RURAL WATER PIPELINE HANDBOOK FOR SASKATCHEWAN

UNIT FOUR (IV) - REGULATORY REQUIREMENTS

April 2009

Section 1 Introduction

1.0 General

Safe drinking water is a vital component in the protection of public health and disease prevention and therefore essential for the health and well being of Saskatchewan's citizens. High quality water is important in maintaining natural ecosystems and the species that depend upon them. The productivity of industry and sustaining commerce is vital to ensuring productive farms and ranches. The quality of drinking water, the condition of systems that produce it and the protection of source waters is an important public health and environmental issue in Saskatchewan now and for the future.

1.1 What is the Safe Drinking Water Strategy?

The Safe Drinking Water Strategy, announced in April 2002, is a comprehensive plan of action designed to deal with the risks that affect drinking water and potentially impact the health of Saskatchewan residents. The Strategy will also provide more assurance to the citizens of the province that government agencies are helping to ensure that the water we drink is safe. The Strategy was created as one of a series of Government measures to address drinking water quality and management following the tragedy in Walkerton, Ontario where people died because of contaminated drinking water. It also responds to recommendations from the North Battleford Commission of Inquiry, which examined the waterborne Cryptosporidiosis outbreak that affected that city in 2001. The vision of the Strategy is a sustainable, reliable, safe and clean supply of drinking water that is valued by the citizens of Saskatchewan.

Several departments and agencies are involved in implementing the Strategy including: Ministries of Environment, Health and Agriculture; Regional Health Authorities; Saskatchewan Watershed Authority and SaskWater.

Further information on drinking water quality is available on the SaskH_2O website (http://www.SaskH_2O.ca) and on Ministry of Environment's website (http://www.environment.gov.sk.ca). Additional detailed background information regarding drinking water quality in Saskatchewan is available at http://www.SaskH_2O.ca/news.asp on the Internet.

1.2 Key Departments and Agencies for Water Pipelines

Although pipelines may deal with all the government departments involved in the implementation of the Strategy, the Ministry of Environment and the Ministry of Health and the Regional Health Authorities are the key departments and agencies involved with water pipelines.

The following is a summary of Ministry of Environment's role, priority and the actions involved in the implementation of the Strategy:

- ✓ Lead ongoing planning, implementation and reporting work for the Strategy to which all participating departments and agencies contribute;
- ✓ Implementation, inspections and compliance for water and wastewater facilities regulated under The Water Regulations, 2002;
- ✓ Issue permits for construction and operation of water and wastewater works;
- ✓ Policy, protocol, water quality standard and guideline development to support protection of drinking water and implementation of The Water Regulations, 2002;
- ✓ Operator certification liaison;
- ✓ Manage the drinking water information system, Environmental Management System, that houses water quality and inspection data for all Saskatchewan Environment regulated waterworks (drinking water and wastewater) in the province; and
- ✓ Manage the *SaskH_2O.ca* website that supplies a broad range of drinking water related information gathered from water management authorities within the province.

1.3 Ministry of Environment and Water Pipeline Regulations

MOE regulates many pipelines under *The Water Regulations, 2002*. MOE-regulated pipeline systems include those directly connected to a municipal waterworks and other pipelines not directly connected to a municipal waterworks with 15 or more service connections.

MOE delivers the Strategy through the Environmental Protection Branch (EPB), Drinking Water Quality Section (DWQS). The Drinking Water Quality Section is responsible for the approval and permitting process for construction, alterations, and operation of these systems. It consists of: Approvals, Standards & Compliance Unit, and two Water & Municipal Programs Units (North and South unit). The program is administered in the field by Environmental Project Officers (EPO's) for each region of the province.

1.4 Saskatchewan Health/Health Regions and Pipelines

Saskatchewan Health's legislation and regulations that can apply to pipelines include: ***The Public Health Act, 1994,*** The Plumbing and Drainage Regulations and The Health Hazard Regulations. The Act and regulations are administered and enforced by Health Region Public Health Inspectors throughout the province.

In addition, Health officials work closely with MOE when there are human health concerns relating to the water quality in a pipeline that is regulated by Environment. If necessary, the Regional Health Authority will take action (e.g. issuing a "Precautionary Drinking Water Advisory" or an "Emergency Boil Water Order" to address an existing or potential health hazard.

Section 2 Ministry of Environment Legislation

MINISTRY OF ENVIRONMENT DISCLAIMER:

This section does not present all of the regulatory requirements for a drinking water pipeline system in Saskatchewan and does not take precedence over any Acts, Regulations or other regulatory documents. For more information please contact your Environmental Project Officer and visit the website at:

www.saskh20.ca

2.0 General

MOE regulates drinking water under two bodies of legislation: *The Environmental Management and Protection Act, 2002* (the Act) and *The Water Regulations, 2002* (the Regulations). There are many clauses of both the Act and the Regulations that pertain to pipelines and therefore each *Pipeline Organization* is responsible for understanding all the requirements of these legislations.

2.1 Permit to Construct

A permit to construct is required for new construction, extension or alterations of existing works. Section 21 of *The Environmental Management and Protection Act, 2002* states:

> "…no person shall commence the construction, extension, alteration or operation of any waterworks or sewage works unless that person has first obtained a permit from the minister to do so".

