

**APPROVAL**  
**PROVINCE OF ALBERTA**

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

APPROVAL NO.: ..... 722-02-00

APPLICATION NO.: ..... 007-722

EFFECTIVE DATE: ..... January 31, 2012

EXPIRY DATE: ..... January 1, 2022

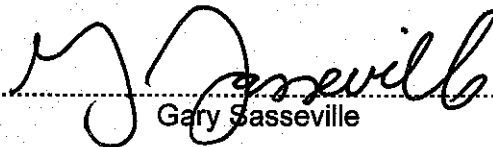
APPROVAL HOLDER: ..... Aquatera Utilities Inc.

ACTIVITY: ..... construction, operation and reclamation of the Grande Prairie

..... Aquatera Regional Waterworks System

is subject to the attached terms and conditions.

Designated Director under the Act

  
.....  
Gary Sasseville

Date Signed ..... January 31, 2012

## 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) "alternate program" means the Alternate Laboratory Data Quality Assurance Program, as detailed in the Department's *Laboratory Data Quality Assurance Policy Procedures and Guidelines*;
  - (c) "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;
  - (d) "as-built engineering drawings" means the drawings used in construction that have been updated to record what was actually built;
  - (e) "bacteriological analysis" means the analysis of water for the presence of *E. coli* or total coliforms;
  - (f) "challenge test" means a study conducted to determine the log removal efficiency of a membrane material for a particular organism, particulate or surrogate;
  - (g) "chemical" means any substance that is added or used as part of the treatment process;
  - (h) "chlorine residual" means free chlorine, or combined chlorine or total chlorine;
  - (i) "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;
  - (j) "contact time" (" $T_{10}$ ") means the time taken in minutes for 10% of the water to pass through the particular process unit;
  - (k) "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;

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- (l) "CT" means disinfectant residual in mg/L multiplied by the contact time;
- (m) "CT<sub>lowest actual</sub>" means the lowest CT calculated in a particular day:

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

Where: C = lowest recorded daily free chlorine residual concentration (in milligrams per litre) at the point T<sub>10</sub> is measured;

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

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<sub>10</sub> = 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<sub>10</sub>, by the flow that was used to determine T<sub>10</sub>;

V<sub>min</sub> = the daily minimum volume (in Litres) of water being treated by chlorine contact;

Q<sub>peak</sub> = maximum recorded hourly flow (Litres per minute) or twice the daily average flow (Litres per minute)

- (n) "CT<sub>required</sub>" 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";
- (o) "CT<sub>performance ratio</sub>" means CT<sub>lowest actual</sub> / CT<sub>required</sub>;
- (p) "day" means calendar day;

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- (q) "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;
- (r) "direct integrity testing" means a physical test applied to a membrane unit in order to identify and isolate integrity breaches;
- (s) "Director" means an employee of the Government of Alberta designated as a Director under the Act;
- (t) "disinfectant residual" means total concentration of disinfectant in water;
- (u) "disinfection" means a chemical or physical process of treating water to inactivate microorganisms;
- (v) "*E. coli*" means *Escherichia coli* bacteria;
- (w) "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 <http://www.environment.alberta.ca/1506.html>;
- (x) "GCDWQ" means the *Guidelines for Canadian Drinking Water Quality*, published by Health Canada, as amended;
- (y) "grab", when referring to a sample, means an individual sample collected in less than 30 minutes and which is representative of the substance sampled;
- (z) "ISO/IEC" means the International Organization for Standardization / the International Electrotechnical Commission;
- (aa) "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;
- (bb) "MAC" means the Maximum Acceptable Concentration, specified in the GCDWQ for a particular parameter;
- (cc) "particle count" means a microscopic examination of treated water with a particle counter that classifies suspended particles by number and size;
- (dd) "PWR" means the *Potable Water Regulation*, as amended;
- (ee) "produced water" means all water that has gone through treatment and has entered the distribution system;

