

A joint Work Session of the City Council and the Treatment Stakeholder Subcommittee for the City of Junction City, met at 6:30 p.m. on Thursday, December 5, 2013, in the Council Chambers of City Hall, 680 Greenwood Street, Junction City, Oregon.

PRESENT: CITY COUNCIL: Mayor, David Brunscheon; Councilors Karen Leach, Bill DiMarco, Jim Leach, Randy Nelson, Steven Hitchcock; and Herb Christensen.

TREATMENT STAKEHOLDER SUBCOMMITTEE: Jock Gibson, Dean Skiller, Charles Wallace, Chris Meyer, Mike Kaiser, and Jeff Haag.

CITY STAFF: City Administrator, Melissa Bowers; Public Works Director, Jason Knope; and City Recorder, Kitty Vodrup.

I. CALL TO ORDER AND PLEDGE OF ALLEGIANCE

Mayor Brunscheon called the meeting to order at 6:30 p.m. and led the Pledge of Allegiance.

II. SEWER SECOND OPINION WORK REVIEW

Director Knope introduced Mr. Mike Henry and Mr. Rob Henry of HBH Engineering. They distributed and reviewed a City of Junction City WWTP (Wastewater Treatment Plant) Alternative Solution handout.

Summary

HBH Engineering was tasked with reviewing alternatives to the current Wastewater Facilities Plan, which consists of a hybrid plant with an SBR (Sequencing Batch Reactor) and Aerated Lagoon combination. They reviewed the following options:

1. Effluent Irrigation for Summer Reuse
2. Use of Aerated Lagoon for Advanced Treatment - The MAO requires the City to install interim improvements by October 2014. Could use these improvements as part of a permanent solution.
3. Use of Wetlands for Effluent – Discussed with DEQ and was dismissed as the City is in a groundwater limited area; any created wetlands would have to have a liner underneath, which is very expensive, so the effluent would not get into the groundwater.

Limiting Factors for Any Proposed Solutions

1. Effluent Limits for Discharge to the Long Tom River.
 - a. In the summertime, the City has to have 10/10 (10 milligrams per liter of BOD [Biochemical Oxygen Demand], 10 milligram per liter of TSS [Total Suspended Solids], and 1 milligram per liter of ammonia.
 - b. In the wintertime, the City has to have 17/22 (17 milligrams per liter of BOD, 22 milligrams per liter of TSS, and 4 milligrams per liter of ammonia.
2. Southern Willamette Valley Groundwater Management Area – Junction City is within this area and this means that the City cannot do anything that adversely impacts the groundwater. This limits irrigation and wetlands options.
3. Soil Conditions – There are soil types within the WWTP vicinity that are not recommended for effluent reuse/disposal, due to the soil saturation and localized high groundwater table.

Effluent Reuse

Scenario 1: No Discharge to Long Tom River during Dry Weather Season – This would include holding discharge all summer from May through October and would require at least 550 acres, including buffer zones (total 750 acres) for poplar plantation. DEQ would be hesitant with the effluent being dependent on so many acres. Finding that much acreage to plant trees could be problematic.

Scenario 2: Summer Discharge to Long Tom River with Effluent Reuse – The need exists for advanced treatment of effluent disposal to the Long Tom even in the winter months, due to ammonia limits. The solution considered for advanced treatment is capable of high quality effluent, which would meet the discharge limits needed in the summer months (10/10/1); therefore, the need to irrigate is not required, but they looked at keeping irrigation as an option and providing 40 acres of poplar plantation to get started. Once the irrigation is part of the City's treatment protocol, it would be simple to increase the amount of effluent irrigated as the demand from farmers increase. 40 acres of poplar irrigation could get rid of 120,000 gallons per day of effluent and at the 20 year design

level that is only about 8% of the dry weather flows. Irrigation has to be done at the agronomic rate that the plants are using the water, so there is not any water going down into the soil and into the groundwater protected area.

