Alberta Environment and Protected Areas

APPROVAL

PROVINCE OF ALBERTA

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

APPROVAL NO.: 722-03-00

APPLICATION NO.: 013-722

EFFECTIVE DATE: January 2, 2023

EXPIRY DATE: January 1, 2033

APPROVAL HOLDER: Aquatera Utilities Inc.

ACTIVITY: Construction, operation and reclamation of a waterworks system for Aquatera Regional Waterworks System in the City of Grande Prairie

is subject to the attached terms and conditions.

Fidelma Horgan.

Designated Director under the Act: Fidelma Horgan, P. Eng.

Date Signed: December 16, 2022

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) "approved laboratory" means laboratory accredited to the requirements of ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories,* for the drinking water tests methods specified by the Director;

(c) "as-built engineering drawings" means the drawings used in construction that have been updated to record what was actually built;

(d) "bacteriological analysis" means the analysis of water for the presence of *E. coli* or total coliforms;

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

(f) "chlorine residual" means free chlorine, or combined chlorine or total chlorine;

(g) "clearwell" means a reservoir for the storage of filtered water of sufficient capacity to prevent the need to vary the filtration rate with variations in demand. May also be used to provide chlorine contact time for disinfection;

(h) "contact time" ("T_{10}") means the time taken in minutes for 10% of the water to pass through the particular process unit;

(i) "continuous monitoring" means flow measurement or sample analysis through in-line equipment that creates flow measurements or frequent, discrete sample analysis output and includes a data recorder;

(j) "CT" means disinfectant residual in mg/L multiplied by the contact time;

(k) "$CT_{lowest\ actual}$" means the lowest CT calculated in a particular day:

TERMS AND CONDITIONS ATTACHED TO APPROVAL

$$CT_{\text{lowest actual}} = C \times \frac{T_{10}}{T} \times \frac{V_{min}}{Q_{peak}}$$

Where: C = lowest recorded daily free chorine residual concentration (in milligrams per litre) at the point T_{10} is measured;

$\frac{T_{10}}{T}$ = 0.1; OR

Varies based on the empirical method using typical baffling conditions as per Appendix D in the Standards and Guidelines Document; OR

Varies based on a tracer study, where

T_{10} = the contact time established from the most recent tracer study; and

T = the calculated contact time, assuming no short-circuiting and obtained by dividing the treated water chlorine contact storage volume that was used to determine T_{10}, by the flow that was used to determine T_{10};

V_{min} = the daily minimum volume (in Litres) of water in the clearwell;

Q_{peak} = maximum recorded hourly flow (Litres per minute) or twice the daily average flow (Litres per minute)

(l) "$CT_{required}$" means the CT required to demonstrate the specified Log reduction of *Giardia* cysts and / or viruses as specified in Appendix A or Appendix B of the "Standards and Guidelines Document";

(m) "$CT_{performance\ ratio}$" means $CT_{lowest\ actual}$ / $CT_{required;}$;

(n) "day" means calendar day;

(o) "design capacity" means the production capacity for which the waterworks system was designed, as stated in the engineering drawings and specifications for the waterworks system;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

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

(q) "disinfectant residual" means total concentration of disinfectant in water;

(r) "disinfection" means a chemical or physical process of treating water to inactivate microorganisms;

(s) "*E. coli*" means *Escherichia coli* bacteria;

(t) "electronic reporting" means submitting monitoring results to the Director as required in this approval, electronically through the secure internet website provided by Alberta Environment at Drinking water quality reporting | Alberta.ca;

(u) "GCDWQ" means the *Guidelines for Canadian Drinking Water Quality*, published by Health Canada, as amended;

(v) "grab", when referring to a sample, means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;

(w) "ISO/IEC" means the International Organization for Standardization / the International Electrotechnical Commission;

(x) "Log reduction" means the base 10 logarithm of the ratio of raw water concentrations divided by the treated water concentration of total *Giardia* cysts, *Cryptosporidium* oocysts or viruses;

(y) "MAC" means the Maximum Acceptable Concentration, specified in the GCDWQ for a particular parameter;

(z) "particle count" means a microscopic examination of treated water with a particle counter that classifies suspended particles by number and size;

(aa) "PWR" means the *Potable Water Regulation*, as amended;

(bb) "produced water" means all water that has gone through treatment and has entered the water distribution system;

