2025 McLoughlin Point Wastewater Treatment Plant Compliance Summary

The McLoughlin Point WWTP is authorized to discharge under BC Municipal Wastewater Regulation (MWR) registration RE-108831 (under the BC Environmental Management Act [EMA]). The Core Area Liquid Waste Management Plan (LWMP) also under the EMA, contains the CRD's commitments to build and operate the facility, and work with the other municipal and First Nations plan members to manage wastewater and other liquid wastes in a manner that ensures protection of human health and the environment. Finally, the facility must also meet all requirements of the Federal Wastewater Systems Effluent Regulation (WSER) under the Fisheries Act.

Under the above legislation, the facility must meet several regulatory compliance conditions; the most significant being ensuring effluent quality limits are not exceeded and the facility does not adversely impact human health or the environment.

Regulatory conditions, in part, include ensuring:

1. The plant is operated as designed, and adverse operational events (e.g., bypasses, overflows, system malfunctions or failures, non-compliant effluent quality, missed sampling, or spills) are reported immediately.
2. All required monitoring, both for compliance and to assess risks to human health and the environment, is completed on an annual basis.
    a. Sampling and testing meet the monitoring requirement.
    b. Final effluent quality and total daily flow volumes do not exceed regulatory limits.

1. Operating Compliance

The facility generally operated as designed for the majority of 2025 and routinely produced high quality effluent. However, there were a few exceptions, some of which led to non-compliance with provincial and federal requirements.

The facility experienced three equipment malfunctions in 2025, which resulted in non-compliant conditions as the plant was considered not fully functional as per normal operating conditions, and unplanned bypasses of some treatment works occurred without provincial authorization. One of the malfunctions was associated with the tertiary disc filters which failed throughout the year. Further details related to these failures are outlined below. . There was also a power outage (February 26, 2025) and a flow gate failure (December 11, 2025) that led to unexpected and unauthorized treatment bypasses; staff are still evaluating the root cause of these events.

A planned maintenance bypass of the secondary treatment processes took place in March/April 2025. This bypass was authorized by both the provincial and federal regulators and was required to clean out and repair the dirty backwash tank. During the bypass, effluent quality limits were relaxed.

2. Monitoring Compliance

a. Sampling and Testing

Wastewater and receiving environment monitoring are required to ensure that the facility is performing as expected, effluent quality limits are achieved, and adverse impacts to human health and the environment are minimized. Samples must be collected at frequencies prescribed in the

regulations, and the approved comprehensive receiving environment monitoring program design document.

Monitoring requirements for McLoughlin Point WWTP include operational and compliance effluent quality sampling, comprehensive effluent contaminant characterization sampling, water column monitoring around the McLoughlin outfall (both during routine operation and the March/April 2025 bypass), surface water sampling at far-field locations of interest to First Nations (during the bypass), seafloor monitoring around the Clover Point overflow outfall, and a finfish and crab survey around the McLoughlin, Clover and Macaulay outfalls.

In 2025, 98% of the monitoring requirements were completed in accordance with requirements. The following provides further details on the monitoring requirements that were not met in 2025:

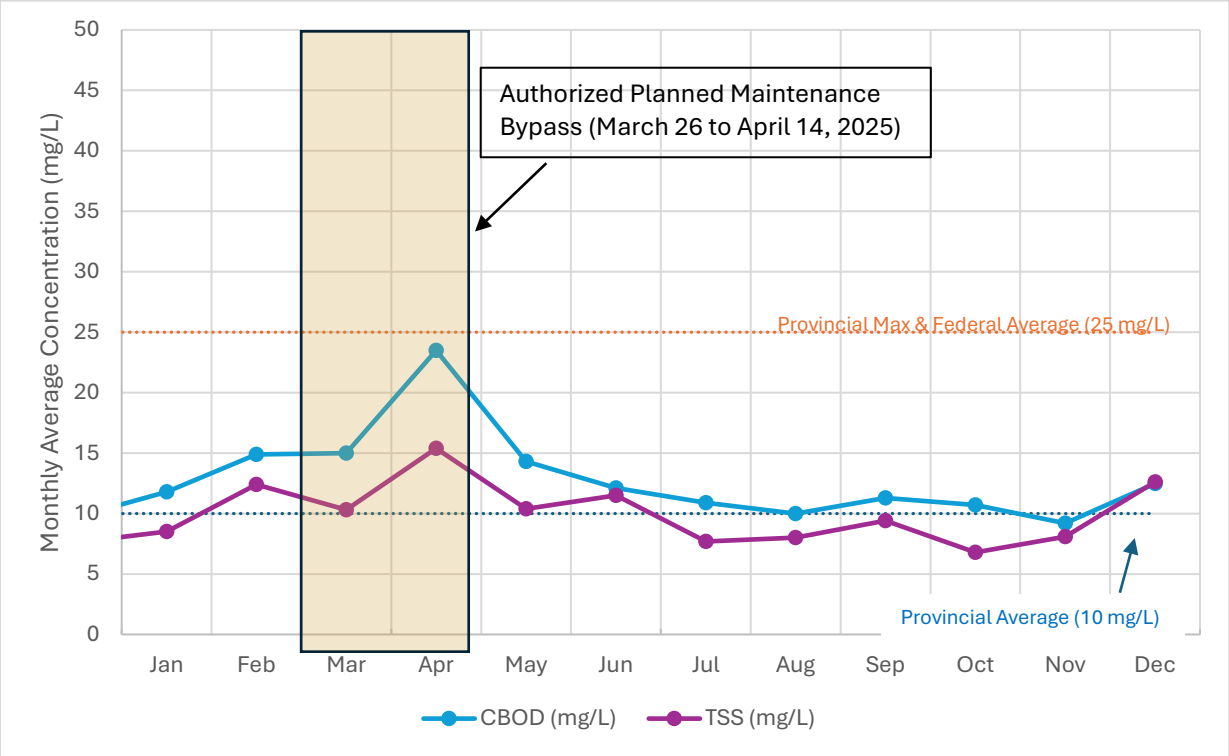
1) one week (of 52) that aligned with staffing capacity issues where lab services were unavailable and the required effluent sampling frequency could not be met (e.g. five samples are required each week for some effluent parameters, and only four samples could be collected)
2) five days (of 260) where lab data was not reported on time due to a discrepancy between CRD databases. Samples were collected and reported next cycle.
3) one day (of 20) where adverse weather conditions made it unsafe to sample the marine receiving environment (e.g. sampling the water column around the outfall is typically required five days per quarter. There was one quarter in 2025 when only four days could be sampled due to adverse weather, and the contracted sampling vessel was no longer available).

b. Effluent Quality

A summary of the provincial and federal effluent quality limits are summarized in Table 1, along with the required sampling frequency. Compliance with these limits during routine and unexpected operational conditions is summarized in Tables 2 through 8, and Figure 1. It should be noted that the effluent quality limits were relaxed by the regulator during the planned bypass event in March/April.

The provincial limits depend on whether the facility is experiencing flows in excess of 216,000 m^3/day. Flows up to this threshold must achieve a hybrid of secondary and advanced limits in the MWR. These hybrid provincial limits are more stringent than those typically required for marine discharges and were set due to the CRD's commitment in the LWMP to install tertiary treatment. For flows in excess of 216,000 m^3/day, the facility must achieve effluent quality limits equivalent to primary in the MWR. The facility is also authorized to have no more than 70 days per year when flows can exceed 216,000 m^3/day, and total daily flows must never exceed the total plant capacity of 432,000 m^3/day.

Figure 1 Monthly average total suspended solids (TSS) and carbonaceous biochemical oxygen demand (CBOD) in 2025. Federal and provincial effluent quality limits are included for comparison.



