



INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

We Protect Hoosiers and Our Environment.

Mitchell E. Daniels Jr.
Governor

Thomas W. Easterly
Commissioner

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February 13, 2012

Mr. John Perrecone, RAP/AOC Program Manager
Great Lakes National Program Office
United States Environmental Protection Agency, Region 5
77 West Jackson Blvd.
Chicago, IL 60604

Dear Mr. Perrecone:

I am pleased to submit to you the enclosed recommendation to remove the "Restrictions on Drinking Water Consumption- Taste and Odor" Beneficial Use Impairment (BUI) from the Grand Calumet River/Indiana Harbor Ship Canal Area of Concern (AOC). For the reasons set forth in the enclosed document, we respectfully request that you accept the recommendation and remove the aforementioned BUI from our AOC.

Please let me know if you have any questions. Thank you.

Sincerely,

Thomas W. Easterly
Commissioner

Enclosure



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Recommendation to U.S. EPA to remove the “Restrictions on Drinking Water Consumption-Taste and Odor” Beneficial Use Impairment from the Grand Calumet River/Indiana Harbor Ship Canal Area of Concern

Overview

The Grand Calumet River Area of Concern (AOC) lists “restrictions on drinking water consumption-taste-odor” as one of 14 beneficial use impairments (BUI). This AOC currently has three drinking water utilities, the City of Hammond, the City of East Chicago, and Indiana-American Water Northwest, all of which draw water directly from Lake Michigan. A review of the status of this BUI indicates that only one of the three water treatment facilities in the region that draw water from within the boundaries of the AOC tests for taste and odor in the raw water, while the other two do not test. However, one does treat for taste and odor continuously while the third does not. These processes and treatments do not significantly differ from processes used throughout southern Lake Michigan at comparable water treatment facilities not within AOC boundaries. Given this fact, the BUI should be removed from the BUI list for the Grand Calumet River/Indiana Harbor Ship Canal Area of Concern.

Background

Annex 2 of the Great Lakes Water Quality Agreement defines “impairment of beneficial use” as “a change in the chemical, physical, or biological integrity of the Great Lakes system sufficient to cause any of the 14 use impairments or other related uses covered by Article IV such as the microbial objective for waters used for body contact recreational activities.”¹

The Grand Calumet River AOC lists “restrictions-drinking water consumption-taste-odor” as one of 14 beneficial use impairments. The Grand Calumet River AOC is listed for taste and odor problems only. The BUI was never listed as a result of health standards or increased treatment requirements. Water supplies can be affected by any musty odor and taste caused by algae growing in Lake Michigan and the other Great Lakes. The algae tend to appear every summer when Lake Michigan warms and it is drawn into the water supply. In most cases, taste and odor problems are addressed through the use of activated carbon or a form of membrane filtration. Activated carbon absorbs the organic material that causes the taste and odor problems while filtration filters out the same materials.

¹ <http://www.ijc.org/rel/boards/annex2/buis.htm>

This BUI was defined as the following:

When treated drinking water supplies are impacted to the extent that: 1) densities of disease-causing organisms or concentrations of hazardous or toxic chemicals or radioactive substances exceed human health standards, objectives or guidelines; 2) taste and odor problems are present; or 3) treatment needed to make raw water suitable for drinking is beyond the standard treatment used in comparable portions of the Great Lakes which are not degraded (i.e. settling, coagulation, disinfection).²

Annex 2 of the Great Lakes Water Quality Agreement states that the BUI can be delisted for treated drinking water supplies:

- 1) when densities of disease-causing organisms or concentrations of hazardous or toxic chemicals or radioactive substances do not exceed human health objectives, standards or guidelines; 2) when taste and odor problems are absent; and 3) when treatment needed to make raw water suitable for drinking does not exceed the standard treatment used in comparable portions of the Great Lakes which are not degraded (i.e. settling, coagulation, disinfection).³

The Indiana Department of Environmental Management, in concert with the Citizens Advisory for the Remediation of the Environment (CARE) Committee, developed a Beneficial Use Impairment removal document for the AOC that identifies the criteria for removing BUIs from the Area of Concern. This BUI can be considered for delisting when:

- A reevaluation of this BUI indicates that the initial basis for listing the BU as impaired was in error;

Or

- There are no complaints of taste and/or odor in the raw water intake source as a result of contaminants originating within the AOC for a period of three consecutive years; and
- There are no taste and/or odor problems associated with raw water intakes as a result of excessive algae and/or algal species that would cause taste and/or odor problems in the water; and
- There is no additional raw water treatment that needs to be supplied specifically for control of taste and/or odor problems in the finished water supply.