There are a few circumstances where a Permit to Construct is not required. They are as follows:

- ✓ Maintenance projects,
- ✓ Line break repairs,
- ✓ Service connections,
- ✓ Fire hydrants & similar valves,
- ✓ Replacement of pipe materials, and
- ✓ New pipe with capacity increase of < 100% at same location.

It is best to verify with MOE that the intended work does not require a permit since contravention of the Act may result in enforcement action.

The following outlines the general procedures for the construction permitting process:

Step 1:

The *Pipeline Organization* applies for a Permit to Construct.

Step 2:

The application is received by MOE and is reviewed by both the local Environmental Project Officer (EPO) and the Approval Engineer. It is mandatory for the *Pipeline Organization* to submit copies of all approvals that are required to complete the project. The approvals can be forwarded to the MOE after the *Organization* has applied for the Permit to Construct. (see Unit V for more information) The Approval Engineer will notify the applicant if design changes are required. The MOE requires a maximum review time that does not exceed 45 days unless the review requires information not included in the application.

Step 3:

If the proposed system meets all MOE requirements, a "Permit to Construct" is issued by the Approval Engineer and the permit and cover letter are sent to the *Pipeline Organization*.

The permit and cover letter will explain the conditions of the permit being issued and the next steps required such as notifying your local EPO when the construction is complete.

The "Permit to Construct" also provides information for the following:

- ✓ Flushing, disinfection and bacteriological testing of the water distribution system;
- ✓ Backflow prevention requirements;
- ✓ Routine bacteriological monitoring during operation of the pipeline;
- ✓ Mainline flushing;
- ✓ Routine and emergency boosting of chlorine residuals;
- ✓ Certified operator;
- ✓ Saskatchewan Regional Health Authority;
- ✓ Residential Mechanical equipment;
- ✓ obtaining a Permit to Operate for the works.

2.1.1 Application Forms

There are two types of applications for "Permits to Construct" used for rural water pipelines that are designated Human Consumptive use. They are:

Application for a Permit to Construct and/or Operate a Waterworks
Application for Permit to Construct, Extend or Alter Existing Works

These applications can be found at http://www.saskh2o.ca/foroperators.asp
(Scroll down to Forms)

(Application for a Permit to Construct and/or Operate a Waterworks)

(Appendix III - K)

(Application for Permit to Construct, Extend or Alter Existing Works)

(Appendix IV - B)

2.2 Permit to Operate

The Pipeline Organization is required to apply for and obtain a "Permit to Operate" prior to distribution of water to their consumers. The application is sent to the Pipeline Organization's local Environmental Protection Officer (EPO). A list of the EPO's location and contact information can be found on Page 1 of the Application for Permit to Construct and/or Operate a Waterworks.

The "Permit to Operate" can be applied for prior to the completion of construction. The Pipeline Organization should make application a minimum of 45 days prior to the anticipated use of the new facilities. This will ensure that the Permit to Operate may be issued when the pipeline is ready to begin water distribution.

The "Permit to Operate" will outline items that the Pipeline Organization will be required to follow throughout normal use of the pipeline system, including testing requirements, sampling, and monitoring water quality, record keeping, MOE and consumer reporting and inspection procedures / requirements.

2.3 Design and Safety Considerations

MOE requires a Professional Engineer's stamped drawings for every pipeline system. Please refer to MOE's - "A Guide to Waterworks Design" and the "Water Pipeline Design Guidelines" regarding design requirements for pipelines.

http://www.saskh2o.ca/DWBinder/EPB201AGuideWaterworksDesign.pdf

Addendum to above - http://www.saskh2o.ca/DWBinder/EPB201AddendumJan08.pdf

2.3.1 Ability To Flush Out Main Lines

The distribution system must have the ability to flush out main lines and/or lateral lines utilizing fire hydrants, blow offs, flushout assemblies, yard hydrants or any other acceptable means.
Consideration must be given to the type of system utilized to provide flushing capabilities. A fire hydrant may provide a false sense of security to locals as many *Pipeline Organizations* may not be able to provide the flow rate that is typically expected from a fire hydrant. Yard hydrants may not provide the desired level of security, ie. it may be easy for people to use the yard hydrant for their own purposes. Flushout assemblies, while providing some level of security, may require additional work to pump out the line to prevent freezing. Each *Pipeline Organization* will need to assess their requirements in regards to provision flushing capabilities.

2.3.2 Ability to Boost Chlorine

The system must have the ability to boost chlorine and maintain proper chlorine residuals throughout the Distribution System.

In cases of contamination or a drop in chlorine residuals, all pipeline distribution systems are required to add additional disinfectant. This can be achieved by incorporating chemical feed pumps that are capable of injecting chlorine into the distribution system through injection ports or nipples that are installed at strategic locations but are usually located at your main pump houses or booster stations. Other locations may include manholes but are typically not recommended because of confined space entry protocol , unsatisfactory environmental conditions such as a high water table, and the difficulty to ventilate the air in the manhole if the chlorine inadvertently off-gasses.

