24 July 2023

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Re: WSP Receiver Monitoring and Mitigation Plan – V6 Draft

Dear Sirs:

The Coalition for the West Credit River (Coalition) is writing with regard to the WSP Receiver Monitoring and Mitigation Plan – V6 Draft.

The Coalition's Technical Committee has carefully reviewed and discussed the provisions set out in the draft Plan, and we have included our detailed comments, concerns, questions and recommendations within the enclosed document for your response.

We are requesting a meeting at your earliest convenience, as we feel it would be productive to discuss our comments with the aim of providing more effective mitigation measures for the West Credit River ecosystem.

We look forward to your response!

Respectfully,

Judy Mabee

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Chair, Coalition for the West Credit River
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Enclosure (1)

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FEBRUARY 17, 2023

TOWN OF ERIN

RECEIVER MONITORING AND MITIGATION PLAN

ERIN WATER RESOURCE RECOVERY FACILITY

wsp

RECEIVER MONITORING AND MITIGATION PLAN

ERIN WATER RESOURCE RECOVERY FACILITY

TOWN OF ERIN

REVISION 6

PROJECT NO.: 20M-00741-01
DATE: FEBRUARY 17, 2023

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Date

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TABLE OF CONTENTS

1 INTRODUCTION 1

2 PRE-DISCHARGE MONITORING PHASE 2

3 HISTORICAL MONITORING STATION LOCATIONS 2

4 PROJECT SPECIFIC MONITORING LOCATION DETAILS 4

4.1 WRRF Effluent Monitoring Locations 6

4.1.1 Pumping Station Monitoring Station (EFF-PS) 6

4.1.2 Manhole 10 Monitoring Station (MH-010) 6

4.2 Receiving Watercourse Monitoring Locations 6

4.2.1 Upstream Monitoring Station (U-001) 7

4.2.2 Downstream Monitoring Stations (D-001 and D-002) 7

5 MONITORING SAMPLING PROTOCOLS 9

5.1 Grab Samples 10

5.2 Real-Time Monitoring 10

5.3 Fish Sampling 10

5.4 Aquatic Invertebrate Sampling 11

5.5 Flow Spot Measurements 11

6 MITIGATION PARAMETER TRIGGERS AND ACTIONS 12

6.1 Water Temperature 14

6.2 Dissolved Oxygen 14

6.3 Chlorides 15

7 BACI STUDY DESIGN AND IMPACT DETECTION INDICATORS 16

8 PRE-DISCHARGE MONITORING REPORTING 22

8.1 Data Management 22

8.2 RMMP Review 22

8.3 Next Steps 22

9 STANDARD LIMITATIONS 23

10 REFERENCES 25

TABLES

TABLE 3-1: HISTORICAL REGIONAL SURFACE WATER MONITORING STATIONS (CURRENTLY OPERATED BY OTHERS).....3
TABLE 4-1: PROJECT SPECIFIC ECA RMMP MONITORING STATIONS 5
TABLE 5-1: RECEIVING WATERCOURSE (U-001, D-001 AND D-002) WATER QUALITY MONITORING PARAMETERS 9
TABLE 6-1: SUMMARY OF DISCHARGE MITIGATION PARAMETER TRIGGERS, MONITORING THRESHOLDS, IMPACT DETECTION METHODS AND MITIGATION ACTIONS.....13
TABLE 7-1: BACI STUDY DESIGN RECEIVING WATERCOURSE IMPACT DETECTION PARAMETERS AND CRITERIA 18
TABLE 7-2: WRRF EFFLUENT RECEIVER ECA CRITERIA 21

APPENDICES

A FIGURE 1, RMMP MONITORING LOCATIONS SITE PLAN

B ENVIRONMENTAL COMPLIANCE APPROVAL (ECA) – 7877 – CALRZU DATE MAY 3, 2022

1 INTRODUCTION

WSP Canada Inc. (WSP) was retained by the Town of Erin to prepare the Receiver Monitoring and Mitigation Plan (RMMP) for the Town of Erin's new Water Resource Recovery Facility (WRRF). The WRRF's treated effluent will discharge into the West Credit River (receiving watercourse) through a series of diffusers embedded in the riverbed close to the intersection of Winston Churchill Boulevard and Wellington Road 52; as illustrated on the monitoring location site plan, **Figure 1**, included in **Appendix A**.

This WRRF is located upstream of a designated Niagara Escarpment Plan area and resides within a designated Greenbelt Plan area. The Provincially Significant Wetland (PSW) called the West Credit River Wetland Complex is located upstream of the outfall along the West Credit River.

The main branch of the West Credit River is a perennial feature and a key headwater to the Credit River, which eventually discharges into Lake Ontario. The West Credit River is classified as having a Cold-Cool thermal regime, whereby the July mean temperature is not expected to exceed 19°C. The Credit Valley Conservation Authority (CVC) water temperature and fish community data supports this classification, as historical conditions have met the threshold of the AEC Classification index for Cold-Cool (Northern Development, M. N., 2022).

The objectives of this RMMP are as follows:

1. Identification of proposed and existing monitoring stations' locations; to collect long term water quality and biotic (fish and benthic invertebrates) monitoring data;
2. Identification of receiving water quality parameters of concern with their respective objectives, limits, and thresholds;
3. Identification of protocols for water quality and biotic monitoring, including frequency and schedule; and,
4. Identification of measures to validate the mixing zone modeling results through strategically placed monitoring locations and parameter tracing.

The RMMP has been prepared in accordance with the Environmental Compliance Approval (ECA) 7877-CALRZU dated May 3, 2022; including monitoring requirements pursuant to *Condition 10. Monitoring and Recording, Condition 11. Adaptive Management and Contingency Plan, Condition 13. Reporting*, and the monitoring requirements prescribed in *Schedule D*. A copy of ECA 7877-CALRZU is provided in **Appendix B**.

The execution of the RMMP will encompass two phases: the pre-discharge and discharge monitoring phases, respectively. The initial collection of data will be characterized as the "pre-discharge" monitoring phase and will be completed prior to the start of the discharge from the Town of Erin's WRRF in order to obtain project specific West Credit River baseline water quality and biotic (fish and benthic invertebrates) monitoring data. Following the completion of the pre-discharge monitoring phase, an adaptive monitoring program will continue for the subsequent WRRF operation period; this phase will be characterized as the "discharge" monitoring phase.

2 PRE-DISCHARGE MONITORING PHASE

The pre-discharge monitoring phase will provide information on specific monitoring requirements associated with collecting data for the pre-discharge baseline characterization of the West Credit River upstream and downstream of the final effluent discharge location.

The pre-discharge monitoring phase includes provisions for the following:

1. Sampling of receiving watercourse monitoring stations (U-001, D-001 and D-002) to collect pre-discharge water quality and biotic monitoring data (see **Sections 4** and **5** for details);
2. Identification of select receiving water quality parameters and their respective impact criteria and thresholds to determine when mitigation measures are triggered, preventing impacts to biotic inhabitants; and,
3. Preparation of summary report including the pre-discharge monitoring results and impact assessment.

The results obtained from the pre-discharge monitoring phase will be used to frame and guide the Before-After Control Impact (BACI) study design, which is described in detail in **Section 7**.

3 HISTORICAL MONITORING STATION LOCATIONS

The CVC has a long history of collecting data in the West Credit sub-watershed that dates back to 1999 as part of the Integrated Watershed Monitoring Program (IWMP) (CVC, 2018). The existing river monitoring infrastructure, in conjunction with new monitoring stations, will provide information to characterize the receiving watercourse.

Table 3-1 describes the existing regional surface water monitoring stations currently operated by others and the parameters analyzed. The historical regional surface water monitoring stations are not solely monitored within the scope of this pre-discharge monitoring phase. The data from these stations will be used in conjunction with that from the new monitoring stations associated with the pre-discharge monitoring phase, which will be installed specifically for this project.

Historical monitoring station locations are identified in the monitoring site plan, **Figure 1**, included in **Appendix A.**

Table 3-1: Historical Regional Surface Water Monitoring Stations (Currently Operated by Others)

Location ID	Distance from the Proposed Outfall	UTM Coordinates	Description	Current Parameters Monitored
S-051	2.0 km Upstream	E_576396 N_4847426	— IWMP station (biennial, summer data[1]) (CVC, 2021)	— Temperature — Fish [2] — Aquatic Invertebrates [3]
8150006	1.5 km Upstream	E_576782 N_4847289	— CVC real-time Flow Monitoring Station (continuous year-round data) (CVC, 2023)	— Real-time Flow
6007601502	Proximate to outfall	E_577660 N_4848279	— Existing Provincial Water Quality Monitoring Network (PWQMN) (monthly 11 times per year) (Ontario Ministry of Environment, Conservation and Parks, 2022)	— Water Chemistry [5]
S-050 / 8150002	2.4 km Downstream	E_579493 N_4849540	— Belfountain Conservation Area; — IWMP (annual, summer data) (CVC, 2021); — CVC real-Time Water Quality Station (continuous year-round data) (CVC, 2023)	— Real-time Water Quality [4] — Water Chemistry [5] — Fish [2] — Aquatic Invertebrates [3] — Temperature

Notes:

1- May to August only (CVC, 2018).
2- Fish Community Sampling following Ontario Stream Assessment Protocol (OSAP) (Stanfield, 2017).
3- Benthic Community Sampling following Ontario Benthos Biomonitoring Network (OBBN) protocol (Jones, C., Somers, K., B., C., & Reynoldson, T., 2007).
4- Water Quality includes year-round monitoring of water temperature, pH, Dissolved Oxygen (DO), chloride, specific conductivity, and turbidity.
5- Water Chemistry refers to testing for Total Suspended Solids, Total Nitrogen, Orthophosphate, Total Phosphorus, Chloride, DO, pH, and metal concentrations.

4 PROJECT SPECIFIC MONITORING LOCATION DETAILS

The following section outlines the Town of Erin's new RMMP effluent and receiving watercourse monitoring locations, with respect to the BACI study design, to assess impacts to the West Credit River based on the operation of the WRRF.

The pre-discharge monitoring phase is intended to complete baseline monitoring at the same locations and frequency as what is required to be completed during the effluent monitoring stage, as outlined in the WRRF ECA, *Schedule D*. See **Appendix A**, **Figure 1** for the monitoring locations.

The frequency of surface water monitoring in the receiving watercourse during the pre-discharge monitoring phase of the WRRF period must remain consistent throughout the pre-discharge monitoring phase. However, the monitoring frequency can be revisited / revised prior to the initiation of the discharge monitoring phase after a review of the collected data and in consultation with, but not limited to, the CVC, the Ministry of Environment, Conservation and Parks (MECP) and the Town of Erin.

Only after the WRRF has been commissioned can monitoring locations be changed or abandoned, and new locations identified. Changes to the RMMP, as outlined in the ECA, including relocation or addition of new permanent monitoring stations or otherwise removing monitoring locations, can only be undertaken after consultation with CVC and approval by the MECP.

Descriptions of the effluent and receiving watercourse monitoring stations and the type of monitoring to be undertaken at each location are outlined in **Table 4-1** below.

Table 4-1: Project Specific ECA RMMP Monitoring Stations

Location Tag	Distance from the Proposed Outfall	UTM Coordinates	Parameter
U-001	250 m Upstream	E_577594.7 N_4848192.2	— Fish Community [6] — Aquatic Invertebrate Community [7] — Monthly Water Quality Parameters [9] — Real-Time Field Parameters [10] — Monthly Manual Measurements[11] — Monthly Field Measurements[12]
MH-010	Manhole 10	E_577666.8 N_4848285.4	— Real-Time Field Parameters [8]
EFF-PS	Effluent Pumping Station	E_576749.0 N_4846848.8	— 24-hour Composite Parameters [1] — Grab Sample Parameters [2] — Grab Sample Parameters [3] — Grab / Probe / Analyzer Parameters [4] — Grab / Probe / Analyzer Parameters [5]
D-001	150 m Downstream	E_577703.7 N_4848410.0	— Fish Community [6] — Aquatic Invertebrate Community [7] — Monthly Water Quality Parameters [9] — Real-Time Field Parameters [10] — Monthly Manual Measurements[11] — Monthly Field Measurements[12]
D-002	700 m Downstream	E_578112.7 N_4848740.0	— Monthly Water Quality Parameters [9] — Real-Time Field Parameters [10] — Monthly Manual Measurements[11] — Monthly Field Measurements[12]

Notes:

1- 24-hour Composite Parameters refer to $cBOD_5$, TSS, Total Phosphorus, Dissolved Reactive Phosphorus, Total Ammonia Nitrogen, TKN, Nitrate as Nitrogen, Nitrite as Nitrogen with a monitoring frequency of weekly.
2- Parameter refers to *E. coli* with a grab sample monitoring frequency of weekly.
3- Parameter refers to Acute Lethality to Rainbow Trout with a grab sample monitoring frequency of quarterly.
4- Parameters refers to DO, pH, and Temperature with a grab / probe / analyzer monitoring frequency of weekly.
5- Parameter refers to Chloride with a grab / probe / analyzer monitoring frequency of daily.
6- Fish Community Sampling following OSAP with a monitoring frequency of once per year.
7- Benthic Community Sampling following OBBN protocol with a monitoring frequency of once per year.
8- Temperature and DO with monitoring frequency of every 15 minutes.
9- Water Quality Parameters refers to monthly grab sampling, and testing for Total Phosphorus, Orthophosphate, Dissolved Reactive Phosphorous, Nitrate-Nitrogen, Nitrite-Nitrogen, Organic Nitrogen, TKN, Total Ammonia-Nitrogen, Total Nitrogen, Un-ionized Ammonia (calculated), TSS, $cBOD_5$, Chloride, Hardness, *E. coli* and Total Coliforms, Ion Characterization (Ca^{2+}, Mg^{2+}, Na^{+}, Cl^{-}, SO_4^{2+}), and Metals (Al, Fe, As, Cd, Hg and Ni) with a monitoring frequency of monthly.
10- Temperature, pH, water level, turbidity, specific conductivity, Chloride and DO monitoring with monitoring frequency of every 15 minutes.
11- Stream flow and water level
12- DO, pH, temperature, specific conductivity

4.1 WRRF EFFLUENT MONITORING LOCATIONS

Two effluent monitoring stations will be added to the RMMP once the facility is commissioned. These two new stations, as stated in the ECA (**Appendix B),** are noted below and shown on **Figure 1** in **Appendix A**:

1. Effluent Pumping Station (EFF-PS); and,
2. Manhole 10 (MH-010).

4.1.1 PUMPING STATION MONITORING STATION (EFF-PS)

The purpose of effluent quality monitoring station EFF-PS is to characterize the final effluent from the WRRF prior to discharging to the West Credit River, in accordance with ECA requirements. The monitoring station EFF-PS will be maintained and operated by the WRRF operator. Pumping station data will not be collected during the pre-discharge monitoring phase as data collection can only start once effluent is generated, which will be in the discharge phase. Sampling, monitoring and reporting will be the responsibility of Town of Erin's WRRF operator, as stated in the ECA under *Condition 10 monitoring and recording and Condition 13 Reporting* (refer to **Appendix B)**.

As previously noted in **Table 4-1**, the following monitoring will occur at station EFF-PS:

1. 24-hour composite parameters consisting of carbonaceous biochemical oxygen demand ($cBOD_5$), total suspended solids (TSS), total phosphorus, dissolved reactive phosphorus, total ammonia nitrogen, total Kjeldahl nitrogen (TKN), nitrate as nitrogen and nitrite as nitrogen. The monitoring frequency will be weekly.
2. Grab sample parameters consisting of both:
   a. *Escherichia coli* (*E. coli*) with a monitoring frequency of weekly; and,
   b. Acute lethality to Rainbow Trout with a monitoring frequency of quarterly.
3. Grab / probe / analyzer parameters consisting of both:
   a. Dissolved oxygen (DO), pH and temperature with a monitoring frequency of weekly; and,
   b. Chloride with a monitoring frequency of daily.

Additional monitoring details are provided in **Section 5,** Monitoring Sampling Protocols.

4.1.2 MANHOLE 10 MONITORING STATION (MH-010)

As set out in the ECA, *Schedule B* in **Appendix B**, temperature and DO monitoring of the effluent is required before being discharged through the diffusers installed in the receiving watercourse. As such, monitoring at Manhole 10 station MH-010 will be instated with the purpose of fulfilling this requirement. The monitoring will be reported in real-time during the operation of the WRRF.

As previously noted in **Table 4-1**, both temperature and DO monitoring will occur at station MH-010 with a monitoring frequency of every 15 minutes.

Additional monitoring details are provided in **Section 5,** Monitoring Sampling Protocols.

4.2 RECEIVING WATERCOURSE MONITORING LOCATIONS

The three project specific receiving watercourse monitoring stations will be installed by the Town of Erin in coordination with CVC and MECP's approval of the RMMP.

4.2.1 UPSTREAM MONITORING STATION (U-001)

The monitoring station U-001 will be located upstream of the effluent outfall location and will serve the role of upstream control throughout both the pre-discharge and discharge monitoring phases, respectively. The purpose of Station U-001 is to develop a characterization of baseline water quality and biotic conditions. It will also serve to function as the control monitoring station during operation of the WRRF to assess if an impact is occurring in the receiving watercourse when results are compared between the upstream and downstream (D-001) stations.

Biotic monitoring (fish and benthic invertebrates) will be established within the polygon denoted around Station U-001 as noted in **Figure 1**, **Appendix A**. Once the monitoring station is established within the polygon, based on a site review of the habitat present during the initial station set-up, the same monitoring location will be maintained for all future monitoring events. Adjustments to the monitoring station's location within the polygon will not be allowed without prior consultation with CVC and/or MECP.

As previously noted in **Table 4-1**, the following monitoring will occur at station U-001 to support the BACI study design:

1. Water quality parameters including testing for Total Phosphorus, Orthophosphate, Dissolved Reactive Phosphorous, Nitrate-Nitrogen, Nitrite-Nitrogen, Organic Nitrogen, TKN, Total Ammonia-Nitrogen, Total Nitrogen, Un-ionized Ammonia (calculated), TSS, $cBOD_5$, Chloride, Hardness, E. coli and Total Coliforms, Ion Characterization (Ca^{2+}, Mg^{2+}, Na^{+}, Cl^{-}, SO_4^{2+}), and Metals (Al, Fr, As, Cd, Hg and Ni). The monitoring frequency will be monthly.
2. Monthly Manual Measurements: Stream flow and water level
3. Monthly Field Measurements: DO, pH, temperature, specific conductivity
4. Real-time field parameters including temperature, pH, water level, turbidity, specific conductivity, chloride and DO. The monitoring frequency will be every 15 minutes.
5. Fish community monitoring with sampling to follow the OSAP with a monitoring frequency of once a year.
6. Benthic community monitoring with sampling to follow the OBBN protocols with a monitoring frequency of once a year.