(cc) "Public Health Laboratory (ProvLab)" means the:

(i) the Public Health Laboratory North Sector at the University of Alberta Hospital, Edmonton, Alberta, or

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(ii) the Public Health Laboratory South Sector at the Foothills Hospital, Calgary, Alberta;

(dd) "raw water" means untreated source water from water wells, surface water intakes or infiltration galleries that constitute the water supply;

(ee) "regulations" means the regulations enacted pursuant to the Act and as amended;

(ff) "Standards and Guidelines Document" means the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*, published by the Alberta Environment, as amended;

(gg) "User Agreement" means the *Drinking Water Quality User Agreement* signed by the approval holder and the Director; and

(hh) "UV" means ultraviolet light.

PART 2: GENERAL PROVISIONS

SECTION 2.1: GENERAL

2.1.1 The approval holder shall comply with all conditions in this approval.

2.1.2 Any conflict between the approval application and the terms and conditions of this approval shall be resolved in favour of this approval.

2.1.3 The terms and conditions of this approval do not affect any rights or obligations created under any other authorization issued by the Department.

2.1.4 The approval holder shall carry out all electronic reporting, or cause all electronic reporting to be carried out in accordance with the User Agreement.

2.1.5 The approval holder shall comply with the terms and conditions of the User Agreement.

2.1.6 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.

2.1.7 If the approval holder monitors for any substances or parameters, which are the subject of limits in this approval more frequently than is required, using procedures authorized in this approval, then the approval holder shall provide the results of such monitoring as an addendum to the next reports required by this approval.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

2.1.8 *Environmental Protection and Enhancement Act* Approval No. 722-02-00 is cancelled.

PART 3: PLANNING, CONSTRUCTION AND / OR UPGRADING REQUIREMENTS

SECTION 3.1: PLANNING

3.1.1 The approval holder shall maintain a Drinking Water Safety Plan of the waterworks system.

3.1.2 The *Drinking Water Safety Plan* in 3.1.1 shall:

(a) identify potential risks to the waterworks system including, but not limited to risks associated with the following:

(i) the source of raw water,

(ii) the treatment processes associated with the water treatment plant, and

(b) prescribe appropriate measures to control and/or reduce such risks to the waterworks system

in accordance with the requirements in the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems; Part 1 Standards for Municipal Waterworks* (2012, revised 2021), as amended.

3.1.3 The *Drinking Water Safety Plan* in 3.1.1 shall utilize the *Drinking Water Safety Plan* template located at http://www.environment.alberta.ca/apps/regulateddwq/dwsp.aspx unless otherwise authorized in writing by the Director.

3.1.4 The approval holder shall:

(a) implement; and

(b) update the *Drinking Water Safety Plan*

at least once per calendar year.

3.1.5 The approval holder shall:

(a) develop; and

(b) implement a Laboratory QA/QC Program.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

3.1.6 The approval holder shall complete development and implementation of the Laboratory QA/QC Program by December 31, 2023.

SECTION 3.2: CONSTRUCTION

Not used at this time.

SECTION 3.3: UPGRADE

3.3.1 If a MAC specified in the *GCDWQ* is changed or a new limit MAC is added in the *GCDWQ and the waterworks system will be unable to meet the new or revised* MAC*,* then the approval holder shall make application to the Director to upgrade the waterworks system such that the waterworks system will be able to meet the new or revised MAC within five (5) years of the date the new or revised guideline was published.

PART 4: OPERATIONAL REQUIREMENTS

SECTION 4.1: WATERWORKS SYSTEM

4.1.1 The approval holder shall:

(a) operate; and

(b) maintain

a waterworks system which shall include all of the following:

(i) a source consisting of:

(A) surface water from Wapiti River located at NW of Section 24, Township 70, Range 6, West of the 6th Meridian,

(ii) raw water storage,

(iii) a water treatment plant consisting of:

(A) coagulation and flocculation,

(B) clarification,

(C) rapid sand filtration unit(s),

(D) disinfection by chlorination,

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(E) disinfection by UV radiation,

(F) fluoridation (optional),

(iv) potable water storage reservoirs; and

(v) potable water supply to the Aquatera Regional Waterworks System.

4.1.2 On or before December 31, 2023, the approval holder shall develop and submit a waterworks system *Operations Program* that shall include, at a minimum, all of the information is SCHEDULE 1 of this approval.

