



Public Works Department

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January 21, 2016

David Cole
700 NE Multnomah St, Suite 600
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RE: 2015 Recycled Water Use Summary

Dear David:

Introduction:

The City of Molalla operates a (2) cell lagoon system with Pre-Aeration. Lagoon #1 surface area is approximately 11.4 acres and lagoon #2 surface area 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/antracite coal 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. The City meets Class A and B water quality standards consistently with these practices per the City's NPDES Permit No. 101514 and approved Recycled Water Use Plan (RWUP).

Maintenance:

Setbacks: Operations staff marked North and South Coleman Ranch's setbacks with "T" posts to easily identify where the setbacks are located and to verify that operations staff were following the RWUP.

Cemetery Facilities: At the start of the season the cemetery's irrigation line broke, as well as the irrigation pump. Jeff Kylo, facility manager for the cemetery, repaired and replaced the broken items.

Moisture Blocks: Prior to irrigating Operations staff inspected and replaced all of the moisture blocks with new ones at Coleman's Ranch and the Cemetery. New "T" posts and PVC pipe were installed to protect the moisture blocks from Coleman's cattle. Operations staff repaired and/or replaced all of the piezometers at North and South Coleman Ranch. Moisture blocks were replaced throughout the summer as needed.

Coleman Ranch Irrigation Equipment: The hand line header at Section #1 in North Coleman was leaking. Steve Coleman repaired the leaking header. The City's 24" HDPE pressure main failed at one of the friction welded seams in Section #4 at North Coleman Ranch. The north section of Coleman ranch was shut down immediately by closing an isolation value and there was no irrigation for approximately 2 weeks until the line was repaired. During this period, Steve Coleman began using his river water rights to irrigate North Coleman ranch. A new irrigation "big gun" was purchased by the City from the

Wastewater capital improvement fund to increase the production of recycled water and improve operations of the system by reducing plant downtime. The original irrigation "big gun" had several repairs and upgrades completed prior to and during the irrigation season; new water pump, repaired a broken section of discharge hose, new computer control system, new fuel pump and injectors, valve readjustments and fuel booster pump. Oil on both "big guns" were changed every 250 hours. Oil filters were changed every 500 hours. The fuel filters were changed once this summer as well as the hydraulic filters for both "big guns".

Operations:

The City began producing and land applying Class A recycled water at Coleman Ranch on 06/08/2015 and Class B on the wastewater treatment facility property per the approved RWUP. Shortly after, the Cemetery began land applying Class A recycled water on 6/18/2015.

Operations staff took a proactive approach to the irrigation season. Everything from ordering and replacing moisture blocks, replacing piezometers, physical setbacks, new maps for north and south Coleman ranch, calculating available set times based on the daily moisture readings, implementing Irrigation Checklists, to relocating the irrigation "big guns". Additionally hand lines were visually monitored daily and turned off prior to shifts ending, improved maintenance practices, and improved record keeping.

By staggering summer hire hours, the "big guns" operated six days a week to keep lagoon levels down. There was marked improvement in operations staff communication to prevent runoff, ponding, puddling and equipment failures. As mentioned above, some mechanical issues arose throughout the irrigation season, but with proper communication and fast response downtimes were minimized.

Due to the short available contact times in the plant's Chlorine Contact Basin, the chlorination dosing and output was increased to compensate for this. The higher dosing also scoured the 24" irrigation line making for a more successful transition to Molalla River discharge, starting November 2, 2015.

On the 26th of October, an irrigation extension was requested due to the low river levels and flows that were still occurring. DEQ agreed the RWUP and permit conditions allowed for continued irrigation beyond November 1st. However, there was a large rain event the weekend of October 31st giving the WWTP the opportunity to discharge to the Molalla River beginning on November 2nd.

Monitoring:

Operations staff produced Class A effluent throughout the summer irrigation season with the exception of nine (9) days. Twenty-four (24) hour Bac-T's were prepared and the results were recorded. Daily Cl₂ and turbidity was recorded. Moisture block readings were taken prior to irrigating and relocating the "big guns" to a new section of Coleman Ranch. Fuel usage, oil changes, filter changes, total effluent, inches irrigated, AWC (available water capacity) were all recorded. Throughout the weekly shifts, operations staff monitored the irrigation sites for any possible issues that may have arisen. No irrigation was conducted on Sunday's, with a few exceptions.

Per the NPDES Permit, Operation's monitors for the following parameters during the irrigation season:

<u>Parameter</u>	<u>Frequency required</u>	<u>Frequency tested</u>
Total coliforms (Class A or less)	Daily when irrigating	Daily when irrigating
pH	2 per week	Daily
TKN, NO2, NO3, NH3	Twice per season	Twice this 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 (January '14)
Turbidity	Hourly	Continuous

The City of Molalla uses a HACH DR3900 Spectrophotometer to test for TKN, NO2, NO3, ammonia, 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	TNTC	6.9	120
pH	6-9 S.U.	7.6	7.3	2x weekly
Chlorine Residual	N/A	8.8 ppm	2.5	When irrigating
NO2+ NO3	N/A	9.61 ppm	7.2	2 (June, Sept)
Ammonia	16.7 ppm monthly avg 25.9 ppm daily max	17.2 ppm	13.1	2 (June, Sept)
TKN	N/A	9.36 ppm	6.71	2 (June, Sept)
Turbidity	2.0 NTU	1.49 ppm	0.40	Continuous

During the irrigation season the City of Molalla used a total of 11,055 pounds of Calcium Hypochlorite.

Irrigation Sites:

Site	North Coleman Ranch	South Coleman Ranch	Wastewater Plant
Total Million Gallons	52.242	51.376	6.767
Average Daily use MGD	0.5682	0.4566	0.2976
Total inches/ Acre	7.126	11.186	12.141
Average Inches/Acre/day	1.4252	2.2336	2.4282

Compliance:

Despite some issues as described in the maintenance section, there were no public reported incidents to the City of puddling/ponding throughout the irrigation season and no runoff occurred into Bear Creek. The WWTP had exceeded coliform counts during the irrigation period due to unseasonably hot weather (July 7-9, 12; Aug 4; Sept 29; Oct 3, 6, 9). Appropriate steps were taken when coliform counts were

exceeded: Operations shut down the plant and did not resume irrigation until a resample of the final effluent did not exceed the maximum allowable limit.

Summary:

In summary the City produced the following monthly recycle water totals in accordance with NPDES Permit and RWUP.

Month	Influent (Million Gallons)	Effluent irrigation (Million Gallons)	Rain (inches)
June	26.856	24.483	0.4"
July	21.763	17.945	0.0"
August	20.376	28.516	0.6"
September	20.405	22.378	1.43"
October	20.823	17.888	4.26"
Total	110.223	111.210	6.69"

The City will continue to take a proactive approach by; working early on with property owners to prepare and train ahead for the 2016 irrigation season, performing mechanical preventative maintenance during the off season on the irrigation "big guns" and other equipment used, implementing preventative measures by updating operating procedures or making capital improvements to maintain compliance under the NPDES permit/RWUP and exploring new opportunities for recycled water use applications.



Jennifer Cline
Public Works Director

Cc: Dan Huff, City Manager
Jason Clifford, Lead Operator