

2017 Recycled Water Use Summary

City of Molalla Wastewater Treatment Plant

Introduction:

The City of Molalla operates a (2) cell lagoon system with Pre-Aeration. Lagoon #1 is approximately 11.4 acres and lagoon #2 is approximately 13.6 acres. They are operated in series and are designed to hold 12 feet of water, max. The lagoon effluent is further treated by (2) Dissolved Air Flotation units, then (4) sand/anthracite coal mixed media gravity filters to polish the final effluent. After filtration, the final effluent is disinfected with calcium hypochlorite. The irrigation effluent is chlorinated prior to entering the chlorine contact basin by way of an inline injector. It receives short contact time before entering the Effluent Pump Station where further contact time is available.

Maintenance:

Moisture blocks were replaced throughout the summer as needed. Hand line headers that were leaking were repaired by Steve Coleman. "Big Gun" #3 was purchased from Ernst Irrigation. Small issues were resolved quickly, ie broken springs, new hose guide wheels, bearings, etc. Oil on all (3) "big guns" were changed every 250 hours. Oil filters were changed every 500 hours. The fuel filters were changed once this summer for (3) "big guns". At the WWTP, (2) new transfer pumps were installed and (2) original pumps were rebuilt. There are (2) backup transfer pumps in storage for future use. (6) new, fine bubble mixers/aerators were installed in the aeration basin. The headworks bar screen was rebuilt with new parts. A new level controller was installed in the effluent pump station wet well. A new autodialer was installed. New staff gauges for lagoon #1 and #2 were built and installed. Various pneumatic air valve repairs were done throughout the summer. Another leak test was conducted. The Chlorine Contact Basin was drained, pressure washed and squeegeed three times this summer to remove sediment and algae growth on the basin walls.

Operations:

Operations staff took another proactive approach to the irrigation season. Everything from ordering and replacing moisture blocks, replacing piezometers, protecting moisture blocks and piezometers from cattle damage, moving the "big guns" ourselves, hand line monitoring, continuation of proper maintenance practices, good recordkeeping, etc. We ran the "big guns" five days a week to keep lagoon levels at optimum depths. There were some mechanical issues that arose throughout the irrigation season, but with proper communication and fast response, those downtimes were lessened significantly. Due to the short contact time in the plant's Chlorine Contact Basin, I continued to keep chlorination dosing and output higher than normal. The higher dosing also scoured the 24" irrigation line making for a more successful transition to Molalla River discharge, starting October 12th. The WWTP also discharged to the Molalla River in May and June due to lagoon levels and the inability to irrigate. The proper authorities were notified when early discharge occurred. The WWTP had only (1) total coliform violation on 8/9/17 There were many NTU violations throughout the irrigation season.

Month	Influent (Million Gallons)	Effluent irrigation (Million Gallons)	Rain (inches)
May	47.791	21.681 river	4.53
June	49.390	2.290 irr./26.686 river	3.38
July	28.250	17.408	0.00
August	26.974	18.100	.20
September	29.366	10.641	3.55
October	34.565	5.842 irr./42.921 river	4.88
Total	216.336	145.569	16.54

Monitoring:

The WWTP had difficulty producing Class A effluent throughout the summer irrigation season due to the hot weather. 24 hour coliform tests were prepared and the results were recorded. Daily Cl₂ and turbidity was recorded. Effluent pH was tested twice a week. Ammonia, nitrites/nitrates, TKN of the final effluent was tested quarterly, (June/Sept) and recorded. Influent BOD was tested twice a week. Moisture block readings were taken prior to the “big guns” being moved to a new section of Coleman Ranch. Moisture block readings were also taken prior to irrigating. Fuel usage, oil changes, filter changes, total effluent, inches irrigated, AWC (available water capacity) were all recorded. Throughout the daily shift, operations staff monitored the irrigation sites for any possible issues that may have arisen. No irrigation was conducted on Saturday’s and Sunday’s. The WWTP discharged treated effluent in May, June and October, violating NPDES permit 101514.

We currently monitor for the following parameters during the irrigation season:

<u>Parameter</u>	<u>Frequency required</u>	<u>Frequency tested</u>
Total coliforms	Daily when irrigating	Daily when irrigating
pH	2 per week	2x week
TKN, NO ₂ , NO ₃ , NH ₋₃	Twice per season	June and September
Chlorine Residual	Daily when irrigating	Daily when irrigating
Pounds of Chlorine used	Daily when irrigating	Daily when irrigating
Quantity irrigated	Daily when irrigating	Daily when irrigating
Flow meter Calibration	Annually	Annually
Turbidity	Hourly	Continuous

The City of Molalla uses a HACH DR3900 Spectrophotometer to test for TKN, NO₂, NO₃, NH₃, alkalinity and total phosphorous. The following are the laboratory results:

Test	Limit	Max	Average	Number of tests
Total Coliforms	2.2/100ml, 7 day avg 23/100mL any sample	151	7.84	69
pH	6-9 S.U.	7.5	7.3	2x weekly
Chlorine Residual	N/A	9.0	2.31	When irrigating
NO₂+ NO₃	N/A	8.71	8.49	2 (June, Sept)
Ammonia	16.7 ppm monthly avg 25.9 ppm daily max	13.4	12.3	2 (June, Sept)
TKN	N/A	8.46	8.13	2 (June, Sept)
Turbidity	2.0 NTU	12.38	3.5	Continuous

During the irrigation season the City of Molalla used a total of 10,649 pounds of Calcium Hypochlorite.

Irrigation Sites:

Site	North Coleman Ranch	South Coleman Ranch	Wastewater Plant
Total Million Gallons	26.984	23.270	.148
Average Daily use MGD	.359	.365	.049
Total inches/ Acre	4.06	4.99	.075
Average Inches/Acre/day	.035	.040	.000

Compliance:

The 2017 irrigation season went extremely well. There were no reported incidents of puddling/ponding throughout the irrigation season. No runoff occurred into Bear Creek and equipment failures ceased. The WWTP had exceeded coliform counts once during the irrigation period due to unseasonably hot weather. Due to rain and high moisture block readings at Coleman Ranch, the city was forced to discharge early in May, June and October to protect the structural integrity of the lagoons. Signs were posted according to the consent decree, DEQ was notified, winter discharge requirements were met, the City of Canby was notified and the city's website posted the early discharges.

Summary:

Despite the early river discharge and (1) high coliform on 8/9/17, operations staff solved all problems that we were confronted with exceptionally well. Plant operation and maintenance will continue to improve, plant upgrades will continue as budget allows and operations staff will continue to stay positive and motivated to make the city's WWTP successful.

Jason Clifford

Lead Treatment Plant Operator

City of Molalla