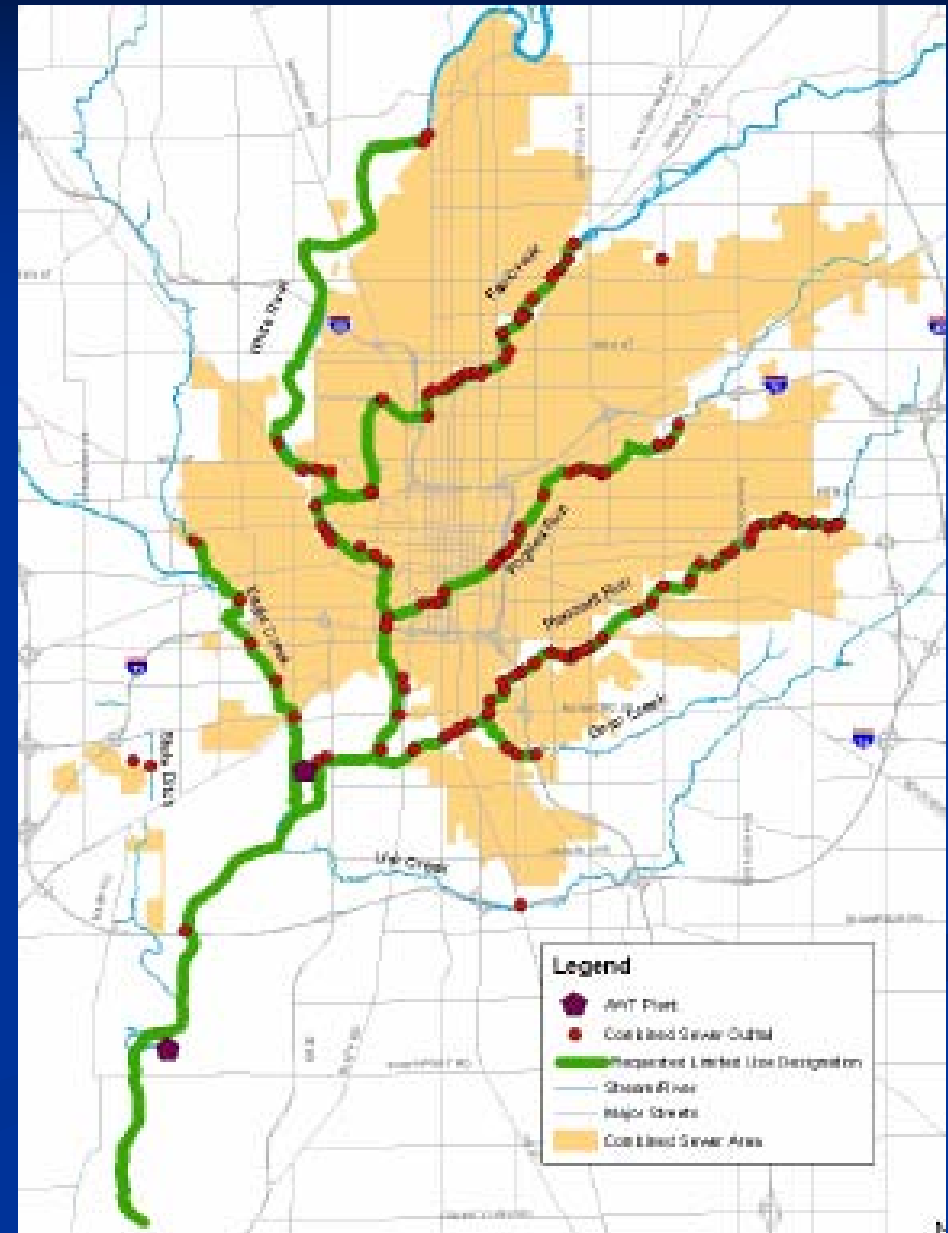
Portion of White River Affected

- 56th Street in Indianapolis to Worthington in Greene County
- Affects portions of river in 6 mostly rural counties



White River Tributaries Affected

- Fall Creek
- Eagle Creek
- Pleasant Run/Bean Creek
- Pogues Run



Six Factors in 40 CFR 131.10 (g)

1. Naturally occurring pollutants prevent attainment of the use; or
2. Natural, ephemeral, intermittent, or low flow conditions or water levels prevent the attainment of the uses, or
3. Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more damage than to leave in place.; or
4. Dams, diversions, or other types of hydrologic modifications preclude use attainment; or
5. Physical natural features of the water body, unrelated to water quality, preclude attainment of aquatic life uses; or
6. Controls necessary to attain the use would cause substantial and widespread economic and social impact.

Natural Stream Flows are Unsafe

- Factor 2 in 40 CFR 131.10(g) is based on natural conditions prior to human settlement
- What would natural stream flows be like without:
 - Impervious surface, channels and urbanization?
 - Dams and reservoirs?
 - Levees?
 - Other human-made conditions?



