Alberta Environment and Parks

APPROVAL

PROVINCE OF ALBERTA

ENVIRONMENTAL PROTECTION AND ENHANCEMENT ACT
R.S.A. 2000, c.E-12, as amended.

APPROVAL NO.: 361975-00-00

APPLICATION NO.: 001-361975

EFFECTIVE DATE: May 29, 2015

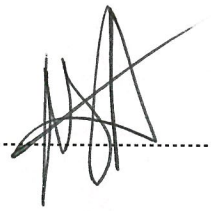
EXPIRY DATE: MAY 1, 2025

APPROVAL HOLDER: EPCOR WATER SERVICES INC.

ACTIVITY: Construction, operation and reclamation of the Gold Bar Wastewater Treatment Plant serving the City of Edmonton, City of Leduc, Town of Beaumont, Nisku Business Park and Edmonton International Airport

is subject to the attached terms and conditions.

Designated Director under the Act



Date Signed May 29, 2015

TERMS AND CONDITIONS ATTACHED TO APPROVAL

PART 1: DEFINITIONS

SECTION 1.1: DEFINITIONS

1.1.1 All definitions from the Act and the regulations apply except where expressly defined in this approval.

1.1.2 In all PARTS of this approval:

(a) "Act" means the *Environmental Protection and Enhancement Act*, R.S.A. 2000, c.E-12, as amended;

(b) "application" means the written submissions to the Director in respect of application number 001-361975 and any subsequent applications for amendments of approval number 361975-00-00;

(c) "arithmetic mean" means the sum of all the sample analysis results divided by the total number of samples per reporting period;

(d) "BOD_5" means the Biochemical Oxygen Demand in milligrams per litre measured at 20°C over a 5 day period;

(e) "$CBOD_5$" means the carbonaceous BOD_5 in milligrams per litre which is measured after the nitrogenous demand has been inhibited with an inhibitory chemical;

(f) "chemical" means any substance that is added or used as part of the treatment process;

(g) "composite sample" means a refrigerated (approximately 4°C) sample consisting of not less than twelve portions of equal volume which are representative of the stream sampled, collected over a 24 hour period, at a rate proportional to the flow rate of the stream sampled,

(h) "continuous monitoring" means sampling or flow measurement through equipment that creates an uninterrupted output of the analysis or flow measurement;

(i) "day" means calendar day;

(j) "Director" means an employee of the Government of Alberta designated as a Director under the Act;

(k) "dry weather condition" means a condition where wastewater flow is not impacted by the run off from snow melt or rainfall;

(l) "*E. Coli* " means *Escherichia coli* bacteria;

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(m) "enhanced primary treatment (EPT)" means coagulant aided primary treatment for a better removal of contaminants by settlement;

(n) "geometric mean" means the calculated n^{th} root of the product of all the sample analyses within the reporting period, where n equals the total number of samples within the reporting period, as follows;

$$\text{Geometric Mean} = \sqrt[n]{S_1 \times S_2 \times S_3 \times \ldots \times S_n)}$$

where,
n = the total number of samples within the reporting period
S_1 = the 1^{st} sample analysis value
S_n = the n^{th} sample analysis value

(o) "grab sample" means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;

(p) "ISO 17025" means the international standard, developed and published by International Organization for Standardization (ISO), specifying management and technical requirements for laboratories;

(q) "nutrient removal" means the chemical, physical or biological treatment of the wastewater to reduce the amounts of total phosphorus and total nitrogen in the treated effluent;

(r) "regulations" means the regulations issued pursuant to the Act and as amended;

(s) "primary treatment" means treatment where the untreated wastewater is passed through clarifiers to settle the solids;

(t) "secondary treatment" means treatment where aeration takes place and the dissolve organics are removed from the wastewater;

(u) "sludge" means the settled solids collected from the primary and secondary clarifiers;

(v) "total ammonia-nitrogen" means the total of ionized ammonia-nitrogen (NH_4^+-N) and un-ionized ammonia-nitrogen (NH_3-N), measured in milligram per litre;

(w) "TKN" means total Kjeldhal nitrogen which includes organic nitrogen and total ammonia-nitrogen, measured in milligram per litre;