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- (ff) "Provincial Laboratory of Public Health" means:
- (i) the Environmental Microbiology Provincial Laboratory of Public Health, University of Alberta Hospital, Edmonton, Alberta, or
  - (ii) the Provincial Laboratory of Public Health, Foothills Hospital, Calgary, Alberta;
- (gg) "raw water" means untreated source water from water wells, surface water intakes or infiltration galleries that constitute the water supply;
- (hh) "regulations" means the regulations enacted pursuant to the Act and as amended;
- (ii) "Standards and Guidelines Document" means the *Standards and Guidelines for Municipal Waterworks, Wastewater and Storm Drainage Systems*, published by the Alberta Environment, as amended;
- (jj) "User Agreement" means the *Drinking Water Quality User Agreement* signed by the approval holder and the Director;
- (kk) "UV" means ultraviolet light; and
- (ll) "water treatment plant" means the physical components of the waterworks system that are used to produce potable water including components associated with the management of any wastes generated during treatment and includes the land located within the NW of Section 24, Township 70, Range 6, West of the 6<sup>th</sup> Meridian and the SE of Section 11, Township 71, Range 6, West of the 6<sup>th</sup> Meridian.

**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.

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- 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.
- 2.1.8 *Environmental Protection and Enhancement Act* Approval No. 722-01-00 is cancelled.

**PART 3: PLANNING, CONSTRUCTION AND / OR UPGRADING REQUIREMENTS****SECTION 3.1: PLANNING AND RISK ASSESSMENT**

- 3.1.1 For a period of two years commencing at the latest on February 1, 2012, the approval holder shall sample the raw water and analyze it for *Giardia* cysts and *Cryptosporidium* oocysts:
- (a) Monthly; and
  - (b) once a week, during the spring run-off period.
- 3.1.2 Until the raw water monitoring in 3.1.1 is completed, the waterworks system shall meet or exceed the 3-log reduction of *Giardia* cysts and *Cryptosporidium* oocyst and a 4-log reduction of viruses.
- 3.1.3 On or before May 2, 2014, the approval holder shall submit to the Director, the following:
- (a) a raw water report that summarizes the results of 3.1.1 or 3.1.2, and
  - (b) a strategy with time schedule to upgrade the waterworks system, if the raw water assessment in 3.1.1 or 3.1.2 indicates a higher log reduction is required than the log reduction specified in the latest Standards and Guidelines Document.
- 3.1.4 The approval holder shall undertake a risk assessment of the waterworks system from source to tap to ascertain the integrity, reliability and the long-term sustainability of the waterworks system to provide safe drinking water according to the following:

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- (a) the risk assessment shall be performed in accordance with the Standards and Guidelines Document, *Facility Risk Assessment Standards*;
  - (b) the risk assessment shall be performed by a professional; and
  - (c) the risk assessment report, including any upgrade, shall be submitted to the Director in 2014 and 2019, according to 6.3.3.
- 3.1.5 Any upgrade outlined in 3.1.3 and 3.1.4 shall be in operation, on or before January 1, 2017.
- 3.1.6 If the raw water monitoring in 3.1.1 or 3.1.2 is not performed, the approval holder shall meet or exceed the maximum 5.5-log reduction of *Giardia* and *Cryptosporidium*, and 4-log reduction of viruses, on or before January 1, 2017.

**SECTION 3.2: CONSTRUCTION**

- 3.2.1 The approval holder shall upgrade or expand the waterworks system in accordance with the terms and conditions of the approval.
- 3.2.2 The approval holder shall notify the Director upon commencement of operation of any upgrade or expansion in 3.2.1.
- 3.2.3 If construction or expansion of the waterworks system is not completed to meet operating deadlines of this approval, the approval holder shall:
- (a) notify the Director of the new date of completion and receive either a letter of acknowledgement or a letter of authorization; or
  - (b) apply to the Director to amend the approval.
- 3.2.4 Prior to tendering of any water treatment construction, the approval holder shall submit to the Director all of the following, and be in receipt of either a letter of acknowledgement or a letter of authorization:
- (a) an engineering feasibility study or pre-design report;
  - (b) detailed design, plans and specification;
  - (c) the cysts/Oocysts reduction credit of any membrane filtration process established based on product specific challenge test and verified by direct integrity testing of the membrane, as described in the latest edition of the Membrane Filtration Guidance Manual, published by the USEPA;

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- (d) documentation that the product specific challenge tests were performed by an independent third party in accordance with the criteria outlined in the Membrane Filtration Guidance Manual, published by the USEPA;
- (e) proposed upgrading schedule and completion date;
- (f) UV validation certificate for any UV disinfection, as applicable, as specified in the Standards and Guidelines document; and
- (g) any other information specified in writing by the Director.