2.3.3 Representative Sampling Ports

In order to meet the requirements of the Permit to Operate, which will provide the frequency and type of sampling/testing required, *Pipeline Organizations* should have their system designed with sampling stations that are approved by MOE and are in a location that is representative of the pipeline distribution system. Consideration should be given to ease of access and operator safety. Generally, the consultant is involved with the design and location of these sampling ports. Sample collection points may be located at existing pumphouses, booster stations or local schools could be a possible consideration. Your local EPO must approve the site selection.

Sampling ports are also required by MOE to be included as a part of the in-house mechanical assembly (metering assembly) that most subscribers will have. This provides easy access to the water being supplied at any residence on the pipeline system without the need to remove the supply pipe from the water storage tank. However, this does require access to a resident's home and the timing of such would need to be coordinated with the home-owner.

2.3.4 Backflow Prevention Methods / Devices

Appropriate measures must be taken to protect the system from varying degrees of potential backflow contamination. The most effective control of backflow is eliminating the possibility of any cross connection and/or installing a suitable backflow prevention device. The "Permit to Construct" will typically outline recommendations regarding the type of backflow protection required on each pipeline system. However, the local Regional Health Authority has jurisdiction on the service connection portion of the work and may modify the "Permit to Construct" recommendations.

Below is a list of backflow prevention methods and devices commonly used on rural water pipeline subscriber connections. Further information on backflow devices and prevention is included in (Appendix IV - C) and in Unit VI Section 4.

- **Reduced Pressure Principal Backflow Prevention Assembly (RP)**

The Reduced Pressure Principal Backflow Prevention Assembly is normally found in pump houses or booster stations. This valve has two independent check valves, separated by a reduced pressure zone, with a relief valve and test cocks. It should be installed to isolate a severe hazard and requires a sump, storm sewer, floor drain or drain pipe to dispose of water during a reduced pressure condition. This type of device is appropriate for severe cross connection hazards.

- **Air Gap**

An air gap is the unobstructed vertical distance through air between the lowest point of a water supply outlet and the flood level rim (or overflow) of the reservoir or fixture into which the outlet discharges. A proper air gap vertical distance is related to the diameter of the incoming pipe. This approach is the best means available for protection against backflow and should be used at all points of delivery. To ensure that the risk of contamination is minimized in the event that a cross-connection is made in the future, mechanical backflow prevention devices (described below) should also be installed. Please note that mechanical devices can fail and therefore the air gap is the most fail-safe backflow preventative system.

- **Double Check Valve Assembly (DCVA)**

The Double Check Valve Assembly has two independent check valves. These devices can be equipped with test cocks and are normally used to isolate a moderate hazard. Rural pipeline systems, serving a household, are typically classified as a moderate hazard by the Ministry of Environment, and may therefore require the double check valve assembly.

- **Dual Check Valve (DuC)**

The Dual Check valve has two independent wafer style check valves and is normally used as a preventative device to isolate a minor hazard.

- **Hose Connection Vacuum Breaker (HCVB)**

The Hose Connection Vacuum Breaker is a single check with atmospheric vacuum breaker vent and should be installed on all hydrants and hose bibs.

- **Other**

Other backflow prevention valves are available, but the ones above are the most commonly used for pipeline projects. Generally, double check valve assemblies are installed in all situations of minor and moderate hazard ratings. All backflow prevention valves should be tested regularly as recommended in your preventative maintenance guidelines. See Unit VI for more information.

Please refer to the "Water Pipeline Design Guidelines" regarding backflow prevention device types and their appropriate use.

http://www.saskh2o.ca/DWBinder/EPB276WaterPipelineDesignGuidelines.pdf

2.4 Operational Guidelines

2.4.1 General

Every MOE regulated system must have a "Permit to Operate". Listed in the "Permit to Operate" are numerous operating conditions. This section will discuss some of the many requirements necessary for a *Pipeline Organization* to operate.

2.4.2 Quality Assurance/Quality Control (QA/QC)

All *Pipeline Organizations* are required to have a Quality Assurance and Quality Control policy prepared and kept on file as well as an Emergency Response Plan (ERP) manual. In simple terms, a QA/QC policy is a written statement of intent to provide safe drinking water, typically water that meets all the quality and production related requirements of *The Water Regulations, 2002.* Please see Unit VI for more information. Further information is available in MOE's Drinking Water Information Binder. This binder and the QA/QC fact sheet are also listed at the following links:

http://www.saskh20.ca/DWBinder.asp

http://www.saskh2o.ca/DWBinder/EPB243_Qc_QC_Policy_Waterworks_factsheet.pdf

2.4.3 Certified Operator

Every *Pipeline Organization* that is required to have a "Permit to Operate" to supply water to subscribers will require a certified operator that is in Direct Responsible Charge (DRC) at all times. Operators seeking certification in Saskatchewan are generally required to fulfill criteria including formal education, related work experience and completion of appropriate certification examination(s). Please see the following link for more information. Also refer to Unit VI for further information.

http://www.saskh2o.ca/DWBinder/EPB144Water_and_WastewaterOperatorCertificationProgram.pdf

2.4.4 Regional Contract Operator

Organizations that are unable to acquire a certified operator may enter into an agreement with another nearby community or *Pipeline Organization* so that the conditions of a certified operator in DRC are met according to MOE. The Regional/Contract Operator Program allows smaller *Organizations* to meet the health and safety objectives without their own designated certified operator. Please see the following link for more information. Also refer to Unit VI for further information.

http://www.saskh2o.ca/PDF/Regional-ContractOperatorProgram.pdf

2.5 Sampling/Monitoring

Drinking Water quality monitoring is important to both the consumer and the waterworks owner as it ensures the safety of the water supply. It determines the aesthetic quality, and helps determine if treatment upgrades are required. It also helps to determine if there are any trends in water quality.

