Lessons Learned from the First Use Attainability Analysis Approved for Combined Sewer Overflows

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Agenda

- Background
- What is a Use Attainability Analysis (UAA)?
- History of the Indianapolis UAA
- UAA Supporting Factors
- Key Elements for Approval
- Summary & Discussion



NACWA & WERF, 2017



Background

- Two Advanced Wastewater (AWT) Plants
- Combined Sewer Area with
 ~ 34 square miles, 131
 outfalls
- Service area population of ~ 800,000
- 20-year Combined Sewer
 Overflow Long-Term
 Control Plan (CSO LTCP)
 approved December 2006
- Amended Three Times
- Completion 2025





Background

Indiana: All waterbodies are primary contact recreation

- 1998 Indianapolis waterbodies on 303(d) list
- 2004 Total Maximum
 Daily Load Developed
- 2005 Indiana codified the UAA process
 - Includes CSO Wet Weather Limited Use Subcategory



Indiana Department of Environmental

Management



What is a Use Attainability Analysis?

- Component of Citizens' Consent Decree
- Scientific assessment of the factors affecting the attainment of designated uses in a water body
- Used to support a change to the designated use of a water body
- Based on six possible factors defined in the EPA's UAA guidance documents





What is a Use Attainability Analysis?

• One of Five Pathways Identified in EPA's Post-Construction Monitoring Guidance

After reviewing their post construction compliance monitoring data, the permittee, in conjunction with the NPDES authority, should evaluate the need for additional controls that would meet WQS and then revise their LTCP and implement the appropriate additional controls. If, however, the data analysis indicates that a community could not meet WQS due to financial and/or technological infeasibility, they should develop a schedule for incremental improvements and then revisit additional controls as financial conditions choose or as new control technologies emerge. The community can also request that the NPDES authority consider enforcement discretion, or they could seek a revious TMDL or try to obtain approval of UAA or variance and revise their WQS.

Source: US EPA, 2012

- 1. Develop a plan to get to zero overflows
- 2. Beg for mercy
- 3. Revise the stream TMDL
- 4. Get an approved Use Attainability Analysis (UAA)
- 5. Get an approved variance



History of the Indianapolis UAA

Citizens' UAA seeks suspension of the fishable/swimmable standard on its receiving waters during and for up to four days after the end of any remaining CSO discharges



UAA Supporting Factors

- Factor 1: Pollution
 - Naturally-occurring pollutants prevent attainment of use
- Factor 2: Flow Conditions
 - CSO-impacted waterways unsuitable for recreation during and following large storm events
- Factor 3: Human-Caused Conditions
 - Human-caused conditions prevent the attainment of the use and cannot be reasonably remedied
- Factor 4: Hydrologic Modifications
 - Heavy urbanization has modified the natural hydrology of streams increasing peak stream flows to unsafe levels
- Factor 5: Natural Features
 - Physical conditions and features preclude attainment
- Factor 6: Economic and Social Impact
 - Attaining a designate use results in substantial and widespread economic and social impacts

Factor 2: Flow Conditions

CSO-impacted waterways are especially unsuitable for recreational use during and following large storm events due to high stream flows, velocities, and depths

Modeled Instream Flow for a 3-Month SCS Storm Compared to Flow considered Unsafe for Wading by USGS Staff						
Watershed	Flows Considered Unsafe for Wading by USGS Staff (cfs)	Peak (Modeled) Stream Flows after LTCP Implementation (cfs)				
Fall Creek	>340	990				
Pleasant Run	>160	770				
Pogues Run	>25	205				
Eagle Creek	>140	1,020				
White River	>540	4,490				
White River (with CSO Tributaries)	>540	5,600				



Factor 2: Flow Conditions

CSO-impacted waterways are especially unsuitable for recreational use during and following large storm events due to high stream flows, velocities, and depths



Three Scenarios Evaluated in Water Quality Model

Scenario	Bacteria Description	Purpose	Anticipated Results
1	CSOs only	Evaluate impact of CSOs	CSOs do not cause exceedance
2	CSOs and non-CSO bacteria sources in compliance (ALIGN TO TMDL)	Evaluate impact of CSOs assuming other bacteria sources are also in compliance	With other bacteria sources in compliance, CSOs do not cause exceedances
3	CSOs and existing bacteria loading	Evaluate impact of CSOs assuming other bacteria sources remain unchanged	Further reducing CSOs post- LTCP will not impact water quality compliance



Comparison of Federal Bacteria Standard to Indiana Bacteria Standard











- CSOs are not the main cause or contributor to WQ violations
- Limited sensitivity to 410 or 235 cfu/100 mL



Factor 4: Hydrologic Modification

Urbanization has modified the natural hydrology of the streams, increasing peak stream flows to unsafe levels.