3.2.5 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 5 years of the date the new or revised guideline was published.

3.2.6 If the approval will be renewed within the 5 year implementation schedule for a MAC specified in 3.2.5, the approval holder shall submit the information in 3.2.4, as part of the application requirements for an approval renewal.

**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 surface water source consisting of:
  - (A) raw water from the Wapiti River watershed, and
  - (B) during an emergency any raw water from an adjacent watershed;
- (ii) raw water storage;
- (iii) a water treatment plant consisting of:
  - (A) coagulation, flocculation and clarification,



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- (B) rapid sand filtration unit(s), until installation and commissioning of the membrane filtration unit(s),
  - (C) disinfection by chlorination,
  - (D) fluoridation, according to the approval,
  - (E) membrane filtration unit(s), after installation and commissioning and according to 3.2.2, and
  - (F) disinfection by UV radiation, after installation and commissioning and according to 3.2.2; and
- (iv) potable water supply either to a municipality or rural waterworks system that holds an Alberta Environment and Water Registration to operate a distribution system or to bulk water users.
- 4.1.2 On or before April 2, 2014, the approval holder shall update its waterworks system *Operations Program* that shall include, at a minimum, all of the information in SCHEDULE 1 of this approval.
- 4.1.3 The approval holder shall update the *Operations Program* as needed at least on an annual basis, and maintain a working copy at the water treatment plant.
- 4.1.4 Where the first sample of a sampling event pursuant to 5.1.1 is less than the chlorine residual limit in SCHEDULE 3, the approval holder shall:
- (a) immediately resample and analyze the chlorine residual as free chlorine and total chlorine at the same location;
  - (b) immediately stop the production of water to the distribution system in the event that the total chlorine residual in 4.1.4 (a) is less than 0.1 mg/L; and
  - (c) in the event that any of the resample results are less than the limit in SCHEDULE 3 the approval holder shall report immediately as per 6.1.1 and continue to take corrective action, according to the *Operations Program* of the approval.

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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 to filter-to-waste 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.

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

- (a) exceeds the UV dose limit in SCHEDULE 3 for a UV reactor, when installed and in operation,
- (b) exceeds the flow limit in SCHEDULE 3 for a UV reactor; or
- (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 to waste, and
- (ii) continue to divert to waste until all the water that:
  - (A) exceeded 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.

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- 4.1.7 Where any instance of a membrane integrity testing event pursuant to 5.1.1 does not meet or exceed the log reduction credit limit for the membrane filtration system in SCHEDULE 3, the approval holder shall:
- (a) immediately stop water production;
  - (b) identify and segregate the faulty membrane module in the membrane filtration system;
  - (c) retest the direct integrity of the remaining membrane modules until the testing verifies that the log reduction credit meets or exceeds the limit in SCHEDULE 3; and
  - (d) place the remaining membrane modules back into service.

**SECTION 4.2: FACILITY CLASSIFICATION AND CERTIFIED OPERATOR REQUIREMENTS****FACILITY CLASSIFICATION**

- 4.2.1 The water treatment facility, located within the municipal boundaries of the City of Grande Prairie and described in this approval, is classified as a Class III in accordance with the *Water and Wastewater Operators' Certification Guidelines*.

**CERTIFIED OPERATOR REQUIREMENTS**

- 4.2.2 At all times, the operation of the water treatment plant(s) shall be performed by, or under the direction of, a person 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
  - (c) at least one other operator who holds a valid Level I (or higher) Water Treatment Operators Certificate; and
  - (d) there shall be 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, or as specified in the approval.