Comparison of Urbanized to Estimated Natural Stream Flows

Waterway	Urbanized Peak Flow (cfs)	Natural Peak Flow (cfs)
Fall Creek	500	3,100
Pleasant Run	510	200
Pogues Run	565	100
Eagle Creek	620	2,200
White River	2,500	19,900

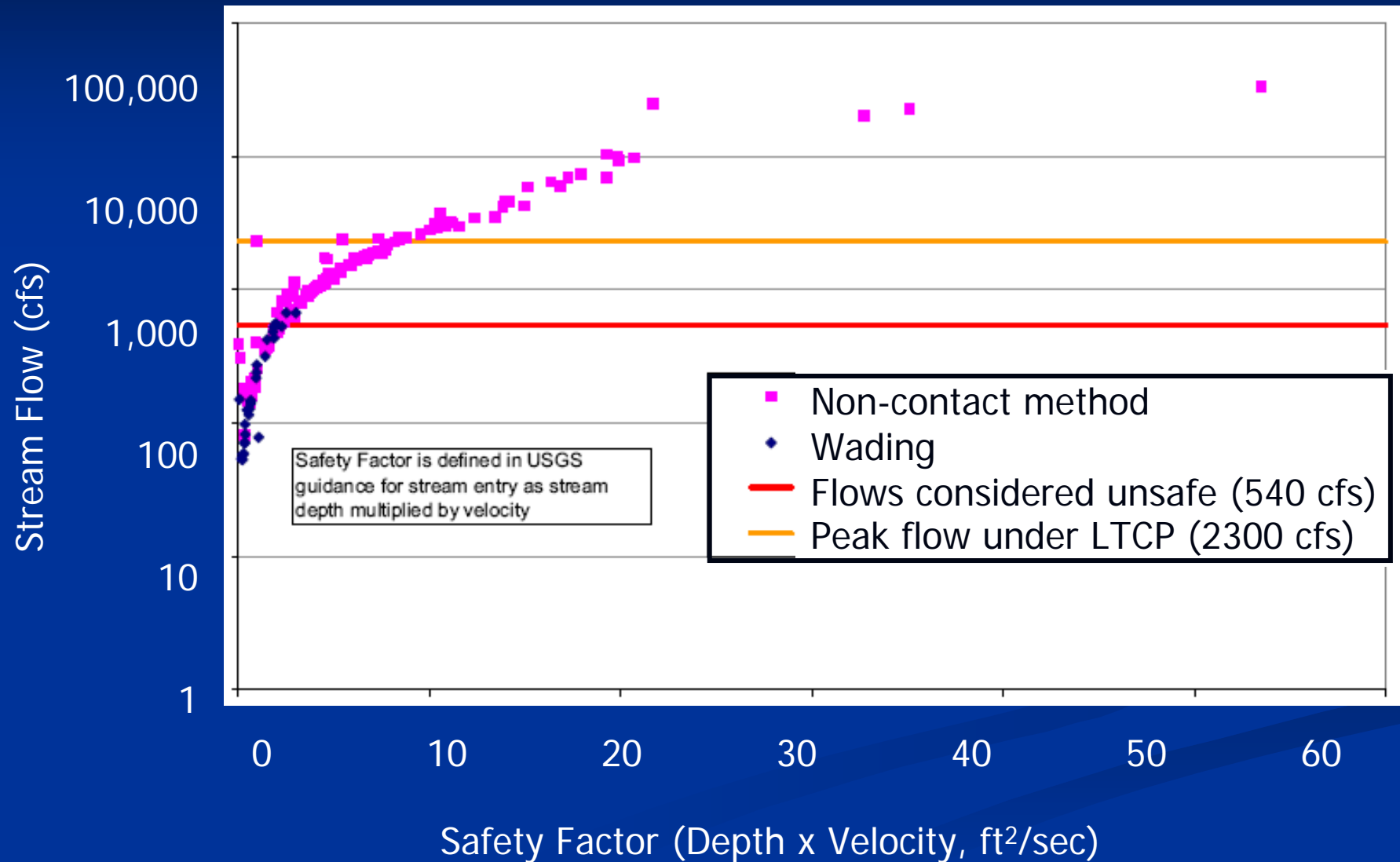
*Based on model simulations using 3-month SCS storm event

What flows are unsafe for recreation?

