Government of Alberta
Environment and Water

APPLICATION FORM AND GUIDE FOR A NEW OR RENEWED APPROVAL OF A MUNICIPAL WATERWORKS SYSTEM

INTRODUCTION

The attached form and guidelines outline the information required for an application for an approval or approval renewal of a waterworks system. The application has been prepared in accordance with the *Environmental Protection and Enhancement Act* (EPEA) and Approval and Registrations Procedure Regulation 113/93. Please ensure that each section of the application is completed in a concise and clear manner.

A waterworks system includes shallow water wells or surface water intake, water supply line, water treatment plant, storage, pumping and distribution systems.

For your information, the general steps and procedures that are followed when reviewing and issuing an Approval for a municipal waterworks system is illustrated by the attached flow chart (Figure 1). Of particular note is the fact that the application for this Approval must be advertised by the applicant and that the applicant, upon request, must provide copies of the application to the public. It is therefore important that the application for this approval, contain all the information required and be formatted to facilitate public review.

Application for new approvals must contain written confirmation, by a Professional Engineer, that all aspects of the waterworks design conform to the requirements of the Regulations under the Act, or a statement identifying and justifying and deviation. The plans and specifications submitted in support of the new approval must also be signed and stamped by a Professional Engineer.

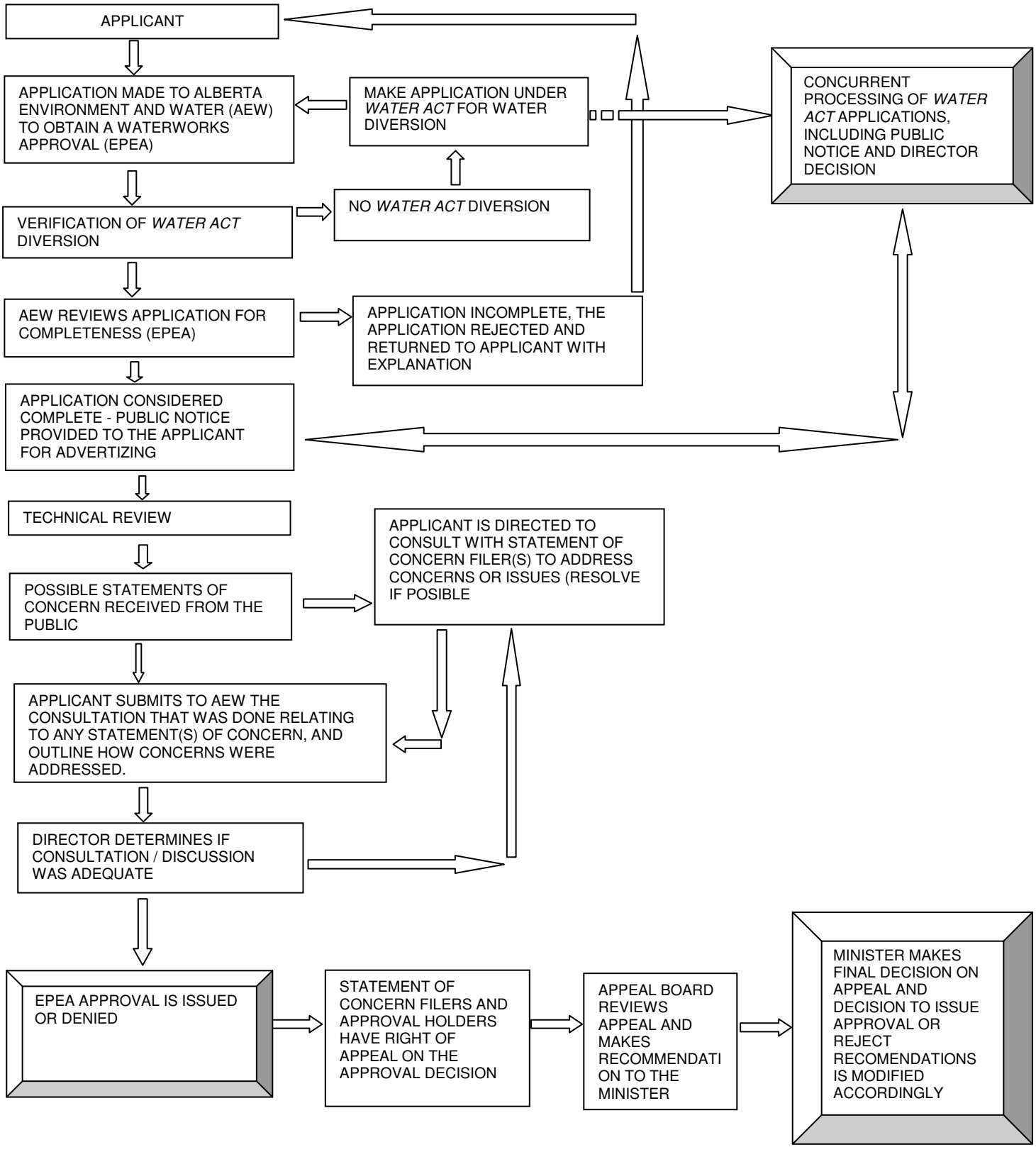
All information spaces in this application must be filled in or marked not applicable (N/A). Failure to provide all necessary information may cause the application to be rejected and returned to the applicant.