2.5.1 Start-up Testing for New Pipelines, Extensions or Alterations

Start-up testing for new pipelines, extensions or alterations must include super-chlorination and flushing upon completion. The "Permit to Construct" outlines the requirements for flushing and disinfecting the pipeline during the initial start-up procedures. Disinfecting and testing is based on AWWA practices. Prior to delivery of water for subscriber usage, water sampling must be undertaken in accordance to MOE guidelines which includes a minimum of two consecutive sets of two bacteriological samples. Upon meeting the testing requirements, a "Permit to Operate" may be issued to the *Pipeline Organization*. For further information, please refer to Unit VI.

2.5.2 Monitoring Schedule

Upon issuance of a "Permit to Operate" to a waterworks, the Permittee's Monitoring requirements are outlined in a "Monitoring Schedule" attached to the Permit.

Waterworks organizations are required to follow sampling schedules as set out in your "Permit to Operate". The permit outlines the number and frequency of samples to submit. More information on all parameters of Saskatchewan's Drinking Water Standards can be viewed at the following link:

http://www.saskh2o.ca/DWBinder/EPB207Drinking_Water_Standards_post.pdf

2.5.3 Water Sample Testing

Water samples must be taken by a Certified Operator, unless permission can be obtained from the local Environmental Project Officer to have non-certified personnel obtain the samples. Certain information must be included with the water sample when it is sent to the accredited laboratory (lab), including date, time, location of sample as well as the person who collected the sample and chain of custody.
All water samples, other than chlorine residual and turbidity, must be tested at an accredited laboratory in the province of Saskatchewan. If using an accredited lab other than the Saskatchewan Disease Control Laboratory (Provincial Lab), the lab must be instructed to provide records to MOE.

The water sampling results are normally compared with standards and guidelines as listed in MOE's Saskatchewan's Drinking Water Quality Standards and Objectives. There is a difference between a Guideline/Objective and a Standard:

- ✓ Guideline/Objective – a recommended maximum acceptable level or Aesthetic Objective (AO)

e.g. - Iron AO = 0.30 mg/l

- ✓ Standard – an enforceable Maximum Acceptable Concentration (MAC)
  e.g. - Selenium MAC = 0.01 mg/l

The following are some items that may be analyzed:

- **Bacteriological**

Samples must be collected in sterile bottles at representative location(s) throughout the distribution system. Sterile bottles can be obtained from an accredited testing facility. It is important to take the water sample directly from the point of discharge into the reservoir or from a sample port on the in-house mechanical assembly and not from the cistern, reservoir tank or the subscriber's kitchen tap. Please ensure water being sampled has not passed through a water softener/treatment device. Samples must be shipped to the accredited lab in a cooler bag, with a freezer pack and must arrive at the lab within 48 hours of collection. The lab will determine the presence of Coliform bacteria and will forward an analysis to your *Organization* for your records. A copy will be sent to your MOE Environmental Project Officer.

- **Turbidity**

Turbidity is a measurement of the amount of light scattered by particles in a sample of water. In simple terms, it is a measurement of the clarity of water or the amount of particles in the water. The units are measured as Nephelometric Turbidity Units (NTU's). Lower numbers represent better water quality. Measurements are usually conducted on site using a Turbidity meter. Typically, testing is not required for *Pipeline Organizations* that rely on a treated water supply as their source; however, if the *Pipeline Organization* has its own source and treats its own water, then turbidity monitoring is mandatory. MOE's *The Water Regulations,* 2002 currently requires that *Pipeline Organizations* serving a population of 5000 or greater and as of December 5, 2008, *Pipeline Organizations* serving a population of less than 5000, have the following turbidity standards for treatment as listed below:

Surface Water must meet the following criteria at each filter:

- ✓ Chemically assisted filtration – 0.2 or 0.3 NTU (depending on source water quality) 95% of the time and never exceeding 1.0 NTU
- ✓ Membranes – 0.1 NTU 95% of the time never exceeding 0.3 NTU
- ✓ Slow sand filtration or diatomaceous earth filtration – 1.0 NTU 95% of the time never exceeding 3.0 NTU

Ground water must meet the following criteria for water entering the distribution system:

- ✓ All true groundwater sources – 1.0 NTU 95% of the time

Pipeline Organizations should strive to maintain turbidity levels that are as low as possible within the pipeline. Some waterworks self-impose guidelines that help them to maintain low turbidity levels. Your EPO may include in your "Permit to Operate", a maximum acceptable level for Turbidity.

For further information, please refer to Unit VI.

