State of Local Infrastructure

Water Treatment Plant

The Water Treatment Facility was constructed in 1992-93 following a catastrophic mine tailings spill that occurred upstream near the Town of Matachewan in October, 1990 and was Officially Opened in 1994. The value of the facility makes up approximately 60% of the net book value of the listed municipal assets.

The facility is operated by Ontario Clean Water Agency.

As per the Operational Plan for the Elk Lake Drinking Water System (full document in available on line at www.elklake.ca

The Elk Lake Drinking Water System is owned by the Corporation of the Township of James and is operated by the Ontario Clean Water Agency (OCWA). The system consists of a Class 1 water treatment subsystem and a Class 1 water distribution subsystem.

Description of the Elk Lake Drinking Water System (DWS# 220007329)

The Elk Lake Drinking Water System is a communal ground water well supply that services the Town of Elk Lake. It is a standalone system not connected to any other drinking water systems.

The water treatment facility is located on Lot 83, First Street in the Township of James

and is supplied by one 65 m deep, double steel casing production well. The production well is located in the pump house and is equipped with a single variable-speed vertical turbine pump, rated at 63 L/s with a 250 mm diameter magnetic flow meter installed on the discharge line.

A second well located in Lot 5, Concession 5 in the Township of James acts as a monitoring/observation well. It is drilled to a depth of 65 meters and consists of a steel casing.

The raw water is directed to an iron and manganese removal system consisting of two reaction vessels for sodium hypochlorite injection, three pressure filters each having a rated capacity of 646 L/min, three flow meters dedicated to each filter and continuous monitoring of chlorine residual and filter operation. The filter backwash recycling system is equipped with a 40 m3 underground holding tank, a submersible pump rated at 3.8 L/s with a discharge line that re-circulates the supernatant with raw water at the well pump header, and a sludge pump for residual disposal to a tanker truck.

The disinfection system consists of a 450 L sodium hypochlorite solution tank with duplicate pace-to-flow chemical feed injection pumps (one duty and one standby).Chemical injection is accomplished at the raw water pipe header, prior to entering the reaction vessels. The treated water discharges into twin cell storage clearwells having a total volume of 540 m3.

Curtain baffling was installed in Cell #2 of the clearwell to provide sufficient chlorine contact time during scheduled cleaning of the cells.

Three vertical turbine pumps (one duty, one standby draw from clearwell #1, and one fire pump installed over clearwell #2) with variable frequency drives each rated at 37.5 L/s. A magnetic finished flow meter, chlorine residual analyzer, and a surge anticipator are installed on the discharge main prior to exiting the pump house and entering the distribution system. An emergency stand by power generator is available and capable of supplying power to the entire facility during power failures. The water treatment process is controlled by a dedicated SCADA computer system.

The Elk Lake Drinking Water System is classified as a Large Municipal Residential Drinking Water System and provides water to an estimated population of 440 Residents. The distribution system was constructed in 1992 and consists of mainly of PVC Constructed pipe. It contains about 53 fire hydrants and approximately 160 service connections There are no off-site water storage facilities in the distribution system, as storage is incorporated within the treatment plant.

The Municipality may need to revisit their policies regarding user fees, such as water rates. The prices of water and wastewater services in Ontario are low compared to many other jurisdictions and in many cases rates charged do not reflect the full cost of services. In the case where individual homes and/or business are consuming a disproportional volume of treated water, water meters may need to be installed.

Ontario Clean Water Agency provides the Township with a 5 Year Recommended Capital /Major Maintenance from 2024 – 2029 (full report available at the Municipal Office).

The Most pressing project is to be the replacement of the Supervisory Control And Data Acquisition (SCADA). The SCADA is used for controlling and monitoring various processes such as drinking water management. It uses a combination of software to collect real time data from remote locations, processes and allow monitors to make adjustments remotely.

4. Water and Drainage

Water Treatment Plant Inventory

Water System	Year Installed/replaced	Cost	Useful Life	Anticipated Replacement Year	2022 Net Book Value	Replacement Value
Water Plant, Distribution System, wells	1990-1998	$3,857,869.00	50	2040-2048	$2,297,633.00	$8,201,829.00
New Water Services	2003	$67,503.00	50	2051-2056	$55,217.00	$109,085.00
Distribution System, Filtration, Industrial Pk.	2008	$887,739.00	50	2057-2059	$791,216.00	$1,082,154
Process Computer	2016	$31,889.00	5	2021	$12,755.00	$36,162.00
TOTAL		**$4,845,000**			**$3,156,821.00**	**$9,429,230**

Main Inventory

Size	Quantity	Date Installed	Years in Service	Useful Life	Average Condition	Replacement Year	Cost to Replace
50mm	3	1993	29	50	Fair	2043	$2,700/meter
150mm	72	1993	29	50	Fair	2043	$2,700/meter
200mm	13	1993	29	50	Fair	2043	$2,700/meter
300mm	3	1993	29	50	Fair	2043	$2,700/meter

Hydrant Inventory

Hydrant	Quantity	Date Installed	Years in Service	Useful Life	Average Condition	Replacement Year	Cost to Replace
Fire Hydrants	63	1993	29	50	Good	2043	$12000/hydrant

Condition Analysis

The condition of the water main and associated valves will be based on the age of the pipe and the remaining service life. The condition of the Hydrants is based on a visual inspection completed by Township of James Public Works as well as a manual inspection completed by OCWA semi-annually.