4.1.3 The approval holder shall maintain and follow a waterworks system *Operations Program* for the Aquatera Regional Waterworks System.

4.1.4 The approval holder shall:

(a) review the *Operations Program* annually at a minimum;

(b) update the *Operations Program* as required; and

(c) submit a summary of the changes to the *Operations Program* to the Director each year.

4.1.5 Where any sample of a sampling event pursuant to 5.1.1 exceeds the turbidity limit in SCHEDULE 3, the approval holder shall:

(a) immediately divert the water from entering the clearwell until the water does not exceed the turbidity limit in SCHEDULE 3; or

(b) in the event that the water has entered the clearwell then:

(i) immediately divert all the water from the clearwell to waste, and

(ii) continue to divert to waste until all the water that exceeded the turbidity limit in SCHEDULE 3 has been flushed from the clearwell; or

(c) report in accordance with 6.1.1.

4.1.6 Where any sample of a sampling event pursuant to 5.1.1:

(a) is less than the UV dose limit in SCHEDULE 3 for a UV reactor,

(b) exceeds the flow limit in SCHEDULE 3 for a UV reactor; or

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(c) is less than the UV transmittance of filtered water limit in SCHEDULE 3 entering a UV reactor

the approval holder shall:

(i) immediately divert all the water from the clearwell, and

(ii) continue to divert until all the water that:

(A) is less than the UV dose limit in SCHEDULE 3 for a UV reactor,

(B) exceeded the flow limit in SCHEDULE 3 for a UV reactor, or

(C) was less than the UV transmittance of filtered water limit in SCHEDULE 3 entering a UV reactor

so that no more than:

(I) 1% of water in a month, and

(II) 2 % of water in a day

passes through the UV reactors without the required level of UV dose being applied; or

(d) report in accordance with 6.1.1.

SECTION 4.2: FACILITY CLASSIFICATION AND CERTIFIED OPERATOR REQUIREMENTS

FACILITY CLASSIFICATION

4.2.1 The water treatment plant in this approval is classified as Class III in accordance with the *Water and Wastewater Operators' Certification Guidelines,* as amended.

CERTIFIED OPERATOR

4.2.2 At all times the operation of the waterworks system shall be performed by, or under the direction of the following number of persons who holds:

(a) a valid Level III (or higher) Water Treatment Operators Certificate; and

(b) at least one other operator who holds a valid Level II (or higher) Water Treatment Operators Certificate to act in the absence of the Level III operator; and

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(c) at least one other operator who holds a valid Level I (or higher) Water Treatment Operators Certificate; and

(d) at least one certified operator (any level) for each shift when shift operation is required.

SECTION 4.3: PERFORMANCE LIMITS

POTABLE WATER QUALITY STANDARDS

4.3.1 All produced water shall meet the Treated Water Limits specified in SCHEDULE 3.

4.3.2 At all times, the disinfection and filtration, together, shall achieve:

(a) a total 4-Log reduction for viruses; and

(b) a total 5-Log reduction for *Giardia* and

(c) a total 3-log reduction for *Cryptosporidium (sp)*.

4.3.3 If treated water turbidity after rapid sand filtration, and disinfection with UV and chlorine meet the Treated Water Limits in SCHEDULE 3, the inactivation credit through filtration and disinfection shall be in accordance with Table 4-1.

TABLE 4-1: LOG REDUCTION CREDIT

WATER TREATMENT PROCESS	SYSTEM PERFORMANCE	LOG REDUCTION CREDIT		
		Giardia	***Cryptosporidium***	***Viruses***
Conventional Filtration	As per SCHEDULE 3	3.0	3.0	2.0
Chlorine Disinfection		0	0	2.0
UV Disinfection		2.0	1.0	0
Total Log Reduction Credit		5.0	4.0	4.0

4.3.4 In addition to compliance with the limits specified in SCHEDULE 3, the produced water shall comply with the Potable Water Quality requirements of the *Potable Water Regulation*, as amended, for those parameters:

(a) specified in SCHEDULE 4, and

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(b) any parameters added to the GCDWQ

that:

(i) the Director has directed in writing to be complied with,

(ii) and by the date required in the Director's written direction.

4.3.5 The Treated Water Limits for fluoride ion concentration in the treated water, specified in SCHEDULE 3, shall be met when fluoridation is practiced.