- U.S. EPA and most states are reluctant to set one safety criteria
- Safe recreation depends on many factors, including velocity, depth, substrate, shipping traffic, local uses and norms, etc.
- Indianapolis method: USGS flow measurement activities
 - Wading vs. non-wading methods
 - 90th percentile of wading set used to establish a threshold for safe recreation by public



White River Safety Criteria



Comparison of Urbanized to Estimated Natural Stream Flows

Waterway	Urbanized Peak Flow (cfs)	Natural Peak Flow (cfs)	Safety Criteria
Fall Creek	500	3,100	>340
Pleasant Run	510	200	>160
Pogues Run	565	100	>160
Eagle Creek	620	2,200	>140
White River	2,500	19,900	>540

*Based on model simulations using 3-month SCS storm event

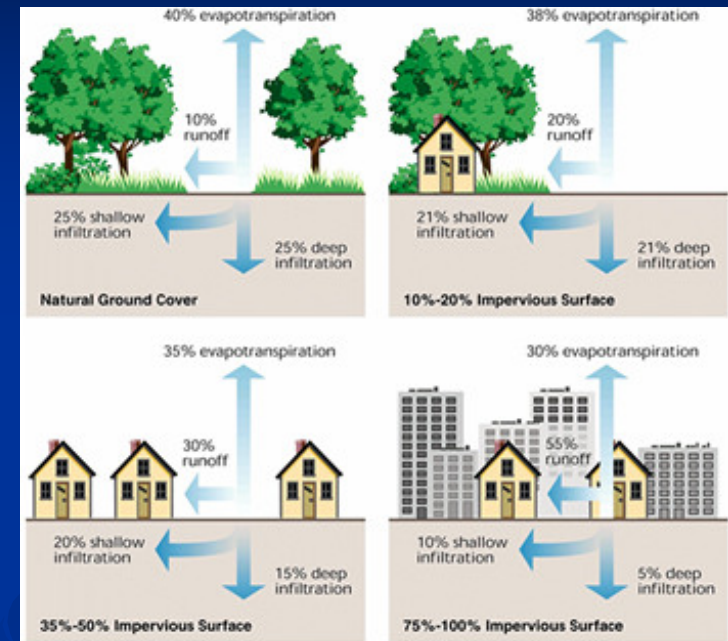
Human-caused Conditions: Urbanization

- Factor 3 in 40 CFR 131.10(g) relates to human-caused conditions that cannot be remedied.
- Human-caused conditions may prevent the attainment of the designated use due to two common wet-weather conditions:
 - Increased *E. coli* bacteria pollution
 - Unsafe stream flows during and after large storms
- **Caution: This is a moving target!**