Additional monitoring details are provided in **Section 5,** Monitoring Sampling Protocols.

4.2.2 DOWNSTREAM MONITORING STATIONS (D-001 AND D-002)

Two monitoring stations downstream of the effluent outfall location are to be installed at approximately 150 m (D-001) and 700 m (D-002) downstream. The purpose of Station D-001 is to provide downstream characterization during the pre-discharge monitoring phase and serve as the downstream BACI monitoring station to Station U-001 (control), where results will be compared against to assess if the effluent is impacting the receiving watercourse following operation of the WRRF during the discharge period. During the discharge monitoring phase, the purpose of Station D-002 will be to monitor and validate the far-mixing zone modelling result / effects of the discharge in the receiving watercourse to fulfill the requirements of the ECA.

Similar to Station U-001, biotic monitoring (fish and benthic invertebrates) will be established within the polygon denoted around Station D-001 as noted of **Figure 1**, **Appendix A**. Once the monitoring station is established with the polygon, based on a site review of the habitat present during the initial station set-up, the same monitoring location will be maintained for all future monitoring events. Adjustments to the

monitoring station's location within the polygon will not be allowed without prior consultation with CVC and/or MECP. Biotic monitoring will not be undertaken at Station D-002.

As previously noted in **Table 4-1**, the following monitoring will occur at station D-001 to support the BACI study design:

1. Water quality parameters including testing for Total Phosphorus, Orthophosphate, Dissolved Reactive Phosphorous, Nitrate-Nitrogen, Nitrite-Nitrogen, Organic Nitrogen, TKN, Total Ammonia-Nitrogen, Total Nitrogen, Un-ionized Ammonia (calculated), TSS, $cBOD_5$, Chloride, Hardness, E. coli and Total Coliforms, Ion Characterization (Ca^{2+}, Mg^{2+}, Na^{+}, Cl^{-}, SO_4^{2+}), and Metals (Al, Fr, As, Cd, Hg and Ni). The monitoring frequency will be monthly.
2. Monthly Manual Measurements: Stream flow and water level
3. Monthly Field Measurements: DO, pH, temperature, specific conductivity
4. Real-time field parameters including temperature, pH, water level, turbidity, specific conductivity, chloride and DO. The monitoring frequency will be every 15 minutes.
5. Fish community monitoring with sampling to follow the OSAP with a monitoring frequency of once a year.
6. Benthic community monitoring with sampling to follow the OBBN protocols with a monitoring frequency of once a year.

As previously noted in **Table 4-1**, the following monitoring will occur at station D-002 and will be used to validate the mixing zone models and to fulfill the requirements of the ECA:

1. Water quality parameters including testing for Total Phosphorus, Orthophosphate, Dissolved Reactive Phosphorous, Nitrate-Nitrogen, Nitrite-Nitrogen, Organic Nitrogen, TKN, Total Ammonia-Nitrogen, Total Nitrogen, Un-ionized Ammonia (calculated), TSS, $cBOD_5$, Chloride, Hardness, E. coli and Total Coliforms, Ion Characterization (Ca^{2+}, Mg^{2+}, Na^{+}, Cl^{-}, SO_4^{2+}), and Metals (Al, Fr, As, Cd, Hg and Ni). The monitoring frequency will be monthly.
2. Monthly Manual Measurements: Stream flow and water level
3. Monthly Field Measurements: DO, pH, temperature, specific conductivity
4. Real-time field parameters including temperature, pH, water level, turbidity, specific conductivity, chloride and DO. The monitoring frequency will be every 15 minutes.

Additional monitoring details are provided in **Section 5,** Monitoring Sampling Protocols.

5 MONITORING SAMPLING PROTOCOLS

The following describes the recommended pre-discharge monitoring phase sampling protocol to be used for the RMMP. The frequency of monitoring in the receiving watercourse will remain largely consistent throughout the pre-discharge monitoring phase. However, opportunities to revisit and revise the frequency prior to the discharge monitoring phase may be modified during the execution of the pre-discharge monitoring phase program. Potential modifications would be based upon review of data during the pre-discharge monitoring phase, considering that the baseline phase is not occurring during the operational phase. Effluent monitoring stations will follow similar sampling protocols to the receiving watercourse monitoring stations during the discharge phase; sample parameters and frequencies are provided in **Table 4-1**.

A summary of surface water parameters is provided in **Table 5-1**.

Table 5-1: Receiving Watercourse (U-001, D-001 and D-002) Water Quality Monitoring Parameters

Parameters	Sample Type	Frequency
Temperature	Grab [2] / Real-Time monitoring	Monthly [1] / Every 15 minutes
Specific Conductivity	Grab [2] / Real-Time monitoring	Monthly [1] / Every 15 minutes
Water Level	Manual [2] / Real-Time monitoring	Monthly [1] / Every 15 minutes
Dissolved Oxygen	Grab [2] / Real-Time monitoring	Monthly [1] / Every 15 minutes
pH	Grab [2] / Real-Time monitoring	Monthly [1] / Every 15 minutes
Chloride	Grab / Real-Time monitoring	Monthly [1] / Every 15 minutes
Turbidity	Real-Time monitoring	Every 15 minutes
$cBOD_5$	Grab	Monthly [1]
Total Suspended Solids	Grab	Monthly [1]
Total Ammonia Nitrogen (time stamped to standardize for temperature and pH)	Grab	Monthly [1]
Nitrate-Nitrogen, Nitrite-Nitrogen, and Organic Nitrogen	Grab	Monthly [1]
Total Kjeldahl Nitrogen	Grab	Monthly [1]
Total Phosphorous	Grab	Monthly [1]
Dissolved Reactive Phosphorous	Grab	Monthly [1]
E. coli and Total Coliforms	Grab	Monthly [1]
Metals (Al, Fe, As, Cd, Hg, Ni)	Grab	Monthly [1]
Ca^{2+}, Mg^{2+}, Na^{+}, Cl^{-}, SO_4^{2+}	Grab	Monthly [1]
Orthophosphate, Total Nitrogen, Hardness	Grab	Monthly [1]
Un-ionized Ammonia	As Calculated	Monthly [1]
Stream Flow	Manual [2]	Monthly [1]

Notes:

1- "Monthly" is defined as 'once per month'.
2- Field measurement.

At the time of sampling for total ammonia nitrogen, pH and temperature will also be measured. The concentration of un-ionized ammonia will be calculated using the total ammonia concentration while simultaneously calculating pH and temperature according to the methodology stipulated in the “Ontario’s Provincial Water Quality Objectives” (OPWQ) dated July 1994, as amended.

5.1 GRAB SAMPLES

Grab samples will be collected in general accordance with the methods and protocols outlined in the *Protocols Manual for Water Quality Sampling in Canada* document (Canadian Council of Minister of the Environment (CCME), 2011). Sample collection will be conducted in a consistent and proper manner with the appropriate equipment. Grab sample containers will be placed in a clean cooler containing loose ice to ensure cold transport to a Canadian Association of Environmental Analytical Laboratories (CALA) accredited laboratory for analysis within 48 hours from the time of sample collection. Water levels, stream flow, temperature, specific conductivity, DO and pH will be measured in the field at the time of collection of grab samples, as prescribed by ECA, *Schedule D*. The monitoring parameters and frequency of grab samples are provided in **Table 5-1**.

In addition to monthly field sampling, total suspended solids, nitrogen, phosphorus, metals and other parameters will be sampled by others at historical monitoring station 6007601502 located near the outfall, as part of the PWQMN.

5.2 REAL-TIME MONITORING

During the pre-discharge monitoring phase, in addition to monthly manual sampling of select parameters, the following will be monitored continuously and recorded every 15 minutes by installing respective probes in the riverbed and downloading the data once a month: temperature, pH, water level, turbidity, specific conductivity, chloride and DO.

Real-time monitoring will follow standard instream monitoring methodologies, and techniques to ensure consistency in data collection and outputs as performed in the Ontario’s PWQMN Comprehensive Guide. Additional strategies on monitoring frequency were also used, as described in “Real-Time Water Quality Monitoring: A How-To Guide” Webinar by Lorna Murison and Jan Siwierski, October 4, 2018. Real-time measurements will also be collected according to the *Protocols Manual for Water Quality Sampling in Canada* document (Canadian Council of Minister of the Environment (CCME), 2011).

The monitoring station will include, at a minimum, a multi-probe sensor; data recorder and communications device for remote data acquisition, control and communications; digital wireless transmission technology; a solar panel and battery; and an enclosure for protection of the recording equipment. It is assumed that the Town of Erin will enter into an agreement with CVC for the type of station and the frequency of sonde calibration.

5.3 FISH SAMPLING

All baseline pre-discharge monitoring phase stations (i.e., within the polygon limits as shown on **Figure 1** in **Appendix A**), will be selected to be outside of the influence of beaver dams. If a marked monitoring location is not accessible due to uncontrollable factors such as ice, weather or other cause(s) of inaccessibility, a suitable nearby location will be selected and noted to act as proxy. Sampling will resume at the original location as soon as it becomes accessible.

Fish community sampling will be undertaken once per year, likely in the fall, using a single pass backpack electrofishing method performed according to the OSAP. The sampling will be conducted by trained and experienced individuals. All species are to be bulk weighed and representative mean, minimum and maximum total lengths recorded. Individual lengths and weights are to be collected for all Brook Trout specimens. All sampling effort (e.g., electrofishing seconds, power calculation) and monitoring station site data (e.g., channel length, wetted widths) are to be recorded. Handling of fish will adhere to conditions specified by Ministry of Natural Resources and Forestry (MNRF) (Stanfield, 2017).

For baseline monitoring of Brook Trout habitats, sampling can be expected to be restricted to between June 15 and September 30, in consultation with the MNRF. Sampling is to be postponed if air temperature exceeds 30°C and/or if turbidity conditions hinder efficient sampling (shocking efficiency and visibility). All individual fish will be identified to species. The lead person must demonstrate competency in identification of Ontario fishes (e.g., Royal Ontario Museum – Ontario Fish Identification Workshop(s), OSAP Fish Identification Level 2, minimum three seasons of experience sampling Ontario fishes). Staff will take voucher photos of each species collected. If species level identification cannot be determined in the field, voucher photos (or specimens) shall be collected in accordance with MNRF permit conditions.

5.4 AQUATIC INVERTEBRATE SAMPLING

Similar to fish sampling conditions, all baseline pre-discharge monitoring phase stations for aquatic invertebrates (i.e., within the polygon limits as shown on **Figure 1** in **Appendix A**), will be selected to be outside of the influence of beaver dams. If a marked monitoring location is not accessible due to uncontrollable factors such as ice, weather or other cause(s) of inaccessibility, a suitable nearby location will be selected and noted to act as proxy. Sampling will resume at the original location as soon as it becomes accessible.

Aquatic invertebrate community sampling will be undertaken once per year, likely in the fall, following a travelling kick and sweep protocol in accordance with the OBBN protocol for consistency with CVC methodologies. The sampling will be conducted by an OBBN certified practitioner. Samples will be identified to family level or lower practical taxonomic level by a certified taxonomist (Jones et al, 2007).

It is expected that in the late summer when stress from high water temperatures and low stream flows are greatest, benthic invertebrate communities will naturally have lower numbers of sensitive taxa (i.e., EPT). As monitoring is proposed to occur during August, it is expected that results may indicate greater ‘impairment’ and will be factored into the average during any findings which may suggest degradation of conditions due to EPT Taxa.

5.5 FLOW SPOT MEASUREMENTS

Monthly spot flow measurements at D-001, D-002, and U-001 will be collected as per the ECA requirements. Water level fluctuation patterns at these three monitoring stations will be compared.

6 MITIGATION PARAMETER TRIGGERS AND ACTIONS

As set out in the ECA under *Condition 11 Adaptive Management and Contingency Plan*, actionable effluent thresholds are in place for temperature, DO, and chloride. The following describes the objectives for effluent standards, and contingency plans in place if those parameters exceed their objectives. A summary is provided in **Table 6-1**.

It is anticipated that any refinement of receiver thresholds would be developed using data from the pre-discharge monitoring phase, in coordination with the CVC, MECP and Town of Erin.

After review of the baseline monitoring data collected during the pre-discharge monitoring phase, consistent to that which is detailed in the ECA, any changes to the ECA would require MECP approval.

Table 6-1: Summary of Discharge Mitigation Parameter Triggers, Monitoring Thresholds, Impact Detection Methods and Mitigation Actions

Mitigation Parameters Triggers	ECA Condition	Location	Threshold	Impact Detection Method	Mitigation Action(s)
Water Temperature	11.1. a	Effluent (MH-010)	Objective: 19°C (ECA)	4-day moving average water temperature in the effluent (manhole 10 MH-010) exceeds 19°C (ECA).	Methods for decreasing temperature levels are still being designed. This system is to be finalized by the end of the pre-discharge monitoring phase in consultation with the MECP and CVC.
Water Temperature	N/A	Receiver (U-001, D-001 & D-002)	To be determined after pre-discharge monitoring phase.	Impact detection methods to be developed in consultation with MECP and CVC following the pre-discharge monitoring phase.	Methods for decreasing temperature levels are still being designed. This system is to be finalized by the end of the pre-discharge monitoring phase in consultation with MECP and CVC.
Dissolved Oxygen (DO)	11.2. a	Effluent (MH-010)	Objective: 5 mg/L minimum (ECA) Limit: 4mg/L minimum (ECA)	Dissolved oxygen drops below 4 mg/L and sustained for more than 12 hours (ECA).	Methods for increasing dissolved oxygen levels are still being designed. This system is to be finalized by the end of the pre-discharge monitoring phase in consultation with MECP and CVC.
Dissolved Oxygen (DO)	N/A	Receiver (U-001, D-001 & D-002)	To be determined after pre-discharge monitoring phase.	Impact detection methods to be developed in consultation with MECP and CVC with reference to PWQO (Ontario Ministry of Environment and Energy, 1999) following the pre-discharge monitoring phase.	Methods for increasing dissolved oxygen levels are still being designed. This system is to be finalized by the end of the pre-discharge monitoring phase in consultation with MECP and CVC.
Chloride	11.3. a	Effluent (MH-010)	Limit: 640 mg/L (ECA)	4-day moving mean chloride concentration exceeds 640 mg/L (ECA).	The Town of Erin will notify the MECP and CVC of the exceedance and duration. The cause will be investigated to determine if all measures as identified in the salt management plan have been properly implemented and enforced to bring the chloride level below 640 mg/L. If all source control measures are exhausted, the WRRF Operator shall initiate discussions with the MECP and CVC to explore further avenues for chloride reduction.

6.1 WATER TEMPERATURE

The upper limit for effluent temperature is a 4-day moving average period of 19°C, as described in the ECA *Schedule B* and *Condition 11-1-a*.

Effluent trigger - mitigation action:

- If a 4-day moving average temperature exceeds 19°C in Manhole 10 (station MH-010), an effluent cooling system must be implemented to bring the objective 4-day moving average effluent temperature of 19°C or below (ECA).
- When the 4-day average exceeds 19°C for 3 hours at Manhole 10, the cooling system shall be triggered to return the effluent temperature to 19°C within the following 3 hours (MECP Regional Tech Support).

There are three methods for reducing the temperature of the effluent, which have been selected based on reliability and operational costs. They are:

1. Using secondary clarifier covers to reduce the potential of heat gain through solar radiation.
2. Implementing chillers (mechanical, water-type) in a modular approach to allow for maintenance without interruptions to the cooling processes.
3. Amending the Town of Erin's bylaws to restrict commercial / industrial effluent discharge temperatures to 20°C.

Receiving watercourse triggers and mitigation actions for the West Credit River temperature will be reviewed and established during the pre-discharge monitoring phase in conjunction with data from the pre-discharge monitoring phase plan and inputs from the CVC, MECP, the Town of Erin and WSP.

Data from the site-specific receiving watercourse stations (U-001, D-001 and D-002) and the historical monitoring stations during the pre-discharge monitoring phase will be used to provide threshold limits for temperature. This shall be used to maintain the receiver temperature to support successful spawning, egg development and growth of the Brook Trout as described in the ECA *Condition 11-1-b*.

6.2 DISSOLVED OXYGEN

The lower limit of DO for the WRRF effluent is 4 mg/L over a sustained 12-hour period, as described in the ECA *Schedule B* and *Condition 11-2-a*. It is not expected for DO to increase after the last manhole observation point (Manhole 10, station MH-010) prior to discharging through the diffusers. Station MH-010 is located adjacent to the receiving watercourse. As such, an aeration system at the final pump station (EFF-PS) will be implemented prior to the effluent being discharged into the receiving watercourse.

To determine whether there is undue impact in the receiving watercourse due to discharging effluent, DO levels will be recorded on a real-time basis at U-001 (i.e., the upstream control station) and compared against values recorded at D-001 (i.e., the downstream impact station). In the case that discharging effluent DO concentrations are greater at D-001 than at U-001, but below the 5 mg/L objective, conditions will be reported, but corrective actions will not be triggered.

Effluent trigger - mitigation action:

- If DO reading obtained at Manhole 10, station MH-010 drops below 4 mg/L (ECA minimum allowable value) and is sustained for more than 12 hours, additional air shall be introduced at the biological

process to increase the level of dissolved oxygen at the final pumping station (EFF-PS) until the levels of dissolved oxygen at Manhole 10 (station MH-010) is above 4 mg/L (subject to the maximum saturation limit at the temperature of the effluent). The blowers within the biological process at the Erin WRRF are capable of increasing the residual DO by 1 mg/L to 3 mg/L.

Specific methods for air injection are still under discussion, to be finalized during the first year of the pre-discharge monitoring phase. However, the general solution would be to increase the available DO in the effluent using the process blower system prior to leaving Pump Station EFF-PS. Based on the design of the outflow pipe alignment, if the effluent has an acceptable DO level leaving station EFF-PS, then, due to the pressure within the outfall pipe, it is not anticipated that a decrease in DO levels would occur during movement to station MH-010. Along the outfall pipe alignment, the effluent will start its gravity fall over a series of three drops, which should theoretically increase the DO levels in the effluent before discharging into the receiving watercourse. It is possible, however, for DO levels to decrease within the outfall pipe if the temperature of the effluent has risen to a point where the required DO level is affected by the saturation limit. As such, if the cooling system has been activated, then the temperature of the effluent would be of suitable value to meet the effluent DO level requirements.