Advanced Treatment Option - Keep the Existing Lagoon and do Advanced Aerated Lagoon Treatment

This was considered, as the City will be putting quite a bit of money into the interim improvements at the lagoon as required by the MAO (Mutual Agreement Order) with DEQ. And because the City will be putting in aeration to treat BOD in the interim, they looked at making that a permanent solution. Aerated lagoons by themselves may be able to treat to 10/10 in the summer, but they cannot treat to low ammonia levels that are needed; therefore, they looked at the aerated rock filter option.

Aerated Rock Filter

- Two companies make these: Air Diffusions Systems (ADS) and Nelson Environmental (SAGR – Submerged Attached Growth Reactor)
- DEQ suggested that the City look at these systems.
- These systems have been quite successful in treating to low effluent BOD, TSS, and ammonia levels.
- Aerated rock filters are attached growth systems where the bacteria attach to the rock media so that it does not get washed out of the lagoons. Both the ADS and Nelson SAGR designs consist of coarsely graded rock media inside a lined, earthen basin. Aeration is added to the rock filter to facilitate the denitrification reaction which reduces the ammonia.
- Mulch is placed over the top of the ADS/SAGR to keep the temperature warm inside.
- WWTP design with this system would include:
 - Using the existing primary screening/grinder headworks
 - The wastewater would then go into the two existing lagoons. The first lagoon is where it would be completely mixed to get the treatment started and then it would go into the second lagoon, where it would be partially mixed and go into a settling area.
 - Then it would go into the aerated rock filters.
- The design parameters of this would be very similar to what the City was looking at with a hybrid plant with a SBR, which is what the facilities plan selected alternative was. The big difference is that the hybrid plant in the facilities plan does not have all the water going through the SBR in the wintertime, so it was relying on another constructed lagoon to provide some of that treatment; thus, contributing to the higher cost for this option.
- There are currently no aerated rock filters in Oregon, but there is a lot of data to support their use; consequently, DEQ would require the design engineer to work closely with them.

Cost Estimate and Comparison

Estimate #1: High level cost that kept a lot of the same numbers in the facilities plan.

- Nelson Environmental SAGR
- Keep facilities plan costs for chlorination system, effluent force main, overall improvements including diffuser and reaeration.
- Reduced cost for effluent pump station, due to the ability of the lagoons to hold water better than a SBR.
- Total Cost: \$19,707,000

Estimate #2: Low level cost

- ADS Aerated Rock Filter
- Keep facilities plan cost for chlorination system.
- Reduced cost for effluent pump, due to the ability of the lagoons to hold water better than a SBR.
- Reduced cost for effluent forcemain, as it would be smaller due to not needing to push a max day out of it.
- Reduce costs of diffuser and reaeration.
- Total Cost: \$14,773,000

Junction City Facilities Plan Selected Option Cost

- Total: \$27,725,000

Questions from Council/Committee and Answers from HBH and/or City Staff

Question: Do the existing lagoon dikes need to be raised by 2 feet? Answer: No.

Question: What is the maintenance for the aerated rock filters? Answer: The biggest maintenance cost would be the electrical costs, due to the blowers to supply the air. Other than that, they are fairly maintenance free. Depending on the amount of alkalinity that you would get out of the aerated lagoons, they might have to add soda ash. In the ADS system, they recommend using limestone as part of the rock media, which provides natural alkalinity; that would need to be monitored. In comparison to a SBR, it's substantially less operations and maintenance.

Question: Does the City have enough land now to build the rock filter and have the 40 acres of poplars? Answer: Yes.

Question: What is the footprint that is being proposed for the filter? Answer: The footprint of the gravel filters is about 1/3 to 1/4 of the size of one of the existing lagoons. (HBH distributed a drawing of the proposed aerated lagoon with submerged attached growth reactors).

Question: Are there no rock filters in Oregon, because they are new? Answer: The big thing in Oregon is the need for denitrification and this hasn't been an option that people in Oregon have chosen. There has been a lot of research done on these as they are used in Canada because of the cold weather.

Question: DEQ likes them? Answer: Yes.

Question: Where is the nearest one? Answer: They are in Canada. In the United States, the nearest ones are in Montana, Missouri, and Iowa.