Analysis of Stormwater Reduction Practices to Reach Safe Wading Thresholds							
Watershed	Flows Considered Unsafe for Wading by USGS Staff (cfs)	Peak (Modeled) Stream Flows after LTCP Implementation (cfs)	Peak (Modeled) Stream Flows after LTCP Implementation with Stormwater Controls (cfs)				
Fall Creek	>340	990	980				
Pleasant Run	>160	770	760				
Pogues Run	>25	205	205				
Eagle Creek	>140	1,020	1,000				
White River	>540	4,490	4,410				
White River (with CSO Tributaries)	>540	5,600	5,500				



Factor 6: Economic and Social Impact

Attaining a designated use would result in substantial and widespread economic and social impacts.







Key Elements for Approval

- What Did Citizens Submit?
- What Did EPA Emphasize in their Approval?
- What Supporting Data was Necessary?



Key Elements:

CSO Limited Use Subcategory Request:

- Spatial Extents
- Temporal Extents



Key Elements: What did Citizens Submit?

Stream Segment	Factor 2: Natural or Intermittent High Flow Conditions	Factor 3: Human-Caused Conditions	Factor 4: Hydrologic Modifications	Factor 6: Substantial and Widespread Economic and Social Impact	
Fall Creek SM 6.1 to 0	96 hours	72 hours	96 hours	High Burden / Substantial and widespread economic and social impact	
Pleasant Run SM 7.8 to 0	48 hours	96 hours	48 hours		
Pogues Run SM 5.3 to 0	96 hours	96 hours	96 hours		
Eagle Creek SM 4.2 to 0	96 hours	96 hours	96 hours	(FCA Residential Indicator)	
White River RM 251 to 146	96 hours	96 hours	96 hours		



Key Elements: What did EPA Emphasize in their Approval?

EPA's Review of Revisions to Indiana's Water Quality Standards: CSO Wet Weather Limited Use Designation for White River, Fall Creek, Little Eagle CSU wer weather Limited Use Designation for white Kiver, Fau Creek, Little Eagle Creek, Big Eagle Creek, Pogues Run, Pleasant Run and Bean Creek (327 IAC 2-1-11.5) and Revisions to CSO Wet Weather Limited Use (327 IAC 2-1-3.1) Under Section 303(c) of the Clean Water Act Date: July 29, 2020 WQSTS # IN2007-180

I. Executive Summary

On July 13, 2020, the U.S. Environmental Protection Agency received from the Indiana On July 15, 2020, the U.S. Environmental Protection Agency received from the induata Department of Environmental Management (IDEM) changes to the State's water quality Department of Environmental Management (LDEM) Changes to the State's water quality standards that revise the recreational use designation for seven waterbodies near Indianapolis so standards that the state is constructed control construction (CSC) waterbodies near Indianapolis so station us that tevise the recreational use designation for seven wateroodies near mutanapous s that they are now within the State's combined sever overflow (CSO) wet weather limited use uar mey are now whim me state's comonicul sewer over now (CSO) wer weather minicul use subcategory. Indiana also made several minor revisions to Indiana's existing CSO wet weather to be a subcategory of the subcategory of the subcategory. As discussed in Section II of this document, EPA determines that these revisions are consistent As discussed in Section 11 of this document, ErA determines that mese revisions are consistent with the relevant requirements of the Clean Water Act (CWA) and federal regulations at the constant of the constant and the section of the clean Water Act (CWA) and federal regulations at the constant of the With the relevant requirements of the Creati water ACT (CWA) and rederiat regulations at 40 CFR Part 131 and therefore approves the water quality standards revisions. Consistent with 40 CFR Part 131 and the rederived Consistent Act, EDA and based the potential imposes of the 40 CFA Part 151 and meteore approves me water quarty standards revisions. Consistent with the requirements of the Endangered Species Act, EPA evaluated the potential impacts of its approves and designated existent behints. As discussed in approval on federally-protected species and designated critical habitat. As discussed in approval on recerally-protected species and designated critical natural. As discussed in Section III of this document, because the action pertains to water quality standards revisions of a human baster extend decimated the and is unrelated to motion from the activity of a statistic sector. Section 111 of this document, because the action pertains to water quality standards revisions is human health-related designated use and is unrelated to protect aquatic life or wildlife, EPA human health at the two discretions of the theorem discretion of the two is the two in the section of the two is the two in the section of the two is the two in the section of the two is the two in the section of the two is the two in the section of the two is the two is the two in the section of the two is the two in the section of the two is the two is the two in the section of the two is the two is the two in the section of the two is two is the two is tw numan nearm-related designated use and is unrelated to protect aquatic me of window concludes that it has no discretionary authority to take protection of listed species into concludes that it has no discretionary authority to take protection of listed species into the species of the specie concluses that it has no discretionary autionty to take projection of instea species and consideration in its review of the adopted revisions and, thus, consultation with the U.S. Fish and Consideration in its review of the adopted revisions and, units, consultation with the U.S. Fu Wildlife Service (FWS) is not required. Additionally, consistent with the "EPA Policy on Consultation and Constitution with Testion 77 the "EPA producted established established of the Consultation and Coordination with Indian Tribes," EPA evaluated whether approval of the