(x) "total loading" means the annual mass of a substance released to flowing water bodies from all sources under the control of the approval holder;

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(y) "total nitrogen" means the calculated total of TKN, nitrate-nitrogen and nitrite nitrogen;

(z) "TP" means total phosphorus measured in milligram per litre;

(aa) "TSS" means the total suspended solids or non-filterable residue (NFR) measured in milligrams per litre;

(bb) "tertiary treatment" means treatment beyond secondary treatment and includes but not limited to disinfection and nutrient removal;

(cc) "uncommitted hydraulic reserve capacity" means the design capacity of the wastewater treatment plant minus the sum of the peak daily flow and the peak daily flow that would be used by development that is approved but not yet built;

(dd) "wastewater treatment plant" means the physical components of the wastewater system that are used to treat wastewater including components associated with the management of any wastes generated during treatment and includes the land located within Southwest of Section 12, Township 53, Range 24, West of the 4th Meridian, that is being or has been used or held for or in connection with the Gold Bar Wastewater Treatment Plant at 10977-50 Street;

(ee) "week" means calendar week;

(ff) "wet weather condition" means a condition where wastewater flow is impacted by the run off from snow melt or rainfall; and

(gg) "year" means calendar year.

PART 2: GENERAL

SECTION 2.1: GENERAL

2.1.1 The approval holder shall immediately report by telephone any contravention of the terms and conditions of this approval to the Director at 1-780-422-4505.

2.1.2 In addition to reporting pursuant to 2.1.1, the approval holder shall submit, within 7 days from any contravention of the terms and conditions of this approval, a written report to the Director.

2.1.3 The terms and conditions of this approval are severable. If any term or condition of this approval or the application of any term or condition is held invalid, the application of such term or condition to other circumstances and the remainder of this approval shall not be affected thereby.

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SECTION 2.2: RECORD KEEPING

2.2.1 The approval holder shall record and retain all the following information in respect of any sampling conducted or analyses performed for a minimum of three years:

(a) the place, date and time of sampling;

(b) the dates the analyses were performed;

(c) the analytical techniques, methods or procedures used in the analyses;

(d) the names of the persons who collected and analyzed each sample; and

(e) the results of the analyses.

SECTION 2.3: ANALYTICAL REQUIREMENTS

2.3.1 Collection, preservation, storage, handling and analysis of samples, and reporting shall be conducted in accordance with the following unless otherwise specified in writing by the Director:

(a) the *Standard Methods for the Examination of Water and Wastewater* published jointly by the American Public Health Association, American Water Works Association, and the Water Environment Federation, as amended; and/or

(b) the *United States Environmental Protection Agency (USEPA) Water and Wastewater Methods* approved by USEPA from time to time *in the Code of Federal Regulations Title 40 Part 136*; and/or

(c) the *American Society for Testing and Materials (ASTM) water and wastewater methods* approved by the USEPA from time to time in the *Code of Federal Regulations Title 40 Part 136;*

(d) Toxicity tests:

(i) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Rainbow Trout*, Environment Canada, Environmental Protection Series 1/RM/13, December 2000, as amended;

(ii) the *Biological Test Method: Reference Method for Determining Acute Lethality of Effluents to Daphnia Magna*, Environment Canada, Environmental Protection Series 1/RM/14, December 2000, as amended;

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(iii) the *Biological Test Method: Growth Inhibition Test Using the Freshwater Alga Selenastrum capricornutum*, Environment Canada, Environmental Protection Series 1/RM/25, March 2007, as amended;

(iv) the *Biological Test Method: Test of Reproduction and Survival Using the Cladoceran Ceriodaphnia dubia*, Environment Canada, Environmental Protection Series 1/RM/21, February 2007, as amended;

(v) the *Biological Test Method: Test of Larval Growth and Survival Using Fathead Minnows*, Environment Canada, Environmental Protection Series 1/RM/22, February 2011, as amended; and

(vi) the *Biological Test Method: Toxicity Test Using Luminescent Bacteria (Photobacterium phosphoreum)*, Environment Canada, Environmental Protection Series, 1/RM/24, November 1992, as amended.