² <http://www.ijc.org/rel/boards/annex2/buis.htm#table1>

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Water Treatment at Facilities in the Grand Calumet River Area of Concern

There are three public water supply operators that draw water from the boundaries of the Grand Calumet River Area of Concern in northwest Indiana: the City of Hammond, the City of East Chicago, and Indiana-American Water Northwest. All of these utilities draw their water supply from Lake Michigan. Of these utilities Hammond and Indiana-American Water Northwest treat for taste and odor using activated carbon. Hammond continually utilizes activated carbon as a filter media whereas Indiana-American will add powdered activated carbon seasonally and alter the amounts based on odor test results. It is most common that the results of the sniff test are undetectable, however when the test results indicate that the odor is less than standard the facility will add anywhere from 2.4 ppm to 6 ppm of powdered activated carbon to the system and continue at these levels for several days. After the period of treatment the system will be void of activated carbon as the facility does not continuously keep the carbon in their system.

The East Chicago Water Filtration plant currently does not treat for taste or odor. Upgrades several years ago changed the facilities process so that it no longer needed to use activated carbon. There have been no complaints regarding taste or odor in the last three years.⁴ A new membrane filtration water treatment plant is being brought on-line that will allow the facility to use activated carbon if they choose to do so.

Two of the three water utilities operating in the Grand Calumet River Area of Concern could be evidence that the beneficial use is impaired. However, among the BUI removal indicators is "when treatment needed to make raw water suitable for drinking does not exceed the standard treatment used in comparable portions of the Great Lakes which are not degraded." Therefore, if treatment activities within the AOC do not exceed the standard practices outside the AOC then a solid case for removal of this BUI can be made. In order to do this drinking water utilities outside the AOC had to be evaluated.

Water Treatment at Comparable Facilities outside the Area of Concern

To determine whether treating for taste and odor is standard practice for water utilities, research was conducted into the water treatment processes for four water utilities outside the area of concern that draw water from southern Lake Michigan. These include Chicago, Illinois, Michigan City, Indiana, Grand Rapids, Michigan, and the Central Lake County (Illinois) Joint Action Water Authority. It was determined that all four of these facilities do treat for taste and odor. The specific treatment for each plant is as follows:

- **Grand Rapids, Michigan.** "In an effort to maintain superior taste and smell in its drinking water supply, the Grand Rapids Water Department is treating the city water with activated carbon before the water is affected by any musty odor and taste caused by algae growing in Lake Michigan."⁵ The water department begins treating for taste and odor in late spring by the addition of 1 part per million (ppm)

⁴ Phone conversation with Richard Carr, East Chicago, Indiana Water Utility, August 2, 2011.

⁵ Grand Rapids, Michigan website, http://www.grand-rapids.mi.us/index.pl?page_id=5089&article_id=1996, accessed June 21, 2011 and "Activated carbon protects taste, smell of Grand Rapids drinking water," Rapid Growth, <http://rapidgrowthmedia.com/devnews/drink0619.aspx>, accessed August 8, 2011

of activated carbon, one week later the concentration is increased to 2 ppm, and then after two weeks the concentration in the system is increased to 3 ppm. The concentration of activated carbon is kept up at 3 ppm continuously throughout the summer season because as conditions warrant each season the concentration will be increased to 4ppm. The conditions that warrant such an increase are elevated temperatures and stronger odors in raw water. These conditions typically occur once or twice a season.

- **Central Lake County Joint Action Water Authority.** This facility continuously treats for taste and odor through the use of activated carbon filters. "The plant is equipped with 12 filters, each consisting of a large concrete box containing four feet of biologically active carbon over sand and gravel."⁶
- **Chicago, Illinois.** The City of Chicago uses "activated Carbon to remove unpleasant tastes and odors"⁷ only when it receives enough complaints through its 311 information system. The Facility has not received enough complaints to warrant the use of carbon to treat for taste and odor since 2000. Prior to 2000, the city used a sniff test to determine need.
- **Michigan City, Indiana.** The Michigan City, Indiana facility continuously treats for taste and odor using granulated activated carbon filters as part of its treatment process at all times.⁸

These four comparable utilities indicate that treatment for taste and odor occurs throughout the southern Lake Michigan basin. Each facility has a unique treatment approach, but it is evident that treatment within the AOC is comparable to that outside the AOC to the extent that taste and odor is treated for continuously in both areas and as little as not at all in both areas.

Eligibility for Removal from the Beneficial Use Impairment List

As stated previously, there are two sets of criteria by which the BUI can be removed from listing in the AOC. One is based on listing in error and the second is based on presence of taste or odor problems different from comparable facilities.