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- 4.3.2 The approval holder shall maintain an operational target for disinfection and filtration to achieve:
- (a) a total 4-Log reduction for viruses; and
  - (b) a total 3-Log reduction for *Giardia* and *Cryptosporidium* (sp), unless otherwise specified in 3.1.4 to 3.1.6 inclusive.
- 4.3.3 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 specified in SCHEDULE 4, and any parameters added to the GCDWQ.
- 4.3.4 The approval holder shall manage fluoridation, as follows:
- (a) the Treated Water Limits for fluoride ion concentration in the treated water, specified in SCHEDULE 3, shall be met when fluoridation is practiced; or
  - (b) the Treated Water Limits for fluoride ion concentration in the treated water, specified in SCHEDULE 3, do not apply when fluoridation is not practiced, and the monthly and annual reports shall indicate that fluoridation is not 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;
  - (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 water for maintenance activities and filter backwash or filter-to-waste shall be discharged to an approved wastewater system;

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- (b) when membranes are in operation, membrane backpulse / draindown, membrane clean in place waste and membrane rejection stream shall be discharged to an approved wastewater system;
- (c) sanitary wastewater shall be discharged to an approved wastewater system;
- (d) potable water from hydrant flushing or draining of reservoirs shall be discharged to the surrounding ground surface;
- (e) an emergency overflow to Bear Creek shall be used only to release either raw water or partially treated water, according to the Operations Program in Schedule 1; and
- (f) 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, preserved, stored, handled; and
- (b) 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 an approved laboratory or in a laboratory that complies with the Department's alternate program.

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- 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 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.

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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*

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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 responsible 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 not practiced;
  - (g) a description of any emergency overflows in 4.5.1 (e); 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 4.1.4 through 4.1.7.



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### **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 notice that fluoridation is not practiced;
  - (d) a copy of the risk assessment, according to 3.1.4 (c);
  - (e) a summary of the number, sampling dates and analytical results of the bacteriological samples analyzed for each month;
  - (f) the results of any other compliance monitoring done during the year pursuant to this approval, that was not included in any monthly report;
  - (g) a description of any problems experienced, and corrective actions taken at the waterworks system during the year; and
  - (h) any changes to the *Operations Program*.

### **SECTION 6.4: ELECTRONIC REPORTING**

- 6.4.1 The Director may, by notice in writing, require the approval holder to submit periodic reports:
- (a) in an electronic format; and

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- (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,
  - (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.

6.4.2 The approval holder who receives a notice as specified in 6.4.1 shall comply with the notice.

### **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 monitoringrequired under this approval;
  - (iii) all monthly reports required under this approval, and

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- (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:

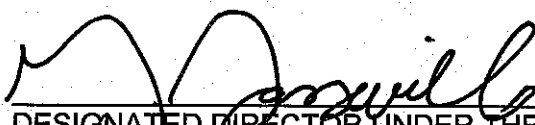
- (a) the *Operations Program* including all amendments;
- (b) copies of all:
  - (i) applications submitted to the Department for an approval regarding the waterworks system which includes, but are not limited to:
    - (A) correspondence, and
    - (B) drawings;
  - (ii) project reports,
  - (iii) 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.

**TERMS AND CONDITIONS ATTACHED TO APPROVAL**

- 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;
  - (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.

DATED January 31, 2012  
DESIGNATED DIRECTOR UNDER THE ACT  
Gary Sasseville

**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. description of organization, roles and responsibilities of all persons involved as it relates to due diligence, decision making and communication;
  - c. operating instructions:
    - i. raw water management including source, quantity and quality,
    - ii. general description of treatment process and operating procedures,
    - iii. performance limits and requirements, and
    - iv. location and management of equipment major controls;
  - d. general maintenance schedule; and
  - e. general maintenance and management instructions for:
    - i. treatment / process equipment,
    - ii. monitoring equipment,
    - iii. pumping equipment,
    - iv. membrane repair and replacement procedures (when applicable),
    - v. filter media assessment and cleaning, and
    - vi. filter replacement procedures;
  
2. Routine Operational Procedures for Monitoring and Analysis, which shall, at a minimum, include:
  - a. operational, compliance and source water tests to be performed;
  - b. bacteriological quality monitoring plan;
  - c. methods used for monitoring and analysis;
  - d. locations of monitoring points;
  - e. laboratory data quality assurance information;
  - f. direct integrity testing (when applicable); and
  - g. data collection and analysis of integrity testing (when applicable).

