

E. Coli and disinfection update

Staff report to the Ames City Council
February 24, 2009

Vitally Important Services



"We are protectors of both the public health
and of the environment."

Water Quality Standards

- “All waters of the state are classified for protection of beneficial uses.”
- Classifications include:
 - “General Use” segments
 - “Designated Use” segments

IAC 567 61.3(1)

Water Use Categories

- “Designated Use Segments” – Stream segments that maintain flow throughout the year, or maintain significant pools during nonflow periods.

IAC 567 61.3(1)“b”

Designated Use Classifications

- **Class “A” Segments**
 - Protected for recreational uses
 - **Class “B” Segments**
 - Protected for aquatic life uses
 - **Class “C” Segments**
 - Protected for drinking water supplies
- South Skunk River
IAC 567 61.3(1)“b”

“A” Sub-classifications

- **Class “A1” - Primary Contact Recreation**
 - Considerable risk of ingesting large quantities of water
 - Swimming, skiing, diving
 - **Class “A2” – Non-Contact Recreation**
 - Minimal probability of ingesting appreciable quantities of water
 - Fishing, boating, shoreline activities
 - **Class “A3” – Children’s Recreation**
 - Recreational uses by children are common
 - Primarily urban or residential areas
- South Skunk River
IAC 567 61.3(1)“b”(1-3)

Disinfection

	Geometric Mean	Sample Maximum
Class A1		
3/15 - 11/15	126	235
11/16 - 3/14	Does Not Apply	Does Not Apply

From IAC 567 Chapter 61.3(3)a(1)

EPA Position

“...the single sample maximum values in the 1986 bacteria criteria were not developed as acute criteria... single sample maximums were not designed to provide a further reduction in the design illness level provided for by the geometric mean criterion...”

69 Fed Reg. 67225 (Nov. 16, 2004)

EPA Position

“...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)

Ames Water Pollution Control Facility

- 20.4 MGD Hydraulic capacity
- 34 MGD Pumping capacity
- Equalization basins
- High flows and full EQ basins
 - Rare occurrence
 - Some flow from the EQ basins is blended with treated effluent.
 - Blended effluent still meets all the current permit requirements.
- Over 20 years, only 0.7% has been diverted, most of which was during 1993.

Proposed E. coli limits

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

How could this affect WPC?

- If IDNR clarifies the application of the single sample maximum limit
 - A disinfection system would be designed for WPC plant capacity
 - Approximately \$3 million in construction costs, depending on type of disinfection system selected.
 - Using a geometric mean, one or two higher samples could occur and still meet permit requirements.

How could this affect WPC?

- If IDNR maintains single sample maximum limit
 - ALL flow would need to be disinfected before discharging.
- Problematic during high flows
 - Would need separate disinfection for EQ basin flows

Disinfecting EQ basin flow

- A separate disinfection system for the EQ basins is needed because of water quality.
- A second system will cost about \$4 million to construct, bringing the total construction cost to \$7 million.
- The EQ disinfection system must be fully operational at any time
 - Significantly increases the O&M demand on staff for equipment that may only be used once or twice in many years.

When do high flows occur?

- The infrequent periods of controlled blending occur when there is a significant amount of rain.
- During these periods, the flow in the South Skunk River is extremely high and it would be unlikely that someone would be recreating in the river.
- If activity were occurring in the river during high flows, there are many other dangers a person may encounter.





Disinfection

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

\$3 M

\$7 M

Requested Action

- Request Mayor to send a letter to the Iowa League of Cities
- Authorize staff to send a letter to IDNR
- Direct staff to continue efforts to begin planning activities for one disinfection system

