

Wyoming DEQ Interview Notes

Interview with Wyoming DEQ, Northwest District Senior Engineer Hannes Stueckler

October 12, 2011

by Ken Markert

In our telephone interview, Mr. Stueckler discussed the Basin Sewage Lagoon in terms of the treatment process, observations about the system, and recommendations for the Town to consider in addressing the situation. The discussion is summarized as follows:

Treatment process:

Grinder pump puts wastewater into anaerobic pretreatment cell, entering from the bottom of the cell. Cell should separate solids and top layer of water goes to the main lagoon. This process does not work well with dilution. Wastewater in main lagoon moves directly to the main lagoon outflow point. An ultraviolet light process was installed three years ago and is used to disinfect the discharge water.

Observations:

- As statewide and national water quality standards have increased, Basin's plant has become more obsolete.
- Influent grinder pump is a big maintenance headache. The pump grinds up solid components of the wastewater and pumps it all into the pretreatment cell.
- Anaerobic pretreatment cell was constructed three years ago and has not improved treatment.
- The main lagoon is not working properly. The wastewater is not sufficiently mixed in the main lagoon--baffles or dikes are needed to make the wastewater take a more circuitous route to the discharge point, thereby increasing retention time in the lagoon.
- The ultra-violet disinfection process is not performing as desired because algae and Total Dissolved Solids¹ inhibit the disinfection process.
- Sewer infiltration (water leaking into sewer pipes) becomes an issue whenever the treatment process is not meeting its permit requirements.
- In addition, excessive infiltration raises operating costs.
- If the Town reconfigures the lagoon as an aerated lagoon, operating costs will become a significant issue. The main cost is the cost of electricity to run aeration machinery.

Recommendations:

¹Total Dissolved Solids refers to the total amount of all inorganic and organic substances – including minerals, salts, metals, and ions – that are dispersed within a volume of water. By definition, the solids must be small enough to be filtered through a sieve measuring 2 micrometers (2 thousandths of a millimeter -- very small!).

1. Town should work closely with DEQ due to DEQ's experience with small town systems in Wyoming.
 2. Town should develop and consider estimated costs to households of each corrective alternative, including long-term operating costs and debt repayment.
 3. Town should monitor treatment effectiveness at outflow from the new anaerobic cell in order to better understand what is happening with this part of the treatment process.
 4. Town should evaluate the effectiveness and feasibility of constructing an interceptor drain below the canal.
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Interview with Wyoming DEQ, Water Quality Division Environmental Scientist Marcia Porter

November 7, 2011

by Ken Markert

Porter is involved in regulating the Basin wastewater treatment facility. She explained how Basin will soon have a new operating permit which will require more frequent and more detailed water quality monitoring. However, the new permit will not tighten up the treatment standards that the Town must meet--those will stay the same as they have been recently. She also indicated that even though Basin has had incidents of failing to meet with water quality standards, the situation is not the the point where DEQ would take enforcement action compelling the Town to upgrade the treatment system.

In terms of future regulatory issues, Porter noted that there is likely to be a Total Maximum Daily Limit (TMDL) established for the Big Horn River. The TMDL would cap the amount of fecal coliform bacteria that can be discharged to the river. This would put more focus on the need for the Town to comply with its bacterial limits of its permit.

Porter felt that the Town's fairly new ultra-violet disinfection system (which for removing bacteria from the discharge) should work better than it has and that the Town needs to improve the treatment process in the main lagoon so that the ultra-violet system will work better. Increasing the detention time of the main lagoon (the length of time it takes for wastewater to move from the inflow point, across the lagoon, to the discharge point). She noted that Greybull has the same sewage treatment system as Basin and recently installed baffles in the lagoon to increase detention time from 50 days to 177 days; this change is too new to be sure of its impact, but it is expected to improve the treatment process.

Porter also suggested that the Town try to determine the sources of inflow and infiltration into the sewers and make sure that new connections to sewer mains do not create new points for additional groundwater infiltration into the system.