For an EPEA approval renewal, this application must be completed and forwarded to the Alberta Environment and Water, at least six months prior to the expiry date of the existing Approval for the waterworks system. All applications must be forwarded to:

Alberta Environment and Water
Regulatory Approvals Centre
Main Floor, Oxbridge Place
9820 - 106 Street
Edmonton, AB T5K 2J6
Phone No.: (780) 427-6311
Fax No.: (780) 422-0154

FOIP STATEMENT: Personal information on this form is collected under the authority of section 33(c) of the Freedom of Information and Protection of Privacy (FOIP) Act and will be used to administer the Environmental Protection and Enhancement Act and its associated regulations. ***This form is a public record that is available to anyone****. All information contained on this form (including personal information) is disclosed by Alberta Environment and Water to anyone requesting a copy in accordance with Section 2 of the Environmental Protection and Enhancement Act, Disclosure of Information Regulation. For further information about the collection and use of this information please contact Alberta Environment and Water's - Regulatory Approvals Centre at RAC.Environment@gov.ab.ca or call (780) 427-6311*

FIGURE 1 - THE APPROVAL PROCEDURE FOR MUNICIPAL WATERWORKS SYSTEM



APPLICATION FORM AND GUIDE FOR A NEW OR RENEWED APPROVAL OF A MUNICIPAL WATERWORKS SYSTEM

1.0 Administrative Information

1.1 Name of the Waterworks System:_____

Existing EPEA Approval No. (if applicable)_____Expiry Date:_____

1.2 Copies of the latest existing approval (if applicable) that were issued to the applicant in respect of the activity under this Act or a predecessor of this Act must be submitted in support of this application.

1.3 Legal land description of the water treatment facility:

Land Location_____SEC_____TWP_____RG_____M_____

or other (i.e.: street address)_____

GPS Co-ordinates: Latitude:_____ Longitude:_____

1.4 Submission of a map / plan of the area showing the location of the following landmarks must be submitted in support of the application. The map should show:

(a) the raw water supply intake/well or surface runoff area;

(b) any raw water reservoirs or pump stations;

(c) water treatment plant (including a schematic of the plant);

(d) treated water reservoir(s) and pump stations if any.

1.5 Confirmation that *Water Act* Licence for diversion has been obtained:

Yes____Date of Licence Issuance_____Expiry Date of Licence_____

Copy of *Water Resources Act* or *Water Act* Licence attached: Yes_____No_____

If No, please submit explanation, rationale, and date of *Water Act* application.

_____

_____

_____

_____

1.6 Name and Address of waterworks Owner (Municipality / Commission / Water Co-op / Company):

Name: _____

Address: _____

Contact Person: _____ *Position:* _____

Telephone: _____ *Fax:* _____

Email Address: _____

Is your organization registered with Corporate Registry?
Yes ☐ No ☐

1.7 Operating staff and person(s) responsible for the day to day operation of the waterworks system:

NAME OF OPERATOR(S)	POSITION	AEW CERTIFICATION		WORK PHONE #
		CERT. #	CLASS	

1.8 As a requirement of the *Environmental Protection and Enhancement Act* (section 72), this activity / application must be advertised. Therefore, please provide the name of the newspaper(s) most widely distributed in the area where the facility is located. Also, you may suggest other methods of public notification.