6.3 CHLORIDES

Chlorides typically enter the receiving watercourse from two sources: firstly from surface runoff containing road salt by means of the stormwater collection system, and secondly from sewage influences. This situation could influence the recorded downstream chloride concentration and should be taken into consideration during the effluent reporting period. During these potential conditions where elevated chloride levels are recorded at the upstream control station (U-001), only the relative deviations between the upstream and downstream (D-001) station readings would be flagged for investigation.

Effluent trigger - mitigation actions:

- Should the 4-day moving average of chloride levels at Manhole 10 (station MH-010) exceed 640 mg/L during the discharge phase, the MECP and CVC will be notified immediately of this exceedance and its duration, as per the ECA. The cause will then be investigated, and if all source control measures are exhausted, further avenues for chloride reduction in the influent will be discussed with the MECP, CVC and the Town of Erin for implementation.

7 BACI STUDY DESIGN AND IMPACT DETECTION INDICATORS

The structure of the pre-discharge monitoring phase is intended to provide information pursuant to undertaking an impact assessment, using an adapted methodology derived from a BACI study design (BACI, Smith 2002). The purpose of utilizing a BACI study is to determine if WRRF effluent is having an impact on the receiving watercourse. In order to determine if an impact is occurring, two monitoring stations will be established. One station will be within the zone of impact (D-001) and the other outside of the zone of impact (U-001) in relation to the effluent outfall. The monitoring stations U-001 and D-001 are clouded on **Figure 1** in **Appendix A** to represent the approximate location of the monitoring stations, as the exact locations have not been confirmed[1]. Sampling will be undertaken at the two (2) identified BACI monitoring stations to monitor the impact detection parameters noted in **Table 7-1** (refer to **Section 5** for specific monitoring frequencies).

It is anticipated that the discharge monitoring phase will include the change detection mechanisms, parameter-specific impact criteria limits and mitigation actions for the impact detection parameters, as indicated in **Table 7-1**. These parameters and their associated impact criteria limits will be used to determine the magnitude of receiver impacts and identify issues of concern that may require follow-up action. The proposed impact criteria limits will be determined following the pre-discharge monitoring phase in consultation with the reviewing agencies.[2] In the event that follow-up action is required, the Town of Erin and/or its delegated authority will work the MECP and CVC to develop acceptable recommendations and determine if corrective or mitigation action is necessary.

The following outlines how the BACI study design will be applied to determine if the effluent from the facility is impacting the receiving watercourse. Results at both the U-001 (control) and D-001 (impact) stations are tracked over the same monitoring event and then compared to determine if there is an adverse impact on the receiving watercourse. Potential impacts associated with the impact detection parameters will be determined through a two (2) step analysis process:

1. Compare the U-001 (control) station data with D-001 (impact) station data to determine if there is an impact occurring based on each specific monitored impact detection parameter and associated impact criteria.
   An impact is determined by comparing means and standard deviations among the control and impact site using the agreed-upon threshold of one standard deviation from the mean. If it is determined that there is a statistically significant difference among control and impact monitoring station results, it can be inferred the WRRF effluent is having an impact on the receiving watercourse. If no impact is identified in step 1, continue monitoring. However, if an impact is observed during step 1, proceed to step 2.

[1] Confirmation will occur after signed agreements with property owners are finalized. Negotiations are already underway with property owners.

[2] At this time, it is premature to establish what the proposed impact criteria limits are prior to undertaking the pre-discharge monitoring phase. The results of this phase of the study will provide the baseline data / conditions, in conjunction with historical monitoring data, as applicable.

2 Proposed impact criteria that are noted to be significantly different based on step 1 need to be investigated to determine if the impact is having a negative ecological impact to the receiving watercourse as it relates to its function.

This second step in the analysis process is essential to understanding the magnitude in which the biotic components of the receiving watercourse may be affected by the observed impact from step 1. It is quite possible that impacts observed in step 1 are having no negative ecological impact to the watercourse biotic community, which is measured by the proposed impact criteria for fish and benthic invertebrate communities noted in **Table 7-1**. If the results are shown to have a negative ecological impact, then appropriate mitigation and contingency measures will be developed and implemented. Since the ECA does not have prescribed thresholds and actionable mitigation targets for fish and benthic invertebrate communities, an adaptive management plan to address ecological (biotic) impacts is required. This adaptive management plan requires consultation with, but not limited to, the CVC, MECP and the Town of Erin so that actions taken have a real and targeted effect to address the impact and maintain the ecological health and function of the receiving watercourse.

The BACI parameters outlined in **Table 7-1** are consistent with the effluent limits. Effluent limits prescribed in the ECA, *Schedules B* and *C* (refer to **Appendix B**) are summarized in **Table 7-2** below, for reference.

It should be noted that pre-discharge monitoring will occur at receiving watercourse monitoring stations. Only once the WRRF is constructed will the effluent monitoring stations (EFF-PS and MH-010) be added to the program.

Table 7-1: BACI Study Design Receiving Watercourse Impact Detection Parameters and Criteria

Impact Detection Parameters	Location	Sample Type	Proposed Impact Criteria
Turbidity	Receiver (U-001 & D-001)	Grab Sample / Real -Time	To be determined as an outcome of the pre-discharge monitoring phase results review with reference to the PWQO (Ontario Ministry of Environment and Energy, 1999).
Specific conductivity	Receiver (U-001 & D-001)	Grab Sample / Real -Time	To be determined as an outcome of the pre-discharge monitoring phase results review.
pH	Receiver (U-001 & D-001)	Grab Sample / Real -Time	To be determined as an outcome of the pre-discharge monitoring phase results review with reference to the PWQO (Ontario Ministry of Environment and Energy, 1999).
TSS	Receiver (U-001 & D-001)	Grab Sample	Proposed impact criteria to be determined as an outcome after pre-discharge monitoring phase results review with reference to the CWQG for TSS (Canadian Council of Ministers of the Environment, 2002) and BACI design concept.
$cBOD_5$	Receiver (U-001 & D-001)	Grab Sample	To be determined as an outcome of the pre-discharge monitoring phase results review.
Total Ammonia Nitrogen	Receiver (U-001 & D-001)	Grab Sample	To be determined as an outcome of the pre-discharge monitoring phase results review with reference to the PWQO (Ontario Ministry of Environment and Energy, 1999).
Nitrite-Nitrogen	Receiver (U-001 & D-001)	Grab Sample	To be determined as an outcome of the pre-discharge monitoring phase results review with reference to the CWQG for nitrite-nitrogen (Canadian Council of Ministers of the Environment, 2023) and BACI design concept.
Nitrate-Nitrogen	Receiver (U-001 & D-001)	Grab Sample	To be determined as an outcome of the pre-discharge monitoring phase results review with reference to the CWQG for nitrate-nitrogen (Canadian Council of Ministers of the Environment, 2012) and BACI design concept.
Total Phosphorus	Receiver (U-001 & D-001)	Grab Sample	To be determined as an outcome of the pre-discharge monitoring phase results review with reference to the PWQO (Ontario Ministry of Environment and Energy, 1999).
E. Coli	Receiver (U-001 & D-001)	Grab Sample	To be determined as an outcome of the pre-discharge monitoring phase results review.

Impact Detection Parameters	Location	Sample Type	Proposed Impact Criteria
Metals (Al, Fe, Zn, As, Cd, Hg, Ni)	Receiver (U-001 & D-001)	Grab Sample	— Al: 75 ug/L (6.5-9 pH) for clay free sample (measured in 0.45 micron filtered sample) — Fe: 300 ug/L — Zn: 7.0 ug/L (long-term exposure) to 37 ug/L (short term exposure); 2018 CWQG for dissolved Zn (Canadian Council of Ministers of the Environment, 2018) — As: 5 ug/L — Cd: 0.04 ug/L to 0.37 ug/L dependent on hardness (long-term) and 0.11 ug/L to 7.7 ug/L dependent on hardness (short-term); 2014 CWQG for cadmium (Canadian Council of Ministers of the Environment, 2023) — Hg : 0.02 ug/L — Ni : 25 ug/L
Benthic Invertebrate Community	Receiver (U-001 & D-001)	Community Composition	For each index noted below, the sample will be assigned a score of 1 for impaired, 2 for possibly impaired, and 3 for unimpaired. Based on the tabulation of the score between 8 and 24, a final score of <14 will suggest degradation of the community or an impaired stream environment *Taxon Richness* [1] Impaired - <15 Possibly Impaired – 12 to 20 Unimpaired - >20 *Number of EPA Taxa* [1] Impaired – 0 Possibly Impaired – 1 to 3 Unimpaired - >3 *Percent EPT* [2] Impaired - <5 Possibly Impaired – 5 to 10 Unimpaired - >10 *Diversity (Shannon H')* Impaired - <1 Possibly Impaired – 1 to 3 Unimpaired - >3 *HBI* [1,3] Impaired - >8 Possibly Impaired – 6 to 8 Unimpaired - <6

Impact Detection Parameters	Location	Sample Type	Proposed Impact Criteria
			Precent Oligochaeta [2] Impaired - >60 Possibly Impaired – 10 to 60 Unimpaired - <10 *Precent Chironomidae* [1] Impaired - >40 Possibly Impaired – 10 to 40 Unimpaired - <10 *Precent Isopoda* [1] Impaired - >5 Possibly Impaired – 1 to 5 Unimpaired - <1
Fish Community	Receiver (U-001 & D-001)	Community Composition	— Percentage of total individuals which are Brook Trout — Brook Trout density (number of individuals/m^2) — Brook Trout biomass (g/m^2) — Fish species thermal guilds (percentage of each thermal class as represented by individuals)
Ca^{2+}, Mg^{2+}, Na^{+}, Cl^{-}, SO_4^{2+}	Receiver (U-001 & D-001)	Grab Sample	To be determined as an outcome of the pre-discharge monitoring phase results review with reference to the PWQO (Ontario Ministry of Environment and Energy, 1999).

Notes and Sources:

1 - Barton (1996)

2 - David et al. (1998)

3 - Tolerance values for the HBI were obtained from Mandaville (2002)

Table 7-2: WRRF Effluent Receiver ECA Criteria

Effluent Parameters	Location	ECA Objectives and Limits [1]
pH	Effluent (EFF-PS and MH-010)	— Lower Objective: 6.5 (ECA *Schedule B*) — Upper Objective: 8.0 (ECA *Schedule B*) — Lower Limit: 6.5 (ECA *Schedule C*) — Upper Limit: 8.5 (ECA *Schedule C*)
TSS	Effluent (EFF-PS and MH-010)	— Objective: 3 mg/L (ECA *Schedule B*) — Limit: 5 mg/L (ECA *Schedule C*)
$cBOD_5$	Effluent (EFF-PS and MH-010)	— Objective: 3 mg/L (ECA *Schedule B*) — Limit: 5 mg/L (ECA *Schedule C*)
Total Ammonia Nitrogen	Effluent (EFF-PS and MH-010)	— Objective: 0.3 mg/L (May 15 - Oct 31) (ECA *Schedule B*) 1 mg/L (Nov 1 - May 14) (ECA *Schedule B*) — Limit: 0.6 mg/L (May 15 – Oct 31) (ECA *Schedule C*) 2 mg/L (Nov 1 – May 14) (ECA *Schedule C*)
Nitrate-Nitrogen	Effluent (EFF-PS and MH-010)	— Objective: 4 mg/L (ECA *Schedule B*) — Limit: 5 mg/L (ECA *Schedule C*)
Total Phosphorus	Effluent (EFF-PS and MH-010)	— Objective: 0.03 mg/L (ECA *Schedule B*) — Limit: 0.045 mg/L (ECA *Schedule C*)
E. coli	Effluent (EFF-PS and MH-010)	— Objective: 100 CFU per 100 mL or 100 MPN/100 mL (ECA *Schedule B*) — Limit: 100 counts per 100 ml or 100 MPN/100 mL (ECA *Schedule C*)
Temperature	Effluent (EFF-PS and MH-010)	— Objective: 19 degrees Celsius (ECA *Schedule B*)
Dissolved Oxygen	Effluent (EFF-PS and MH-010)	— Objective: minimum 5 mg/L (ECA *Schedule B*) — Limit: minimum 4 mg/L (ECA *Schedule C*)
Toxicity to Rainbow Trout and Daphnia magna	Effluent (EFF-PS and MH-010)	— Objective: Non-acutely lethal (ECA *Schedule B*) — Limit: Non-acutely lethal (no more than 50% mortality) (ECA *Schedule C*)

Notes:

1- Please refer to ECA *Schedule B* and *Schedule C* for averaging calculator methodology.

8 PRE-DISCHARGE MONITORING REPORTING

Pre-discharge monitoring phase data will provide supplemental project location specific data in conjunction with historical data. This will ensure appropriate mitigation triggers (parameters described in *Condition 11-1, 2* and *3* of the ECA) are in place for the receiving watercourse during the subsequent operational period. Appropriate thresholds and change detection for indicator parameters for the receiving watercourse will be created after review of the pre-discharge monitoring phase results and will be in place during the subsequent operational period.

The pre-discharge monitoring phase is anticipated to occur between 12 and 18 months prior to construction completion of the Town of Erin's WRRF.

The results of the pre-discharge monitoring phase will enhance the development of actionable mitigation threshold responses to be used in response to real-time and seasonal West Credit River receiver conditions during the subsequent operational period.

8.1 DATA MANAGEMENT

The monitoring data from both pre- and discharge conditions will be stored in a database created by WSP, allowing the Town of Erin, CVC, and the MECP to regularly assess any adverse impacts to the West Credit River, and will ultimately be used to initiate corrective management or mitigation actions, as necessary. This data will be retained indefinitely, by the Town of Erin.

8.2 RMMP REVIEW

During the operational phase, all reporting will be in accordance with ECA requirements / conditions.

The RMMP is required to be reviewed every five (5) years to ensure that the monitoring is aligned with the BACI study design. This will include a review of parameters, thresholds, and mitigation measures to confirm they are still applicable and functioning to provide the data required to make informed decisions regarding the operation of the Erin WRRF. During this review, the ECA requirements and conditions will be reviewed and updated, as required.

8.3 NEXT STEPS

Prior to commencing the discharge monitoring phase, the following steps are to be undertaken by the Town of Erin or its representative with concurrence from the CVC and the MECP:

1. **Table 6-1** will be revised with final mitigation measures. A final copy of **Table 6-1** will be documented within the Erin WRRF Operations Manual.
2. **Table 7-1** will be updated with respect to the final thresholds and impact detections methods. A final copy of **Table 7-1** will be inserted into the Erin WRRF Operations Manual.

9 STANDARD LIMITATIONS

This Report was prepared for the Client, Town of Erin, in accordance with the professional services agreement, solely for their exclusive use to provide an assessment of current environmental conditions in association with the receiving watercourse. The intended recipient is solely responsible for the disclosure of any information contained in this report. The content and opinions contained in the present report are based on the observations and/or information available to WSP at the time of preparation. If a third party makes use of, relies on, or makes decisions in accordance with this report, said third party is solely responsible for such use, reliance or decisions. WSP does not accept responsibility for damages, if any, suffered by any third party as a result of decisions made or actions taken by said third party based on this report. This limitations statement is considered an integral part of this report.

The Report summarizes WSP's review of available data in accordance with the principal components of the stated regulations, standards and guidelines and the scope, terms and conditions of the contract or proposal to which the Assignment was conducted. No other warranties are either expressed or implied with respect to the professional services provided under the terms of the contract or proposal and represented in this Report. Conditions may exist which were not detected given the nature of the inquiry WSP was retained to undertake with respect to the receiving watercourse. Additional environmental studies and actions may be recommended.

The Report is based on data and information collected at the time of this Assessment, as stated in the Report. Uses within the receiving watercourse or changing conditions may result in the information and conclusions in the Report may no longer apply following the date of this Report. If any conditions become apparent that differ significantly from that presented in this Report, we request that we be notified to reassess the conclusions and recommendations provided herein. WSP disclaims any obligation to update this Report for conditions that may be identified after the date of this Report; however, WSP reserves the right to amend or supplement this report based on additional information, documentation or evidence.

In evaluating the receiving watercourse, WSP has relied in good faith on information provided by others, as noted in the Report. WSP has assumed that the information provided is correct and WSP assumes no responsibility for the accuracy, completeness or workmanship of any such information.

The Report is intended to be used in its entirety. No excerpts may be taken to be representative of the findings in the assessment.

The conclusions are based on the conditions within the receiving watercourse observed by WSP at the time the work was performed and may include information obtained at specific testing and/or sampling locations. It is recognized that overall conditions can only be extrapolated to an undefined limited area around these testing and sampling locations. The conditions that WSP interprets to exist between testing and sampling points may differ from those that actually exist. The accuracy of any extrapolation and interpretation beyond the monitoring stations will depend on natural conditions, the history of receiving watercourse as it pertains to development (previous, on-going and future) and changes through construction and other activities. In addition, analysis has been carried out for the identified chemical and physical parameters only, and it should not be inferred that other chemical species or physical conditions are not present. WSP cannot warrant against undiscovered environmental liabilities or adverse impacts off-Site.

The conclusions presented in this Report are based on Work undertaken by trained professional and technical staff and the reasonable and professional interpretation of the information considered.

Conclusions presented in this report should not be construed as legal advice. WSP makes no other representations whatsoever, including those concerning the legal significance of its findings, or as to other legal matters touched on in the Report, including, but not limited to, ownership of any property, or the application of any law to the findings of the Assessment.