SECTION 4.4: CHEMICALS USED

4.4.1 The approval holder shall not add any substance, material or compound to water being treated to be potable unless the substance, material or compound:

(a) conforms to American National Standards Institute and National Sanitation Foundation ANSI/NSF Standard 60 or Standard 61; or

(b) is certified for potable use by an agency accredited to the requirements of ISO/IEC 9000 and ISO/IEC 14001; and

(c) is added in a dosage that does not exceed the dosage specified as Maximum Use; or

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

SECTION 4.5: WASTE STREAM

4.5.1 Waste streams shall be released only as follows:

(a) clarifier blowdown or clarifier washdown waste for maintenance activities and filter backwash or filter-to-waste shall be discharged to an approved wastewater system;

(b) sanitary wastewater shall be discharged to an approved wastewater system;

(c) water from hydrant flushing or de-chlorinated reservoir draining and washdown shall be discharged to the drainage ditch on site;

(d) an emergency overflow to Bear Creek shall be used only to release either raw water or partially treated water after de-chlorination, according to the *Operations Program* in Schedule 1; and

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(e) any other waste stream shall be discharged as authorized in writing by the Director.

PART 5: MONITORING REQUIREMENTS

SECTION 5.1: MONITORING

5.1.1 The approval holder shall monitor the waterworks system in accordance with:

(a) SCHEDULE 2; and

(b) SCHEDULE 3.

SECTION 5.2: DATA QUALITY ASSURANCE

5.2.1 With respect to any monitoring required pursuant to this approval, all samples shall be:

(a) collected;

(b) preserved;

(c) stored;

(d) handled; and

(e) analysed in accordance with:

(i) the *Standard Methods for the Examination of Water and Wastewater*, published by the American Public Health Association, the American Waterworks Association and the Water Environment Federation, as amended or replaced from time to time, or

(ii) a method authorized in writing by the Director.

5.2.2 Any analysis of a sample required pursuant to this approval shall be done only in:

(a) an approved laboratory;

(b) a laboratory that complies with Laboratory QA/QC Program and splitting sampling program; or

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

TERMS AND CONDITIONS ATTACHED TO APPROVAL

5.2.3 Data results of the on-line or continuous monitoring equipment must be validated to ensure that the results reflect the actual quality of the water and are not an electronic or meter spike by direct or indirect means.

5.2.4 Any analysis for treated water bacteriological quality required pursuant to this approval shall be conducted by the Provincial Laboratory for Public Health.

PART 6: REPORTING REQUIREMENTS

SECTION 6.1: CONTRAVENTION REPORTING

6.1.1 In addition to any other reporting required pursuant to this approval, the Act, or the regulations, the approval holder shall immediately report to the Director any contravention of this approval, either:

(a) by telephone at 1-780-422-4505; or

(b) by a method:

(i) in compliance with the release reporting provisions in the Act and the regulations, or

(ii) as authorized in writing by the Director.

6.1.2 In addition to any other reporting required pursuant to this approval, the Act, or the regulations, the approval holder shall immediately report to the Director by a method specified in 6.1.1, any structural or equipment malfunction in the waterworks system that may affect the quality or supply of potable water.

6.1.3 In addition to the immediate reporting in 6.1.1, the approval holder shall provide a report to the Director:

(a) in writing; or

(b) by a method:

(i) in compliance with the release reporting provisions in the Act and the regulations, or

(ii) authorized in writing by the Director

within seven (7) calendar days after the discovery of the contravention, or within another time period specified in writing by the Director, unless the requirement for the report is waived by the Director.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

6.1.4 The report required in 6.1.3 shall contain, at a minimum, the following information:

(a) a description of the contravention;

(b) the date of the contravention;

(c) the duration of the contravention;

(d) the legal land description of the location of the contravention;

(e) an explanation as to why the contravention occurred;

(f) a summary of all preventive measures and actions that were taken prior to the contravention;

(g) a summary of all measures and actions that were taken to mitigate any effects of the contravention;

(h) a summary of all measures that will be taken to address any remaining effects and potential effects related to the contravention;

(i) the number of the approval issued under the Act for the waterworks system, and the name of the approval holder who held the approval at the time the contravention occurred;

(j) the name, address, phone number and responsibilities of all persons operating the waterworks system at the time the contravention occurred;

(k) the name, address, phone number and responsibilities of all persons who had charge, management or control of the waterworks system at the time that the contravention occurred;

(l) a summary of proposed measures that will prevent future contraventions, including a schedule of implementation for these measures;

(m) any information that was maintained or recorded under this approval, as a result of the incident; and

(n) any other information required by the Director in writing.