For total suspended solids (TSS), the facility was non-compliant with provincial limits for five months of the year when flows were less than 216,000 m3/day (Table 2, Figure 1). For carbonaceous biochemical oxygen demand (CBOD), the facility was non-compliant for 10 months of the year with provincial limits when flows were less than 216,000 m3/day, and one month of the year when flows were greater than 216,000 m3/day (Table 3, Figure 1). Overall, 30% of the daily CBOD and 56% of the daily TSS results were below the 10 mg/L average monthly regulatory limit. With respect to the 25 mg/L maximum daily regulatory limit, 91% of the daily CBOD and 93% of the daily TSS were less than this threshold. Annual averages were 18.1 and 14.0 mg/L for CBOD and TSS, respectively.

The primary factor contributing to the final effluent exceedances of the 10 mg/L TSS and CBOD limit in 2025 was the limited performance and availability of the tertiary disc filters. The McLoughlin Point WWTP has redundancy for both the primary and secondary processes, allowing operations to transfer flows between the treatment trains to undertake repairs and required maintenance. McLoughlin Point WWTP tertiary filtration process or tertiary disc filters does not include the same redundancy. There are three disc filters within the plant, each are rated for 90MLD. Based on the Basis of Design Report for the plant, all three are required to be operational to reliably achieve the 10 mg/L TSS and CBOD limit.

In 2025, approximately 75% of the total flow to McLoughlin Point WWTP received tertiary treatment. Disk Filter #1 was offline for periods of June, July & August for media replacement & cover installation. Disk Filter #2 was offline in July, August & September for annual inspection, service and a second longer period for drive train issues. Disc Filter #3 was offline for the year as operation and maintenance staff worked with the supplier to retrofit this filter to address the

systemic issues that have been observed with all three filters. A summary of downtime is listed below:

Disk Filter 1: 77 Days Offline
- Disk Filter 2: 87 Days Offline
- Disk Filter 3: 364 Days Offline

Aside from the required downtime for routine maintenance, biological fouling and mechanical failures have significantly contributed to the increase in time the filters were offline, further details provided below:

- Biological fouling – The tertiary disk filters receive effluent from secondary treatment processes based on attached-growth biological treatment (i.e., Moving Bed Biofilm Reactors (MBBR) and Biological Aerated Filters (BAF)). These processes can periodically release biological solids and biofilm fragments into the secondary effluent. This material accumulates on the filter cloth surface and within the filter media; reducing filter permeability and hydraulic throughput if not periodically removed through cleaning and maintenance.
    - Filters require more chemical cleans to remove biological fouling
    - Staff are trialing three different filter cloth fabrics to optimize the treatment.

- Mechanical failures: 3 catastrophic failures (disk filter 1, 2 & 3) have occurred since 2023 when the filter segments have become dislodged causing the segment to be caught in the drive train which exerts enough force to dislodge the whole disk filter assembly.
    - Staff installed VFD's to improve torque on start-up and torque limiting hubs on drive gearboxes to prevent catastrophic system failures
    - Staff is working with the supplier to redesign the following components; this redesign will be trailed on Disc Filter #3 and if effective will be implemented on the remaining filters.
        - Filter segment center tube engagement tab lengths have been extended;
        - Filter segment retaining bars (male/female design) have been lengthened to prevent segment disengagement (primary cause of failures); and,
        - Backwash shoe engagement angle has been modified to cross connection points at a steeper angle (less chance of engaging joint).

The retrofit program and operational changes implemented in 2025 and 2026 are intended to improve long-term reliability and increase tertiary filtration availability in future operating periods. However, even with these improvements, MPWWTP tertiary treatment will continue to lack redundancy.

The facility was compliant with the federal effluent quality limits for TSS and CBOD in 2025. The facility did not consistently achieve the federal effluent limit for unionized ammonia. The maximum daily unionized ammonia limit was exceeded five days in four separate months of the year (Table 5). Unionized ammonia is sampled three times a week each month, the five exceedances of the daily maximum represent a single sample (or two in April) within that month that exceeded the federal limit, all remaining samples within that month were below the limit. Laboratory and operations staff are investigating probable causes. Preliminary findings indicate that the exceedances were a result of delays in external laboratory analysis that caused changes in pH levels during transport and holding, thereby affecting the calculation for unionized ammonia. While there has been slight increases over time in Core Area total ammonia concentrations, this factor is less significant in the calculations of unionized ammonia.