(a) Newspaper(s): _____

(b) Other methods: _____

2.0 Waterworks System (Technical Data)

2.1 Raw water analysis:

Raw water analysis (Mineralogical, Heavy metals, and *Giardia / Cryptosporidium*) must be submitted in support of this application. Date of analysis: _____

Lack of *Giardia/ Cryptosporidium* analyses in a new EPEA approval application will dictate a default 5.5 log removal requirement for the waterworks system (Alberta Environment and Water's Standards and Guidelines, 2006).

2.2 Present population served by the waterworks system: _____

2.3 Projected population at end of life for the water treatment plant (20-25 years): _____

FLOWS)	AVERAGE DAILY FLOW (M^3 / DAY)	MAXIMUM DAILY FLOW (M^3 / DAY)	PEAK HOURLY FLOW (LITRES / HOUR)
Current			
Design			

2.4 Are there any other Municipality(ies), Development(s) Commissions / Co-ops / or Companies outside the municipal boundaries obtaining potable water from the waterworks system (other than truck haul)?

Yes ☐ No ☐ If yes, please provide a list of the systems, the name and phone number of the contact person(s) and approximate annual flows or population.

NAME OF SYSTEM	CONTACT PERSON	PHONE NUMBER	ANNUAL FLOW (M^3) OR POPULATION

2.5 Are there any truck fill stations? Yes ☐ No ☐ If yes, how many?_____
Are the truck fill stations metered? Yes ☐ No ☐ Average monthly flows (m^3)_____

2.6 Raw Water Supply (choose raw water source(s):

☐ **GWUDI** (Groundwater Under the Influence of Surface Water)

Location of Shallow well(s) or spring(s):

Well #1 – Designation_____Land location_____SEC____TWP____RG____M_____
Well #2 – Designation_____Land location_____SEC____TWP____RG____M_____
Well #3 – Designation_____Land location_____SEC____TWP____RG____M_____
Well #4 – Designation_____Land location_____SEC____TWP____RG____M_____
Well #5 – Designation_____Land location_____SEC____TWP____RG____M_____

☐ Surface Supply

Name of River / Stream / Creek:_____
Point of Diversion Land location_____SEC_____TWP_____RG_____M_____
On-stream ☐ Off-Stream ☐
Point of Diversion Land location_____SEC_____TWP_____RG_____M_____
On-stream ☐ Off-Stream ☐
Point of Diversion Land location_____SEC_____TWP_____RG_____M_____
On-stream ☐ Off-Stream ☐

Point of Diversion Land location_____SEC_____TWP_____RG_____M_____
On-stream ☐ Off-Stream ☐
Point of Diversion Land location_____SEC_____TWP_____RG_____M_____
On-stream ☐ Off-Stream ☐

Raw water pumping:

UNIT	POWER RATING (KW)	CAPACITY (L/S)

2.7 Number of raw water storage reservoirs (if applicable):

LAND LOCATION	APPROXIMATE USEABLE CAPACITY (M^3)	TYPE (ON-STREAM OR OFF-STREAM)	HOW OFTEN FILLED
Total Capacity			

- Is the raw water reservoir(s) aerated? Yes ☐ No ☐
  If yes, please identify the reservoir(s) and the method of aeration _____
- Intake from reservoir (fixed or adjustable) _____
- Method of algae control, if any _____

2.8 Water Metering:

(a) Please list all flow monitoring locations:

i) Monitoring in the Treatment Process:

A) Raw water monitoring location:_____

B) Treated water monitoring location:_____

C) Other monitoring location:_____

ii) In the distribution system (i.e. residential, commercial, industrial, public/government, or any combination of):_____

2.9 Water Treatment Requirement:

Table 1 - Log Reduction Required For Filtered Systems

RAW WATER GIARDIA LEVELS (CYCSTS / 100 LITRES)	RAW WATER CRYPTOSPORIDIUM LEVEL (OOCYCSTS / 100 LITRES)	LOG REDUCTION
< 1	<7.5	3.0 log
>1 and < 10	> 7.5 and < 100	4.0 log
>10 and < 100	> 100 and < 300	5.0 log
> 100	> 300	5.5 log