2.3.2 The approval holder shall analyse all samples that are required to be obtained by this approval in a laboratory accredited pursuant to ISO 17025, as amended, and accredited for the specific parameter(s) to be analysed, unless otherwise authorized in writing by the Director.

2.3.3 The term sample as used in clause 2.3.2 does not include samples directed to continuous monitoring equipment, until specifically required in writing by the Director.

2.3.4 The approval holder shall comply with the terms and conditions of any written authorization issued by the Director under 2.3.2.

PART 3: CONSTRUCTION AND UPGRADING REQUIREMENTS

3.1.1 The approval holder shall:

(a) assist City of Edmonton in implementing the *Combined Sewer Overflow Control Strategy* as outlined in the *Combined Sewer Discharge Strategy* (June 2013), unless otherwise authorized in writing by the Director; and

(b) coordinate with the City of Edmonton to maximize treatment during wet weather conditions.

PART 4: OPERATIONS

SECTION 4.1: GENERAL

4.1.1 The approvals holder shall coordinate with the City of Edmonton and Alberta Capital Region Wastewater Commission to update and implement the *Total Loading Management Plan* as authorized in writing by the Director.

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4.1.2 The approval holder shall conduct Effluent Characterization as requested in writing by the Director.

4.1.3 The approval holder shall conduct a Pollution Minimization Study as requested in writing by the Director.

SECTION 4.2: WASTEWATER TREATMENT PLANT

4.2.1 The approval holder shall not release any substances from the Gold Bar Wastewater Treatment Plant to the surrounding watershed except as authorized under this approval.

4.2.2 The approval holder shall operate the Gold Bar Wastewater Treatment Plant consisting of all of the following treatment units as a minimum:

(a) bar screening;

(b) aerated grit removal;

(c) primary treatment;

(d) enhanced primary treatment;

(e) biological activated sludge process with capability for nutrients removal;

(f) chemical phosphorus trimming;

(g) secondary clarification;

(h) UV disinfection;

(i) Membrane filtration for effluent reuse;

(j) Odour control; and

(k) sludge treatment, including all of the following at a minimum:

(i) primary sludge fermentation,

(ii) sludge thickening by dissolved air floatation (DAF),

(iii) anaerobic sludge digestion,

(iv) digested sludge transmission pipeline from the Gold Bar Wastewater Treatment Plant to the City of Edmonton's Clover Bar Biosolids Lagoons located at NE 21-53-23-W4M, and

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(v) Supernatant of Clover Bar Biosolids Lagoons returning to the Gold Bar Wastewater Treatment Plant or the Alberta Capital Region Wastewater Treatment Plant located at SW 3-54-23-W4M.

SECTION 4.3: OPERATIONS PLANS

4.3.1 The approval holder shall maintain and update the *Wastewater Treatment Operations Plan* as per this approval to include all of the following at a minimum:

(a) Wastewater Treatment Certified Operator Requirements;

(b) Communications Protocol;

(c) Preventive and Corrective Maintenance Protocol for Maximizing Treatment Capacity;

(d) Standard Operating Procedure of the biological nutrients removal (BNR) Process

(i) Nitrification Maintenance Protocol,

(ii) Nitrification Recovery Strategy Protocol,

(iii) Improved Nitrogen Removal Protocol, and

(iv) Phosphorus Removal Protocol;

(e) Treatment Facility Hydraulic and Organic Loading Capacity Estimates and Plans for Future Capacity and/or Effluent Quality Improvements;

(f) Sludge and Solids Disposal Protocol;

(g) Wastewater Treatment System Chemical Usage Protocol;

(h) Odour Control and Management Protocol;

(i) Effluent Toxicity Testing Protocol;

(j) Treated Effluent Reuse Protocol;

(k) Monitoring Protocol;

(l) Digester Gas Protocol;

(m) Laboratory Accreditation Program;

(n) Wet Weather Operations Protocol including

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(i) Wet Weather Reporting Protocol,

(ii) EPT-Secondary Bypass Protocol,

(iii) Enhanced Primary Treatment Protocol,

(iv) Wet weather Solids Handling Protocol;

(o) Capital Construction, Commission and Performance Testing Protocol; and

(p) River Load Calculation Protocol.