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10 REFERENCES

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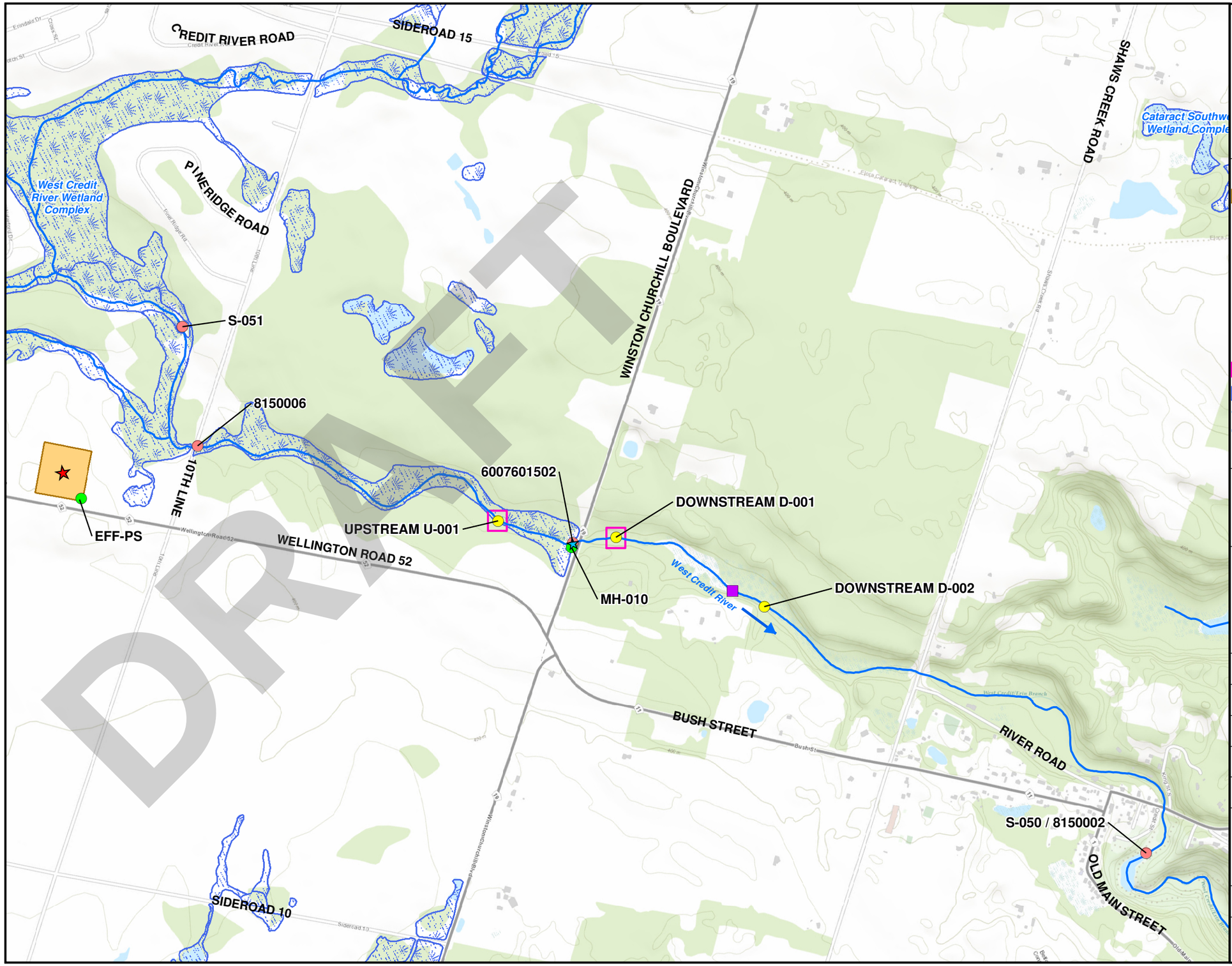
APPENDIX

A FIGURE 1, RMMP MONITORING LOCATIONS SITE PLAN



126 DON HILLOCK DRIVE, UNIT 2
AURORA, ONTARIO CANADA L4G 0G9
TEL.: 905-750-3080 | FAX: 905-727-0463 | WWW.WSP.COM

LEGEND

- APPROXIMATE PROPERTY BOUNDARY FOR ERIN WRRF
- ERIN WRRF
- EXISTING REGIONAL MONITORING LOCATIONS
- ERIN RMMP RECEIVING WATERCOURSE MONITORING STATION
- DAM LOCATION
- ERIN RMMP EFFLUENT MONITORING STATIONS
- PROPOSED OUTFALL LOCATION
- MONITORING STATION TO BE SETUP WITHIN THIS AREA
- PROVINCIALLY SIGNIFICANT WETLAND
- WATERCOURSE
- FLOW DIRECTION

130 65 0 130 Metres

CLIENT:
TOWN OF ERIN

PROJECT:
ERIN WRRF ENVIRONMENTAL MONITORING PLAN
ERIN, ONTARIO

PROJECT NO:	DATE:
20M-00741-01	FEBRUARY 2023

DESIGNED BY: -

DRAWN BY: TP

CHECKED BY: -

FIGURE NO:	SCALE:
1	1:13,000

TITLE:
RMMP
MONITORING LOCATION SITE PLAN

DISCIPLINE:
ENVIRONMENT

ISSUE:	REV.:
	-

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APPENDIX

B

ENVIRONMENTAL COMPLIANCE APPROVAL (ECA) – 7877 – CALRZU DATE MAY 3, 2022

Ontario

Ministry of the Environment, Conservation and Parks
Ministère de l'Environnement, de la Protection de la nature et des Parcs

ENVIRONMENTAL COMPLIANCE APPROVAL

NUMBER 7877-CALRZU
Issue Date: May 3, 2022

The Corporation of the Town of Erin
5684 Trafalgar Road
Erin, Ontario
N0B 1Z0,

Site Location: 9682 Wellington Road 52
Town of Erin, County of Wellington
N0B 1T0

You have applied under section 20.2 of Part II.1 of the Environmental Protection Act, R.S.O. 1990, c. E. 19 (Environmental Protection Act) for approval of:

establishment, usage and operation of new municipal sewage works, for the treatment of sanitary sewage and disposal of effluent to the West Credit River via a Sewage Treatment Plant (Erin Water Resource Recovery Facility) and Final Effluent disposal facilities as follows:

Classification of Collection System: Separate Sanitary Sewer System

Classification of Sewage Treatment Plant: Tertiary

Design Capacity of Sewage Treatment Plant

Design Capacity with All Treatment Trains in Operation	Interim (Upon Implementation of All Works)	Upon Successful Verification of Treatment Capability as set out in Condition 14
Rated Capacity	5,073 m^3/d	7,172 m^3/d

Influent and Imported Sewage

Receiving Location	Types
In Collection System	Sanitary Sewage
At Sewage Treatment Plant	Septage

Erin Water Resource Recovery Facility (WRRF)

Influent Structure

- two (2) 300 mm diameter inlet pipes to an influent chamber;
- one (1) influent chamber with sluice gates, discharge sewage to inlet channel of the screens, or divert sewage to inlet channel of the grit removal units for bypass of the intermediate pumping station;

Imported Sewage Receiving Facilities

- a septage receiving station to receive truck delivered septage from the Town of Erin via a 300 mm pipe into a screening system including a rock trap and a mechanically cleaned coarse spiral screen with 6 mm openings, equipped with a screen spray system and screenings hygienic bagger;
- two (2) septage storage tanks, each with storage capacity of 70 m^3 and each equipped with a mechanical mixer;
- two (2) submersible grinder pumps (one duty, one standby) with variable frequency drives (VFD), each rated at a flow rate of 1.5 L/s at a TDH of 12 m, discharge to the wet well of intermediate pumping station, or to the aerated blend tanks during low influent flows;

Preliminary Treatment System

- Screening
  - two (2) 600 mm wide and 2,500 mm deep channels in parallel, each equipped with mechanically cleaned bar screen with a 6 mm openings and a shaftless spiral, each with designed Peak Instantaneous Flow Rate of 224 L/s;
  - sluice gates to isolate any given screen for maintenance;
  - one (1) transport screening conveyor and one (1) disposal bin;
- Intermediate Pumping Station
  - one (1) submersible pumping station, complete with one (1) 13.5 m x 9 m x 4.1 m (depth) wet

well equipped with three (3) submersible pumps (two duty, one standby) with VFDs, each rated at 112 L/s at a TDH of 24 m;

- a 350 mm diameter forcemain to influent channel of the grit removal units;

- Grit Removal

  - two (2) concrete vortex grit removal units in parallel, each with designed Peak Instantaneous Flow Rate of 224 L/s;

  - two (2) grit pumps, each rated at 10 L/s at a TDH of 11 m, two (2) dewatering screws, discharge grit to grit storage bin;

  - one (1) 1 m wide common channel to primary clarifiers;

Influent Flow Measurement and Sampling Point

- flow measurement device at the influent channel of grit removal units;

- automatic composite sampler at the influent channel of grit removal units;

- grab sample at the septage receiving station;

Primary Treatment System

- three (3) 20 m x 5 m x 4 m side water depth (SWD) primary clarifiers in parallel, equipped with perforated fiberglass baffle plate at the inlet of each primary clarifier, longitudinal collector, scum trough, effluent baffle, and effluent weir at the outlet;

- two (2) sludge pumps (one duty, on standby) for each clarifier (total six (6) sludge pumps) with VFDs, each rated at 2.87 L/s at a TDH of 12 m, discharge to the aerated blend tanks;

- one (1) 2 m wide common channel to the biological nutrient removal system;

- one (1) 0.92 m diameter x 1.7 m scum tank with a conical bottom, two (2) scum pumps (one duty, one standby), each rated at 2.87 L/s at a TDH of 12 m, discharge to the aerated blend tanks;

Secondary Treatment Systems

- Biological Treatment

  - three (3) biological nutrient removal reactors (four-stage Bardenpho) in parallel, each consisting of the following:

    - one (1) 38 m x 3.5 m x 4 m SWD first anoxic zone (Anoxic 1), equipped with submersible

mixers;

- one (1) 95 m x 3.5 m x 4 SWD first aerobic zone (Aerobic 1), equipped with fine bubble diffuser aeration system, two (2) mixed liquor return pumps (one duty, one standby), each rated at 215 L/s at a TDH of 0.4 m for internal recycle from the Aerobic 1 to the Anoxic 1;

- one (1) 38 m x 3.5 m x 4 m SWD second anoxic zone (Anoxic 2), equipped with submersible mixers;

- one (1) 8 m x 3.5 m x 4 SWD second aerobic zone (Aerobic 2), equipped with fine-bubble diffuser aeration system;

- four (4) blowers (three duty, one standby), each rated at 40.41 m^3/min at 97.2 kPa;

- a 1.0 m wide common channel via flow distribution structures/pipes to the secondary clarifiers;

- Secondary Sedimentation

  - three (3) 19.8 m diameter x 4 m SWD conical bottom secondary clarifiers in parallel, each equipped with sludge and scum removal mechanisms;

  - two (2) return activated sludge (RAS) pumps (one duty, one standby) for each secondary clarifier (total six (6) RAS pumps) with VFDs, each with a capacity range of 18 L/s to 72 L/s, discharging to upstream of the Anoxic-1 zone;

  - one (1) 0.92 m diameter x 1.7 m secondary clarifier scum tank with a conical bottom for each of the two (2) RAS chambers, each with two scum transfer pumps (one duty, one standby), each rated at 2.12 L/s at a TDH of 26.4 m, discharge to the aerated blend tanks;

  - branch-off line with actuated plug valves from the RAS line for waste activated sludge (WAS), discharging to the aerated blend tanks;

  - a 600 mm common discharge header pipe to the flocculation tank of the ultrafiltration membrane system;

Tertiary Treatment System

- Ultrafiltration Membrane System

  - one (1) flocculation tank equipped with one (1) flocculator and four (4) pumps (three duty, one standby) with VFDs, each rated at 276 m^3/h at a TDH of 42.1 m via two (2) micro screens (one duty, one standby) with 0.5 mm openings to the ultrafiltration membrane system;

  - two (2) coagulated/precipitated phosphorous sludge pumps (one duty, one standby), each rated at

15 L/s at a TDH of 9.8 m to the aerated blend tanks;

- pressurized hollow fibre ultrafiltration membrane system with a total membrane surface area of 20,000 m^2, consisting of three (3) trains of ultrafiltration membrane process in parallel with designed Peak Hourly Flow Rate of 748 m^3/h;

- backpulse system, recirculation/neutralization system, chemical cleaning system, air compressors and reject drain system;

Supplementary Treatment Systems

- Phosphorus Removal
  - two (2) liquid alum storage tanks, each with a storage capacity of 22.8 m^3;
  - two (2) diaphragm metering pumps (one duty, one standby) each rated at 363 L/h, for a single dosing point into a gravity pipe feeding flocculation chamber downstream of the secondary clarifiers;
  - two (2) diaphragm metering pumps (one duty, one standby) each rated at 12.5 L/h for a trim dose into the feed to the membrane trains;
- Carbon Source Addition
  - two (2) MicroC2000® solution storage tanks, each with a storage capacity of 22.8 m^3,
  - four (4) diaphragm metering pumps (three duty, one standby), each rated at 117 L/h, adding supplemental carbon source to the biological nutrient removal reactors;
- Alkalinity Addition
  - one (1) magnesium hydroxide slurry storage tank with a storage capacity of 22.8 m^3;
  - four (4) peristaltis metering pumps (three duty, one standby), each rated at 22 L/h, adding supplemental alkalinity source to the biological nutrient removal reactors;
  - one (1) centrifugal pump to recirculate the storage tank slurry with capacity range of 1.8 - 4.44 L/s at a TDH between 2.5 m and 3.8 m;
- pH Control
  - one (1) sodium hydroxide storage tank with a storage capacity of 22.8 m^3;
  - two (2) diaphragm metering pumps (one duty, one standby), each rated at 64 L/h for a single

dosing point into a gravity pipe feeding the flocculation chamber;

Disinfection System

- two (2) closed vessels in parallel (one duty, one standby), each with twelve (12) low pressure, high intensity ultraviolet (UV) lamps capable of providing a minimum UV dosage of 30 mJ/cm^2 at designed Peak Hourly Flow Rate of 748 m^3/h and a UV transmission of 80%, complete with online UV sensors and automatic cleaning system;

Re-Aeration

- one (1) 0.5 m cascade step in the outlet channel of the biological nutrient removal system common drop shaft;
- one (1) 0.5 m cascade step in the outlet of the hydraulic shaft feeding each secondary clarifier;
- one (1) 0.5 m cascade step in the outlet channel of each secondary clarifier;
- one (1) cascade four-step aerator for final aeration discharge to the membrane backwash tank that overflows to the wet well of effluent pumping station;

Effluent Sewage Pumping Station

- one (1) wet well type effluent sewage pumping station, equipped with three (3) submersible pumps (two duty, one standby) with VFDs, each rated at 86 L/s at TDH of 32 m;
- two (2) 350 mm diameter connections (flow side stream outlet and return) located on the effluent pump header to allow flow via the effluent cooling system to the outfall;

Effluent Cooling System

- one (1) effluent cooling system, designed to reduce effluent temperature;

Final Effluent Flow Measurement and Sampling Point

- flow measurement device at effluent pumping station;
- automatic composite sampler at effluent pumping station;
- grab sample at the effluent pumping station;
- real time sampling probe at the effluent pumping station discharge header for temperature (one duty, one standby) and dissolved oxygen;
- real time sampling probe at the outfall for temperature (one duty, one standby) and dissolved

oxygen;

Sludge Management System

- Sludge Storage
  - two (2) aerated blend tanks, each with a diameter of 16.2 m, a SWD of 6.6 m and a working volume of 1,393 m^3;
  - three (3) blowers (two duty, one standby), each rated at 44.72 m^3/min and 97.2 kPa;
- Lystek System
  - two (2) rotary lobe blended sludge transfer pumps (one duty, one standby) with VFDs, each with a capacity range of 0.1 m^3/h to 118 m^3/h at TDH of 6.8 m and discharge pressure of 344.7 kPa;
  - one (1) inline grinder rated at 125 m^3/h;
  - one (1) dewatering centrifuge with a rated capacity range of 600 kg/h to 1,000 kg/h of dry solids;
  - one (1) 2.4 m diameter with a conical bottom dewatered sludge storage tank/cake hopper with a nominal volume of 9.3 m^3, equipped with one (1) progressive cavity pump, rated at 9.46 L/s and a discharge pressure of 448 kPa for 15% - 20% solids;
  - one (1) 2.4 m diameter Lystek Process Reactor with a nominal volume of 12.6 m^3, complete with potassium hydroxide and low pressure steam injection, a top mounted single shaft mixer as a disperser;
  - two (2) rotary lobe LysteGro product pumps, each rated at 25.2 L/s and a discharge pressure of 414 kPa for 15% biosolids;
- Biosolids Storage and Disposal
  - two (2) LysteGro storage tanks, each with a diameter of 27.3 m, SWD of 8.1 m and a working volume of 4,755 m^3, each with pressure relief and flame arrester;
  - one (1) biosolids truck loading facility with a self-adjusting stair gangway and platform with safety cage;

Final Effluent Disposal Facilities

- two (2) 350 mm diameter effluent forcemains along Wellington Road 52 to a sanitary manhole near the

intersection of Wellington Road and Winston Churchill Boulevard;

- one (1) 375 mm gravity sanitary sewer along Winston Churchill Boulevard to a manhole located on the bank of West Credit River;

- one (1) 5 m long, 375 mm diameter stainless steel piping with 75 mm vertical diameter diffuser ports complete with 50 mm diameter orifice, discharging to the West Credit River;

including all other mechanical system, electrical system, instrumentation and control system, standby power system, piping, pumps, valves and appurtenances essential for the proper, safe and reliable operation of the Works in accordance with this Approval, in the context of process performance and general principles of wastewater engineering only;

all in accordance with the submitted supporting documents listed in Schedule A.