Table 2 - Giardia, Cryptosporidium and Viruses reduction credit through filtration

FILTRATION TECHNOLOGY	GIARDIA CYSTS / CRYPTOSPORIDIUM OOCYSTS CREDIT	VIRUS CREDIT
Conventional filtration	3.0 log	2.0 log
Direct filtration	2.5 log	1.0 log
Slow sand or diatomaceous earth filtration	3.0 log	2.0 log
Microfiltration, ultrafiltration and membrane cartridge filtration	Removal efficiency demonstrated through challenge testing and verified by direct integrity testing	No credit
Nanofiltration and reverse osmosis	Removal efficiency demonstrated through challenge testing and verified by direct integrity testing	Removal efficiency demonstrated through challenge testing and verified by direct integrity testing
Microfiltration, ultrafiltration, Nanofiltration, reverse osmosis and membrane cartridge filtration, preceded by coagulation, flocculation and sedimentation	Minimum 3.0 log if removal efficiency demonstrated through challenge testing and verified by direct integrity testing	Minimum 2.0 log if removal efficiency demonstrated through challenge testing and verified by direct integrity testing

2.10 Water Treatment Processes (indicate applicable treatment process):

- **Disinfection only method** (exceptional and only site specific)_____
- **Aeration (treated water)** Yes ☐ No ☐ Type of aeration_____
- **Pre-disinfection or oxidation** Yes ☐ No ☐ Chemical used_____
- **Coagulant or filter-aid chemical addition** Yes ☐ No ☐
- **Flocculation** Yes ☐ No ☐
- **Ballasted** Yes ☐ No ☐
- **DAF** Yes ☐ No ☐

- **Filters – Greensand** (Iron and/or Manganese removal)
  On-line turbidity meters with data capture: Yes ☐ No ☐
  On-line particle counters with data capture: Yes ☐ No ☐

FILTER NUMBER	FILTER MEDIA	SURFACE AREA	DESIGN LOADING RATE (M/H)
1			
2			
3			

- **Filter(s) – Pressure**

On-line turbidity meters with data capture: Yes ☐ No ☐
On-line particle counters with data capture: Yes ☐ No ☐

FILTER NUMBER	FILTER MEDIA	SURFACE AREA	DESIGN LOADING RATE (M/H)
1			
2			
3			

- **Clarifier(s)**

DESCRIPTOR / NUMBER	DESIGN CAPACITY	RETENTION TIME	VOLUME	RISE RATE

- **Filter(s) – Rapid Sand / Slow Sand**

On-line turbidity meters with data capture: Yes ☐ No ☐
On-line particle counters with data capture: Yes ☐ No ☐

FILTER NUMBER	FILTER MEDIA	SURFACE AREA	DESIGN LOADING RATE (M/H)
1			
2			
3			

- **Filter(s) – Cartridge**

Confirmation that cartridge design flow < 1.0 litres per second: Yes_____
Confirmation / submission of Challenge testing: Date:_____

On-line turbidity meters with data capture: Yes ☐ No ☐
On-line particle counters with data capture: Yes ☐ No ☐

FILTER NUMBER	PORE SIZE (µ)	NOMINAL OR ABSOLUTE	ORIENTATION OF CARTRIDGE SIZE IN TREATMENT TRAIN
1			
2			
3			

- **Filter(s) – Membrane**

Microfiltration ☐ Ultrafiltration ☐ Nanofiltration ☐ Reverse Osmosis ☐
Confirmation/submission of Challenge testing: Date_____
Pilot study submitted in support of this application: Yes ☐ No ☐
On-line turbidity meters with data: Yes ☐ No ☐
On-line particle counters with data capture: Yes ☐ No ☐

MEMBRANE FILTER MODULES	PORE SIZE (µ)

2.11 Confirmation that all water treatment chemicals used in the waterworks are NSF approved: Yes ☐ No ☐ (If no, include all non-NSF chemicals in the table below)

2.12 Inventory of all water treatment chemicals used. (Please identify all the chemicals used seasonally or continuously, including descalents, pH adjusters, and chlorine as a pre-oxidant or disinfectant).