- **Chlorine**

Chlorine testing is an important site measurement to determine disinfection availability and verification of Free and Total chlorine residuals. Free and Total chlorine residuals are important indicators of tracking disinfectant throughout the pipeline. The Regulations require at least 0.10mg/l of Free residual chlorine entering a distribution system. Regulations require at least 0.10mg/l Free chlorine and/or 0.50mg/l Total chlorine throughout the distribution system. The Permit to Operate will state the frequency of chlorine monitoring required. Usually chlorine tests are also done at the time of bacteriological sample collection and are submitted with the sample for analysis. Most *Organizations* will likely need to monitor Free and Total chlorine daily for water entering the distribution system as well as throughout the pipeline. Chlorine testing is preferably taken at the extremities of the line, but a representative location in the pipeline will suffice. Tests are easy and can be done quickly on site with simple equipment such as a Pocket Colorimeter. It is recommended that the colorimeter used is capable of measuring the chlorine and displays the data in mg/l and not the less expensive method of color comparison by using a color wheel. Pipelines may employ online continuous monitoring devices that record data and can initiate alarms. This equipment can be expensive and may be cost-prohibitive. For further information, please refer to Unit VI.
If the pipeline has its own source and treats its supply, MOE may require additional chlorine monitoring at the discretion of the EPO.

If chloramination (the combination of ammonia with some compounds of chlorine) is practiced as part of the treatment of the source water, free chlorine will typically not be tested for or required (i.e City of Saskatoon). Chloramines are an advantage in longer pipelines as the residuals are normally retained in the water for a longer duration than chlorine, however chloramines is a weak disinfecting agent.

- **Trihalomethanes (THM's)**

Trihalomethanes are a measurement of disinfectant byproducts caused by reaction of free chlorine with organics in the water supply. These consist of Chloroform + bromoform + dibromochloromethane + dichlorobromomethane resulting in Total THM's. Trihalomethanes are potentially carcinogenic (cancer causing). Sampling is taken from representative locations in the distribution system quarterly (seasonal). The current guideline is 0.100 mg/l based on an average of four seasonal samples. MOE's *The Water Regulations, 2002* requires, as of December 5, 2010, for pipelines that serve a population of less than 5000, the THM level be 0.100 mg/L as an enforceable standard.

- **Other / Additional Testing**

Testing for pesticides, synthetic organics, radiological and mercury are typically only required for waterworks *Organizations* that service 5,000 or more subscribers. However, some subscribers or your EPO may request that a complete analysis be completed for all toxins and chemical health parameters every other year.

Those pipelines that actually source and treat their water will be required to conduct General Chemical Analysis (Basic water chemistry - hardness, alkalinity, calcium, sodium, etc.). Surface water standards require quarterly tests to be completed every two years. These tests must be consecutive for four quarters. Ground water standards require testing once every two years. In addition, a completed Health and Toxicity Analysis (Metals analysis – arsenic, barium, boron, iron, selenium, manganese, zinc, etc.) is required once every two years.

2.5.4 Positive Bacteriological Test Results

Bacteriological testing determines the presence of total colifroms (TC), fecal coliform (FC) and E. coli (Escherichia coli). A positive test for any amount of coliform or E. coli indicates unacceptable levels of bacteria. A positive test may result in either a Precautionary Drinking Water Advisory (PDWA) being placed on the pipeline by the Ministry of Environment or an Emergency Boil Water Order (EBWO) placed on the pipeline by the Medical Health Officer.

2.5.4.1 Precautionary Drinking Water Advisory

A Precautionary Drinking Water Advisory (PDWA) is placed on the water pipeline by the Ministry of Environment when it has been determined by the Environment and the Health Region (HR) that water quality concerns exist but immediate public health threats have not been identified.

There are a number of reasons a PDWA may be placed on a water pipeline, some of which are:

- Unacceptable test results from a water sample;
- Deterioration in source water quality;
- Inadequate treatment processes;
- Start-up procedures for a new water pipeline;
- a break in the pipeline.

If a PDWA is placed on a water pipeline, the *Pipeline Organization* will be required to conduct further water testing through repeat samples. The Pipeline Organization will be required to provide test results showing that the water quality has returned to acceptable levels. This typically requires a minimum of two consecutive sets of three samples taken from different locations.

2.5.4.2 Emergency Boil Water Order

An Emergency Boil Water Order (EBWO) is an order issued by the Medical Health Officer, after it has been determined by the Ministry of Environment and the Health Region that a threat to public health exists.

An EBWO may be placed on the water pipeline for the following reasons:

- the presence of E. coli;
- confirmed verification of problems identified through the positive follow-up procedure questions and/or inspections;
- where evidence indicates the drinking water is responsible for an outbreak of an illness.

If a PDWA is placed on a water pipeline, the *Pipeline Organization* will be required to conduct further water testing through repeat samples. The *Pipeline Organization* will be required to provide test results showing that the water quality has returned to acceptable levels. This typically requires two consecutive sets of three samples taken from different locations. Furthermore, Environment and the HR will evaluate the system and consult with each other prior to lifting an EBWO.