For the purpose of this environmental compliance approval, the following definitions apply:

1. "Annual Average Daily Influent Flow" means the cumulative total sewage flow of Influent to the Sewage Treatment Plant during a calendar year divided by the number of days during which sewage was flowing to the Sewage Treatment Plant that year;

2. "Approval" means this environmental compliance approval and any schedules attached to it, and the application;

3. "BOD5" (also known as TBOD5) means five day biochemical oxygen demand measured in an unfiltered sample and includes carbonaceous and nitrogenous oxygen demands;

4. "Bypass" means diversion of sewage around one or more treatment processes, excluding Preliminary Treatment System, within the Sewage Treatment Plant with the diverted sewage flows being returned to the Sewage Treatment Plant treatment train upstream of the Final Effluent sampling point(s) and discharged via the approved effluent disposal facilities;

5. "CBOD5" means five day carbonaceous (nitrification inhibited) biochemical oxygen demand measured in an unfiltered sample;

6. "Director" means a person appointed by the Minister pursuant to section 5 of the EPA for the purposes of Part II.1 of the EPA;

7. "District Manager" means the District Manager of the appropriate local district office of the Ministry where the Works is geographically located;

8. "*E. coli* " refers to coliform bacteria that possess the enzyme beta-glucuronidase and are capable of cleaving a fluorogenic or chromogenic substrate with the corresponding release of a fluorogen or chromogen, that produces fluorescence under long wavelength (366 nm) UV light, or color development, respectively. Enumeration methods include tube, membrane filter, or multi-well procedures. Depending on

the method selected, incubation temperatures include 35.5 ± 0.5 °C or 44.5 ± 0.2 °C (to enumerate thermotolerant species). Depending on the procedure used, data are reported as either colony forming units (CFU) per 100 mL (for membrane filtration methods) or as most probable number (MPN) per 100 mL (for tube or multi-well methods);

9. "EPA" means the *Environmental Protection Act* , R.S.O. 1990, c.E.19, as amended;

10. "Equivalent Equipment" means alternate piece(s) of equipment that meets the design requirements and performance specifications of the piece(s) of equipment to be substituted;

11. "Event" means an action or occurrence, at a given location within the Works that causes a Bypass or Overflow. An Event ends when there is no recurrence of Bypass or Overflow in the 12-hour period following the last Bypass or Overflow. Overflows and Bypasses are separate Events even when they occur concurrently;

12. "Final Effluent" means effluent that is discharged to the environment through the approved effluent disposal facilities, including all Bypasses, that are required to meet the compliance limits stipulated in the Approval for the Sewage Treatment Plant at the Final Effluent sampling point(s);

13. "Imported Sewage" means sewage hauled to the Sewage Treatment Plant by licensed waste management system operators of the types and quantities approved for co-treatment in the Sewage Treatment Plant, including hauled sewage within the meaning of R.R.O. 1990, Regulation 347: General – Waste Management, as amended;

14. "Influent" means flows to the Sewage Treatment Plant from the collection system and Imported Sewage;

15. "Limited Operational Flexibility" (LOF) means the conditions that the Owner shall follow in order to undertake any modification that is pre-authorized as part of this Approval;

16. "Ministry" means the ministry of the government of Ontario responsible for the EPA and OWRA and includes all officials, employees or other persons acting on its behalf;

17. "Monthly Average Effluent Concentration" is the mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar month, calculated and reported as per the methodology specified in Schedule F;

18. "Monthly Average Daily Effluent Flow" means the cumulative total Final Effluent discharged during a calendar month divided by the number of days during which Final Effluent was discharged that month;

19. "Monthly Average Daily Effluent Loading" means the value obtained by multiplying the Monthly Average Effluent Concentration of a contaminant by the Monthly Average Daily Effluent Flow over the same calendar month;

20. "Monthly Geometric Mean Density" is the mean of all Single Sample Results of *E. coli* measurement in the samples taken during a calendar month, calculated and reported as per the methodology specified in

Schedule F;

21. "Normal Operating Condition" means the condition when all unit process(es), excluding Preliminary Treatment System, in a treatment train is operating within its design capacity;

22. "Operating Agency" means the Owner or the entity that is authorized by the Owner for the management, operation, maintenance, or alteration of the Works in accordance with this Approval;

23. "Overflow" means a discharge to the environment from the Works at designed location(s) other than the approved effluent disposal facilities or via the effluent disposal facilities downstream of the Final Effluent sampling point;

24. "Owner" means The Corporation of the Town of Erin and its successors and assignees;

25. "OWRA" means the *Ontario Water Resources Act* , R.S.O. 1990, c. O.40, as amended;

26. "Peak Hourly Flow Rate" (also referred to as maximum hourly flow or maximum hour flow) means the largest volume of flow to be received during a one-hour period for which the sewage treatment process unit or equipment is designed to handle;

27. "Peak Instantaneous Flow Rate" means the instantaneous maximum flow rate as measured by a metering device for which the sewage treatment process unit or equipment is designed to handle;

28. "Preliminary Treatment System" means all facilities in the Sewage Treatment Plant associated with screening and grit removal;

29. "Primary Treatment System" means all facilities in the Sewage Treatment Plant associated with the primary sedimentation unit process and includes chemically enhanced primary treatment;

30. "Professional Engineer" means a person entitled to practice as a Professional Engineer in the Province of Ontario under a license issued under the Professional Engineers Act;

31. "Rated Capacity" means the Annual Average Daily Influent Flow for which the Sewage Treatment Plant is designed to handle;

32. "Sanitary Sewers" means pipes that collect and convey wastewater from residential, commercial, institutional and industrial buildings, and some infiltration and inflow from extraneous sources such as groundwater and surface runoff through means other than stormwater catch basins;

33. "Secondary Treatment System" means all facilities in the Sewage Treatment Plant associated with biological treatment, secondary sedimentation and phosphorus removal unit processes;

34. "Separate Sewer Systems" means wastewater collection systems that comprised of Sanitary Sewers while runoff from precipitation and snowmelt are separately collected in Storm Sewers;

35. "Sewage Treatment Plant" means all the facilities related to sewage treatment within the sewage treatment

plant site excluding the Final Effluent disposal facilities;

36. "Single Sample Result" means the test result of a parameter in the effluent discharged on any day, as measured by a probe, analyzer or in a composite or grab sample, as required;

37. "Storm Sewers" means pipes that collect and convey runoff resulting from precipitation and snowmelt (including infiltration and inflow);

38. "Works" means the approved sewage works, and includes modifications made under Limited Operational Flexibility.

You are hereby notified that this environmental compliance approval is issued to you subject to the terms and conditions outlined below:

TERMS AND CONDITIONS

1. GENERAL PROVISIONS

1. The Owner shall ensure that any person authorized to carry out work on or operate any aspect of the Works is notified of this Approval and the terms and conditions herein and shall take all reasonable measures to ensure any such person complies with the same.

2. The Owner shall design, construct, operate and maintain the Works in accordance with the conditions of this Approval.

3. Where there is a conflict between a provision of any document referred to in this Approval and the conditions of this Approval, the conditions in this Approval shall take precedence.

4. The issuance of, and compliance with the conditions of, this Approval does not:

    a. relieve any person of any obligation to comply with any provision of any applicable statute, regulation or other legal requirement, including, but not limited to, the obligation to obtain approval from the local conservation authority/the Ministry of Northern Development, Mines, Natural Resources and Forestry (MNDMNRF) necessary to construct or operate the sewage works; or

    b. limit in any way the authority of the Ministry to require certain steps be taken to require the Owner to furnish any further information related to compliance with this Approval.

2. CHANGE OF OWNER AND OPERATING AGENCY

1. The Owner shall, within thirty (30) calendar days of issuance of this Approval, prepare/update and submit to the District Manager the Municipal and Local Services Board Wastewater System Profile Information Form, as amended (Schedule G) under any of the following situations:

a. the form has not been previously submitted for the Works;

b. this Approval is issued for extension, re-rating or process treatment upgrade of the Works;

c. when a notification is provided to the District Manager in compliance with requirements of change of Owner or Operating Agency under this condition.

2. The Owner shall notify the District Manager and the Director, in writing, of any of the following changes within thirty (30) days of the change occurring:

   a. change of address of Owner;

   b. change of Owner, including address of new owner;

   c. change of partners where the Owner is or at any time becomes a partnership, and a copy of the most recent declaration filed under the *Business Names Act, R.S.O. 1990, c. B.17* , as amended, shall be included in the notification;

   d. change of name of the corporation where the Owner is or at any time becomes a corporation, and a copy of the most current information filed under the *Corporations Information Act, R.S.O. 1990, c. C.39* , as amended, shall be included in the notification.

3. The Owner shall notify the District Manager, in writing, of any of the following changes within thirty (30) days of the change occurring:

   a. change of address of Operating Agency;

   b. change of Operating Agency, including address of new Operating Agency.

4. In the event of any change in ownership of the Works, the Owner shall notify the succeeding owner in writing, of the existence of this Approval, and forward a copy of the notice to the District Manager.

5. The Owner shall ensure that all communications made pursuant to this condition refer to the environmental compliance approval number.

3. CONSTRUCTION OF WORKS

1. All Works in this Approval shall be constructed and installed and must commence operation within five (5) years of issuance of this Approval, after which time the Approval ceases to apply in respect of any portions of the Works not in operation. In the event that the construction, installation and/or operation of any portion of the Works is anticipated to be delayed beyond the time period stipulated, the Owner shall submit to the Director an application to amend the Approval to extend this time period, at least six (6) months prior to the end of the period. The amendment application shall include the reason(s) for the delay and whether there is any design change(s).

2. The Owner shall not commence construction of any portion under the effluent cooling system of the

Works which are only approved in principle, until detailed design drawings, specifications and an engineer's report containing detailed design calculations for those portions of the Works have been submitted to and approved by the Director through an amendment to the Approval.

3. Within thirty (30) days of commencement of construction, the Owner shall prepare and submit to the District Manager a schedule for the completion of construction and commissioning operation of the Works. The Owner shall notify the District Manager within thirty (30) days of the commissioning operation of any Works. Upon completion of construction of the Works, the Owner shall prepare and submit a statement to the District Manager, certified by a Professional Engineer, that the Proposed Works are constructed in accordance with this Approval.

4. Within one (1) year of completion of construction of the Works, a set of record drawings of the Works shall be prepared or updated. These drawings shall be kept up to date through revisions undertaken from time to time and a copy shall be readily accessible for reference at the Works.

4. TEMPORARY EROSION AND SEDIMENT CONTROL

1. The Owner shall install and maintain temporary sediment and erosion control measures during construction and conduct inspections once every two (2) weeks and after each significant storm event (a significant storm event is defined as a minimum of 25 millimetres of rain in any 24 hours period). The inspections and maintenance of the temporary sediment and erosion control measures shall continue until they are no longer required and at which time they shall be removed and all disturbed areas reinstated properly.

2. The Owner shall maintain records of inspections and maintenance which shall be made available for inspection by the Ministry, upon request. The record shall include the name of the inspector, date of inspection, and the remedial measures, if any, undertaken to maintain the temporary sediment and erosion control measures.

5. BYPASSES

1. Any Bypass is prohibited, except:

    a. an emergency Bypass when a structural, mechanical or electrical failure causes a temporary reduction in the capacity of a treatment process or when an unforeseen flow condition exceeds the design capacity of a treatment process that is likely to result in personal injury, loss of life, health hazard, basement flooding, severe property damage, equipment damage or treatment process upset, if a portion of the flow is not bypassed;

    b. a planned Bypass that is a direct and unavoidable result of a planned repair and maintenance procedure or other circumstance(s), the Owner having notified the District Manager in writing at least fifteen (15) days prior to the occurrence of Bypass, including an estimated quantity and duration of the Bypass, an assessment of the impact on the quality of the Final Effluent and the mitigation measures if necessary, and the District Manager has given written consent of the Bypass;

2. Notwithstanding the exceptions given in Paragraph 1, the Operating Agency shall undertake everything

practicable to maximize the flow through the downstream treatment process(es) prior to bypassing.

3. At the beginning of a Bypass Event, the Owner shall immediately notify the Spills Action Centre (SAC), Credit Valley Conservation (CVC) and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:

   a. the type of the Bypass as indicated in Paragraph 1 and the reason(s) for the Bypass;

   b. the date and time of the beginning of the Bypass;

   c. the treatment process(es) gone through prior to the Bypass and the treatment process(es) bypassed;

   d. the effort(s) done to maximize the flow through the downstream treatment process(es) and the reason(s) why the Bypass was not avoided.

4. Upon confirmation of the end of a Bypass Event, the Owner shall immediately notify the Spills Action Centre (SAC), CVC and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:

   a. the date and time of the end of the Bypass;

   b. the estimated or measured volume of Bypass.

5. For any Bypass Event

   a. the Owner shall collect daily sample(s) of the Final Effluent, inclusive of the Event and analyze for all effluent parameters outlined in Compliance Limits condition that require composite samples, following the same protocol specified in the Monitoring and Recording condition for the regular samples. The sample(s) shall be in addition to the regular Final Effluent samples required under the monitoring and recording condition. If the Event occurs on a scheduled monitoring day, the regular sampling requirements prevail. If representative sample for the effluent parameter(s) that require grab sample cannot be obtained, they shall be collected after the Event at the earliest time when situation returns to normal.

   b. in addition, the Owner shall assess the parameters obtained from real time monitoring stations U-001, D-001, and D-002 as outlined in Schedule D, for the duration of the Bypass Event.

6. The Owner shall submit a summary report of the Bypass Event(s) to the District Manager and CVC on a quarterly basis, no later than each of the following dates for each calendar year: February 15, May 15, August 15, and November 15. The summary reports shall contain, at a minimum, the types of information set out in Paragraphs (3), (4) and (5) and either a statement of compliance or a summary of the non-compliance notifications submitted as required under Paragraph 1 of Condition 13. If there is no Bypass Event during a quarter, a statement of no occurrence of Bypass is deemed sufficient.

7. The Owner shall develop a notification procedure in consultation with the District Manager, SAC and CVC, and notify the public and downstream water users that may be adversely impacted by any Bypass

Event.

6. OVERFLOWS

1. Any Overflow is prohibited, except:

   a. an emergency Overflow in an emergency situation when a structural, mechanical or electrical failure causes a temporary reduction in the capacity of the Works or when an unforeseen flow condition exceeds the design capacity of the Works that is likely to result in personal injury, loss of life, health hazard, basement flooding, severe property damage, equipment damage or treatment process upset, if a portion of the flow is not overflowed;

   b. a planned Overflow that is a direct and unavoidable result of a planned repair and maintenance procedure or other circumstance(s), the Owner having notified the District Manager in writing at least fifteen (15) days prior to the occurrence of Overflow, including an estimated quantity and duration of the Overflow, an assessment of the impact on the environment and the mitigation measures if necessary, and the District Manager has given written consent of the Overflow;

2. Notwithstanding the exceptions given in Paragraph 1, the Operating Agency shall undertake everything practicable to maximize the flow through the downstream treatment process(es) and Bypass(es) prior to overflowing.

3. At the beginning of an Overflow Event, the Owner shall immediately notify the Spills Action Centre (SAC), CVC and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:

   a. the type of the Overflow as indicated in Paragraph 1 and the reason(s) for the Overflow;

   b. the date and time of the beginning of the Overflow;

   c. the point of the Overflow from the Works, the treatment process(es) gone through prior to the Overflow, the disinfection status of the Overflow and whether the Overflow is discharged through the effluent disposal facilities or an alternate location;

   d. the effort(s) done to maximize the flow through the downstream treatment process(es) and Bypass(es) and the reason(s) why the Overflow was not avoided.

4. Upon confirmation of the end of an Overflow Event, the Owner shall immediately notify the Spills Action Centre (SAC), CVC and the local Medical Officer of Health. This notice shall include, at a minimum, the following information:

   a. the date and time of the end of the Overflow;

   b. the estimated or measured volume of the Overflow.

5. For any Overflow Event

    a. in the Sewage Treatment Plant, the Owner shall collect grab sample(s) of the Overflow, one near the beginning of the Event and one every eight (8) hours for the duration of the Event, and have them analyzed at least for CBOD5, total suspended solids, total phosphorus, total ammonia nitrogen, nitrate as N, total Kjeldahl nitrogen, *E. coli.* , except that raw sewage and primary treated effluent Overflow shall be analyzed for BOD5, total suspended solids, total phosphorus and total Kjeldahl nitrogen only.

    b. in addition, the Owner shall assess the parameters obtained from real time monitoring stations U-001, D-001, and D-002 as outlined in Schedule D, for the duration of the Overflow Event.

6. The Owner shall submit a summary report of the Overflow Event(s) to the District Manager and CVC on a quarterly basis, no later than each of the following dates for each calendar year: February 15, May 15, August 15, and November 15. The summary report shall contain, at a minimum, the types of information set out in Paragraphs (3), (4) and (5). If there is no Overflow Event during a quarter, a statement of no occurrence of Overflow is deemed sufficient.

7. The Owner shall develop a notification procedure in consultation with the District Manager, SAC and CVC, and notify the public and downstream water users that may be adversely impacted by any Overflow Event.

7. DESIGN OBJECTIVES

1. The Owner shall design and undertake everything practicable to operate the Sewage Treatment Plant in accordance with the following objectives:

    a. Final Effluent parameters design objectives listed in the table(s) included in Schedule B.

    b. Final Effluent is essentially free of floating and settleable solids and does not contain oil or any other substance in amounts sufficient to create a visible film or sheen or foam or discolouration on the receiving waters.

    c. Annual Average Daily Influent Flow is within the Rated Capacity of the Sewage Treatment Plant.

8. COMPLIANCE LIMITS

1. The Owner shall operate and maintain the Sewage Treatment Plant such that compliance limits for the Final Effluent parameters listed in the table(s) included in Schedule C are met.

9. OPERATION AND MAINTENANCE

1. The Owner shall ensure that, at all times, the Works and the related equipment and appurtenances used to achieve compliance with this Approval are properly operated and maintained. Proper operation and maintenance shall include effective performance, adequate funding, adequate staffing and training, including training in all procedures and other requirements of this Approval and the OWRA and

regulations, adequate laboratory facilities, process controls and alarms and the use of process chemicals and other substances used in the Works.

2. The Owner shall prepare and maintain the operations manual for the Works in consultation with CVC, within six (6) months of completion of construction of the Works, that includes, but not necessarily limited to, the following information:

   a. operating procedures for the Works under Normal Operating Conditions;

   b. inspection programs, including frequency of inspection, for the Works and the methods or tests employed to detect when maintenance is necessary;

   c. repair and maintenance programs, including the frequency of repair and maintenance for the Works;

   d. procedures for the inspection and calibration of monitoring equipment;

   e. operating procedures for the Works to handle situations outside Normal Operating Conditions and emergency situations such as a structural, mechanical or electrical failure, or an unforeseen flow condition, including procedures to minimize Bypasses and Overflows;

   f. a spill prevention and contingency plan, consisting of procedures and contingency plans, including notification to the District Manager and CVC, to reduce the risk of spills of pollutants and prevent, eliminate or ameliorate any adverse effects that result or may result from spills of pollutants;

   g. procedures for receiving, responding and recording public complaints, including recording any followup actions taken;

   h. an operations plan for the operation of the effluent cooling system in consultation with CVC and the Ministry, to maintain receiver temperature to support successful spawning, egg development and growth of Brook Trout.