Consumation and Coordination with minimal titles, LEA evaluated whether approval of the water quality standards revisions may affect the interests of federally-recognized tribes. As water quality of the standards revision of t water quality standards revisions may affect the interests of rederally-recognized under As discussed in Section IV of this document, EPA concludes that approval will not impact tribal interests and that, therefore, tribal consultation is unnecessary. II. EPA Review of IDEM's Submittal

Water quality standards requirements of CWA sections 101(a)(2) and 303(c)(2) are implemented water quanty standards requirements of CWA sections 101(a/(2)) and 505(c/(2)) are impredict through federal regulations contained in 40 CFR Part 131. Consistent with 40 CFR § 131.21. new or revised water quality standards do not become effective for CWA purposes until they are new or revised water quality standards do not become effective for CWA purposes unit uney an approved by EPA. The criteria by which EPA evaluates State-adopted water quality standards are identified in 40 CTP 5 121 COVOL FDA evaluates are achieved and the state of approved by EFA. The criteria by which EFA evaluates state-adopted water quarity standards are identified in 40 CFR § 131.5(a)(1) through 40 CFR § 131.5(a)(8); EPA reviews each of these are identified by the articles of the second state of the s are toenined in 40 CrA § 151.3(a)(1) unough 40 CrA § 151.3(a)(0), ErA teviews each of unexe criteria below. Because the revisions do not affect Indiana's existing antidegradation policy or its involvementation. The transmission of affect Indiana's existing antidegradation policy or its criteria below. Because the revisions do nor affect indiana's existing annoegradation poncy o implementation, grant any water quality standards variances, or affect Indiana's compliance implementation, grant any water quality standards variances, or affect motion is computative schedule provisions, the water quality standards requirements in 40 CFR §§ 131.5(a)(3), (4) and (5) are not relevant in considering whether to approve Indiana's water quality standards

Approval is defined as a "site-specific criteria"

Indiana's water quality standards and UAA process are consistent with Federal Law

IDEM and the state **Environmental Rules Board** followed the law



Key Elements: What did EPA Emphasize in their Approval?

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Factor 3: Human-Caused Conditions **ONLY**

- Other factors were not explicitly rejected
- Does not remove an existing use
- Endangered species, Tribal lands, Great Lakes do not apply



Key Elements: What supporting data was necessary?

- > 10 years of USGS Stream measurement data
- Receiving Stream Water Quality Model
- Positive dialogue with state and federal regulators
- Compliance with intermediate
 Consent decree milestones



The Value of Integrated Modeling for Predicting Bacteria and Dissolved Oxygen in Urban Streams

BY DEREK SUTTON, CHRISTOPHER J. RANCK, AND DAN MARKOWITZ

he city of Indianapolis is a combined sever overflow (CSO) community with approximately 130 outfalls distributed over the following six major receiving streams: White River, Fall Creek, Pleasant Ran and Bean Creek, Pogues Run, and Eagle Creek. The watersheds for each receiving stream have significant areas within and upstream of the Indianapolis combined sever area. Figure 1 presents the Indianapolis combined sever areas, interceptors, and treatment plants. Wastewaters is treated at two locations, the Belmont and Southport Advanced Wastewater Treatment (AWT) Plants, which discharge to the White River. As in many other riverine CSO systems, water-quality modeling was used in the development of the CSO Long Term Control Plan (LTCP) as part of the alternative evaluation and plan selection (Indiamopois 2006). Wates-quality models were also used to develop the total maximum daily load (TMDL) studies for three of the five CSO receiving streams (IDEM 2004a, 2004b, 2004b, 2004b, 2004). Streams (IDEM 2004a, 2004b, 2004b, 2004). Report (Indiamopois 2003). Models generated supplemental data to support evaluations of existing use in the CSO receiving streams (Indiamopolis 2005).

On August 26, 2011, the wastewater collection and treatment system assets were transferred from Indianapolis to Citizens Energy Group (Citizens), and CWA Authority Inc was formed for the wastewater system. In this article, all activity relevant to the water-quality model is referred to as Citizens' work, including work performed before August

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Summary & Discussion

- A UAA is a pathway for regulatory certainty in CSO consent decree programs
- Elements in the UAA process are specific to the state and region
- Non-financial factors require an understanding of stream hydrology and water quality





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