2.6 Record Keeping

Accurate records must be maintained by your *Organization* and have to be available for review at the request of MOE. It is essential that records be in chronological order and are retained for a minimum of five years. All records must be initialed by the recorder and it is a requirement that these records are presented and reviewed by your Board/Council monthly. All information must be factual and be available for review by the permittee or designate for abnormalities. Information should include the following:

- ✓ Total water pumped
- ✓ Types, dosages, and chemicals added
- ✓ Location of tests
- ✓ Any abnormal operating procedures
- ✓ Any upset conditions
- ✓ Low disinfection levels
- ✓ Recalibration of test equipment

2.7 Reporting to Ministry of Environment

The following items must be reported to MOE:

- ✓ Must report any abnormal operating conditions or upset conditions (upset conditions include events such as a loss of pressure on the system, pipeline breaks, possible backflow events, etc.)
- ✓ Must report low disinfectant levels
- ✓ Must provide a copy of annual notice to consumers

2.8 Reporting to Consumers

Pipeline Organizations must provide the following information to all consumers at least once per year:

a) the quality of water produced or supplied by the waterworks in comparison with the levels set out in these regulations; and
b) the Permittee's compliance with sample submission requirements described in the Permittee's permit.

2.9 Annual Inspections

Pipeline Organizations must provide all records to MOE upon request. Generally, annual inspections are conducted by a MOE Environmental Project Officer (EPO) who has the authority to enter the waterworks at any time to ensure compliance to MOE regulations.

2.10 Waterworks System Assessment (WSA)

The Waterworks System Assessment is intended to identify possible deficiencies in the waterworks system and provide an opportunity to rectify before the waterworks is adversely affected. A WSA is an inspection and reporting process intended to aid waterworks owners to identify items such as potential health risks or environmental impacts, evaluate the current performance of the system, recommend improvements, and provide cost estimates for upgrades and capital replacement costs.

Typically the WSA is conducted by an Engineering firm hired by the *Pipeline Organization* to evaluate the current pipeline system, including assets such as existing pipeline infrastructure, booster station or pumphouses.

The Ministry of Environment's WSA Standard outlines facilities that need to perform WSA's and what the WSA must contain.

The WSA Standard is online at:
http://www.saskh2o.ca/DWBinder/EPB233WaterworksSystemAssessmentStandards.pdf

Section 3 Saskatchewan Health Regulations

This section does not represent all of the regulatory requirements and or guidelines that apply to pipelines. For more information please contact your local Health Region Public Health Inspector.

Health Regions are responsible for administering and enforcing the following Act and these regulations can apply to pipelines.

3.1 The Public Health Act, 1994

The Act contains provisions that enable the Health Region to issue orders to remove or remedy a health hazard. In the case of pipelines, this can include the issuance of an emergency boil water order when the water quality is deemed to be a health hazard. The Act also includes a section that prohibits a person from making available to the public a water supply that is not potable unless the public are advised that the water is not potable and of the uses to which the water may safely be put in which the regulations authorize it. (Note: An amendment to this section is currently in progress. Contact your local health region for more current information).

3.2 Health Hazard Regulations

Introduced in 2002, the Health Hazard Regulations contain sections that apply to public water supplies that are not regulated by Ministry of Environment. This includes a distribution system that is connected to at least three, but less than 15, service connections and receives water directly from a surface water source, ground water source or other raw water source.

In July of 2007, Saskatchewan Health amended the Health Hazard Regulations to address limited-scope pipelines. These regulations were brought into force to address small pipelines that are not directly connected to a municipal water supply which were not previously regulated. The amended regulations contain sections that address limited-scope pipelines. (see (Appendix IV - D) for example of a limited-scope pipeline)

Specifically, the regulations state the following:

(1) Sections That Apply to a Limited-Scope Water Pipeline:

{**NOTE:** the following sections are quoted from *"The Health Hazards Regulations"*}

2(1) (a.1) "limited-scope water pipeline" means a pipeline that:

(i) is used to distribute a supply of water that is intended to be used for drinking or personal hygiene purposes;
(ii) is connected to at least three but less than 15 service connections;
(iii) is not directly connected to a municipal waterworks that is the subject of a permit issued pursuant to *The Environmental Management*

and Protection Act, 2002; and

(iv) does not receive water directly from a surface water source, ground water source or other raw water source;

9.1 (1) If a supply of water intended to be used for drinking or personal hygiene purposes is provided from a limited-scope water pipeline, the owner or operator of the pipeline shall, at least once every three months:

(a) take samples of the water;
(b) submit the samples to a laboratory mentioned in clause 6(1)(c) (of the *"Health Hazards Regulations"* for bacteriological analysis; and
(c) include with the samples a notice advising the laboratory that the samples are taken from a limited-scope water pipeline.

(2) The local authority may require the owner or operator of a limited-scope water pipeline to submit samples of water for analysis at more frequent intervals than are required by subsection (1) if:

(a) the results of an analysis indicate that the supply of water distributed by the pipeline is, or has the potential to become, a health hazard; or
(b) for any other reason, the local authority determines that more frequent analysis is appropriate to monitor the safety of the supply of water distributed by the pipeline.

(3) Subject to subsection (4), a laboratory that conducts an analysis of samples of water from a limited-scope water pipeline for the purposes of this section must, within seven days after the date of completion of the analysis, report the results of the analysis to:

(a) the owner or operator of the limited-scope water pipeline; and
(b) the local authority.