**SCHEDULE 1****OPERATIONS PROGRAM**

3. Emergency Response Plan, which shall, at a minimum, include steps to be taken in the event of the following:
  - a. raw water quality problems due to spills, blue-green algae, contamination, etc.;
  - b. raw water shortage including alternate water supply;
  - c. bacteriological results exceeding the prescribed limits;
  - d. boil water advisory action protocol;
  - e. turbidity / particle counts exceeding the limits; *(for rapid sand filtration systems and/or membrane filtration systems)*
  - f. chemical overfeed;
  - g. fluoride overfeed, spill and handling;
  - h. no chemical or coagulant feed;
  - i. low or no chlorine residual;
  - j. equipment breakdown;
  - k. emergency release(s) to the Bear Creek;
  - l. disasters: flood, earthquake, power failure, substance release, structural failure, fire, cyber attack, pandemics, etc.;
  - m. the waterworks system becoming inoperable, including steps in providing an alternate potable water supply;
  - n. cover-off in the event that the Certified Operator is not available to operate the waterworks system;
  - o. list of contacts; Alberta Environment, Alberta Health, Regional Health Authorities, Fire Department, Disaster Coordinator, and other agencies; and
  - p. date of last update.
  
4. Copy of the as-built engineering drawings, manuals pertaining to design, operation and monitoring of equipment and processes, tendering documents, correspondence and related documentation, according to the approval.

**SCHEDULE 2 – RAW WATER**  
**Monitoring, Measuring and Reporting Frequency Requirements**

PARAMETER	STATION LOCATION	MONITORING TYPE and FREQUENCY	REPORTING FREQUENCY
<i>Raw Water Entering the Aquatera Regional Water Treatment Plant located at Grande Prairie</i>			
Turbidity		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	
Particle Counts of particles greater than 2 um	Raw water entering the water treatment plant	Continuous monitoring and recording at ≤ 5 minute sampling intervals, or Equipment is shut down, when continuous monitoring is not available, and until problem has been resolved according to 6.2.2 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
Volume		Metered, Once per day Reported as Total in m <sup>3</sup>	
pH		Grab sample, once per day	
Temperature		Grab sample, once per day	
Fluoride, when fluoridation is practiced		Grab sample, once per week	

**SCHEDULE 2 – RAW WATER**

**Monitoring, Measuring and Reporting Frequency Requirements**

PARAMETER	STATION LOCATION	MONITORING TYPE and FREQUENCY	REPORTING FREQUENCY
<p>The physical, inorganic and organic chemical and pesticide parameters listed in SCHEDULE 4, and any new parameters with MAC's published in the GCDWQ</p>	<p>Raw water entering the water treatment plant</p>	<p>Grab samples per annum for all parameters):                      (a) One sample taken during winter (December to February),                      (b) One sample taken during summer (June to August) and                      (c) Additional samples taken when notified in writing by the Director;                      in any calendar year.</p>	<p>Reported per annum, as per Part 6 of the approval, unless notified in writing by the Director as per 6.4</p>
<p><i>Giardia</i> cysts and <i>Cryptosporidium</i> oocysts</p>	<p>Raw water entering the water treatment plant</p>	<p>Samples taken monthly or weekly according to 3.1, unless otherwise authorized in writing by the Director</p>	