4.3.2 On or before May 1, 2016 the approval holder shall submit a copy of the up-to-date *Wastewater Treatment Operations Plan* to the Director.

4.3.3 The approval holder shall submit a summary of the proposed changes to the *Wastewater Treatment Operations Plan* to the Director by May 1 of each year after 2016.

4.3.4 If *the Wastewater Treatment Operations Plan*, or any part of it, is found to be deficient by the Director, the approval holder shall correct all deficiencies as outlined by the Director within 120 days of the deficiency letter.

4.3.5 The approval holder shall implement the *Wastewater Treatment Operations Plan.*

SECTION 4.4: CERTIFIED OPERATOR REQUIREMENTS

4.4.1 At all times the operation of the wastewater treatment plant shall be performed by, or under the direction of the following number of persons who hold valid certificates of qualification of the following types at the following minimum levels:

(a) two operators each with a Level IV Wastewater Treatment (WWT) Certificate, and

(b) three operators each with a Level III or higher WWT Certificate, and

(c) one operator with a Level II or higher WWT certificate, in charge of each shift.

SECTION 4.5: SLUDGE DISPOSAL

4.5.1 The approval holder shall manage sludge as per the *Sludge and Solids Disposal Protocol*, or as authorized in writing by the Director.

SECTION 4.6: CHEMICALS USED

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4.6.1 The approval holder shall only use chemicals in the wastewater system as described in the *Wastewater Treatment System Chemical Use Protocol*, or as authorized in writing by the Director.

SECTION 4.7: DIGESTER GAS

4.7.1 The approval holder shall dispose of the digester gas by using the gas as a fuel source for one or both of the followings:

(a) On-site heat; and

(b) Power generation.

4.7.2 In the event the excess gas cannot be consumed by the heating and/or power generating equipment, the gas may be flared.

4.7.3 The main flare stack shall be equipped with a suitable wind guard, continuously burning pilot lights and electric lighters to ensure combustion of any gases released to the flare stack.

PART 5: LIMITS

5.1.1 The approval holder shall release treated wastewater from the wastewater treatment plant only as follows:

(a) continuously

(i) to the North Saskatchewan River; and/or

(ii) for effluent reuse water; or

(b) as otherwise authorized in writing by the Director.

5.1.2 The approval holder shall ensure the treated wastewater discharge complies with the limits specified in TABLE 5-1.

5.1.3 The approval holder shall not bypass the untreated or partially treated wastewater into the North Saskatchewan River during dry weather conditions.

5.1.4 The approval holder shall not bypass the untreated or partially treated wastewater to the North Saskatchewan River during periods of wet weather conditions unless the wastewater flows exceed the seasonal target operating capacities specified in the *Wastewater Treatment Operations Plan*.

5.1.5 The approval holder shall carry out preventive maintenance of the wastewater treatment systems in accordance with the *Wastewater Treatment Operations Plan* to maximize the treatment of all plant inflows.

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TABLE 5-1: LIMITS FOR TREATED WASTEWATER

Parameter	Limit
$CBOD_5$	≤ 20 mg/L monthly arithmetic mean of daily composite samples
TSS	≤ 20 mg/L monthly arithmetic mean of daily composite samples
Total Phosphorus	≤ 1.0 mg/L monthly arithmetic mean of daily composite samples
Total Ammonia-nitrogen (December 1 to May 31)	≤ 10 mg/L monthly arithmetic mean of daily composite samples
Total Ammonia-nitrogen (June 1 to November 30)	≤ 5.0 mg/L monthly arithmetic mean of daily composite samples
E. Coli	≤ 126 per 100 mL/monthly geometric mean
pH	6.5-8.5

PART 6: MONITORING, REPORTING AND RECORD KEEPING

6.1.1 The approval holder shall monitor the wastewater treatment system as required in TABLE 6-1.

TABLE 6-1: MONITORING – WASTEWATER TREATMENT PLANT

Parameter	Frequency (Minimum)	Sample Type	Sampling Location
UNTREATED WASTEWATER			
pH BOD_5 TSS Total Phosphorus Total Ammonia-nitrogen	Once per day	Composite	Untreated Wastewater entering the wastewater treatment plant
Volume of Flow	Continuous, recorded daily	Calculated	Untreated Wastewater entering the wastewater treatment plant
TREATED WASTEWATER			
pH $CBOD_5$ TSS Total Phosphorus Total Ammonia-nitrogen	Once per day	Composite	Wastewater treated plant effluent prior to release to the North Saskatchewan River
E. Coli	Once per day	Grab	After ultraviolet (UV) disinfection