3. The Owner shall maintain the operations manual up-to-date and make the manual readily accessible for reference at the Works.

4. The Owner shall ensure that the Operating Agency fulfills the requirements under O. Reg. 129/04, as amended for the Works, including the classification of facilities, licensing of operators and operating standards.

10. MONITORING AND RECORDING

1. The Owner shall, upon commencement of operation of the Works, carry out a scheduled monitoring program of collecting samples at the required sampling points, at the frequency specified or higher, by means of the specified sample type and analyzed for each parameter listed in the tables under the monitoring program included in Schedule D and record all results, as follows:

   a. all samples and measurements are to be taken at a time and in a location characteristic of the quality

and quantity of the sewage stream over the time period being monitored.

b. definitions and preparation requirements for each sample type are included in document referenced in Paragraph 3.b.

c. definitions for frequency:

i. Daily means once every day;

ii. Weekly means once every week;

iii. Monthly means once every month;

iv. Quarterly means once every three months;

d. a schedule of the day of the week/month for the scheduled sampling shall be created. The sampling schedule shall be revised and updated every year through rotation of the day of the week/month for the scheduled sampling program, except when the actual scheduled monitoring frequency is three (3) or more times per week.

2. In addition to the scheduled monitoring program required in Paragraph 1

a. the Owner shall collect daily sample(s) of the Final Effluent, on any day when there is any situation outside Normal Operating Conditions, and analyze for all effluent parameters outlined in Compliance Limits condition that require composite samples, following the same protocol specified in this condition for the regular samples. If the Event occurs on a scheduled monitoring day, the regular sampling requirements prevail. If representative sample for the effluent parameter(s) that require grab sample cannot be obtained, they shall be collected after the Event at the earliest time when situation returns to normal.

b. the Owner shall assess and report on the parameters obtained from real time monitoring stations U-001, D-001 and D-002 as outlined in Schedule D, on any day when there is any situation outside Normal Operating Conditions.

3. The methods and protocols for sampling, analysis and recording shall conform, in order of precedence, to the methods and protocols specified in the following documents and all analysis shall be conducted by a laboratory accredited to the ISO/IEC:17025 standard or as directed by the District Manager:

a. the Ministry's Procedure F-10-1, “Procedures for Sampling and Analysis Requirements for Municipal and Private Sewage Treatment Works (Liquid Waste Streams Only), as amended;

b. the Ministry's publication "Protocol for the Sampling and Analysis of Industrial/Municipal Wastewater Version 2.0" (January 2016), PIBS 2724e02, as amended;

c. the publication "Standard Methods for the Examination of Water and Wastewater", as amended.

d. the Environment Canada publications "Biological Test Method: Reference Method for Determining

Acute Lethality of Effluents to Rainbow Trout" (EPS 1/RM/13 Second Edition - December 2000) and "Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to *Daphnia magna* " (EPS 1/RM/14 Second Edition - December 2000), as amended, subject to the following:

i. the use of pH stabilization in the determination of acute lethality of Final Effluent to Rainbow Trout in accordance with the Environment Canada publication "Procedure for pH Stabilization during the Testing of Acute Lethality of Wastewater Effluent to Rainbow Trout (EPS 1/RM/50)" (2008), as amended, is permitted only if:

   a. all the three criteria stipulated in the Environment Canada EPS 1/RM/50 are met; and

   b. the Final Effluent is not discharged to a receiver in which the Final Effluent contributes more than 50% of the total flow in the receiving water, unless the District Manager, having reviewed additional information submitted regarding the Final Effluent and the receiving water approves on the use of RM50 on a site-specific basis.

4. The Owner shall monitor and record the flow rate and daily quantity using flow measuring devices or other methods of measurement as approved below calibrated to an accuracy within plus or minus 5 per cent (+/- 5%) of the actual flowrate of the following:

   a. Influent flow to the Sewage Treatment Plant by continuous flow measuring devices and instrumentations/pumping rates, or in lieu of an actual installation of equipment, adopt the flow measurements of the Final Effluent for the purpose of estimating Influent flows if the Influent and Final Effluent streams are considered not significantly different in flow rates and quantities;

   b. Final Effluent discharged from the Sewage Treatment Plant by continuous flow measuring devices and instrumentations/pumping rates, or in lieu of an actual installation of equipment, adopt the flow measurements of the Influent for the purpose of estimating Final Effluent flows if the Influent and Final Effluent streams are considered not significantly different in flow rates and quantities;

   c. each type of Imported Sewage received for co-treatment at the Sewage Treatment Plant by flow measuring devices/pumping rates/haul truck manifests;

5. The Owner shall retain for a minimum of five (5) years from the date of their creation, all records and information related to or resulting from the monitoring activities required by this Approval.

6. The Owner shall post near real time data to the Town of Erin website or partner agency, with a delay of no more than two (2) weeks to verify and quality control the data according to standard data quality objectives.

7. The Owner shall conduct biological monitoring for fish and benthic communities in the surface water upstream and downstream of the outfall in accordance with the Ministry approved plan as referenced in Schedule D.

11. ADAPTIVE MANAGEMENT AND CONTINGENCY PLAN

1. Temperature

    a. Temperature in the final effluent (measured at the outfall in manhole #10) shall always be maintained at or below the objective of 19 degrees Celsius (4-day moving average) to ensure end-of-pipe non-lethal ammonia toxicity. If 4-day moving average temperature exceeds 19 degrees Celsius, effluent cooling system shall be turned on to bring the effluent temperature to the objective of 19 degrees Celsius (4-day moving average).

    b. The Owner shall develop a plan for operation of the effluent cooling system, in consultation with CVC and the Ministry, to maintain the receiver temperature to support successful spawning, egg development and growth of Brook Trout, and include the plan in the operations manual as per Condition 9.

2. Dissolved Oxygen

    a. Dissolved oxygen in the final effluent shall always be maintained above 4 mg/L. If dissolved oxygen level in the effluent drops below 4 mg/L and sustained for more than 12 hours, air shall be introduced into the effluent at the final effluent pumping station to bring the dissolved oxygen level in the effluent above 4 mg/L (subject to oxygen solubility criteria and measured at the outfall in manhole #10 real time).

3. Chloride

    a. Chloride level in the final effluent shall not exceed 640 mg/L (4-day moving average). If chloride concentration exceeds that threshold, the Owner shall notify the District Manager and CVC of this exceedance and its duration. The Owner shall investigate the cause and examine if all measures as identified in the receiver monitoring plan have been properly implemented and enforced to bring the chloride level below 640 mg/L. If all source control measures are exhausted, the Owner shall discuss with the Ministry and CVC to explore further avenues for chloride reduction in the influent.

12. LIMITED OPERATIONAL FLEXIBILITY

1. The Owner may make pre-authorized modifications to the sewage pumping stations and Sewage Treatment Plant in Works in accordance with the document "Limited Operational Flexibility - Protocol for Pre-Authorized Modifications to Municipal Sewage Works" (Schedule E), as amended, subject to the following:

    a. the modifications will not involve the addition of any new treatment process or the removal of an existing treatment process, including chemical systems, from the liquid or solids treatment trains as originally designed and approved.

    b. the scope and technical aspects of the modifications are in line with those delineated in Schedule E and conform with the Ministry's publication "Design Guidelines for Sewage Works 2008", as

amended, Ministry's regulations, policies, guidelines, and industry engineering standards;

c. the modifications shall not negatively impact on the performance of any process or equipment in the Works or result in deterioration in the Final Effluent quality;

d. where the pre-authorized modification requires notification, a "Notice of Modifications to Sewage Works" (Schedule E), as amended shall be completed with declarations from a Professional Engineer and the Owner and retained on-site prior to the scheduled implementation date. All supporting information including technical memorandum, engineering plans and specifications, as applicable and appropriate to support the declarations that the modifications conform with LOF shall remain on-site for future inspection.

2. The following modifications are not pre-authorized under Limited Operational Flexibility:

a. Modifications that involve addition or extension of process structures, tankages or channels;

b. Modifications that involve relocation of the Final Effluent outfall or any other discharge location or that may require reassessment of the impact to the receiver or environment;

c. Modifications that involve addition of or change in technology of a treatment process or that may involve reassessment of the treatment train process design;

d. Modifications that require changes to be made to the emergency response, spill prevention and contingency plan; or

e. Modifications that are required pursuant to an order issued by the Ministry.

13. REPORTING

1. The Owner shall report to the District Manager orally as soon as possible any non-compliance with the compliance limits, and in writing within seven (7) days of non-compliance.

2. The Owner shall, within fifteen (15) days of occurrence of a spill within the meaning of Part X of the EPA, submit a full written report of the occurrence to the District Manager describing the cause and discovery of the spill, clean-up and recovery measures taken, preventative measures to be taken and schedule of implementation, in addition to fulfilling the requirements under the EPA and O. Reg. 675/98 "Classification and Exemption of Spills and Reporting of Discharges".

3. The Owner shall, upon request, make all manuals, plans, records, data, procedures and supporting documentation available to Ministry staff.

4. The Owner shall prepare performance reports on a calendar year basis and submit to the District Manager and publish to the Town of Erin's website for public viewing by March 31 of the calendar year following the period being reported upon. The reports shall contain, but shall not be limited to, the following information pertaining to the reporting period:

a. a summary and interpretation of all Influent, Imported Sewage monitoring data, and a review of the historical trend of the sewage characteristics and flow rates;

b. a summary and interpretation of all Final Effluent monitoring data, including concentration, flow rates, loading and a comparison to the design objectives and compliance limits in this Approval, including an overview of the success and adequacy of the Works;

c. a summary of all normal and emergency repairs and maintenance activities carried out on any major structure, equipment, apparatus or mechanism forming part of the Works;

d. a summary of any effluent quality assurance or control measures undertaken;

e. a summary of the calibration and maintenance carried out on all Influent, Imported Sewage and Final Effluent monitoring equipment to ensure that the accuracy is within the tolerance of that equipment as required in this Approval or recommended by the manufacturer;

f. a summary of efforts made to achieve the design objectives in this Approval, including an assessment of the issues and recommendations for pro-active actions if any are required under the following situations:

    i. when any of the design objectives is not achieved more than 50% of the time in a year, or there is an increasing trend in deterioration of Final Effluent quality;

    ii. when the Annual Average Daily Influent Flow reaches 80% of the Rated Capacity;

g. a tabulation of the volume of sludge generated, an outline of anticipated volumes to be generated in the next reporting period and a summary of the locations to where the sludge was disposed;

h. a summary of any complaints received and any steps taken to address the complaints;

i. a summary of all Bypasses, Overflows, other situations outside Normal Operating Conditions and spills within the meaning of Part X of EPA and abnormal discharge events;

j. a summary of all Notice of Modifications to Sewage Works completed under Paragraph 1.d. of Condition 12, including a report on status of implementation of all modification;

k. a summary of efforts made to achieve conformance with Procedure F-5-1 including but not limited to projects undertaken and completed in the sanitary sewer system that result in overall Bypass/Overflow elimination including expenditures and proposed projects to eliminate Bypass/Overflows with estimated budget forecast for the year following that for which the report is submitted;

l. any changes or updates to the schedule for the completion of construction and commissioning operation of major process(es) / equipment groups in the Works;

m. a summary of any deviation from the monitoring schedule and reasons for the current reporting year

and a schedule for the next reporting year;

n. interpretation of all receiver monitoring data (i.e., surface water quality, fish and benthic communities data) in accordance with the Ministry approved receiver monitoring plan included in Schedule D.

5. The Owner shall prepare summary of all operating issues and corrective actions taken on a quarterly basis and submit to the District Manager and CVC, no later than each of the following dates for each calendar year: February 15, May 15, August 15, and November 15, and publish to the Town of Erin's website for public viewing. If there is no operating issues during a quarter, a statement of no operating issues is deemed sufficient.

14. VERIFICATION OF TREATMENT CAPABILITY - PROCESS TESTING

1. The Owner shall within eighteen (18) months of the implementation of the Works but before the Annual Average Daily Influent Flow reaches 5,073 m^3/d, carry a process testing of the Works for a minimum of one (1) year to simulate conditions representative of the Annual Average Daily Influent Flow of 7,172 m^3/d and Peak Hourly Flow Rate of 748 m^3/h to verify treatment capability of the Works in meeting the effluent requirements under this Approval.

2. At least (6) months prior to the scheduled commencement of the process testing for the verification of treatment capability of the ultrafiltration membrane process and the rest of the Works, the Owner shall prepare and submit to the Director a detailed Terms of Reference and implementation plan for review and approval.

3. Within six (6) months of the completion of the process testing, the Owner shall prepare a final report including a summary of all pertinent data, assessment and analysis, conclusions and recommendations for the treatment capability of the Works, and submit to the Director for review and concurrence.

15. CHLORIDE MANAGEMENT AT SOURCE

1. The Owner shall develop the following two programs and submit to the Ministry by January 31, 2023:

   a. an education program to address the use of home water softeners with the aim of reducing the chloride discharges to the sewer system; and

   b. a program to reduce road salt discharges to the West Credit River.

2. Upon agreement by the Ministry, the Owner shall implement reduction measures in Paragraph 1, report on implementation as part of annual performance reports outlined in Condition 13.4, and update the plans as required.

The reasons for the imposition of these terms and conditions are as follows:

1. Condition 1 regarding general provisions is imposed to ensure that the Works are constructed and operated

in the manner in which they were described and upon which approval was granted.

2. Condition 2 regarding change of Owner and Operating Agency is included to ensure that the Ministry records are kept accurate and current with respect to ownership and Operating Agency of the Works and to ensure that subsequent owners of the Works are made aware of the Approval and continue to operate the Works in compliance with it.

3. Condition 3 regarding construction of Works is included to ensure that the Works are constructed in a timely manner so that standards applicable at the time of Approval of the Works are still applicable at the time of construction to ensure the ongoing protection of the environment, and that prior to the commencement of construction of the portion of the Works that are approved in principle only, the Director will have the opportunity to review detailed design drawings, specifications and an engineer's report containing detailed design calculations for that portion of the Works, to determine capability to comply with the Ministry's requirements stipulated in the terms and conditions of the Approval, and also ensure that the Works are constructed in accordance with the Approval and that record drawings of the Works "as constructed" are updated and maintained for future references.

4. Condition 4 is included as installation, regular inspection and maintenance of the temporary sediment and erosion control measures is required to mitigate the impact on the downstream receiving watercourse during construction until they are no longer required.

5. Condition 5 regarding Bypasses is included to indicate that Bypass is prohibited, except in circumstances where the failure to Bypass could result in greater damage to the environment than the Bypass itself. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the Owner is aware of the extent and frequency of Bypass Events.

6. Condition 6 regarding Overflows is included to indicate that Overflow of untreated or partially treated sewage to the receiver is prohibited, except in circumstances where the failure to Overflow could result in greater damage to the environment than the Overflow itself. The notification and documentation requirements allow the Ministry to take action in an informed manner and will ensure the Owner is aware of the extent and frequency of Overflow Events.

7. Condition 7 regarding design objectives is imposed to establish non-enforceable design objectives to be used as a mechanism to trigger corrective action proactively and voluntarily before environmental impairment occurs.

8. Condition 8 regarding compliance limits is imposed to ensure that the Final Effluent discharged from the Works to the environment meets the Ministry's effluent quality requirements.

9. Condition 9 regarding operation and maintenance is included to require that the Works be properly operated, maintained, funded, staffed and equipped such that the environment is protected and deterioration, loss, injury or damage to any person or property is prevented. As well, the inclusion of a comprehensive operations manual governing all significant areas of operation, maintenance and repair is prepared, implemented and kept up-to-date by the Owner. Such a manual is an integral part of the operation of the Works. Its compilation and use should assist the Owner in staff training, in proper plant operation and in identifying and planning for contingencies during possible abnormal conditions. The manual will also act

as a benchmark for Ministry staff when reviewing the Owner's operation of the Works.

10. Condition 10 regarding monitoring and recording is included to enable the Owner to evaluate and demonstrate the performance of the Works, on a continual basis, so that the Works are properly operated and maintained at a level which is consistent with the design objectives and compliance limits.

11. Condition 11 regarding adaptive management and contingency plan is imposed to ensure that the Owner shall take corrective measures to protect the receiver from adverse effects when trigger criteria for contingency is met.

12. Condition 12 regarding Limited Operational Flexibility is included to ensure that the Works are constructed, maintained and operated in accordance with the Approval, and that any pre-approved modification will not negatively impact on the performance of the Works.

13. Condition 13 regarding reporting is included to provide a performance record for future references, to ensure that the Ministry is made aware of problems as they arise, and to provide a compliance record for this Approval.

14. Condition 14 is included to ensure that sufficient data is available to verify that the proposed ultrafiltration membrane process and the rest of the Works is capable of achieving the design objectives and the effluent compliance criteria on a long-term basis and under a range of operating conditions that will be encountered during full-scale operation.

15. Condition 15 is included to ensure aquatic life in the receiver is protected from adverse effects of chloride.

Schedule A

1. Application for Environmental Compliance Approval submitted by The Corporation of the Town of Erin received on May 21, 2021 for the proposed Town of Erin Water Resource Recovery Facility, including all supporting design documentation and information, plans and specifications.