6.1.5 Where a bacteriological quality sample shows the presence of:

(a) total coliform; or

(b) *E. Coli*

TERMS AND CONDITIONS ATTACHED TO APPROVAL

in addition to any reporting or other requirements pursuant to the Act, or the Regulations, the approval holder shall carry out the corrective actions set out in the *Communication and Action Protocol for Failed Bacteriological Results in Drinking Water for Waterworks Systems Authorized under the Environmental Protection and Enhancement Act*, August 2009, entered into by Alberta Environment, Alberta Health Services, Alberta Health and Wellness and Health Canada, as amended.

6.1.6 Where a sample does not meet the Maximum Acceptable Concentration as specified in the GCDWQ for one or more of the physical, inorganic, organic chemical or pesticide parameters in SCHEDULE 4, in addition to any reporting or other requirements pursuant to the Act, or the Regulations, the approval holder shall carry out the corrective actions set out in the *Action Protocol for Exceedances of Chemical Health Parameters in Drinking Water*, Alberta Environment, August 2009, as amended.

SECTION 6.2: MONTHLY REPORTING

6.2.1 The approval holder shall compile and retain monthly reports at the water treatment plant.

6.2.2 The monthly report in 6.2.1 shall include, at a minimum:

(a) the name, telephone and fax numbers of all certified operators;

(b) the analytical results for all parameters required to be monitored in accordance with this approval during the month;

(c) the locations of all sampling performed during the month in accordance with this approval;

(d) the name and manufacturer of all treatment chemicals added during the month, and each manufacturer as listed by the certified agency that tested the chemical to ANSI/NSF Standard 60 or Standard 61;

(e) the results of all required monitoring and measurements conducted during the month in accordance with this approval;

(f) a notice that fluoridation is or is not being practiced;

(g) a description of any emergency overflows in 4.5.1 (d); and

(h) a description of any problems experienced, and corrective actions taken at the waterworks system during the month, including all actions taken as per 4.1.5 and 4.1.6.

TERMS AND CONDITIONS ATTACHED TO APPROVAL

SECTION 6.3: ANNUAL REPORTING

6.3.1 In addition to any other reporting required under the Act, the regulations and this approval, the approval holder shall compile an annual report, by February 28 of the year following the calendar year in which the information on which the report is based was collected.

6.3.2 Unless otherwise notified in writing by the Director, the approval holder shall submit to the Director the annual report in 6.3.1, by February 28 of the year following the calendar year in which the information on which the report is based was collected.

6.3.3 The annual report in 6.3.1 shall contain, at a minimum, all of the following information:

(a) a summary of the monthly reports, specifying the monthly minimum, average, and maximum results for each parameter monitored, excluding bacteriological results, for each month;

(b) a summary of the total volume of treated water, for each month;

(c) a summary of the number, sampling dates and analytical results of the bacteriological samples analyzed for each month;

(d) a notice that fluoridation is or is not being practiced;

(e) the results of any other compliance monitoring done during the year pursuant to this approval, that was not included in any monthly report;

(f) a description of any problems experienced, and corrective actions taken at the waterworks system during the year; and

(g) any changes to the *Operations Program*.

SECTION 6.4: ELECTRONIC REPORTING

6.4.1 The approval holder shall submit periodic reports:

(a) in an electronic format; and

(b) with the following frequency:

(i) monthly, to the Director on or before the end of the month following the month in which the information on which the report is based was collected,

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(ii) annually, 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, or

(iii) as specified in writing by the Director.

PART 7: RECORD KEEPING REQUIREMENTS

SECTION 7.1: GENERAL

7.1.1 The approval holder shall:

(a) record the following information; and

(b) maintain and retain the following records for five (5) years from the date the record was created:

(i) bacteriological analysis results,

(ii) daily records, including but not limited to:

(A) flow meter readings,

(B) chlorine concentrations,

(C) treatment chemical dosages, and

(D) all the requirements of SCHEDULE 3 specific to daily monitoring

required under this approval;

(iii) all monthly reports required under this approval, and

(iv) records of action taken by the approval holder to correct contraventions of the limits in SCHEDULE 3, including the following information for each contravention:

(A) name and address of the person who discovered the contravention, and

(B) copies of all notifications to the public.