(4) If the results of an analysis indicate the presence of *E. coli* or fecal coliforms in the sample, the laboratory that conducted the analysis shall:

(a) immediately notify the local authority; and
(b) within 72 hours after obtaining the results, send a written copy of the results to the local authority and the owner or operator who submitted the sample.

(5) An owner of a limited-scope water pipeline who receives notice pursuant to subsection (4) must immediately inform any operator and the local authority of the notification.

(6) An operator of a limited-scope water pipeline who receives notice pursuant to subsection (4) must immediately inform the owner and the local authority of the notification.

Note: As limited-scope water pipelines make use of a water source that is already regulated, no additional requirements are imposed.

(2) Sections that apply to a distribution system that has at least three, but less than 15, service connections and are not connected to an Environment regulated water system:

3 (1) Subject to subsection (2), sections 5 to 9 apply to a supply of water that is intended to be used for drinking or personal hygiene purposes and:

(a) is provided at any of the following places:
- (i) a facility as defined in *The Child Care Act*;
- (ii) an approved home as defined in *The Mental Health Services Act*;
- (iii) a hospital approved pursuant to *The Hospital Standards Act* or a facility designated as a hospital or health centre pursuant to *The Regional Health Services Act*;
- (iv) a personal care home as defined in *The Personal Care Homes Act*;
- (v) a private-service home or a residential-service facility, as defined in *The Residential Services Act*;
- (vi) a special-care home as defined in *The Housing and Special-care Homes Act* or a facility designated as a special-care home pursuant to *The Regional Health Services Act*;
- (vii) any facility, establishment, business or premises that is required to be licensed by any regulations pursuant to *The Public Health Act, 1994*;
- (viii) a school or an independent school, as defined in *The Education Act, 1995*;
- (ix) a recreational area;
- (x) a special event;
- (xi) a wayside area;
- (xii) an itinerant use accommodation as defined in *The Public Accommodation Regulations*;
- (xiii) a multi-dwelling unit owned by the Saskatchewan Housing Corporation;

(b) is a well or other supply of water intended for public use that is not connected to a distribution system; or

(c) is provided from a distribution system that:

- (i) is connected to at least three but less than 15 service connections; and
- (ii) receives water directly from a surface water source, ground water source or other raw water source.

(2) Subsection (1) does not apply to:
- (a) commercially bottled water;
- (b) a supply of water that is a waterworks within the meaning of *The Environmental Management and Protection Act, 2002*;
- (b.1) a supply of water to which section 9.1 applies;
- (c) a supply of water to which subsection 10(1) applies; or
- (d) a supply of water that, for the purposes of section 15 of the Act, is posted

as being not potable water.

4. Where a provision of these regulations imposes a duty or requirement on more than one person, the duty or requirement applies to all of those persons, but the duty or requirement is imposed primarily on the person with the greatest degree of control over the matters that are the subject of the duty or requirement.
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5. (1) No person shall establish, extend, renovate or alter a public water supply unless the owner or operator has obtained written approval to do so from the local authority.

(2) Subsection (1) does not apply to the routine maintenance of a public water supply or to any alteration to, or renovation of, a public water supply that is governed by *The Plumbing and Drainage Regulations*.

(3) Nothing in subsection (1) requires the operator of a public water supply in operation on the coming into force of these regulations to obtain written approval to establish that public water supply.

6. (1) The owner or operator of a public water supply shall:

(a) ensure that the water is potable at the place where it is delivered for use;
(b) locate, construct and operate the public water supply in a manner that will:

- reduce the potential of contamination of the water source; and
- prevent the contamination of water within the distribution system, including any place where water is collected, stored or treated; and

(c) subject to subsections (4) and (5), submit samples of water for analysis to the Provincial Laboratory or another laboratory approved by the minister, in accordance with subsection (3).

(2) An owner or operator of a public water supply who submits samples of water for analysis as required by clause (1)(c) shall include with the sample a notice advising the laboratory that the sample is taken from a public water supply.

(3) The owner or operator of a public water supply shall submit samples of water from the supply:

(a) for bacteriological analysis:
i. in the case of a public water supply that is operated throughout the year, once every three months; and
ii. in the case of a public water supply that is operated on a seasonal basis, once per year, with the sample for a year being taken at a time specified by the local authority; and

(b) for major ion analysis:
(i) in the case of a ground water supply, at least once in every period of 365 days unless otherwise directed by the local authority; and

(ii) in the case of a surface water supply, at least once in every period of 730 days unless otherwise directed by the local authority.

(4) A local authority may require the owner or operator of a public water supply to submit samples for analysis at more frequent intervals than subsection (3) requires if:

(a) the results of an analysis indicate that the supply is, or has the potential to become, a health hazard; or
(b) for any other reason, the local authority determines that more frequent analysis is appropriate to monitor the safety of the supply.

(5) A local authority may require the owner or operator of a public water supply to submit samples for analysis other than those mentioned in subsection (3) if the local authority suspects that the supply may be subject to contamination that would not be identified in an analysis required by that subsection.