Question: What type of rock filters do they have? Answer: SAGR. Tim McFetridge from DEQ has indicated that he wants to take a road trip during the pre-design study to look at one.

Question: How long have they been up and running? Answer: 14 years. Veneta has a rock filter, but it is not aerated.

Question: What is the life of one of these systems? Answer: The hope is 15 to 20 years out of the aeration portion; however, the rock does not need to be replaced. If the City went with an ADS that has limestone, the limestone would eventually degrade, depending on the alkalinity of the effluent from the aerated lagoons.

Question: Does the bacteria on the rocks have to be cleaned? Answer: No. As long as you keep flow through it, there is nothing you have to do to it.

Alternatives Comparison

Hybrid SBR/Lagoon

Pros: Tried and true technology with many examples in Oregon and the SBR process is more flexible in operations.

Cons: Higher capital costs, higher operation/maintenance costs, involves property acquisition and wetlands mitigation, higher level of operator training, and requires larger footprint.

Aerated Lagoons with Aerated Rock Filter

Pros: Lower capital costs, lower operation/maintenance costs, more effectively uses existing treatment facilities, and does not require additional property for treatment.

Cons: Aerated rock filters have not been used in Oregon and aerated rock filters for ammonia removal are relatively new compared to SBRs.

Additional Questions/Answers

Question: Why haven't the rock filters been used in Oregon? Answer: Same reason why there are not many aerated lagoons in Oregon; there was a push to go away from aerated lagoons.

Question: Why was there a push to go away from aerated lagoons? Answer: One of the reasons is because the old style aerators used a ton of electricity.

Question: Would the aeration be at the bottom of the lagoon? Answer: Yes and would be in the water. The new aeration would be energy efficient, using an EPA fine bubble that has good oxygen exchange.

Question: So the bubbles are providing the energy, rather than pumping electricity through the propeller? Answer: Yes. The bubbles provide the right oxygen levels and are run by an industrial blower.

Question: Will there be a smell? Answer: It would be similar to a trickling filter, which has a strong algae smell sometimes, but that smell doesn't carry very well. The interim improvements will reduce the current odor significantly.

Question: If there is a problem with the new proposed option, would the City fall back on the facilities plan SBR option? Answer: Yes.

Question: Why would DEQ consider lagoons now, when in the past, it didn't seem to be an option? Answer: The old analysis on the lagoons was treating to 30/20, which doesn't work. The improved lagoons are better and will be like lagoons on steroids.

Question: Does the City have to have poplar trees? Answer: No, but Committee and staff have indicated that they would like to have the option to spray irrigate. This leaves options open, once the permit is written.

Question: What are the costs of the interim improvements required by DEQ? Answer: \$680,000 and it would be utilized in the air system, but not in the SBR system; either way, the improvements have to be done.

Question: Why is the forcemain half as much in the aerated option? Answer: That option would not need a 24" pipe.

Question: What is the population number this will serve and what is the expandability of this for the future? Answer: It will be good for the design population in the facilities plan. As the population goes up, the flows do not go up as much because it is new construction. The big reason the City's flows are so high is because of the inflow and infiltration problem. As new population comes in there is more of a concern about increasing the BOD and ways of addressing that include adding more aeration or adding more rock filters. The expandability is good, as long as you have land around the lagoons so their size could be increased. The City could also take out the 40 acres of poplar trees and expand the lagoons in that area, since it is not required to have the trees. With the SBR, once you've expanded beyond the 20 years, you would add another unit.

Question: How do we accommodate the prison and their laundry facilities, if they decide to build? Answer: The mental hospital and the 20,000 gallons per day for the prison are already included in the facilities plan and the 20 year growth.

Question: Will there be a pre-treatment requirement for the prison laundry? Answer: One of the requirements from DEQ for the permit is going to be that the City has a pretreatment ordinance and the prison will be required to pretreat or make the necessary modifications to the existing plant to treat their effluent.

Question: Are there any type of emissions from the aerated plant that are regulated by the state or county? Answer: No. They are introducing air that gets transferred into liquid and used by the bacteria. The rest escapes into the atmosphere. It is unknown whether other states have regulations on these types of systems.