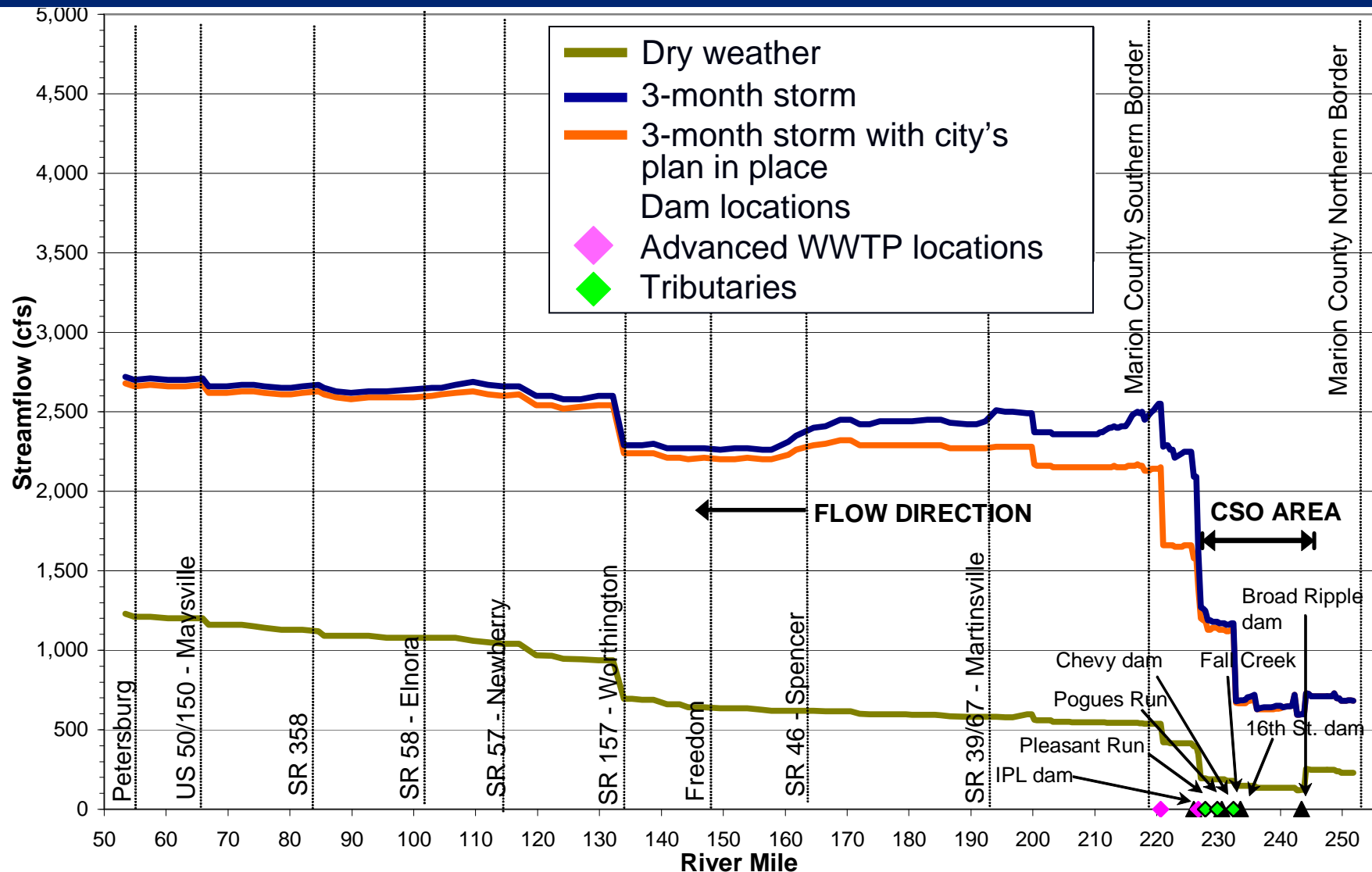


Urbanization: High Flow

- Parking lots, roads, rooftops and other hard surfaces disrupt the natural water cycle
- Runoff creates large stream flows and swift currents that are unsafe for recreation.
- No Remedy: Green infrastructure (stormwater ponds, wetlands, green roofs, rain barrels, rain gardens, etc.) may help, but cannot fully capture the peak flows during large storms



White River modeled maximum stream flows: Indianapolis to Petersburg



EPA Also Requests Velocity Info

Waterway	Peak flows (cfs)	Peak Velocity (fps)	Peak Velocity (mph)
Fall Creek	480	6.4	4.4
Pleasant Run	520	8.4	5.7
Pogues Run	260	23.7	16.2
Eagle Creek	640	6.0	4.1
White River	2,300	10.2	7.0

*Based on model simulations of 3-month SCS storm after LTCP implementation

Urbanization: High Bacteria

- Urban runoff also contains bacteria from pets, wildlife and other sources
- Estimates are from EPA 2002 study in Four Mile Run, Va.
- This watershed is an urbanized area with approximately 40 percent impervious surface



Waterfowl 38%



Raccoons 15%



**Humans &
Pets 26%**



Rats 11%



Deer 9%

Sources of *E. coli* in Indianapolis

- TMDL identified sources of *E. coli* in Indianapolis:
 - Stormwater
 - Failing septic tanks
 - Illicit sanitary connections to storm sewers
 - Urbanization
 - Domestic animals and wildlife
 - Belmont and Southport AWT Plant discharges
 - Pollutant sources upstream of Marion County
- TMDL Conclusion: Total bacteria load reductions of 99 percent or greater are required to meet standard
- No Remedy: No known method for treating bacteria at this level in high flow conditions



Hydrologic Modification

- Factor 4 in 40 CFR 131.10(g) applies to hydrologic modifications that cannot be remedied
- The urbanization of a watershed can modify the natural hydrology
- As imperviousness increases and vegetative cover is lost, the following effects are seen:
 - Runoff increases
 - Soil percolation decreases
 - Evaporation decreases
 - Transpiration decreases (USEPA, 2006)



Pleasant Run – Dry weather



Pleasant Run – 4-month storm

Widespread Social and Economic Impacts

- Factor 6 in 40 CFR 131.10(g) requires a showing of widespread social and economic impacts
- Sewer separation (\$6.2 billion) would eliminate sewer overflows but increase stormwater impacts
- LTCP plus anticipated costs for stormwater, septic tank elimination and other sanitary needs would impose a burden of 2% of MHI on community & 3.29% on Center Township
- Requiring more controls would cause widespread social and economic impacts



Steps in UAA Process

- IDEM and EPA review of UAA (complete)
- IDEM completeness letter and tentative approval (complete)
- Public information meetings and public comment period (complete)
- IDEM recommendation to Water Pollution Control Board
- Board public hearing and possible adoption of rule with new subcategory
- EPA final review and possible approval (90 days)



Tips for Managing UAA Process

- Work with state and EPA on UAA approach
 - State must be supportive
 - Coordinate with EPA Region and HQ water quality standards staff
- Go beyond traditional public notice and public meetings to increase understanding
 - Identify key stakeholders & meet with them 1-on-1
 - Emphasize benefits of LTCP and need for WQS change to minimize risk of investment
- Keep good documentation
- Remember that factors can be a moving target
- Stay on top of the process





Questions?

UAA available on-line at:

www.indycleanstreams.org

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