7. (1) Subject to subsection (2), a laboratory that conducts an analysis of samples of water from a public water supply for the purposes of section 6 must, within seven days after the date of completion of the analysis, report the results of the analysis to:

(a) the owner or operator of the public water supply; and
(b) the local authority.

(2) If the results of an analysis indicate the presence of *E. coli* or fecal coliforms in the sample, the laboratory that conducted the analysis shall:

(a) immediately notify the local authority; and
(b) within 72 hours after obtaining the results, send a written copy of the results to the owner or operator who submitted the sample and to the local authority.

(3) An owner of a public water supply who receives notice pursuant to subsection (2) must immediately inform any operator and the local authority of the notification.

(4) An operator of a public water supply who receives notice pursuant to subsection (2) must immediately inform the owner and the local authority of the notification.

(5) A local authority may make information available to the public respecting the public water supplies that are located within the jurisdictional area of the local authority, including, without limiting the generality of the foregoing, information respecting:

(a) the location of a public water supply;
(b) the owner and the operator of the public water supply;
(c) the nature of the public water supply;
(d) the compliance of the owner and operator with the requirements to submit samples for analysis pursuant to section 6;
(e) the results of analyses carried out pursuant to section 6 on samples from the public water supply; and

(f) any concerns that the local authority has respecting the safety of the public water supply.

8. If a local authority suspects that a public water supply constitutes a health hazard, the local authority may require the owner or operator to provide ongoing treatment of the kind and to the extent required by the local authority.

9. The owner or operator of a public water supply shall immediately notify the local authority of any event or situation that may affect the safety of the public water supply, including:

(a) any malfunction of treatment equipment that could affect the safety of the public water supply;
(b) any breakdown or contamination of a distribution system; and
(c) any matter that may affect the safety or suitability of the source water from which the public water supply is derived.

See (Appendix IV - E) for additional information on Health requirements for operating a pipeline of a type that is regulated by a Health Region.

3.3 Plumbing and Drainage Regulations

These regulations contain sections that require a permit to be obtained from the local Health Region for the connection of a plumbing system to a water pipeline. The regulations state that the Health Region may inspect the work prior to approving. When inspecting the connections, the Health Region Public Health Inspector will check for protection of the rural pipeline through the installation of acceptable backflow prevention methods or devices See (Appendix IV - C). In cases where the plumbing system includes an interconnection with both the pipeline and a private water source, the regulations require the owner of the pipeline to provide written approval of the interconnection to the local health regions. See (Appendix IV - C) (page 4) for additional information).

3.4 Electrical Regulations

Local building permit requirements may also call for a permit to be obtained for additional electrical work. (i.e. if the *Pipeline Organization* is over-seeing the installation of float assemblies that contain electric solenoid valves).

Contact the local authority that has jurisdiction over the area for issuing permits to see which ones are required.

Section 4 References

4.1 References/Guidelines

Two important documents are available to *Pipeline Organizations* to assist with following the guidelines and standards of Sask. Environment.

1. **Saskatchewan Drinking Water Quality Standards and Objectives** outline the Minimum/Maximum acceptable or desirable levels of constituents.
http://www.saskh2o.ca/DWBinder/EPB207Drinking_Water_Standards_post.pdf

2. The **Municipal Drinking Water Quality Monitoring Guidelines** outlines the frequency of which the sampling will take place.

http://www.saskh2o.ca/DWBinder/EPB202MunicipalDrinkingWaterQualityGuidelinesEdition3.pdf

For Health Region regulated limited-scope pipelines, the health region will typically refer to the Ministry of Environment's Drinking Water Quality Standards and Objectives as well as Health Canada's Guidelines for Canadian Drinking Water Quality.

Other Reference Material

Rural Water Pipelines EPB 254 (Apr/04)
Water Pipeline Design Guidelines EPB 276 (Web only May/04)
Municipal Drinking Water Supplies – Questions and Answers EPB 208 (*Mar/04)
Waterworks System Assessment Standards EPB 233 (*July/03) (updated to Dec/08)
Questions and Answers on Waterworks System Assessment Report EPB 233A (*WEB Mar/05)
A Guide to Waterworks Design November 2002 EPB 201 (*Jan/07)
Operator Certification Standards 2002 EPB 139 (*July/03)
Operator Certification Training and Reading EPB 149 (*Feb/06)
Water and Wastewater Operator Certification Program Guide 2003 EPB 144 (*Mar/05)
Municipal Drinking Water Quality Monitoring Guidelines November, 2002 EPB 202 (*Sept/07)
Annual Notification to Consumers Guidelines for Compliance and Templates (pdf) EPB 236 (*Jan/07)
Quality Assurance and Quality Control for Waterworks: An Overview for Smaller Waterworks (pdf) / word 97) EPB 243 (May/03)
Water Quality Emergency Planning - An Overview EPB 241A (*Dec/03)
The Water Regulations, 2002, amended by Saskatchewan Regulations 15/2007
Bacteriological Follow-up Protocol for Waterworks Regulated by Saskatchewan Ministry of Environment (November 2002) EPB 205 (Revised February 2008)
Chlorine and Water Disinfection EPB 211A (Mar/03)
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