Schedule B

Final Effluent Design Objectives

Concentration Objectives prior and upon Successful Verification of Treatment Capability

Final Effluent Parameter	Averaging Calculator	Objective
CBOD5	Monthly Average Effluent Concentration	3 mg/L
Total Suspended Solids	Monthly Average Effluent Concentration	3 mg/L
Total Phosphorus	Monthly Average Effluent Concentration	0.03 mg/L
Total Ammonia Nitrogen	Monthly Average Effluent Concentration	0.3 mg/L (May 15 - October 31) 1 mg/L (November 1 - May 14)
Nitrate Nitrogen	Monthly Average Effluent Concentration	4 mg/L
E. coli	Monthly Geometric Mean Density	*100 CFU/100 mL
pH	Single Sample Result	6.5 - 8.0 inclusive
Dissolved Oxygen	Single Sample Result	minimum 5 mg/L
Toxicity to Rainbow Trout and Daphnia magna	Single Sample Result	Non-acutely lethal
Temperature	4-Day Average	19 degrees Celsius

*If the MPN method is utilized for *E. coli* analysis the objective shall be 100 MPN/100 mL

Schedule C

Final Effluent Compliance Limits

Concentration Limits prior and upon Successful Verification of Treatment Capability

Final Effluent Parameter	Averaging Calculator	Limit
CBOD5	Monthly Average Effluent Concentration	5 mg/L
Total Suspended Solids	Monthly Average Effluent Concentration	5 mg/L
Total Phosphorus	Monthly Average Effluent Concentration	0.045 mg/L
Total Ammonia Nitrogen	Monthly Average Effluent Concentration	0.6 mg/L (May 15 - October 31) 2 mg/L (November 1 - May 14)
Nitrate Nitrogen	Monthly Average Effluent Concentration	5 mg/L
E. coli	Monthly Geometric Mean Density	*100 CFU/100 mL
pH	Single Sample Result	between 6.5 - 8.5 inclusive
Dissolved Oxygen	Single Sample Result	minimum 4 mg/L
Toxicity to Rainbow Trout and Daphnia magna	Single Sample Result	Non-acutely lethal (no more than 50% mortality)

*If the MPN method is utilized for *E. coli* analysis the limit shall be 100 MPN/100 mL

Loading Limits

Final Effluent Parameter	Averaging Calculator	Limit (maximum unless otherwise indicated)
CBOD5	Monthly Average Daily Effluent Loading	35.86 kg/d
Total Suspended Solids	Monthly Average Daily Effluent Loading	35.86 kg/d
Total Phosphorus	Monthly Average Daily Effluent Loading	0.32 kg/d
Total Ammonia Nitrogen	Monthly Average Daily Effluent Loading	4.3 kg/d (May 15 - October 31) 14.34 kg/d (November 1 - May 14)
Nitrate Nitrogen	Monthly Average Daily Effluent Loading	35.86 kg/d

Schedule D

Monitoring Program

Influent - Influent sampling point

Parameters	Sample Type	Minimum Frequency
BOD5	24 hour composite	Weekly
Total Suspended Solids	24 hour composite	Weekly
Total Phosphorus	24 hour composite	Weekly
Total Kjeldahl Nitrogen	24 hour composite	Weekly
Dissolved Reactive Phosphorous	24 hour composite	Weekly
Chloride	24 hour composite	Weekly
Temperature	Grab/Probe	Weekly

Imported Sewage - Imported Sewage Receiving Station

Parameters	Sample Type	Minimum Frequency*
BOD5	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Phosphorus	Grab	Monthly
Total Kjeldahl Nitrogen	Grab	Monthly

*When the septage receiving station receives septage.

Final Effluent - Final Effluent sampling point

Parameters	Sample Type	Minimum Frequency
CBOD5	24 hour composite	Weekly
Total Suspended Solids	24 hour composite	Weekly
Total Phosphorus	24 hour composite	Weekly
Dissolved Reactive Phosphorus	24 hour composite	Weekly
Total Ammonia Nitrogen	24 hour composite	Weekly
Total Kjeldahl Nitrogen	24 hour composite	Weekly
Nitrate as Nitrogen	24 hour composite	Weekly
Nitrite as Nitrogen	24 hour composite	Weekly
E. coli	Grab	Weekly
Acute Lethality to Rainbow Trout and Daphnia magna	Grab	Quarterly
Chloride	Grab/Probe/Analyzer	Daily
Dissolved Oxygen	Grab/Probe/Analyzer	Weekly
pH*	Grab/Probe/Analyzer	Weekly
Temperature*	Grab/Probe/Analyzer	Weekly
Un-ionized Ammonia**	As Calculated	Weekly

*pH and temperature of the Final Effluent shall be measured in the field at the time of sampling for Total Ammonia Nitrogen.

**The concentration of un-ionized ammonia shall be calculated using the total ammonia concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended.

Final Effluent - Final Effluent Real Time sampling point (Manhole #10)

Parameters	Sample Type	Minimum Frequency
Dissolved Oxygen	Probe	Every 15 Minutes
Temperature	Probe	Every 15 Minutes

Sludge/Biosolids – holding tank/truck loading bay

Parameters	Sample Type	Minimum Frequency
Total Solids	Grab	Quarterly
Total Phosphorus	Grab	Quarterly
Total Ammonia Nitrogen	Grab	Quarterly
Nitrate as Nitrogen	Grab	Quarterly
Metal Scan - Arsenic - Cadmium - Cobalt - Chromium - Copper - Lead - Mercury - Molybdenum - Nickel - Potassium - Selenium - Zinc	Grab	Quarterly

Surface Water - Surface Water Manual Monitoring at Stations U-001, D-001 and D-002

Parameters	Sample Type	Minimum Frequency
CBOD5	Grab	Monthly
Total Suspended Solids	Grab	Monthly
Total Ammonia Nitrogen	Grab	Monthly
Total Kjeldahl Nitrogen	Grab	Monthly
Nitrate Nitrogen	Grab	Monthly
Nitrite Nitrogen	Grab	Monthly
Total Nitrogen	Grab	Monthly
Total Phosphorous	Grab	Monthly
Dissolved Reactive Phosphorous	Grab	Monthly
Chloride	Grab	Monthly
E. coli	Grab	Monthly
Dissolved Oxygen*	Grab/Probe	Monthly
pH*	Grab/Probe	Monthly
Temperature*	Grab/Probe	Monthly
Specific Conductivity*	Grab/Probe	Monthly
Un-ionized Ammonia**	As Calculated	Monthly
Stream Flow***	Manual Measurement	Monthly
Water Level***	Manual Measurement	Monthly

U-001: approximately 250 m upstream of the outfall
D-001: approximately 150 m downstream of the outfall
U-002: approximately 700 m downstream of the outfall

*Dissolved oxygen, pH, temperature and specific conductivity of the Surface Water shall be measured in the field.

*pH and temperature of the Surface Water shall be measured in the field at the time of sampling for Total Ammonia Nitrogen.

**The concentration of un-ionized ammonia shall be calculated using the total ammonia concentration, pH and temperature using the methodology stipulated in "Ontario's Provincial Water Quality Objectives" dated July 1994, as amended.

***Stream Flow shall be manual measured at the time of collection of grab samples.

***Water Level shall be manual measured at the time of collection of grab samples.

Surface Water - Surface Water Real Time Monitoring at Stations U-001, D-001 and D-002

Parameters	Sample Type	Minimum Frequency
Chloride	Probe	Every 15 Minutes
Dissolved Oxygen	Probe	Every 15 Minutes
pH	Probe	Every 15 Minutes
Temperature	Probe	Every 15 Minutes
Specific Conductivity	Probe	Every 15 Minutes
Turbidity	Probe	Every 15 Minutes
Water level	As Measured Above Mean See Level	Every 15 Minutes

U-001: approximately 250 m upstream of the outfall
D-001: approximately 150 m downstream of the outfall
U-002: approximately 700 m downstream of the outfall

Receiver Monitoring and Mitigation Plan on surface water, fish communities and benthic invertebrates will be forming part of this ECA upon agreement by CVC and the Ministry.

Schedule E

Limited Operational Flexibility

Protocol for Pre-Authorized Modifications to Municipal Sewage Works

1. General

1. Pre-authorized modifications are permitted only where Limited Operational Flexibility has already been granted in the Approval and only permitted to be made at the pumping stations and sewage treatment plant in the Works, subject to the conditions of the Approval.

2. Where there is a conflict between the types and scope of pre-authorized modifications listed in this document, and the Approval where Limited Operational Flexibility has been granted, the Approval shall take precedence.

3. The Owner shall consult the District Manager on any proposed modifications that may fall within the scope and intention of the Limited Operational Flexibility but are not listed explicitly or included as an example in this document.

4. The Owner shall ensure that any pre-authorized modifications will not:

   a. adversely affect the hydraulic profile of the Sewage Treatment Plant or the performance of any upstream or downstream processes, both in terms of hydraulics and treatment performance;

   b. result in new Overflow or Bypass locations, or any potential increase in frequency or quantity of Overflow(s) or Bypass(es).

   c. result in a reduction in the required Peak Flow Rate of the treatment process or equipment as originally designed.

2. Modifications that do not require pre-authorization:

1. Sewage works that are exempt from Ministry approval requirements;

2. Modifications to the electrical system, instrumentation and control system.

3. Pre-authorized modifications that do not require preparation of "Notice of Modification to Sewage Works"

1. Normal or emergency maintenance activities, such as repairs, renovations, refurbishments and replacements with Equivalent Equipment, or other improvements to an existing approved piece of equipment of a treatment process do not require pre-authorization. Examples of these activities are:

   a. Repairing a piece of equipment and putting it back into operation, including replacement of minor

components such as belts, gear boxes, seals, bearings;

b. Repairing a piece of equipment by replacing a major component of the equipment such as motor, with the same make and model or another with the same or very close power rating but the capacity of the pump or blower will still be essentially the same as originally designed and approved;

c. Replacing the entire piece of equipment with Equivalent Equipment.

2. Improvements to equipment efficiency or treatment process control do not require pre-authorization. Examples of these activities are:

a. Adding variable frequency drive to pumps;

b. Adding on-line analyzer, dissolved oxygen probe, ORP probe, flow measurement or other process control device.

4. Pre-Authorized Modifications that require preparation of "Notice of Modification to Sewage Works"

1. Pumping Stations

a. Replacement, realignment of existing sewers including manholes, valves, gates, weirs and associated appurtenances provided that the modifications will not add new influent source(s) or result in an increase in flow from existing sources as originally approved.

b. Extension or partition of wetwell to increase retention time for emergency response and improve station maintenance and pump operation;

c. Replacement or installation of inlet screens to the wetwell;

d. Replacement or installation of flowmeters, construction of station bypass;

e. Replacement, reconfiguration or addition of pumps and modifications to pump suctions and discharge pipings including valve, gates, motors, variable frequency drives and associated appurtenances to maintain firm pumping capacity or modulate the pump rate provided that the modifications will not result in a reduction in the firm pumping capacity or discharge head or an increase in the peak pumping rate of the pumping station as originally designed;

f. Replacement, realignment of existing forcemain(s) including valves, gates, and associated appurtenances provided that the modifications will not reduce the flow capacity or increase the total dynamic head and transient in the forcemain.

2. Sewage Treatment Plant

1. Sewers and appurtenances

a. Replacement, realignment of existing sewers (including pipes and channels) or construction of new

sewers, including manholes, valves, gates, weirs and associated appurtenances within the a sewage treatment plant, provided that the modifications will not add new influent source(s) or result in an increase in flow from existing sources as originally approved and that the modifications will remove hydraulic bottlenecks or improve the conveyance of sewage into and through the Works.

2. Flow Distribution Chambers/Splitters

    a. Replacement or modification of existing flow distribution chamber/splitters or construction of new flow distribution chamber/splitters, including replacements or installation of sluice gates, weirs, valves for distribution of flows to the downstream process trains, provided that the modifications will not result in a change in flow distribution ratio to the downstream process trains as originally designed.

3. Imported Sewage Receiving Facility

    a. Replacement, relocation or installation of loading bays, connect/disconnect hook-up systems and unloading/transferring systems;

    b. Replacement, relocation or installation of screens, grit removal units and compactors;

    c. Replacement, relocation or installation of pumps, such as dosing pumps and transfer pumps, valves, piping and appurtenances;

    d. Replacement, relocation or installation of storage tanks/chambers and spill containment systems;

    e. Replacement, relocation or installation of flow measurement and sampling equipment;

    f. Changes to the source(s) or quantity from each source, provided that changes will not result in an increase in the total quantity and waste loading of each type of Imported Sewage already approved for co-treatment.

4. Preliminary Treatment System

    a. Replacement of existing screens and grit removal units with equipment of the same or higher process performance technology, including where necessary replacement or upgrading of existing screenings dewatering washing compactors, hydrocyclones, grit classifiers, grit pumps, air blowers conveyor system, disposal bins and other ancillary equipment to the screening and grit removal processes.

    b. Replacement or installation of channel aeration systems, including air blowers, air supply main, air headers, air laterals, air distribution grids and diffusers.

5. Primary Treatment System

    a. Replacement of existing sludge removal mechanism, including sludge chamber;

    b. Replacement or installation of scum removal mechanism, including scum chamber;

    c. Replacement or installation of primary sludge pumps, scum pumps, provided that the modifications will not result in a reduction in the firm pumping capacity or discharge head that the primary sludge pump(s) and scum pump(s) are originally designed to handle.

6. Secondary Treatment System

    1. Biological Treatment

        a. Conversion of complete mix aeration tank to plug-flow multi-pass aeration tank, including modifications to internal structural configuration;

        b. Addition of inlet gates in multi-pass aeration tank for step-feed operation mode;

        c. Partitioning of an anoxic/flip zone in the inlet of the aeration tank, including installation of submersible mixer(s);

        d. Replacement of aeration system including air blowers, air supply main, air headers, air laterals, air distribution grids and diffusers, provided that the modifications will not result in a reduction in the firm capacity or discharge pressure that the blowers are originally designed to supply or in the net oxygen transferred to the wastewater required for biological treatment as originally required.

    2. Secondary Sedimentation

        a. Replacement of sludge removal mechanism, including sludge chamber;

        b. Replacement or installation of scum removal mechanism, including scum chamber;

        c. Replacement or installation of return activated sludge pump(s), waste activated sludge pump(s), scum pump(s), provided that the modifications will not result in a reduction in the firm pumping capacity or discharge head that the activated sludge pump(s) and scum pump(s) are originally designed to handle.

7. Post-Secondary Treatment System

    a. Replacement of filtration system with equipment of the same filtration technology, including feed pumps, backwash pumps, filter reject pumps, filtrate extract pumps, holding tanks associated with the pumping system, provided that the modifications will not result in a reduction in the capacity of the filtration system as originally designed.

8. Disinfection System

    1. UV Irradiation

        a. Replacement of UV irradiation system, provided that the modifications will not result in a reduction in the design capacity of the disinfection system or the radiation level as originally designed.

    2. Chlorination/Dechlorination and Ozonation Systems

        a. Extension and reconfiguration of contact tank to increase retention time for effective disinfection and reduce dead zones and minimize short-circuiting;

        b. Replacement or installation of chemical storage tanks, provided that the tanks are provided with effective spill containment.

9. Supplementary Treatment Systems

    1. Chemical systems

        a. Replacement, relocation or installation of chemical storage tanks for existing chemical systems only, provided that the tanks are sited with effective spill containment;

        b. Replacement or installation of chemical dosing pumps provided that the modifications will not result in a reduction in the firm capacity that the dosing pumps are originally designed to handle.

        c. Relocation and addition of chemical dosing point(s) including chemical feed pipes and valves and controls, to improve phosphorus removal efficiency;

        d. Use of an alternate chemical provided that it is a non-proprietary product and is a commonly used alternative to the chemical approved in the Works, provided that the chemical storage tanks, chemical dosing pumps, feed pipes and controls are also upgraded, as necessary..

10. Sludge Management System

    1. Sludge Holding and Thickening

        a. Replacement or installation of sludge holding tanks, sludge handling pumps, such as transfer pumps, feed pumps, recirculation pumps, provided that modifications will not result in reduction in the solids storage or handling capacities;

    2. Sludge Digestion

        a. Replacement or installation of digesters, sludge handling pumps, such as transfer pumps, feed pumps, recirculation pumps, provided that modifications will not result in reduction in the solids

storage or handling capacities;

b. replacement of sludge digester covers.

3. Sludge Dewatering and Disposal

a. Replacement of sludge dewatering equipment, sludge handling pumps, such as transfer pumps, feed pumps, cake pumps, loading pumps, provided that modifications will not result in reduction in solids storage or handling capacities.

4. Processed Organic Waste

a. Changes to the source(s) or quantity from each source, provided that changes will not result in an increase in the total quantity already approved for co-processing.

11. Standby Power System

1. Replacement or installation of standby power system, including feed from alternate power grid, emergency power generator, fuel supply and storage systems, provided that the existing standby power generation capacity is not reduced.

12. Pilot Study

1. Small side-stream pilot study for existing or new technologies, alternative treatment process or chemical, provided:

a. all effluent from the pilot system is hauled off-site for proper disposal or returned back to the sewage treatment plant for at a point no further than immediately downstream of the location from where the side-stream is drawn;

b. no proprietary treatment process or propriety chemical is involved in the pilot study;

c. the effluent from the pilot system returned to the sewage treatment plant does not significantly alter the composition/concentration of or add any new contaminant/inhibiting substances to the sewage to be treated in the downstream process;

d. the pilot study will not have any negative impacts on the operation of the sewage treatment plant or cause a deterioration of effluent quality;

e. the pilot study does not exceed a maximum of two years and a notification of completion shall be submitted to the District Manager within one month of completion of the pilot project.

3. Final Effluent Disposal Facilities

a. Replacement or realignment of the Final Effluent channel, sewer or forcemain, including manholes, valves and appurtenances from the end of the treatment train to the discharge outfall section, provided

that the sewer conveys only effluent discharged from the Sewage Treatment Plant and that the replacement or re-aligned sewer has similar dimensions and performance criteria and is in the same or approximately the same location and that the hydraulic capacity will not be reduced.

This page contains an image of the form entitled "Notice of Modification to Sewage Works". A digital copy can be obtained from the District Manager.

Ontario

Ministry of the Environment, Conservation and Parks

Notice of Modification to Sewage Works

RETAIN COPY OF COMPLETED FORM AS PART OF THE ECA ON-SITE PRIOR TO THE SCHEDULED IMPLEMENTATION DATE.

Part 1 – Environmental Compliance Approval (ECA) with Limited Operational Flexibility

(Insert the ECA's owner, number and issuance date and notice number, which should start with "01" and consecutive numbers thereafter)

ECA Number	Issuance Date (mm/dd/yy)	Notice number (if applicable)

ECA Owner	Municipality

Part 2: Description of the modifications as part of the Limited Operational Flexibility

(Attach a detailed description of the sewage works)

Description shall include:
1. A detail description of the modifications and/or operations to the sewage works (e.g. sewage work component, location, size, equipment type/model, material, process name, etc.)
2. Confirmation that the anticipated environmental effects are negligible.
3. List of updated versions of, or amendments to, all relevant technical documents that are affected by the modifications as applicable, i.e. submission of documentation is not required, but the listing of updated documents is (design brief, drawings, emergency plan, etc.)