7.1.2 The approval holder shall retain the following records for the life of the waterworks system:

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(a) the *Operations Program*;

(b) copies of all:

(i) applications submitted to the Department for an approval regarding the waterworks system which includes, but are not limited to:

(A) correspondence, and

(B) drawings,

(ii) project reports,

(iii) engineering drawings and specifications issued for approved construction,

(iv) as-built engineering drawings,

(v) reports of inspections conducted by the Department,

(vi) correspondence and written notifications sent to the Department regarding a proposed extension of a water distribution system, replacement of a portion of a water distribution system, expansion or modification of potable water storage within the water distribution system,

(vii) approvals issued under the Act for the waterworks system,

(viii) annual reports, and

(ix) reports prepared pursuant to 6.1.3 and 6.1.4;

(c) all physical, organic and inorganic chemical and pesticide analytical results required pursuant to this approval, excluding daily monitoring.

7.1.3 The results and records in 7.1.1(b) shall contain, at a minimum, all of the following information:

(a) the date, location and time of monitoring, and the name of the person collecting the sample;

(b) identification of the sample type, including, but not limited to whether the sample is taken as required in the approval, a repeat sample, a source or potable water sample, or other special purpose sample;

TERMS AND CONDITIONS ATTACHED TO APPROVAL

(c) date of analysis;

(d) laboratory name and person responsible for performing analysis;

(e) the analytical method used; and

(f) the results of the analysis.

7.1.4 The approval holder shall immediately provide any records, reports or data required under this approval to the Director or an inspector, upon request.

PART 8: RECLAMATION REQUIREMENTS

SECTION 8.1: GENERAL

8.1.1 Where the land surface has been disturbed during construction, expansion, modification or repair of any portion of a waterworks system, reclamation of the land surface to equivalent land capability shall be performed following the construction, expansion, modification or repair, in accordance with the Standards and Guidelines Document.

8.1.2 Within six months after the waterworks system, or a portion of the waterworks system, permanently ceases operation, the approval holder shall submit a reclamation plan to the Director for the portion of the waterworks system that is no longer in operation.

8.1.3 The approval holder shall not commence reclamation of the waterworks system until that person has received an amendment to this approval from the Director for the reclamation.

Fidelma Horgan.

December 16, 2022
DATED

Designated Director under the Act
Fidelma Horgan, P. Eng.

SCHEDULE 1

OPERATIONS PROGRAM

1) Routine Operational Procedures, which shall, at a minimum, include:

   (a) contact name and telephone numbers for the waterworks system owner, waterworks system operator, engineering consultants and equipment suppliers;

   (b) operating instructions:

      (i) general description of treatment process and operating procedures,

      (ii) performance requirements, and

      (iii) location of equipment major controls;

   (c) general maintenance schedule;

   (d) general maintenance instructions for:

      (i) treatment / process equipment,

      (ii) monitoring equipment,

      (iii) pumping equipment,

      (iv) filter media assessment and cleaning,

      (v) filter replacement procedures, and

      (vi) UV disinfection system; and

   (e) the schedule and procedures for cleaning and flushing of the water distribution system, including potable water storage reservoirs.

2) Routine Operational Procedures for Monitoring and Analysis, which shall, at a minimum, include:

   (a) operational and compliance tests to be performed;

   (b) bacteriological quality monitoring plan;

   (c) methods used for monitoring and analysis;

   (d) locations of monitoring points; and

   (e) laboratory data quality assurance information.

SCHEDULE 1

OPERATIONS PROGRAM

3) *Emergency Response Plan* which shall at a minimum, include:

(a) steps to be taken in the event of the following:

(i) bacteriological results exceeding the prescribed limits,

(ii) turbidity exceeding the limits,

(iii) chemical overfeed,

(iv) fluoride overfeed, spill and handling,

(v) no chemical or coagulant feed,

(vi) low chlorine residual,

(vii) UV disinfection system problem or breakdown,

(viii) equipment breakdown,

(ix) flood,

(x) water distribution system pipeline break and repair, and the return of the pipeline to service,

(xi) power failure, and

(xii) the waterworks system becoming inoperable, including steps in providing an alternate potable water supply;

(b) cover-off in the event that the Certified Operator is not available to operate the waterworks system;

(c) Water Shortage Response Plans for raw and treated water;

(d) list of contacts; Alberta Environment, Alberta Health, Regional Health Authorities, Fire Department, Disaster Coordinator, and other agencies; and

(e) date of last update.

