



# **Grand Calumet River Area of Concern Beach Closings Beneficial Use Impairment (BUI) Discussion**

Citizens Advisory for the Remediation of the Environment (CARE)

Workgroup Meeting

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# Beaches In the Grand Calumet River AOC





# State Recreational Water Quality Standard

- The state water quality standard (WQS) for full-body recreational contact is an *E. coli* concentration of not more than 235 colony-forming units per 100 milliliter water sample
  - *E. coli* is a fecal indicator bacteria (it indicates contamination by human or animal waste)
  - Indiana uses U.S. EPA-approved culture-based methods to assess *E. coli* concentration
- *E. coli* concentrations greater than the state WQS require a beach action (e.g., advisory or beach closure)



# BUI Listing/RAPs

**IJC LISTING GUIDELINE: When waters, which are commonly used for total-body contact or partial-body contact recreation, exceed standards, objectives, or guidelines for such use.**

- The Stage 1 Remedial Action Plan (RAP) in 1991 pointed to the following factors in assessing the applicability of the beach closings BUI:
  - Swimming is not recommended in the river or canal, due to poor water quality
  - The Hammond Beach was closed for several years
  - In 1990, Chicago beaches and the Indiana Dunes National Lakeshore were closed due to high coliform counts, but the source may or may not have been from the AOC
- The Stage 2.5 Update RAP in 1998 specifically pointed to closings at the following beaches as demonstrating the impairment:
  - Marquette Park Beach
  - Jeorse Park Beach
  - Wolf Lake (No longer a public beach)



# **Beneficial Use Impairment (BUI) #10: Beach Closings**

***This BUI can be considered for removal when:***

Each individual beach along the Lake Michigan shoreline in the AOC has a percent exceedance rate of no higher than 15% for the *E. coli* samples taken from Memorial Day to Labor Day for three years out of a five-year period.

**OR ...**



## ***This BUI can be considered for removal when:***

Percent exceedance rates at AOC beaches will be compared to percent exceedance rates for comparable Lake Michigan beaches located outside of the AOC to determine if there is a significant difference\* for three years out of a five-year period, and if none occurs, then the Beach Closings BUI may be suggested for removal.

\*A significant difference is defined as no greater than a one percent variance between an individual AOC beach and an individual non-AOC beach in each of the three years relied upon for suggesting BUI removal.

**Note:** *Contamination that leads to exceedances within the AOC may also be attributable to sources outside the AOC.*



# BUI #10 – Exceedance Rates for Grand Calumet River AOC Beaches

AOC Beach Exceedance % Rates by Year*	2022	2021	2020	2019	2018	2017	2016	2015	2014
Hammond West	5	5	3	2	4	6	4	8	7
Hammond East	10	4	8	7	9	6	11	10	16
Whihala West	16	10	10	17	9	17	20	18	12
Whihala East	6	7	2	6	11	3	8	8	8
Jeorse Park I ***	61	46	30	26	32	11	24	42	54
Jeorse Park II ***	52	28	23	19	23	7	13	26	40
Buffington Harbor***	45	26	20	11	16	5	13	20	29
Lake Street**	0	4	1	2	3	1	4	5	3
Marquette Park**	0	3	1	3	< 1	0	2	5	3

\* Exceedance rates based on number of samples collected from Memorial Day weekend through Labor Day. 2022 data preliminary through August 22.

\*\* Lake Street and Marquette Park started monitoring on July 15, 2020, and on June 1, 2018.

\*\*\* East Chicago beaches started monitoring on June 16, 2020, and June 14, 2021



# BUI #10 - Exceedance Rates for Reference Site Beaches

Non-AOC Beach Exceedance Rates by Year*	2022	2021	2020	2019	2018	2017	2016	2015	2014
Indiana Dunes State Park West	8	5	6	13	12	8	13	12	14
Indiana Dunes State Park East	9	8	9	7	14	8	9	14	12
Ogden Dunes West	<1	4	4	6	2	1	5	6	11
Ogden Dunes East**	0	---	5	4	2	1	3	5	14
Washington Park	3	6	8	5	5	5	5	8	15

\*Exceedance rates based on number of samples collected Memorial Day weekend through Labor Day weekend. 2022 data preliminary through August 22.

\*\*Ogden Dunes East Beach not monitored in 2021 due to severe erosion prohibiting safe public access to the beach.





# Summary of Projects To Identify *E. coli* Sources

- Microbial Source Tracking (MST) studies conducted by USGS have consistently shown that human (sewage) genetic markers are rare compared to gull (primary) and dog (secondary) markers.
- Michigan State University (MSU) modeling work indicated that:
  - *E. coli* contributions from the Grand Calumet River / Indiana Harbor Ship Canal to the East Chicago beaches were minor.
  - The sand in the swash zone (wave-action zone) acts as a reservoir for *E. coli*.
  - The embayed geomorphology of the East Chicago beaches contributes to high *E. coli* levels. There is no practical way to alter this geomorphology to achieve the required reductions.
- Conclusion: Beach best management practices are required to reduce *E. coli* and thus, beach closings.



