

COUNCIL ACTION FORM

SUBJECT: REQUEST TO IOWA DEPARTMENT OF NATURAL RESOURCES FOR POLICY CLARIFICATION ON BACTERIAL STANDARDS

BACKGROUND:

During the summer of 2007, the Iowa Department of Natural Resources (IDNR) determined that the portion of the South Skunk River into which the Ames Water Pollution Control Plant discharges was capable of supporting full-body contact recreation (swimming, water skiing, etc.) and applied a stream use classification A1. This classification is the highest recreation standard contained in the Iowa Administrative Code (IAC).

The IAC contains a table that describes the bacterial standards that are to be applied to point source discharges into recreational waters. The portion of the table that applies to Class A1 recreational waters is as follows:

Taken from IAC 567 – Chapter 61.3(3)a.(1)

	Geometric Mean	Sample Maximum
Class A1		
3/15 – 11/15	126 ¹	235 ¹
11/16 – 3/14	Does not apply	Does not apply

¹ – Concentration, organisms/100 ml of water

The “sample maximum” is just what the name suggests – a maximum concentration below which every sample fall in order to comply with the bacterial standards.

A “geometric mean” is a statistical calculation that allows a determination of the “central tendency” of a group of measurements without being overly influenced by an occasional random high or low value. (For those who prefer the mathematical definition, it is the n^{th} -root of the product of the measurements.) The rationale for using a geometric mean for bacterial concentrations, as opposed to a simple “monthly average,” is because bacterial sampling and analysis are subject to a wider degree of variability than most other environmental analyses, and the geometric mean is less influenced by that variability than calculating a simple average.

These particular water quality standards were adopted by the IDNR in May 2003 and were derived in part from guidance provided in a United States Environmental Protection Agency (US EPA) 1986 bacteria criteria document. The US EPA criteria were established to provide public health protection for full-body contact recreational activities. The level of protection was statistically defined by the US EPA as being not

greater than a 0.8 percent risk of gastrointestinal illness from the inadvertent ingestion of 100 ml of water through body contact recreation.

After the State of Iowa adopted the criteria and the accompanying NPDES implementation policy in 2003, the US EPA issued a clarification in 2004 on the appropriate use and application of the standards. Specifically, US EPA clarified that the use of sample maximum values were not intended to be used as permit limitations imposed on point source discharges, as was the case in Iowa. The US EPA clarifications were published in the *Federal Register* and read in part as shown below.

“The single sample maximum values in the 1986 bacteria criteria were not developed as acute criteria; rather they were developed as a statistical construction to allow decision makers to make informed decisions to open or close beaches on small data sets.” “...Single sample maximums were not designed to provide a further reduction in the design illness level provided for by the geometric mean criterion.” “...Using the single sample maximums as values not to be surpassed...could impart a level of protection much more stringent than intended by the 1986 bacteria criteria document.” 69 Fed Reg. 67225 (Nov. 16, 2004)

“Other than in the beach notification and closure decision context, the geometric mean is the more relevant value for ensuring that appropriate actions are taken to protect and improve water quality because it is a more reliable measure, being less subject to random variation, and more directly linked to the underlying studies on which the 1986 bacteria criteria were based.” 69 Fed Reg. 67224 (Nov. 16, 2004)

This revised guidance from the US EPA clarifies that the single sample maximum provisions should only be used when making beach closure decisions based on limited data sets. By imposing an absolute maximum sample concentration in all Class “A” waters under all concentrations, the IDNR is subjecting discharges, such as stormwater systems and peak wet-weather flows from wastewater treatment plants, to unnecessary expenditures in order to meet a water quality standard that was never intended by the US EPA.

Many states have already revised their water quality standards to reflect the most recent US EPA guidance. The Oregon Department of Environmental Quality has issued a position paper stating that the single sample exceedance value should not be applied as a strict end-of-pipe limit. Similarly, New Jersey has adopted water quality standards that contain a clarification ensuring that daily maximum requirements would not apply to point source discharges and would only be used as an indicator in bathing beach areas. The Missouri DNR has chosen not to include a sample maximum in their water quality standards and have included only a 30-day standard.

IMPLICATIONS FOR AMES:

The dollar impact to the Ames Water Pollution Control Plant due to the difference between the US EPA guidance and the IDNR implementation are substantial. Preliminary estimates are that a disinfection project of approximately \$3 million will be needed to achieve compliance with the geometric mean standard. To comply with a single sample never-to-exceed bacterial standard will push the cost of the disinfection project close to \$7 million.

The reason for the cost difference has to do with the treatment of peak wet-weather flows into the treatment plant. Like other similar facilities, the Ames treatment plant uses flow equalization basins to hold wastewater flows in excess of its hydraulic capacity. The water is held until the flow rate drops back below the capacity, and the stored water can be sent through the plant for full treatment. On those rare occasions when the basins fill completely before the flow drops back below capacity, the excess flow is diverted and blended with our treated effluent before release into the South Skunk River. In the 20-year life of the current treatment plant, this sort of controlled diversion has occurred on 54 days and quite often for just a few hours of those days.

To provide disinfection of the diverted flows, a separate disinfection system will be necessary from the one used for the plant effluent, as the chemistry of the diverted water differs from that of the fully treated effluent. The diverted flows will be higher in hardness, color, dissolved and suspended solids, and turbidity than the plant effluent. As a result, a disinfection system designed for the plant effluent will not be effective on the diverted flow.

