Natural Conditions, Water Quality Standards, and Bacteria – An Alaskan Case Study

Background

The Kenai River is a world renowned destination for fishing aficionados. The area immediately around the mouth of the Kenai is where the city of Kenai is located and can be considered 'lightly' urbanized. With this relatively close proximity to Alaska's most populated areas (Anchorage/Mat-Su Valley) the recreational fisheries that occur on the beaches at the mouth of the Kenai draw thousands of people to its beaches during the summer season.

Bacteria sampling between 2010 and 2019 indicated exceedances of the state bacteria criteria for the designated use of Contact Recreation. Microbial source testing (MST) occurred on 60 samples collected in 2011. All 60 tests indicated avian host markers, but human and animal markers were also found in 5 of the 60 samples. Multiple bird colonies (sea gulls) are present in the Kenai area and large numbers of birds are attracted to the beaches by fish carcasses left by fishermen that butchered their fish on the beach, the presence of spawning salmon, and the presence of salmon roe. There is also a city solid waste disposal facility[1] in close proximity to the area of concern. While adequate sanitary facilities including portable toilets and fish waste disposal containers for fishermen to use, and city-sponsored beach raking on a nightly basis, high bacteria results continue to occur.

Analysis of data collected in 2018 data indicated exceedances occurred well before the recreational fishery begins and ends. MST samples collected at five sites in 2019 tested positive for human markers during the fishery as well as including upstream and gull rookery sites.

[1] The City does have a bird deterrent policy in place.

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Problem Statement: Listing the water as 'impaired' conflicts with state regulatory language pertaining to natural conditions. Technology is not currently available that would allow quantification of bacteria according to source (i.e., human, gull, dog). This leaves regulators wondering whether bacteria high because the bird rookeries have always been there or is the presence of bird colonies (and resultant bacteria concentrations) the result of increased human activity? The local community and decision makers are very adverse to an impairment determination as such a decision does not necessarily characterize the degree of risk present to the general public.

Regulatory Language

18 AAC 70.010(d): Where the department determines that the natural conditions of a water of the state is of lower quality than the water quality criteria set out in 18 AAC 70.020(b), the natural condition supersedes the criteria and becomes the standard for that water.[2]

Implementation Policy (2019 Listing Methodology for Determining Impairments from Pathogens)

DEC bases impairment determinations on a **persistent** impairment to the waterbody. When an exceedance has been determined, DEC's recommended approach is:

- Exceedances found in one of the 30-day sampling period be followed by an additional 30-day sampling period during the same season of a subsequent year or sooner to validate the persistence of the water quality impairment.

EPA guidance

EPA *Overview of Technical Support Materials (TSM): A Guide to the Site-Specific Alternative Recreational Criteria TSM Documents* (2014) states:

> This set of TSM documents discusses tools related to the following areas:
> 1. alternative health relationships (Section 6.2.1 in RWQC "Epidemiological Studies")
> 2. non-human fecal sources (Section 6.2.2 in RWQC "Quantitative Microbial Risk Assessment")
> 3. alternative indicators and methods (Section 6.2.3 in RWQC "Alternative Indicators or Methods") ((Published 2014)
>
> EPA plans to publish TSM documents corresponding to each set of these tools. The TSM documents will provide the detailed information that users need to determine which set of tools may be germane for their needs. They will also provide suggestions for gathering

[2] This language was disapproved of by EPA in 2009 but DEC still has narrative language approved as of 2003 stating: AAC 70.235. Site-specific criteria. (a) The department will, in its discretion, establish a site-specific water quality criterion that modifies a water quality criterion set out in 18 AAC 70.020(b) (1) in a permit, certification, or approval as described in (b) of this section; or (2) in regulation as described in (c) of this section. (b) If the department finds that the natural condition of a waterbody is demonstrated to be of lower quality than a water quality criterion set out in 18 AAC 70.020(b), the natural condition constitutes the applicable water quality criterion.

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> information and data to support the approach, conducting analyses, *deriving site-specific alternative criteria, and preparing documentation for water quality standards packages*.

As of January 2020, EPA has yet to publish the TSM document titled *Site-Specific Alternative Criteria Technical Support Materials for Predominantly Non-Human Fecal Sources*. Without this document, states do not have a clear path forward for establishing site-specific criteria that would be acceptable to EPA.

Options

A. STATUS QUO: Alaska continues to collect bacteria samples before, during, and after the summer to better characterize bacteria concentrations, continues to issue beach advisories during the summer months, continues to discuss the regulatory language with EPA, and works with the local community to implement best management practices for regarding the disposal of fish waste and need to reduce sea gull concentrations.

- Practicable approach but doesn't resolve the tension between the state regulation and the 303(d) requirement for Alaska to submit an Integrated Report based on the best available data and EPA to take action on the report.
- Ensure human health is protected through timely beach advisories when bacteria levels are high

B. Work with EPA to establish site-specific criteria for bacteria on a seasonal basis using MST data

- EPA has an unpublished methodology and without that, DEC doesn't know what is acceptable as far as data requirements – could result in wasted resources.
- This is a dynamic system and seasonal bacteria values could change based on multiple externalities – SSC are static.

C. Standard 303(d) process: Category 5 ⇨ Category 4b

- Would require an alternate waterbody recovery plan to be completed when core questions are still unanswered
- Is counter to Alaska regulations
- The general public doesn't differentiate between 303(d) labels; They just hear "impaired"

D. Establish a 'carve-out' for natural sources of bacteria that does not require formal rulemaking.

- An 'achievable' performance-based approach to developing a SSC for bacteria would be ideal
- Doesn't resolve the question of determining how much is 'natural' and whether human health could be impacted

Questions to States

- Do you have similar situations you're dealing with?
- What have you done to date?