**SCHEDULE 3 – TREATED WATER QUALITY**

**Limits, Monitoring and Reporting Frequency**

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
<b>RAPID SAND FILTER - Treated Water TURBIDITY (until Membrane Filters are installed and commissioned)</b>					
Turbidity	Individual filter train #1, 2, 3 and 4 (after each individual filter train at a point upstream of the clearwell)	Continuous monitoring and recording at $\leq 5$ minute sampling intervals	Report % of measurements $>0.3$ NTU ,	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	$\leq 0.3$ NTU, at least 99% of the samples on a daily basis; and $\leq 1.0$ NTU, 100% of the time
			and maximum daily value Report number of cumulative minutes per day the turbidity was between 0.3 and 1.0 NTU		
<b>RAPID SAND FILTER - Treated Water PARTICLE COUNTS (until Membrane Filters are installed and commissioned)</b>					
Particle Counts of particles greater than 2 $\mu$ m	Individual filter train #1, 2, 3 and 4 (after individual filter train at a point upstream of the clearwell)	Continuous monitoring and recording at $\leq 5$ minute sampling intervals	Report maximum daily value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	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
<b>MEMBRANE FILTER - Treated Water TURBIDITY (effective after installation and commissioning)</b>					
Turbidity	Membrane filter train (after each individual filter train at a point upstream of the clearwell)	Continuous monitoring and recording at $\leq 5$ minute sampling intervals	Report % of measurements $>0.1$ NTU , and maximum daily value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	$\leq 0.1$ NTU, at least 99% of the samples on a daily basis; and $\leq 0.3$ NTU, 100% of the time
			Report number of cumulative minutes per day the turbidity was between 0.1 and 0.3 NTU	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	

**SCHEDULE 3 – TREATED WATER QUALITY**

**Limits, Monitoring and Reporting Frequency**

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
<b>MEMBRANE FILTER - Treated Water PARTICLE COUNTS (effective after installation and commissioning)</b>					
Particle Counts of particles greater than 2 um	Membrane filter train (after each individual filter train at a point upstream of the clearwell)	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Report % of measurements >20 particles/mL, and maximum daily value	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	≤ 20 particles/mL at least 99% of the samples on a daily basis; and < 50 particles/mL, 100% of the time
			In addition to the Membrane Filter limit specified above, the approval holder shall comply with a treated particle count level from each individual membrane filter train of less than or equal to:	Reported monthly As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	Pressure Systems: the readings between 20 and 50 particles/ml for a period of ≤ 15 minutes per day)
			# of cumulative minutes per day the particles/ml was between 20 and 50 particles/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
			# of cumulative minutes per day the particles/ml was between 20 and 200 particles/ml.	Reported monthly  As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	Vacuum Systems: ≤ 20 particles/mL at least 98% of the samples on a daily basis; and  ≤ 200 particles/mL, 100% of the time  Readings between 20 and 200 particles/mL for a period of ≤ 30 minutes per day
<b>MEMBRANE FILTER – Membrane Integrity Testing (effective after installation and commissioning)</b>					
Verification of log removal credit in ultra membrane filters	In each membrane filter train	Once per day	Report log reduction value	Reported monthly  As per Part 6 of the approval, unless notified in writing by the Director as per Section 6.4	≥ 3-log credit <i>Giardia</i> and <i>Cryptosporidium</i>

**SCHEDULE 3 – TREATED WATER QUALITY**

**Limits, Monitoring and Reporting Frequency**

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
<i>Treated Water CHLORINE DISINFECTION – Entering Grande Prairie Distribution System</i>					
Chlorine Residual – Free	Entering distribution system (where "C" is measured for log reduction of <i>Giardia</i> prior to entering distribution system)	Continuous monitoring and recording at $\leq 5$ 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	$\geq 0.2$ mg/L as Free Chlorine
Chlorine Residual – Free	Entering distribution system (where "C" is measured for log reduction of Viruses prior to entering distribution system)	Continuous monitoring and recording at $\leq 5$ minute sampling intervals	Record 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	$\geq 0.2$ mg/L as Free Chlorine