4) Copy of the as-built engineering drawings.

SCHEDULE 2 – RAW WATER

Monitoring, Measuring and Reporting Frequency Requirements

PARAMETER	STATION LOCATION	MONITORING TYPE and FREQUENCY	REPORTING FREQUENCY
Raw Water			
Turbidity	RAW WATER ENTERING THE WATER TREATMENT PLANT	Continuous monitoring and recording at ≤ 5 minute sampling intervals, or Grab sample, once per day, when continuous monitoring is not available , and until problem has been resolved according to 6.1.3 unless otherwise authorized in writing by the Director	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4 Reported monthly
Volume		Metered, Once per day Reported as Total in m^3	
pH		Grab sample, once per day	
Temperature		Grab sample, once per day	
Fluoride, when fluoridation is practiced		Grab sample, once per week	

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
RAPID SAND FILTER *Treated Water - TURBIDITY*					
Turbidity	INDIVIDUAL FILTER TRAIN #1, 2, 3, AND 4 (after individual filter train at a point upstream of the clearwell)	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Report Maximum Daily Value (NTU) Report number of cumulative minutes per day the turbidity was between 0.3 and 1.0 NTU	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	≤ 0.3 NTU, at least 99% of the samples on a daily basis; and ≤1.0 NTU,100% of the time; < 15 minutes per day

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Treated Water - CHLORINE DISINFECTION					
Chlorine Residual – Free	ENTERING WATER DISTRIBUTION SYSTEM (where "C" is measured for log reduction of virus prior to entering water distribution system)	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Recorded MINIMUM value mg/L Recorded Once per day	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	≥ 0.2 mg/L as Free Chlorine
$CT_{required}$	ENTERING WATER DISTRIBUTION SYSTEM	Once per day	Daily values		N/A
$CT_{lowest\ actual}$		Calculated Once per day			N/A
CT performance ratio Viruses	ENTERING WATER DISTRIBUTION SYSTEM	Calculated Once per day	Daily value		≥ 1

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Volume	RESERVOIR	Once per day	MINIMUM daily value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	N/A
Flow	ENTERING WATER DISTRIBUTION SYSTEM	Continuous	MAXIMUM hourly flow in L/Min Recorded Once per day		N/A
pH	ENTERING WATER DISTRIBUTION SYSTEM	Grab Sample Once per day	MAXIMUM Daily value		as per the GCDWQ
Temperature	ENTERING WATER DISTRIBUTION SYSTEM	Grab Sample Once per day	MINIMUM Daily value		N/A

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Treated Water - UV DISINFECTION					
UV dose	UV REACTOR #1, 2, 3 AND 4	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Record MINIMUM daily values	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	≥ 19.87 mJ/cm^2
Flow	UV REACTOR #1, 2, 3 AND 4	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Record MAXIMUM daily value		≤ 156 L/s per reactor (when ≥ 80% but <85% UVT) (equivalent to 13.5 MLD) ≤ 284 L/s per reactor (when ≥ 85% UVT) (equivalent to 24.6 MLD)
UV transmittance of filtered water	ENTERING UV REACTORS	Grab sample Once per day	Daily value		≥ 80 %T

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Treated Water - FLUORIDATION					
Fluoride, when fluoridation is practiced	ENTERING WATER DISTRIBUTION SYSTEM	Grab sample Once per day	Daily value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	0.5 to 0.9 mg/L
Fluoride when fluoridation is practiced	ENTERING WATER DISTRIBUTION SYSTEM	Calculated average of the daily readings	Monthly value		0.6 to 0.8 mg/L

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Treated Water - BACTERIOLOGICAL					
Bacteriological quality *E. coli* Total Coliforms	ENTERING DISTRIBUTION: BACTERIOLOGICAL	4 Grab sample / month, and taken at regular intervals throughout the month	Number of Grab samples taken per month and Presence or Absence of indicator organisms	Reported monthly As per 6.2, 6.3 and 6.4 of this approval	Zero *E. coli* organisms per 100 mL Zero Total coliform organisms per 100 mL