Question: Has DEQ reviewed this alternate plan? Answer: Tim McFetridge brought this system to us and asked us to take a look at it.

Question: Why are there no other rock filters in Oregon? Answer: Part of the issue is companies don't have local representation here. They are just starting to establish that with Beaver Equipment Company in Portland. A guy from Michigan came out and met

with DEQ, so they are just beginning to branch out in this area. It was noted that there are fine air systems in lagoons all over Oregon, just no rock filters to treat ammonia.

Question: There is \$680,000 for existing lagoons modification and are there surprises that could come up with that? Answer: The biggest concern would be if it's leaking. It was noted that a leak test was done a couple of years ago and DEQ would require that leak tests be done. The other surprise would be having more sludge than you thought was in there that would have to be removed. It was noted that the liner in the lagoons was installed in 1968, and Tim McFetridge had said that as long as the lagoons pass the leak tests, new liners would not need to be put in. It was also noted that the lagoons would be used with the SBR hybrid as well.

Question: Does the effluent forcemain in the facilities plan take the effluent north of Ferguson Road? Answer: Yes.

Question: Will the effluent from this plan allow the forcemain to go straight west to reduce costs? Answer: One of the next steps that will need to be done is two mixing zone studies. One will be to a previously suggested DEQ discharge location, which is reflected in the costs. The other will be for a discharge location that City staff and HBH think would be more appropriate and one that two current DEQ representatives have agreed with; this would require a shorter length of pipe.

Question: The mixing zone problem is more intense in the summer when the water level is lower, so if the City puts a portion of the water on trees and reduces the amount going to the Long Tom in summer, could that increase the chances of having a shorter pipeline? Answer: Potentially.

Question: The summer does not include infiltration from groundwater. How much of the summer could the City get by without discharging? Answer: The summer flows are about 400,000 gallons a day. In June or July when the inflow has dropped off, the lagoons are typically down to a level where they can hold the water all summer long. It was added that if the City is going to hold in the summer, it has to stop discharging on May 1st and there is still a lot of I and I coming into the plant through May; the summer discharge period is May 1st to October 1st. Also noted was that the City recently went through an I and I reduction program and they would not know until later how much effluent has been reduced. Estimates are there could be roughly 100,000 to 150,000 gallons a day difference.

Question: Is there money included in the costs for the mixing zone study? Answer: No. That has been budgeted separately under design and predesign work.

Question: How long will the studies take? Will someone have to measure the Long Tom every day for a period of time? Answer: No, they do a bathometric study across the cross sections. It will be a benefit to do the second mixing zone study, because you are looking at a potential savings of at least 1 ½ million dollars.

Question: Have there been discussions on going straight west under Amazon? Answer: DEQ has indicated that was a nonstarter for conversation.

Question: If the City provides this proposed plan to DEQ, would that mess up the timeline for the MAO? Answer: The City has had several discussions with DEQ, and DEQ has no concerns with the City requesting to shift some dates around to give extra time, if needed.

Question: Why are there two years before construction begins? Answer: There are many hoops and loops the City has to go through, and the intent with the original timeline was to put together something that the City would be sure to meet, even with unexpected delays. It was noted that a mixing study would need to be done and a permit to the Long Tom would be the same for either option.

Question: What option does Public Works prefer? Answer: Aerated Lagoons/Rock Filter.

Treatment Stakeholder Subcommittee Consensus

The Treatment Stakeholder Subcommittee's unanimous consensus was to recommend approval of the proposed treatment alternative solution to the Council.

The consensus of the Council was to put this on the December 10, 2013 Council agenda.

III. ADJOURNMENT

As there was no further business, the meeting was adjourned at 7:56 p.m.

ATTEST:

APPROVED:

Kitty Vodrup, City Recorder

David S. Brunscheon, Mayor

ATTEST:

APPROVED:

Tiffany Shafer, Secretary
Treatment Stakeholder Subcommittee

Council Randy Nelson, Chair
Treatment Stakeholder Subcommittee