CHEMICAL NAME	NSF APPROVED Y/N	CHEMICAL TYPE	POINT OF INJECTION	SEASONAL / CONTINUOUS

2.13 Disinfection (indicate disinfection practiced). Type of Primary or Main Disinfection:

Chlorine Gas ☐ Sodium Hypochlorite ☐
Chloramination ☐ Calcium Hypochlorite ☐
Ozonation ☐ Chlorine Dioxide ☐
Ultra Violet ☐ ** secondary chlorination required, see Ultra Violet Disinfection section

Location of primary or main Disinfection introduction_____

On-line chlorine meters (CT) with data capture: Yes ☐ No ☐

Please note log reduction requirements and log reduction credits are for **both *Giardia* and *Cryptosporidiu*m. *Cryptosporidium* is not inactivated by disinfection using chlorine.

CT Disinfection (for new and CT practicing systems)

Use the formula below for CT disinfection calculations (*Giardia* / *Cryptosporidium and Viruses*).

CT Required – Giardia / Cryptosporidium (non U.V. system) – AEW (Standards and Guidelines) Table A_____

Log reduction target for disinfection_____

Minimum temperature (ºC)_____Maximum pH_____

Baffling Factor of treated water reservoir(s) (T_{10}/T)_____

Please include reservoir details (length, width, height, inlet/outlet details, to verify baffling factor).

V_{min} (designed minimum volume in reservoir in Litres)_____

Q peak (max designed hourly flow (L/min) or twice the daily designed flow (L/min)_____

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

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

$\frac{T_{10}}{T}$ = X; 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 (in minutes) established from the most recent tracer study; and

T = the calculated contact time (in minutes), 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 designed minimum volume (in Litres) of treated water in the treated water chlorine contact storage reservoir;

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

Ultra Violet Disinfection

Ultra Violet Disinfection equipment validation must be submitted with this application.

Ultra Violet Disinfection equipment validated by:

AWWARF/NWRI Ultra Violet Guideline	Yes ☐
USEPA Ultra Violet Guidance Manual	Yes ☐
DVGW Technical Standard W 294	Yes ☐

DISINFECTION	GIARDIA CYSTS / CRYPTOSPORIDIUM OOCYSTS CREDIT	VIRUS CREDIT
Ultra Violet Disinfection	3.0 log (properly validated system	No credit

Number of validated Ultra Violet reactors:_____

Multiple Ultra Violet reactors (in parallel – each reactor designed for 100% flow).

Duty (100%) – standby (0%) Yes ☐ No ☐

Duty (___%) - Duty (___%) Yes ☐ No ☐

Chlorination (secondary disinfectant) of the treated water after Ultra Violet disinfection is required to address Viruses and maintain a chlorine residual in the treated water distribution system.

CT calculations for Viruses should be calculated using CT formula provided.

CT Required – Viruses (for UV only) – AEW (Standards and Guidelines) Table B_____

Location of injection of secondary disinfectant (chlorine – UV- Viruses)_____

2.14 Total Log Reduction Requirement for Waterworks System:

Insert *Cryptosporidium*, *Giardia* and *Virus* credit values from Table 1 and Table 2 for your waterworks system. Filtration process Credit added to disinfection process credit must be equal to, or greater than the total log reduction requirement for the raw water supply.

WATER TREATMENT PROCESS	LOG REDUCTION CREDIT		
	Cryptosporidium	***Giardia***	**Viruses**
Filtration process			
Disinfection process (chlorine only)	0		
Disinfection process (Ultra Violet and chlorine)	3.0	3.0	4 (with secondary chlorination)
Log Reduction Achieved			
Total Log Reduction Required (as per Table 1			**4**

2.15 Addition of Fluoride to water: Yes ☐ No ☐

Name of chemical used:_____

Location of injection of fluoridation chemical:_____

2.16 Disposal and handling of wastewater from plant:

TYPE OF WASTE STREAM	DECHLORINATION OF WASTE STREAM BFORE DISCHARGE (YES/NO)	METHOD / LOCATION OF WASTE DISPOSAL
Clarifier Blowdown		
Filter Backwash		
Filter-to-waste		
Waste from on-line Turbidimeter		
Waste from on-line Chlorine analyzer		
Drain down (membranes)		
Clean in place (membranes)		
Rejection stream (membranes)		
Waste from lab sink or floor drain(s)		
Other (Specify)		

3.0 Treated Water Distribution System

3.1 Treated Water Storage Reservoir(s):

DESCRIPTOR	ELEVATED SURFACE, OR UNDERGROUND	CONTRUCTION MATERIAL	VOLUME (M^3)	LOCATION (STREET ADDRESS OR LEGAL LAND DESCRIPTION

Total volume of treated water storage_____(m^3).