# Project Work Aimed at *E. coli* Reduction

- IDEM-funded piloting/implementation of BMPs:
  - Goosinator remote-controlled deterrent
  - Wild Goose Chase dog service program
  - Installation of Eagle Eye structural deterrents at Whihala beach (coordinated with the IDNR ornithologist on use)
  - Installation of wildlife-resistant trash and recycling containers at Hammond, Whiting, and East Chicago beaches
- USDA ring-billed gull/cormorant depredation efforts (GLRI Focus Area 3)
- Jeorse Park Beach Section 506 Great Lakes Fishery and Ecosystem Restoration (GLFER)
  - Restoration of 40 acres of onshore and in-lake habitat
  - Reduction of line-of-sight for gulls, reducing attractiveness of habitat for loafing and foraging
- Outreach
  - Bilingual no handfeeding signage
  - Two-part video on [E. coli problems](#) at AOC beaches and [potential solutions](#)
  - [PSA-style video](#) encouraging adoption of beach BMPs by the public

# East Chicago Beaches Uniquely Impacted

- From 1907-1973, Indiana law facilitated the filling of submerged areas adjacent to Lake Michigan
- Approximately 3,773 acres filled as of 1979
- East Chicago-managed beaches mostly reflect older shoreline
- Creates a bowl effect
  - Interrupts longshore currents
  - *E. coli* trap
  - Not feasible to restructure
- Must rely on best management practices to address exceedances
- Look to other AOCs for guidance?





# BUI Removal Targets Across AOCs

- Beach Closings BUI listed at 20 U.S. or binational AOCs
- BUI restored at 7 of these
- Measures listed in restoration targets:
  - **Number of exceedances of WQS** (e.g., 15% sample exceedance rate)
  - **Number of beach closings/advisories** (e.g., no more than 19 advisory days)
  - **Listing in state 303(d) list of impaired waters**
  - **Causation** (e.g., not due to CSO discharges)
  - **Action-based** (e.g., sources of stormwater & wastewater discharge have been identified and disease risk reduction measures implemented)



# Action-based Targets at AOCs: Waukegan Harbor

The restoration criteria for the Restrictions on Recreational Contact BUI in the Waukegan Harbor AOC are as follows:

The IJC Criteria states that the BUI can be delisted “when waters, commonly used for total-body contact or partial body-contact recreation, do not exceed standards, objectives, or guidelines for such use.”

This BUI will be considered for delisting when:

1. All known man made sources of bacterial contamination to the AOC have been controlled or treated to reduce exposures, where feasible.



# Lower Green Bay/Fox River

Target (Updated 2021)	Status
Removal of this BUI can occur when:	
<ul style="list-style-type: none"> <li>Known sources of bacterial contamination impacting the beaches in the AOC have been identified and, if feasible, have been controlled or treated to reduce possible exposures.</li> </ul>	Assessment in Progress & Action Needed
<ul style="list-style-type: none"> <li>Stormwater outfalls in the AOC that discharge directly or influence beaches are assessed to confirm that there are no human sources of sanitary sewage contamination.</li> </ul>	Assessment Needed
<ul style="list-style-type: none"> <li>Municipalities within the AOC have adopted and are implementing storm water reduction programs that include bacteria source reduction and illicit discharge elimination.</li> </ul>	Complete
<ul style="list-style-type: none"> <li>Each public swimming beach within the AOC is open for at least 90% of the swimming season (between Memorial Day and Labor Day) averaged over a previous 5-year period based on Wisconsin Coastal Beach monitoring protocols for E. coli monitoring and BMPs are in place.</li> </ul> <p>OR</p> <ul style="list-style-type: none"> <li>Public swimming beaches within the AOC are meeting EPA's 2012 recreational water quality criteria over a 3-year period.</li> </ul> <p>OR, in cases where known sources of bacterial contamination impacting beaches in the AOC have been controlled to the extent feasible and the above criteria cannot be met:</p> <ul style="list-style-type: none"> <li>Each public swimming beach within the AOC is open during the swimming season (between Memorial Day and Labor Day) at least as often as the average of all non-AOC beaches in Milwaukee County over the same 5-year period, or...</li> <li><b>*Where beaches have been assessed using microbial source tracking and demonstrate a low human health risk within the AOC, these beaches are open for at least 90% of the swimming season (between Memorial Day and Labor Day) and averaged over a previous 5-year period using evidence-based AOC-specific BAV criteria.</b></li> </ul>	In Progress & Action Needed
<ul style="list-style-type: none"> <li>No unpermitted discharges (combined or sanitary sewers in the Lower Milwaukee Estuary) at outfalls directly impacting AOC beaches during the swimming season (between Memorial Day and Labor Day) in a 3-year period.</li> </ul>	Currently Meeting Target; Reassess After Management Actions are Completed
<ul style="list-style-type: none"> <li>Complete a plan that includes updates to existing advisory and closure procedures for AOC beaches to reduce human health risk during and after storm events.</li> </ul>	In Progress

\*Proposed target revision to the Beach Closings (Recreational Restrictions) BUI. More information to support this change can be found in the following text.





# Summary

- *E. coli* datasets collected through IDEM's Beach Program have indicated that most AOC beaches will be able to meet the 15% exceedance threshold.
- Despite considerable efforts by IDEM and the local communities since 2015 to implement BMPs to reduce *E. coli*, reaching the current removal target as written may not be realistic at a few beaches.
  - Modeling and MST results to date indicate these are due to factors outside RAP Program and regulatory program control.
  - These types of issues are frequently encountered at AOCs and removal targets are modified in response.
- Many other AOC removal targets refer to programs aimed at reducing CSO discharges – dye tracking, MST, and modeling studies have indicated this does not seem to be a significant driver of exceedances (particularly at the East Chicago beaches).

# Discussion

- Potential options for addressing the Beach Closings BUI Removal Target:
  - 1) Add one or more elements to reflect actions taken to improve beach water quality, such as:
    - Investigation of potential sources using MST or other methods
    - Control of identified sources (e.g., beach grooming, gull management programs)
    - Use of local actions to reduce *E. coli* (e.g., beach grooming, pet waste ordinances, illicit discharge detection programs)
    - Implementation of outreach/education campaigns
    - Other elements
  - 2) Modify the target to meet standards listed in a report or plan to be developed
  - 3) No Revision (What would be the path forward for removal?)





# Questions?