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Treated Water - TTHM					
Total Trihalomethanes (TTHM)	1 Grab sample per month distributed as per the following and the samples are to be taken within a 24 hour period		Analytical Results	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	as per the PWR
	ENTERING WATER DISTRIBUTION SYSTEM	1 Grab sample per month			
Total Trihalomethanes (TTHM)	If and only if the TTHM results from the same location, based on running annual average from the previous 12 months, is less than the GCDWQ MAC, subsequent monitoring shall be conducted, at a minimum, in the following manner: (the samples per month are to be taken within a 24 hour period)		Analytical Results	Reported annually As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	as per the PWR
	ENTERING WATER DISTRIBUTION SYSTEM	1 Grab sample every 3 months			

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Treated Water - HAAs					
Haloacetic Acids - Total (HAAs)	1 Grab sample per month distributed as per the following and the samples are to be taken within a 24 hour period		Analytical Results	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	as per the PWR
	ENTERING WATER DISTRIBUTION SYSTEM	1 Grab sample per month			
Haloacetic Acids - Total (HAAs)	If and only if the HAAs results from the same location, based on running annual average from the previous 12 months, is less than the GCDWQ MAC, subsequent monitoring shall be conducted, at a minimum, in the following manner: (the samples per month are to be taken within a 24 hour period)		Analytical Results	Reported annually As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	as per the PWR
	ENTERING WATER DISTRIBUTION SYSTEM	1 Grab sample every 3 months			

SCHEDULE 3 – TREATED WATER QUALITY

Limits, Monitoring and Reporting Frequency

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
Treated Water – PHYSICAL, INORGANIC AND ORGANIC CHEMICAL AND PESTICIDE PARAMETERS					
The physical, inorganic and organic chemical and pesticide parameters listed in SCHEDULE 4, and any new parameters with MAC's published in the GCDWQ	ENTERING WATER DISTRIBUTION SYSTEM	2 Grab samples per annum for all parameters with the exception of Cyanobacterial toxins (as Microcystin-Total): (a) One sample taken during winter (December to February); and (b) One sample taken during summer (June to August); and For Cyanobacterial toxins (as Microcystin-Total) two grab samples: (a) One sample taken during the period August 1 – August 16; and (b) One sample taken during the period of September 1 to September 16 in any calendar year	Analytical Results	Reported annually As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	as per the PWR

SCHEDULE 4

Table of Physical, Inorganic chemicals, Organic chemicals and Pesticides

Substance	Specific Parameter
Physical Parameters	Colour; pH; Total Dissolved Solids; Turbidity; and UV absorbance
Inorganic chemicals (Primary)	Antimony; Arsenic; Barium; Boron; Bromate; Cadmium; Chlorate; Chlorite; Chromium; Cyanide; Fluoride; Lead; Manganese; Mercury; Nitrate; Nitrite; Selenium; Strontium; and Uranium;
Inorganic Chemicals (Secondary)	Aluminum; Ammonia; Calcium; Chloramines; Chloride; Copper; Total Hardness; Iron; Magnesium; Silver; Sodium; Sulphate; Sulphide; Total Organic Carbon; Xylenes (total); and Zinc;

Substance	Specific Parameter
Organic Chemicals and Pesticides (Primary)	Atrazine + metabolites; Benzene; Benzo(a)pyrene; Bromoxynil; Carbaryl; Carbon Tetrachloride; Chlorpyrifos; Cyanobacterial Toxins (as Microcystin-Total) Diazinon; Dicamba; 1,2-Dichlorobenzene; 1,4-Dichlorobenzene; 1,2-Dichlorethane; 1,1-Dichloroethylene; Dichloromethane; 2,4-Dichlorophenol; 2,4-D; Diuron; Dimethoate; Ethylbenzene; Glyphosate; Malathion; Methoxychlor; 2-Methyl-4-Chlorophenoxyacetic Acid (MCPA); Metolachlor; Metribuzin; Monochlorobenzene; Nitrilotriacetic Acid (NTA); Pentachlorophenol; Perfluorooctane Sulfonate (PFOS); Perfluorooactanoic Acid (PFOA); Phorate; Picloram; Simazine; Tetrachloroethylene; 2,3,4,6-Tetrachlorophenol; Toluene; Trichloroethylene; 2,4,6-Trichlorophenol; Trifluralin; and Vinyl Chloride