- ***A reevaluation of this BUI indicates that the initial basis for listing the BU as impaired was in error.*** Based on conversations with CARE Committee members who were present during the BUI listing process, it does not appear that this BUI was listed due to any specific data that would indicate that there are problems with the drinking water and no comparison with other water utilities in the Great Lakes

⁶ Central Lake County Joint Action Water Authority website, www.clcjawa.com/treatmentprocess/filtration

⁷ "Water Treatment", City of Chicago website, http://www.cityofchicago.org/city/en/depts/water/supp_info/education/water_treatment.html

⁸ Phone conversation with James L. Kintzele Jr., Filter Plant Superintendent, Michigan City Indiana, August 2, 2011.

region. According to John Fekete, currently a consultant to the CARE Committee and member of the CARE Committee at the time this BUI was listed, this BUI was listed for taste and odor more because of the *potential* for taste and odor problems.

The second set of criteria deals with monitoring and treatment. An assessment of the criteria follows.

- ***There are no complaints of taste and/or odor in the raw water intake source as a result of contaminants originating within the AOC for a period of three consecutive years.*** East Chicago is the only facility in the AOC that does not treat for taste and odor. The facility has not had any complaints for three years. Indiana-American Water Northwest and Hammond do treat for taste and odor in an effort to not attain complaints.
- ***There are no taste and/or odor problems associated with raw water intakes as a result of excessive algae and/or algal species that would cause taste and/or odor problems in the water.*** Indiana-American Water is the only water utility identified that does test for odor in the raw water supply. They then adjust treatment concentrations based upon these test results, increasing or decreasing where needed. Whereas the City of Hammond will treat continuously for taste and odor without first performing a test for odor. Outside the AOC, Michigan City and Grand Rapids also treat for taste and odor at all times although Grand Rapids will use lake temperature as an indicator that odor may occur and then increase the concentration of activated carbon in their system. Due to the differences in approach for treatment, it is difficult to directly determine whether Indiana-American Northwest is significantly different from the other utilities as it only treats for taste and odor when there is an odor coming from the raw lake water. However, the continuous treatment for taste and odor conducted by the other utilities without analytical results on odor in the raw water indicates that each utility treating does believe that there will be incidences where taste and odor in the raw water will be at an undesirable level. So even though it appears that there are taste and odor issues within the AOC, they are not atypical of the taste and odor issues outside the AOC.
- ***There is no additional raw water treatment that needs to be supplied specifically for control of taste and/or odor problems in the finished water supply.*** It is true that two of the water treatment operators in the AOC treat for taste and odor; however the treatment is standard practice for comparable water treatment facilities in southern Lake Michigan. East Chicago and Hammond are directly comparable to Chicago and Michigan City respectively whereas Indiana American Water, while still comparable to the Grand Rapids Michigan facility, the connection is less direct. Indiana American Water treats for fewer days than Grand Rapids, but when it does treat, it uses higher levels of powdered activated carbon. The higher levels are due, in part, to the fact that they do not treat daily and do not keep carbon in their system continuously. Even though the levels of activated carbon that are added at Indiana American Water may initially be higher than that of Grand Rapids it does not indicate that the water at Indiana American Water

requires more treatment. The reason for the difference is that Indiana American Water does not keep the concentration of activated carbon in their system continually throughout the season but only adds as needed. This makes the amounts of activated carbon used for treatment comparable to that of Grand Rapids who may at times use a lower concentration, but keeps this concentration level up continually for the season. Overall, it appears that the Grand Calumet River AOC clearly meets the criteria for not exceeding the standard treatment used in comparable portions of the Great Lakes which are not degraded for taste and odor as outlined in Annex 2 of the Great Lakes Water Quality Agreement.

Conclusion

The intent of the beneficial use impairment listings was to identify areas that are impaired beyond what is found in other areas of the Great Lakes region. According to the delisting guidelines from the International Joint Commission, the BUI can be removed "when treatment needed to make raw water suitable for drinking does not exceed the standard treatment used in comparable portions of the Great Lakes which are not degraded (i.e. settling, coagulation, disinfection)." In examining the process for testing and treating for taste and odor, the process is similar at comparable utilities in the Lake Michigan basin beyond the Grand Calumet River Area of Concern. The Indiana Department of Environmental Management's Office of Water Quality has reviewed and approved this information, indicating that it is clear that treatment within the AOC does not exceed that which is taking place elsewhere around Lake Michigan.

Given these facts, the beneficial use impairment should be removed from the listing for the Grand Calumet River Area of Concern.

Public Engagement

The members of the CARE Committee were provided with an opportunity to review and comment on the BUI removal justification, and all comments received from CARE Committee members were addressed. Additionally, removal of this BUI was discussed at the January 17, 2012 CARE Committee meeting. The CARE Committee unanimously agreed to recommend to IDEM Commissioner Thomas Easterly that he seek EPA approval for removal of this BUI based on the foregoing justification. (See the attached CARE Committee meeting summary and the list of meeting attendees)

IDEM disseminated the Proposed BUI Removal Recommendation for public comment by posting it in the "Public Notices" page of the IDEM website and by sending it to the individuals that are on the Northwest Indiana Regional Planning Commission Environmental Management Policy Committee e-mail distribution list. IDEM accepted public comment for a 15 day period beginning on Wednesday, January 25, 2012 and ending at 10:00 am (Central Standard Daylight Savings Time) on Thursday, February 9, 2012. No Comments were received.