The facility was in compliance with the remaining effluent quality limits. The final effluent was not acutely toxic throughout the year (Table 4), was within expected ranges for pH (Table 6), and did not exceed any the total daily flow limit (Table 7) or number of allowable blended days (Table 8).

3. Conclusion

Overall, the frequency of non-compliant operation and effluent quality in 2025 was slightly improved relative to 2023 and 2024. This was primarily due to the partial restoration of disc filter operation in 2025, which reduced the frequency of exceedances of the provincial maximum daily TSS effluent quality limit.

Staff will bring back annual compliance updates to the Committee. These reports will complement the monthly compliance reports staff submit to the Province along with the annual report summarizing the comprehensive receiving environment monitoring report.

The Province is aware of the plant's effluent quality, operational status and receiving environment conditions through regular reporting and quarterly meetings.

Table 1 Current McLoughlin Point WWTP Provincial and Federal Effluent Quality Limits and Typical Regulatory Requirements Under the MWR and WSER

Effluent Parameter (Sampling Frequency)	McLoughlin Discharge Limits[1]	MWR Requirements			WSER Secondary[2] Requirements
		Primary	Secondary[2]	Advanced	
Total Suspended Solids (TSS) When Instantaneous Flows < 216,000 m^3/day (5 samples/week)	**Provincial:** 25 mg/L maximum & 10 mg/L monthly average **Federal:** 25 mg/L monthly average	130 mg/L maximum	45 mg/L maximum	10 mg/L maximum	25 mg/L monthly average
Total Suspended Solids (TSS) When Instantaneous Flows > 216,000 m^3/day (5 samples/week)	**Provincial:** 130 mg/L maximum **Federal:** 25 mg/L monthly average	130 mg/L maximum	45 mg/L maximum	10 mg/L maximum	25 mg/L monthly average
Carbonaceous Biochemical Oxygen Demand (CBOD) When Instantaneous Flows < 216,000 m^3/day (5 samples/week)	**Provincial:** 25 mg/L maximum & 10 mg/L monthly average **Federal:** 25 mg/L monthly average	130 mg/L maximum	45 mg/L maximum	10 mg/L maximum	25 mg/L monthly average
Carbonaceous Biochemical Oxygen Demand (CBOD) When Instantaneous Flows > 216,000 m^3/day (5 samples/week)	**Provincial:** 130 mg/L maximum **Federal:** 25 mg/L monthly average	130 mg/L maximum	45 mg/L maximum	10 mg/L maximum	25 mg/L monthly average
Rainbow Trout Toxicity (monthly)	**Provincial & Federal:** pass	Pass	Pass	Pass	Pass
Unionized Ammonia (3 samples/week)	**Federal:** 1.25 mg/L maximum	Not Applicable	Not Applicable	Not Applicable	1.25 mg/L maximum
pH (5 samples/week)	**Provincial:** 6-9	6-9	6-9	6-9	Not Applicable
Effluent Flow (daily)	**Provincial & Federal:** 432,000 m^3/day maximum	Facility specific	Facility specific	Facility specific	Not Applicable
# of Allowable Blended Effluent Days	**Provincial:** 70/year	Facility specific	Facility specific	Facility specific	Not Applicable

[1] The facility has different provincial effluent quality limits when instantaneous flows exceed 216,000 m^3/day resulting in a blend of tertiary and primary effluent being discharged. On these days, TSS and CBOD limits are 130 mg/L. Federal effluent quality limits are fixed at 25 mg/L monthly average regardless of flow levels.
[2] Treatment at a secondary level is what is typically required of marine discharges.