Part 3 – Declaration by Professional Engineer

I hereby declare that I have verified the scope and technical aspects of this modification and confirm that the design:
1. Has been prepared or reviewed by a Professional Engineer who is licensed to practice in the Province of Ontario;
2. Has been designed in accordance with the Limited Operational Flexibility as described in the ECA;
3. Has been designed consistent with Ministry's Design Guidelines, adhering to engineering standards, industry's best management practices, and demonstrating ongoing compliance with s.53 of the Ontario Water Resources Act; and other appropriate regulations.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name (Print)	PEO License Number

Signature	Date (mm/dd/yy)

Name of Employer

Part 4 – Declaration by Owner

I hereby declare that:
1. I am authorized by the Owner to complete this Declaration;
2. The Owner consents to the modification; and
3. This modifications to the sewage works are proposed in accordance with the Limited Operational Flexibility as described in the ECA.
4. The Owner has fulfilled all applicable requirements of the *Environmental Assessment Act*.

I hereby declare that to the best of my knowledge, information and belief the information contained in this form is complete and accurate

Name of Owner Representative (Print)	Owner representative's title (Print)

Owner Representative's Signature	Date (mm/dd/yy)

Schedule F

Methodology for Calculating and Reporting Monthly Average Effluent Concentration, Annual Average Effluent Concentration and Monthly Geometric Mean Density

1. Monthly Average Effluent Concentration

Step 1: Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar month and proceed as follows depending on the result of the calculation:

a. If the arithmetic mean does not exceed the compliance limit for the contaminant, then report and use this arithmetic mean as the Monthly Average Effluent Concentration for this parameter where applicable in this Approval;

b. If the arithmetic mean exceeds the compliance limit for the contaminant and there was no Bypass Event during the calendar month, then report and use this arithmetic mean as the Monthly Average Effluent Concentration for this parameter where applicable in this Approval;

c. If the arithmetic mean exceeds the compliance limit for the contaminant and there was Bypass Event(s) during the calendar month, then proceed to Step 2;

d. If the arithmetic mean does not exceed the compliance limit for the contaminant and there was Bypass Event(s) during the calendar month, the Owner may still elect to proceed to Step 2 calculation of the flow-weighted arithmetic mean.

Step 2: Calculate the flow-weighted arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar month and proceed depending on the result of the calculation:

a. Group No Bypass Days (**NBPD**) data and Bypass Days (**BPD**) data during a calendar month separately;

b. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all NBPD during a calendar month and record it as **Monthly Average NBPD Effluent Concentration**;

c. Obtain the "**Total Monthly NBPD Flow**" which is the total amount of Final Effluent discharged on all NBPD during the calendar month;

d. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all BPD during a calendar month and record it as **Monthly Average BPD Effluent Concentration**;

e. Obtain the "**Total Monthly BPD Flow**" which is the total amount of Final Effluent discharged on all BPD during the calendar month;

f. Calculate the flow-weighted arithmetic mean using the following formula:

[(Monthly Average NBPD Effluent Concentration × Total Monthly NBPD Flow) + (Monthly Average BPD Effluent Concentration × Total Monthly BPD Flow)] ÷ (Total Monthly NBPD Flow + Total Monthly BPD Flow)

It should be noted that in this method, if there are no Bypass Event for the month, the calculated result would be the same as the non-flow-weighted arithmetic mean method;

g. Report and use the lesser of the flow-weighted arithmetic mean obtained in Step 2 and the arithmetic mean obtained in Step 1 as the Monthly Average Effluent Concentration for this parameter where applicable in this Approval.

2. Annual Average Effluent Concentration

Step 1: Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar year and proceed as follows depending on the result of the calculation:

a. If the arithmetic mean does not exceed the compliance limit for the contaminant, then report and use this arithmetic mean as the Annual Average Effluent Concentration for this parameter where applicable in this Approval;

b. If the arithmetic mean exceeds the compliance limit for the contaminant and there was no Bypass Event during the calendar year, then report and use this arithmetic mean as the Annual Average Effluent Concentration for this parameter where applicable in this Approval;

c. If the arithmetic mean exceeds the compliance limit for the contaminant and there was Bypass Event(s) during the calendar year, then proceed to Step 2;

d. If the arithmetic mean does not exceed the compliance limit for the contaminant and there was Bypass Event(s) during the calendar year, the Owner may still elect to proceed to Step 2 calculation of the flow-weighted arithmetic mean.

Step 2: Calculate the flow-weighted arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured during a calendar year and proceed depending on the result of the calculation:

a. Group No Bypass Days (**NBPD**) data and Bypass Days (**BPD**) data during a calendar year separately;

b. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all NBPD during a calendar year

and record it as **Annual Average NBPD Effluent Concentration**;

c. Obtain the "**Total Annual NBPD Flow**" which is the total amount of Final Effluent discharged on all NBPD during the calendar year;

d. Calculate the arithmetic mean of all Single Sample Results of the concentration of a contaminant in the Final Effluent sampled or measured on all BPD during a calendar year and record it as **Annual Average BPD Effluent Concentration**;

e. Obtain the "**Total Annual BPD Flow**" which is the total amount of Final Effluent discharged on all BPD during the calendar year;

f. Calculate the flow-weighted arithmetic mean using the following formula:

[(Annual Average NBPD Effluent Concentration × Total Annual NBPD Flow) + (Annual Average BPD Effluent Concentration × Total Annual BPD Flow)] ÷ (Total Annual NBPD Flow + Total Annual BPD Flow)

It should be noted that in this method, if there are no Bypass Event for the calendar year, the calculated result would be the same as the non-flow-weighted arithmetic mean method;

g. Report and use the lesser of the flow-weighted arithmetic mean obtained in Step 2 and the arithmetic mean obtained in Step 1 as the Annual Average Effluent Concentration for this parameter where applicable in this Approval.

3. Monthly Geometric Mean Density

Geometric mean is defined as the n^{th} root of the product of n numbers. In the context of calculating Monthly Geometric Mean Density for *E. coli*, the following formula shall be used:

$$\sqrt[n]{x_1 x_2 x_3 \cdots x_n}$$

in which,

"n" is the number of samples collected during the calendar month; and

"x" is the value of each Single Sample Result.

For example, four weekly grab samples were collected and tested for *E. coli* during the calendar month. The *E. coli* densities in the Final Effluent were found below:

Sample Number	*E. coli* Densities* (CFU/100 mL)
1	10
2	100
3	300
4	50

The Geometric Mean Density for these data:

$$\sqrt[4]{10 \times 100 \times 300 \times 50} = 62$$

*If a particular result is zero (0), then a value of one (1) will be substituted into the calculation of the Monthly Geometric Mean Density. If the MPN method is utilized for E. coli analysis, values in the table shall be MPN/100 mL.

Schedule G

Municipal and Local Services Board Wastewater System
Profile Information Form

(For reference only, images of the form are attached on the next four pages. A digital copy can be obtained from the District Manger.)

Ontario

Ministry of the Environment, Conservation and Parks

Municipal and Local Services Board Wastewater System Profile Information Form

The information in this form is necessary to administer the Ministry's approvals, compliance and enforcement programs with respect to wastewater treatment and collection systems owned by municipalities and local services boards. These programs are authorized under the *Ontario Water Resources Act*, the *Environmental Protection Act*, the *Nutrient Management Act* and their respective regulations.

Email the completed form to: waterforms@ontario.ca
For any questions call 1-866-793-2588.

[A] SYSTEM PROFILE INFORMATION

Wastewater System Number *(if assigned)*

☐ New Profile
☐ Update Existing Profile

Name of System

Name of Municipality or Local Services Board

Level of Treatment (select one*)
☐ Primary
☐ Secondary
☐ Tertiary
☐ Secondary Equivalent
☐ Other (specify):
*See Terms and Concepts on page 4

Population Served | Population (Design)

Type of System
☐ Treatment & Collection System ☐ Collection System Only

Design Rated Capacity (m^3/day) | Peak Flow Rate (m^3/day) | Current Environmental Compliance Approval (ECA) Number | Current ECA Issue Date (yyyy/mm/dd):

The treatment plant receives sewage from: (Check all that applies.* If you have checked more than one option below, indicate the approximate %)
☐ Sanitary Sewer ☐ Combined Sewer
☐ Nominally Separated Sewer ☐ Partially Separated Sewer *See Terms and Concepts on page 4

[B] OWNER INFORMATION

Legal Name of Municipality or Local Services Board

Unit No	Street No.	Street Name.	Street Type (St, Rd, etc)	Street Direction (N,S,E,W)

PO Box	City/Town	Postal Code

☐ Dr ☐ Miss ☐ Mr ☐ Mrs ☐ Ms	Owner Contact First Name	Owner Contact Last Name	Owner Contact Job Title

Tel. No. ( ) - ext.	Fax Number ( ) -	Email address

[C] OPERATING AUTHORITY ☐ Check if same as owner

Legal Name of Operator

Unit No	Street No.	Street Name.	Street Type (St, Rd, etc)	Street Direction (N,S,E,W)

PO Box	City/Town	Postal Code

☐ Dr ☐ Miss ☐ Mr ☐ Mrs ☐ Ms	Operator Contact First Name	Operator Contact Last Name	Operator Contact Job Title

Tel. No. ( ) - ext.	Fax Number ( ) -	Email address

[D] 24/7 CONTACT

☐ Dr ☐ Miss ☒ Mr ☐ Mrs ☐ Ms	First Name	Last Name	Job Title
Tel. No. ( ) - ext.	Fax Number ( ) -	Email address	

[E] SYSTEM CIVIC LOCATION ADDRESS (I.E. ADDRESS OF TREATMENT PLANT)

Unit No	Street No.	Street Name.	Street Type (St, Rd, etc)	Street Direction (N,S,E,W)

PO Box	City/Town	Postal Code

If the Wastewater System has no street address

Geographical Township	Lot	Concession

Geographical Referencing (if known, enter the Geographical Reference Information for this Wastewater System)

Map Datum	Geo-Referencing Method	Accuracy Estimate	Location Reference	
Latitude	**Longitude**	**Zone**	**Easting**	**Northing**

[F] TREATMENT PROCESS

Preliminary	Primary	Secondary	Secondary Equivalent	Post-Secondary	Additional Treatment
☐ Screening	☐ Settling/sedimentation/ clarification	☐ Conventional Activated Sludge (CAS)	☐ Aerated Lagoon	☐ Filtration	☐ Phosphorous Removal
☐ Shredding/ grinding	☐ Scum Removal	☐ Extended Aeration	☐ Facultative Lagoon	☐ Clarification	☐ Biological ☐ Chemical
☐ Grit Removal	☐ Polymer Addition	☐ Membrane Bioreactor (MBR)	☐ Anaerobic Lagoon	☐ Intermittent Sand Filter (after lagoons)	If chemical is used, specify:
☐ Other(specify):	☐ Other(specify):	☐ Sequencing Batch Reactor (SBR)	☐ Aerobic Lagoon	☐ Polishing Wetlands	☐ Nitrification
		☐ Rotating Biological Contactor (RBC)	☐ Other(specify):	☐ Polishing Lagoons	☐ Denitrification
		☐ Trickling Filter (TF)		☐ Other(specify):	☐ Other(specify):
		☐ Biological Aerated Filter (BAF)			
		☐ Other(specify):			

[G] DISINFECTION

Method of Disinfection	Disinfection Period
☐ Chlorination If you chlorinate, do you practice de-chlorination? ☐ Yes ☐ No	☐ Continuous ☐ Seasonal
☐ Ultraviolet Irradiation	☐ Continuous ☐ Seasonal
☐ Other (specify):	☐ Continuous ☐ Seasonal

[H] SLUDGE	
Sludge Stabilization Process	Method of Sludge Disposal/Utilization
☐ Aerobic Digestion	☐ Agricultural
☐ Anaerobic Digestion	☐ Landfill
☐ Drying & Pelletization	☐ Incineration
☐ Lime Treatment	☐ Other (specify):
☐ Composting	
☐ Other (specify):	
Available Sludge Storage Capacity (m^3):	

[I] EFFLUENT	
Effluent Disposal Method	Effluent Discharge Frequency
☐ Surface Water Receiving Water Body Name:	☐ Continuous ☐ Seasonal
☐ Subsurface	☐ Continuous ☐ Seasonal
☐ Other (specify):	☐ Continuous ☐ Seasonal

Is the effluent discharged in a vulnerable area identified in the local source protection assessment report approved under the Clean Water Act, 2006?
☐ Yes ☐ No

[J] INFLUENT

Does the plant receive sewage from another municipality or local services board either through an interconnected collection system or hauled sewage?
☐ Yes ☐ No
(if yes, name(s) of other municipality or local services board):

Plant receives:
☐ Leachate (approximate annual volume in m^3):
☐ Septage (approximate annual volume in m^3):
☐ Industrial input (approximate annual volume in m^3):
or (approximate volume in %):

Terms and Concepts

The following Terms and Concepts are provided to assist you when completing Wastewater System Profile Information Form.

In order to determine the level of treatment that applies to the wastewater system, the effluent quality objectives that the wastewater treatment plant was designed to meet must be considered. The process based approach often used in the past has led to confusion and is open to interpretation due to recent developments and practices in the wastewater treatment industry. For example, a plant with a high rate filter (often referred to as a tertiary filter) after its secondary treatment was considered a tertiary treatment in the past since the filter was designed and operated to produce a tertiary quality effluent. However, secondary plants are now being constructed with these filters as a safeguard against any potential secondary clarifier performance degradation and not for the purpose of ensuring tertiary treatment performance. Also, new technologies have evolved that can produce tertiary quality effluent without having these high rate filters (e.g., membrane bioreactors). Lagoons were considered in the past as being capable of providing only secondary equivalent treatment. However, with add-on treatment after the lagoons (e.g. intermittent sand filters), many lagoon treatment systems are capable of producing secondary or tertiary quality effluent.

During the establishment of sewage works, site-specific effluent limits (including averaging periods) are provided by the Ministry's Regional Technical Support Section, considering the assimilative capacity of the receivers and the minimum treatment requirements provided in Procedure F-5-1. The designer of the sewage works then selects objective values that are acceptable to the Ministry and are less (i.e. more stringent) than the effluent limits , in order to provide an adequate safety factor based on the designer's confidence/experience with the technology chosen and other site-specific conditions. The sewage works are then designed (and operated) to meet these design objectives in a reliable and consistent manner. Therefore, the values that are to be used in the determination of the level of treatment that applies to the sewage works must be based on the design objectives, and not the effluent limits.

Two common parameters used in almost all sewage works designs and performance evaluations are $CBOD_5$ (carbonaceous biochemical oxygen demand) (BOD_5 – biochemical oxygen demand - for primary sewage works) and total suspended solids (TSS). Therefore, it is logical that the **objective values** of these two parameters are used to determine the level of treatment at the sewage works.

Level of Treatment:

Primary:
Wastewater treatment plants that have only settling/sedimentation (with or without chemical addition) and providing 30% and 50% or better reduction of BOD_5 and TSS respectively are considered primary plants (MOE Procedures F-5-1 and F-5-5).

Secondary:
Wastewater treatment plants that have biological processes (e.g. activated sludge process and its variations, fixed film processes) or physical-chemical processes producing an effluent quality of $CBOD_5$ and TSS of 15 mg/L or better are considered secondary plants (MOE Design Guidelines for Sewage Works, 2008).

Secondary Equivalent:
Wastewater treatment plants producing an effluent quality of $CBOD_5$ of 25 mg/L and TSS of 30 mg/L or better are considered as secondary equivalent plants.

Note: Wastewater treatment plants that provide only primary settling of solids and the addition of chemicals to improve the removal of TSS (and phosphorus) are not considered as secondary treatment plants or secondary equivalent plants (MOE Design Guidelines for Sewage Works, 2008).

Tertiary:
Wastewater treatment plants that have biological processes (e.g. activated sludge process and its variations, fixed film processes) and/or physical-chemical processes producing an effluent quality of $CBOD_5$ and TSS of 5 mg/L or better are considered tertiary plants.

Note: Biological processes such as nitrification, denitrification and enhanced biological phosphorus removal can be part of either a secondary or tertiary treatment plant. They may be described as secondary treatment plant with nitrification, secondary treatment plant with enhanced biological phosphorus removal, tertiary treatment plant with nitrification etc.

Sewer System Type:

Sanitary Sewers:
Pipes that convey sanitary sewage flows made up of wastewater discharges from residential, commercial, institutional and industrial establishments plus extraneous flow components from such sources as groundwater and surface run off.

Combined Sewers:
Pipes that convey both sanitary sewage and stormwater runoff through a single-pipe system.

Partially Separated Sewers:
Exist when either a portion of the combined sewer area was retrofitted to separate (sanitary and storm) sewers and/or a service area with combined sewers has had a new development area with separate sewers added to the service area; whatever the case may be, the final flows will be combined sewage.

Nominally Separated Sewers:
These sewers are constructed as separate sewers, but the sanitary sewers accept stormwater from roof and foundation drains (i.e., these are separated sewers in name only).

In accordance with Section 139 of the *Environmental Protection Act,* you may by written notice served upon me and the Ontario Land Tribunal within 15 days after receipt of this notice, require a hearing by the Tribunal. Section 142 of the *Environmental Protection Act* provides that the notice requiring the hearing ("the Notice") shall state:

a. The portions of the environmental compliance approval or each term or condition in the environmental compliance approval in respect of which the hearing is required, and;
b. The grounds on which you intend to rely at the hearing in relation to each portion appealed.

The Notice should also include:

1. The name of the appellant;
2. The address of the appellant;
3. The environmental compliance approval number;
4. The date of the environmental compliance approval;
5. The name of the Director, and;
6. The municipality or municipalities within which the project is to be engaged in.

And the Notice should be signed and dated by the appellant.

This Notice must be served upon:

Registrar*
Ontario Land Tribunal
655 Bay Street, Suite 1500
Toronto, Ontario
M5G 1E5
OLT.Registrar@ontario.ca

and

The Director appointed for the purposes of
Part II.1 of the *Environmental Protection Act*
Ministry of the Environment,
Conservation and Parks
135 St. Clair Avenue West, 1st Floor
Toronto, Ontario
M4V 1P5

*** Further information on the Ontario Land Tribunal's requirements for an appeal can be obtained directly from the Tribunal at: Tel: (416) 212-6349 or 1 (866) 448-2248, or www.olt.gov.on.ca**

The above noted activity is approved under s.20.3 of Part II.1 of the *Environmental Protection Act.*

DATED AT TORONTO this 3rd day of May, 2022

Aziz Ahmed, P.Eng.
Director
appointed for the purposes of Part II.1 of the
Environmental Protection Act

LW/
c: District Manager, DWECD, MECP Guelph
Michelle Albert, WSP Canada Inc.