3.2 Treated Water Distribution Pumps:

UNIT	POWER RATING (KW)	CAPACITY (L/S)

3.3 Emergency Pumping:

UNIT	POWER RATING (KW)	CAPACITY (L/S)

Total capacity of emergency pumps_____(L/s).

Description and location of fuel source for emergency pumping_____

_____

_____

_____

_____

4.0 Laboratory and Monitoring (for existing EPEA Approved systems)

4.1 Extent of existing monitoring carried out by the municipality/commission/company (check the appropriate monitoring and frequency).

TYPE OF MEASUREMENT	LOCATION	TYPE OF SAMPLE ANALYSES (GRAD, OR ON-LINE, ETC.)	NUMBER OF SAMPLE ANALYSES PER WEEK
Chlorine residual (leaving the plant)			
Chlorine residual (in the dist. system)			
pH (raw)			
pH (treated)			
Turbidity (raw)			
Turbidity (after filter)			
Turbidity (treated)			
Fluoride concentration			
Others (Specify)			

5.0 Operations Plan

5.1 An operations plan must be submitted in support of this application. The operations plan shall contain the following:

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

i) contact name and telephone numbers for the system owner, system operator, engineering consultants and equipment suppliers,

ii) operating instructions:

A) general description of treatment process and operating procedures;

B) performance requirements; and

C) location of equipment major controls;

iii) general maintenance schedule, and

iv) general maintenance instructions for:

A) treatment / process equipment;

B) monitoring equipment; and

C) pumping equipment; and

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

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

i) operational and compliance tests to be performed,

ii) bacteriological quality monitoring plan,

iii) methods used for monitoring and analysis,

iv) locations of monitoring points, and

v) laboratory data quality assurance information.

6.0 Emergency Response Plan

6.1 Confirmation that any emergency response plans that are required to be filed with the local authority of the municipality in which the activity is or is to be carried on or with Alberta Public Safety Services have been so filed must be submitted in support of this application.

Yes ☐ No ☐ If no, please identify the reason and provide a timeline for submission to the specific party:_____

_____

_____

_____

_____

6.2 A copy of any formal Emergency Response Plan must be submitted along with the Operations Plan. The Emergency Response Plan must outline the procedure that would be followed in the event of major problems with the waterworks system such as:

(a) bacteriological results exceeding the prescribed limits;

(b) Turbidity / particle counts exceeding the limits;

(c) Low or no chlorine residual;

(d) CT (if applicable) not being met;

(e) chemical overfeed;

(f) no chemical or coagulant feed;

(g) raw water shortage, (alternative water supply source should be identified and assessed);

(h) raw water quality problems;

(i) treatment plant failures;

(j) power failure;

(k) any unforeseen sudden or gradual releases of substances to the environment;

(l) flood;

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

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

7.0 Waterworks Application Signature

The *Environmental Protection and Enhancement Act* and Regulations, provide a specific definition for the "owner" and "person responsible for a waterworks system". Therefore, the person(s) responsible/person signing this document should be familiar with the applicable sections of the *Environmental Protection and Enhancement Act* and the Regulations.

The sections of the *Environmental Protection and Enhancement Act* and Regulations that are of particular relevance to waterworks system are:

(a) *Environmental Protection and Enhancement Act* Part 2, Division 2 (Approvals and Certificates); Part 7 (Potable Water); Part 10 (Enforcement);

(b) Approvals Procedure Regulation 113/93;

(c) Potable Water Regulation 122/93.

I certify that I am familiar with the information contained in this application, and that to the best of my knowledge and belief, such information is true, complete and accurate.

Printed Name of Person Signing	*Title*
Corporate Address	*Corporate Postal Code*
Corporate Telephone Number	*Corporate Fax Number*
Date of Application	*Signature*