Table 2 Summary of 2025 McLoughlin Point Total Suspended Solids Effluent Quality Limit Compliance

Effluent Parameter	McLoughlin Discharge Limits	Compliance Monitoring Results[1]		
		Daily Maximum (mg/L)	Monthly Average (mg/L)	
Total Suspended Solids (TSS) When Instantaneous Flows < 216,000 m^3/day	Provincial: 25 mg/L maximum & 10 mg/L monthly average Federal: 25 mg/L monthly average	Jan – 16.6 Feb – 22.8 Mar – 16.8 Apr- 19.2 May – 19.6 Jun – 24.4 Jul – 19.0 Aug – 14.6 Sep – 19.4 Oct – 10.8 Nov – 22.0 Dec – 16.0	Jan – 8.5 Feb – 12.4 Mar – 10.3 Apr – 15.4 May – 10.4 Jun – 11.5 Jul – 7.7 Aug – 8.0 Sep – 9.4 Oct – 6.8 Nov – 8.1 Dec – 9.0	
Total Suspended Solids (TSS) When Instantaneous Flows > 216,000 m^3/day	Provincial: 130 mg/L maximum Federal: 25 mg/L monthly average	Jan[2] Feb – 15.2 Mar[3] – 92.0 Apr[3] – 102.0 May – n/a Jun – n/a Jul – n/a Aug – n/a Sep – n/a Oct – 14.0 Nov – 13.6 Dec – 34.7	Jan – 8.5 Feb – 12.5 Mar[3] – 21.3 Apr[3] – 46.0 May – n/a Jun – n/a Jul – n/a Aug – n/a Sep – n/a Oct – 7.1 Nov – 8.3 Dec – 13.1	

[1] The highlighted values are those that exceeded provincial and/or federal effluent quality limits.
[2] There were blended days in these months, but on weekends when no analytical samples were collected to determine effluent quality.
[3] There was an authorized planned maintenance bypass from March 26 to April 14, 2025. These days were effectively equivalent to blended days. Effluent quality was authorized to exceed routine effluent quality limits during the bypass, with temporary provincial TSS and CBOD limits of 130 mg/L. Federal limits were also waived for the bypass days. The annual total is not representative of typical operation due to the bypass days being included.

Table 3 Summary of 2025 McLoughlin Point Carbonaceous Biochemical Oxygen Demand Effluent Quality Limit Compliance

Effluent Parameter	McLoughlin Discharge Limits	Compliance Monitoring Results[1]		
		Daily Maximum (mg/L)	Monthly Average (mg/L)	
Carbonaceous Biochemical Oxygen Demand (CBOD) When Instantaneous Flows < 216,000 m^3/day	Provincial: 25 mg/L maximum & 10 mg/L monthly average Federal: 25 mg/L monthly average	Jan – 16.8 Feb – 64.0 Mar[3] – 37.5 Apr[3] – 45.1 May – 27.0 Jun – 19.2 Jul – 23.6 Aug – 14.2 Sep – 25.0 Oct – 15.6 Nov – 18.3 Dec – 15.5	Jan – 11.8 Feb – 14.9 Mar – 15.0 Apr – 23.5 May – 14.3 Jun – 12.1 Jul – 10.9 Aug – 10.0 Sep – 11.3 Oct – 10.7 Nov – 9.2 Dec – 11.0	
Carbonaceous Biochemical Oxygen Demand (CBOD) When Instantaneous Flows > 216,000 m^3/day	Provincial: 130 mg/L maximum Federal: 25 mg/L monthly average	Jan[2] Feb – 14.9 Mar[3] – 113.0 Apr[3] – 156.0 May – n/a Jun – n/a Jul – n/a Aug – n/a Sep – n/a Oct – 17.4 Nov – 17.1 Dec – 31.7	Jan – 11.8 Feb – 14.8 Mar[3] – 27.3 Apr[3] – 69.3 May – n/a Jun – n/a Jul – n/a Aug – n/a Sep – n/a Oct – 11.0 Nov – 9.5 Dec – 12.5	

[1] The highlighted values are those that exceeded provincial and/or federal effluent quality limits.
[2] There were blended days in these months, but on weekends when no analytical samples were collected to determine effluent quality.
[3] There was an authorized planned maintenance bypass from March 26 to April 14, 2025. These days were effectively equivalent to blended days. Effluent quality was authorized to exceed routine effluent quality limits during the bypass, with temporary provincial TSS and CBOD limits of 130 mg/L. Federal limits were also waived for the bypass days. The annual total is not representative of typical operation due to the bypass days being included.