In addition to the technical and regulatory arguments for not imposing single sample maximum bacterial standards, there are also a number of simple common-sense rationales.

1. Periods of exceptionally high inflow rates into the treatment plant coincide with exceptionally high rainfall events and with elevated river levels. The likelihood of full-body contact recreation becomes increasingly improbable under those conditions. The existing Iowa standards already recognize that there is no value in imposing bacterial standards when there is a low probability of body contact recreation, as the standards do not apply during the winter. It is a simple extension of that current regulatory philosophy to not impose standards during extreme wet-weather events.
2. During these wet-weather periods, the background bacterial levels in the river are already substantially elevated. It is unlikely that it would even be possible to notice a difference in downstream bacterial concentrations, regardless of the degree of disinfection provided by the Ames WPC Plant. Any body contact recreation that does occur under those conditions would face an increased exposure risk even upstream of our facility. Thus, the construction of a multi-

million dollar disinfection system that is only used under these circumstances will essentially provide no additional measure of public health protection.

3. The infrastructure necessary to ensure compliance with the single sample maximum standard under these conditions will sit idle for the greatest portion of the year. In fact, based on the frequency of diversions over the life of the Ames WPC Plant, the facility could sit for years at a time without ever needing to be used. Maintaining this sort of system in a constant state of readiness can be both difficult and expensive.

A number of state trade associations are encouraging the IDNR to issue a policy clarification similar to those issued by other states. In recent meetings between these associations and IDNR staff, it appeared that IDNR understands that the application of single sample maximum to point discharges is not appropriate. The trade associations are appealing directly to IDNR and are encouraging the Iowa League of Cities to do the same. The Iowa Water Pollution Control Association (of which the City of Ames is a utility member) is asking the mayors of member communities to send a letter to the League encouraging the same. **Staff is requesting Council support for such a letter from Mayor Campbell.** In addition, due to the specific financial impact that this misapplication of the national water quality criteria could have on the Ames rate-payers, **staff is also requesting authorization to send a letter directly to the IDNR.**

To be clear, staff is not advocating that the Ames WPC Plant should be exempt from disinfecting the effluent from the treatment plant during periods of high flow. Also, staff does not mean to suggest that there should be no standards imposed to quantify that the treatment objectives are being achieved. Staff is simply asserting that the incremental environmental and public health gains achieved by imposing single sample maximum bacterial limits are, for all practical purposes, zero. The incremental \$4 million price is estimated to result in an additional 10 to 15 percent rate increase *in addition* to the rate increases that will be necessary to pay for the base disinfection system.

While the South Skunk River's designation as a Class A1 stream invokes the bacterial standards, they are not a legal obligation of the City of Ames until specific limitations are included in a new NPDES permit for the facility. Staff has been awaiting the issuance of an updated NPDES permit since October 1999 when the current permit expired. Staff believes that moving ahead with disinfection is an important moral obligation of the City and is recommending that the City begin work to install and operate a disinfection system even without a new permit. However, the issue of the proper application of the bacterial standards has a material impact on the final design of the system. Staff is preparing a Request for Proposals from design professionals predicated on the application of the geometric mean standard only. **If Council grants the requests above, staff will continue preparing to solicit proposals for a scope of work that involves the planning of a disinfection system designed to meet the geometric mean standard.**

ALTERNATIVES:

1. A. Direct the Mayor to send a letter to the Iowa League of Cities encouraging the League to request that the Iowa Department of Natural Resources issue a policy clarification stating that the single sample maximum bacterial standards contained in Chapter 61 of the Iowa Administrative Code not be imposed on wet-weather discharges or wastewater treatment plants.
 - B. Authorize staff to send a letter to the Iowa Department of Natural Resources requesting the issuance of policy clarification stating that the single sample maximum bacterial standards contained in Chapter 61 of the Iowa Administrative Code not be imposed on wet-weather discharges or wastewater treatment plants.
 - C. Direct staff to continue efforts to move ahead with planning activities related to the construction of disinfection facilities designed to meet the geometric mean bacterial standard.
2. Do not authorize either letter and direct staff to move ahead with planning activities related to the construction of disinfection facilities designed to meet both the geometric mean and the single sample maximum standard.
 3. Do not authorize either letter and direct staff not to proceed with planning activities for the construction of disinfection facilities until a new NPDES permit is issued by the IDNR that contains specific bacterial limitations.

MANAGER'S RECOMMENDED ACTION:

Numerous trade associations in Iowa are concerned that the existing bacterial limitations contained in the Iowa Administrative Code are leading to expenditures by municipalities that are not necessary to protect full body contact recreational uses. This position is supported by clarifying guidance issued by the US EPA and is consistent with the water quality standards that have been adopted in other states. The impact on rate payers of the Ames sewer utility could be as much as \$4 million.

Therefore, it is the recommendation of the City Manager that the City Council adopt Alternative No. 1, directing the Mayor to send a letter to the Iowa League of Cities urging their support in encouraging IDNR to issue a policy clarification that single sample maximum bacterial standards not be imposed on wet-weather discharges or wastewater treatment plants. This alternative will also authorize staff to send a letter directly to the IDNR encouraging the same action, and will direct staff to continue efforts to move ahead with planning activities related to the construction of disinfection facilities designed to meet the geometric mean bacterial standard contained in the Iowa Administrative Code 567 Chapter 61.