No public meeting was requested.

Recommendation

For the foregoing reasons, IDEM recommends that U.S. EPA remove the “Restrictions on Drinking Water Consumption-Taste and Odor” BUI from the list of impairments for the Grand Calumet River/Indiana Harbor Ship Canal Area of Concern.

CARE meeting Agenda

Tuesday, January 17, 2012

3:00pm

IDEM NWRO

Call in# 530-881-1000

Access Code for call is in 1069723#

In attendance: Tom Barnett Michelle Caldwell, John Fekete, Colin Highlands, Anne Remek Kominowski, Kris Krouse, Paul Labus, Derek Nimetz, Dan Sparks, Jim Smith, Ashley Snyder, Jeff Edstrom

Via phone: Mike Molnar

1. DW BUI Removal Memo-Jeff Edstrom, ECT and Ashley Snyder, IDEM

- The updated version of the DW removal memo was presented. Jeff Edstrom explained the additional data on amounts of activated carbon used for treatment that was added to the memo.
- The IDEM Drinking Water branch had approved this updated version.
- The CARE members were provided a copy of the updated version prior to the meeting for their review.
- After the brief explanation of the update the CARE committee was asked for reconfirmation to move forward with sending the memo onto Commissioner Easterly for approval.
- All in attendance were in agreement to move forward with removal.

2. US FWS work on BUI #4 Fish Tumors and Deformities – Dan Sparks, US FWS

- Dan provided a power point presentation on his work in collecting data on BUI #4 from 1988 to 2010.
- Dan stated that in all his years of research there have been little to no pure brown bullheads found within the Grand Calumet River. Dan believes this is due to the contaminated sediments not allowing for survival of a food source or spawning. It was stated that this BUI will not be capable of recovery until after dredging/capping has taken place.
- The few bullheads found in the river are believed to be yellow, black, or a hybrid version of any of the three types.
- Due to the lack of bullheads for his research Dan utilized the goldfish/carp found in the river to test. Histology on the goldfish did not show significant deterioration and/or cancer of the liver to say that the PAHs within the river are causing tumors and deformities to goldfish.
- Due to the lack adequate histological data Dan suggests that the removal criteria for BUI#4 be reviewed and that we reconfirm with EPA that our removal criteria of focusing on the DELT anomalies will be adequate for removal justification when the time comes. As the IJC sets the delisting criteria as, "When the incidence rates of fish tumors or other deformities do not exceed rates at unimpacted control sites and when survey data confirm the absence of neoplastic or preneoplastic liver tumors in bullheads or suckers."

- Discussion on this topic came to the conclusion that Dan would put together a brief overview of his findings and then Ashley Snyder would discuss with EPA to confirm the adequacy of our current removal target for this BUI.
- As a note Tom Simon is currently working on data collection on DELT anomalies within the AOC which should provide a baseline for this BUI as long as our current removal criteria are acceptable.

3. Updated RAP Draft Discussion-Ashley Snyder, IDEM

- The update to the RAP 2.5 was briefly discussed. The CARE committee did not have time to review the document prior to the meeting as it was not sent out.
- The document is being attached with these minutes for review by the committee and further discussion at the next meeting.
- The way in which the information was gathered was explained as having been pulled together from previous documents and also by the construction of new tables on Habitat Restoration and Dredging by Jim Smith and Paul Labus. From these tables and the historic information a work matrix was made which describes the work required for removal.
- The document is still in the draft phase but was submitted to John Perrecone, EPA, on Dec. 30, 2011. This document satisfied the need at the time, but a final copy of the document is required to be submitted by July 1, 2012.

4. Funding Opportunity for Habitat Restoration within the AOC-Jim Smith

- Jim Smith and multiple partners from the different Habitat groups are planning on seeking funding through either Sustain of Great Lakes or NOAA for habitat restoration/phragmites removal.
- Both groups currently have grant money available for habitat restoration within an AOC, but both require/suggest a match in funds.
- Jim believes there will be supporting partners and that the Trustees will be able to provide any required matching funds.
- Letters of support will be needed for the project later in the year.
- The submittal deadline for proposals to NOAA is Feb. 16, 2012.

5. Table talk, wrap up, and adjournment

- January 18, 2012 an open house is being held from 3pm to 7pm at the Knights of Columbus in East Chicago for the Roxana Marsh GLLA project. Jim Smith or Carl Wodrich can be contacted in regards to the open house.

6. Next Meeting

- **February 21, 2012 at 3:00 pm**