Table 4 Summary of 2025 McLoughlin Point Rainbow Trout Toxicity Testing Compliance

Effluent Parameter	McLoughlin Discharge Limits	Compliance Monitoring Results[1]		
				Pass/Fail
Rainbow Trout Toxicity	Provincial & Federal: pass			Jan - pass Feb - pass Mar - pass Apr - pass May - pass Jun - pass Jul - pass Aug - pass Sep - pass Oct - pass Nov - pass Dec - pass

[1] The highlighted values are those that exceeded provincial and/or federal effluent quality limits.

Table 5 Summary of 2025 McLoughlin Point Unionized Ammonia Effluent Quality Limit Compliance

Effluent Parameter	McLoughlin Discharge Limits	Compliance Monitoring Results[1]		
		Daily Maximum (mg/L)		
Unionized Ammonia	Federal: 1.25 mg/L maximum	Jan – 0.56 Feb – 0.55 Mar – 0.58 Apr – 1.30 May – 1.17 Jun – 1.36 Jul – 1.05 Aug – 0.91 Sep – 1.29 Oct – 1.83 Nov – 0.56 Dec – 0.37		

[1] The highlighted values are those that exceeded provincial and/or federal effluent quality limits.

Table 6 Summary of 2025 McLoughlin Point pH Effluent Quality Limit Compliance

Effluent Parameter	McLoughlin Discharge Limits	Compliance Monitoring Results[1]		
				Pass/Fail
pH	Provincial: Between 6 and 9			Jan - in range Feb - in range Mar - in range Apr - in range May - in range Jun - in range Jul - in range Aug - in range Sep - in range Oct - in range Nov - in range Dec – in range

[1] The highlighted values are those that exceeded provincial and/or federal effluent quality limits.

Table 7 Summary of 2025 McLoughlin Point Total Daily Flow Limit Compliance

Effluent Parameter	McLoughlin Discharge Limits	Compliance Monitoring Results[1]		
		Daily Maximum (m^3/day)		
Effluent Flow	Provincial & Federal: 432,000 m^3/day maximum	Jan – 127,520 Feb – 134,741 Mar – 235,015 Apr – 104,998 May – 89,107 Jun – 111,457 Jul – 85,535 Aug – 96,064 Sep – 91,902 Oct – 108,548 Nov – 161,200 Dec – 297,780		

[1] The highlighted values are those that exceeded provincial and/or federal effluent quality limits.

Table 8 Summary of 2025 McLoughlin Point Number of Allowable Blended Effluent Days Limit Compliance

Effluent Parameter	McLoughlin Discharge Limits	Compliance Monitoring Results[1]		
		Daily Maximum		
# of Allowable Blended Effluent Days	**Provincial:** 70/year	Jan - 1 Feb - 3 Mar[2] - 8 Apr[2] - 14 May - 0 Jun - 0 Jul - 0 Aug - 0 Sep - 0 Oct - 3 Nov - 2 Dec - 14 **Annual Total[2] - 45**		

[1] The highlighted values are those that exceeded provincial and/or federal effluent quality limits.
[2] There was an authorized planned maintenance bypass from March 26 to April 14, 2025. These days were effectively equivalent to blended days. Effluent quality was authorized to exceed routine effluent quality limits during the bypass, with temporary provincial TSS and CBOD limits of 130 mg/L. Federal limits were also waived for the bypass days. The annual total is not representative of typical operation due to the bypass days being included.