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Parameter	Frequency (Minimum)	Sample Type	Sampling Location
Acute Toxicity	Monthly	Grab	Wastewater treatment plant effluent prior to release to the North Saskatchewan River
Chronic Toxicity	Quarterly	Grab	Wastewater treatment plant effluent prior to release to the North Saskatchewan River
Volume	Continuous, recorded daily	Calculated	Wastewater treatment plant effluent prior to release to the North Saskatchewan River
Volume	Continuous, recorded daily	Calculated	Reuse water transmission main
WASTEWATER TREATMENT PLANT BYPASS AND UNAUTHORIZED RELEASE			
Release Volume	Continuous during bypass event, recorded daily	Calculated	Primary and Secondary Treatment bypass of wastewater at the wastewater treatment plant Unauthorized release point
pH BOD_5 TSS Total Phosphorus Total Ammonia-nitrogen	Any bypass event lasting > 2 hours	Composite	
E. Coli	Any bypass event lasting > 2 hours	Grab	
SLUDGE DISPOSAL			
Sludge Volume	Total Volume	Estimated	Prior to leaving the wastewater treatment plant

6.1.2 The approval holder shall compile a Monthly Wastewater Treatment Report which includes, at a minimum, the following information:

(a) the results of the monitoring requirements of TABLE 6-1;

(b) the name and daily quantity of any chemical added to the wastewater treatment process;

(c) the name of the supervising operator responsible for the operation of the wastewater treatment plant;

(d) the number of days and total volumes bypass the primary and secondary treatment for the month; and

(e) a summary of any operational problems.

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6.1.3 On or before the end of the month following the month in which the information on which the report is based was collected, the approval holder shall:

(a) compile a Monthly Wastewater Treatment Report; and

(b) submit one electronic copy of the Monthly Wastewater Treatment Report to the Director when requested.

6.1.4 The approval holder shall compile an Annual Wastewater Treatment Report which shall include the following:

(a) the monthly arithmetic mean, including maximum and minimum values, of each parameter monitored, excluding *E. Coli* counts, as outlined in TABLE 6-1;

(b) the monthly geometric mean of *E. Coli* counts;

(c) the name of the supervising operator responsible for the operation of the wastewater treatment plant;

(d) a summary of any incidents which required reporting in accordance with 2.1.1;

(e) a calculation of the uncommitted hydraulic reserve capacity for the secondary/tertiary treatment during dry weather conditions;

(f) the number of days and the total volumes bypass the primary and secondary treatment for the year; and

(g) a summary of any operational problems.

6.1.5 The approval holder shall submit one electronic copy of the Annual Wastewater Treatment Report to the Director on or before February 28 of the year following the year in which the information on which the report is based was collected.

6.1.6 If the approval holder monitors for any substances or parameters which are the subject of operational limits as set out in this approval more frequently than is required and using procedures authorized in this approval, then the approval holder shall provide the results of such monitoring as an addendum to the Annual Wastewater Treatment Report required by this approval.

6.1.7 The approval holder shall maintain an operating record for the wastewater treatment plant, which contains all of the following information at a minimum:

(i) a copy of this approval;

(ii) a copy of all monitoring results as required in 6.1.1;

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(iii) a copy of inspection reports prepared by Alberta Environment and Parks;

(iv) a copy of each monthly report; and

(v) a copy of all Annual Wastewater Treatment Reports.

PART 7: RECLAMATION AND DECOMMISSIONING

SECTION 7.1: GENERAL

7.1.1 Within six months of the wastewater treatment plant permanently ceasing operation, the approval holder shall:

(a) submit a decommissioning and land reclamation plan to the Director, and

(b) not commence reclamation or decommissioning until the approval holder has received written authorization from the Director.

DATED May 29, 2015

DESIGNATED DIRECTOR UNDER THE ACT