**SCHEDULE 3 – TREATED WATER QUALITY**

**Limits, Monitoring and Reporting Frequency**

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
<i>Treated Water CHLORINE DISINFECTION – Entering Grande Prairie Distribution System, continued</i>					
CT <sub>required</sub> Giardia	Entering distribution system (at the location where CT is calculated for use in the CT <sub>actual</sub> determination)	Calculated Once per day	Daily values	Reported monthly	N/A
CT <sub>lowest actual</sub>		Calculated Once per day		As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	N/A
CT performance ratio Giardia		Calculated Once per day (based on CT <sub>lowest actual</sub> )		Reported monthly	≥ 1 except for one day per month, which must be > 0.9
CT performance ratio Viruses	Entering distribution system	Calculated Once per day	Daily value	Reported monthly	≥ 1
Volume	Clearwell	Once per day	Minimum daily value	Reported monthly	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
<i>Treated Water CHLORINE DISINFECTION – Entering Grande Prairie Distribution System, continued</i>					
Flow		Continuous	Maximum flow in L/Min Recorded Once per day	Reported monthly	N/A
pH	Entering distribution system	Grab Sample Once per day	Daily value	As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	6.5 -8.5 pH
Temp		Grab Sample Once per day	Daily value	Director as per 6.4	N/A
<i>Treated Water - UV DISINFECTION, EFFECTIVE AFTER INSTALLATION and COMMISSIONING</i>					
UV dose, mJ/cm <sup>2</sup>	UV reactor #1	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Record average and minimum daily values	Reported monthly	According to USEPA, DVGW W-294 or AWWARF/NWRI, as outlined in the Standards and Guidelines, and according to 3.2
Flow	UV reactor #1	Continuous monitoring and recording at ≤ 5 minute sampling intervals	Record maximum daily value	As per Part 6 of the approval, unless notified in writing by the Director as per 6.4	
UV transmittance of filtered water	Entering UV reactors	Grab sample Once per day	Daily value		

**SCHEDULE 3 – TREATED WATER QUALITY**

**Limits, Monitoring and Reporting Frequency**

PARAMETER	STATION LOCATION	MONITORING/MEASUREMENT TYPE, NUMBER AND FREQUENCY	REPORTING CONTENT	REPORTING FREQUENCY	LIMITS
<i>Treated Water BACTERIOLOGICAL</i>					
Bacteriological quality <i>E. coli</i> Total Coliforms	Entering distribution: bacteriological	Grab samples in the quantity specified in the GCDWQ, 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 <i>E. coli</i> organisms per 100 mL  Zero Total coliform organisms per 100 mL
<i>Treated Water FLUORIDATION, EFFECTIVE ONLY WHEN FLUORIDE IS ADDED</i>					
Fluoride	Entering 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	0.6 to 1.0 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
<i>Treated Water</i>					
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 distribution system	2 Grab samples per annum for all parameters: (a) One sample taken during winter (December to February); and (b) One sample taken during summer (June to August); 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	Substance	Specific Parameter
Physical Parameters (Primary and Secondary)	Colour; pH; Total Dissolved Solids	Organic Chemicals and Pesticides (Primary)	Atrazine + metabolites; Benzene; Benzo(a)pyrene; Bromoxynil; Carbon Tetrachloride; Chlorpyrifos; Cyanazine; Diazinon; Dicamba; 1,2-Dichlorobenzene; 1,4-Dichlorobenzene; 1,2-Dichlorethane; Dichloromethane; 2,4-Dichlorophenol; 2,4-D; Diclofop-methyl; Diuron; Dimethoate; Ethylbenzene; Glyphosate; Malathion; Methoxychlor; Metolachlor; Metribuzin; Monochlorobenzene; Nitrilotriacetic Acid (NTA); Pentachlorophenol; Picloram; Simazine; Terbufos; Tetrachloroethylene; 2,3,4,6-Tetrachlorophenol; Toluene; Trichloroethylene; 2,4,6-Trichlorophenol; Trifluralin; and Vinyl Chloride.
Inorganic chemicals (Primary)	Antimony; Arsenic; Barium; Boron; Bromate; Cadmium; Chloramines; Chromium; Cyanide; Fluoride; Lead; Mercury; Nitrate; Nitrite; Selenium; and Uranium		
Inorganic and Organic Chemicals (Secondary)	Aluminum; Ammonia; Calcium; Chloride; Copper; Total Hardness; Iron; Magnesium; Manganese; Silver; Sodium; Sulphate; Sulphide; Total Organic Carbon; Xylenes (total); and Zinc		