Water & Drainage Asset Condition Rating Description

Condition	Description
Good	Physically sound with minimal deterioration
Fair	Some deterioration, requires monitoring & maintenance
Poor	Significant deterioration, at risk of affecting service

Good

Fair

Poor

Summary of Condition State

The water system is in an overall fair state and faces risks:

Aging Infrastructure: Many assets were built and installed at the same time, which could cause simultaneous failures

Funding Limitations: Small tax/user base makes large-scale renewal difficult.

Regulatory Requirments: Ongoing upgrades needed to meet evolving standards

Climate Change risk: Extreme Weather may cause large stress events on the system

Replacement Values

Accepted replacement values in 2024 dollars for the Township of James Water assets are summarized in the table below. There are many variables when considering replacement value of these assets and until township of James tenders a project we are unable to have complete and true accurate costing. However, the below estimated costs were given to us as a starting point by OCWA and Exp Engineering.

Replacement costs

Asset	Size	Unit Cost
Hydrant	N/A	$12,000
Main	ALL SIZES	$2700/m
Valve	ALL SIZES	$1000/m

Expected Useful Life

The expected service life of Water assets were obtained during AMP training sessions with Marmak are summarized in table below.

Useful Life

Asset	Useful Life
Hydrant	50
Main	75
Valve	75

Current Levels of Service

Levels of Service (LOS) are statements of service performance delivery. LOS is established based on Council direction, the needs or wants of the community as well as legislative and regulatory requirements. This report includes Operating Performance Indicators (OPI's) for current levels of service. Through the ongoing Asset Management process LOS will be further defined for the Town, the Town's assets, and the community. All are interconnected.

The level of service is a reflection of the quality, function and capacity of the services being provided. The aspects to be considered include:

- The level of service currently provided to user
- The annual cost to continue to provide the current level of service
- How the current level of service is expected to change in the future given current funding levels
- If you are meeting the level of service expectations of your users given the costs to provide current, increased or decreased levels of service

Customer (i.e. taxpayer) concerns and complaints are typically communicated to the Township Clerk/Treasurer and/or Deputy Clerk during office hours. These concerns are then typically relayed to the Public Works Department staff. After hours concerns and those of a more serious nature (e.g. water main breakages) may be conveyed directly to the Reeve, Council and/or directly to Public Works staff. In the event that concerns are not addressed to the satisfaction of the taxpayer, the issue may be elevated to a discussion at Council.

Although there is no formal Desired Level of Service Policy, it appears that service is satisfactory at this time.

4. Water and Drainage

The following sections present the Current Community and Technical LOS for the Township of James Core Assets, which will drive the Risk and Life Cycle Management Strategies of this AM Plan in the future.

Community & Technical LOS can be categorized as relating to one of the following service attributes:

Capacity: Assessing whether services have enough capacity and are accessible to the customers.

Function: Assessing whether services meet customer needs while limiting health, safety, security, natural and heritage impacts.

Reliability: Assessing whether services are reliable and responsive to customers.

Water Assets Levels Of Service Framework

CORPORATE	LEGISLATED	COMMUNITY Levels of Service	TECHNICAL Levels of Service
OCWA The Township of James OPERATIONAL PLAN for the Elk Lake Drinking Water System Updated: November 8, 2021, The 2021 Annual Summary/Report & Quarterly Operations Report	O. Reg. 588/17: ASSET MANAGEMENT PLANNING FOR MUNICIPAL INFRASTRUCTURE & Safe Drinking Water Act, 2002	Capacity	Capacity
		Services have enough capacity & are accessible to everyone	Assets of sufficient capacity are available, convenient & accessible to everyone
		Function	Function
		services meet customers' needs while limiting health & safety impacts	Assets comply with regulations & perform their intended function.
		Reliability	Reliability
		Services are reliable and responsive to customers	Assets are in adequate condition, maintained and customer requests are responded to

Water Assets Community & Technical Levels of Service

Service Attributes	Service expectations	Community Objectives	Community Levels of Service	Technical Levels of Service	Reference
Capacity: Services have enough capacity & are accessible to everyone	Adequate Capacity	Provide adequate availability of water service to properties	CGIS & Water Distribution System Maps	Number of Properties Connected to the Water Distribution System	O.Reg.588/17
		Provide adequate availability of fire flow to properties	CGIS Mapping of Fire Hydrants and a paper map at the Municipal Office & Fire Hall	Number of properties where fire flow is available	O.Reg.588/17
Function: services meet customers' needs while limiting health & safety impacts	Adequate Water Quality	Provide Safe Drinking Water	boil water advisories	number of days in a year where a boil water advisory is in place	O.Reg.588/17 & OCWA Annual Summary
	System Efficiency				
Reliability: Services are reliable and responsive to customers	Reliable water Service	Water assets are kept in a good state of repair	Overall Asset Condition	Assets described as Fair or Better Condition	CGIS
		Water Mains Remain Intact	Description of Service Interruptions due to water Main Breaks	Number of days without service due to breaks	O. Reg 588/17 OCWA
		hydrants are reliable	Overall Asset Condition	Assets described as Fair or Better Condition	CGIS

Proposed Levels of Service

- Maintain assets at a fair or better condition
- Avoid Boil Water Advisories and water service interruptions
- Maintain adequate availability of water service to households
- Maintain adequate availability if Fire Flow to properties
- Current and proposed levels of service are essentially the same to reflect affordability and sustainability constraints.

Lifecycle Management and financial Strategy

Lifecycle Activities

Type	Activity	Frequency	Cost
Maintenance	Valve Cycling	Yearly	$2/meter
	Water Testing	Daily	OCWA
	Hydrant Exercises	Bi-Annually	OCWA
	Reclaim Tank Clean Out	Yearly	OCWA
Rehabilitation	PLC Upgrade, Generator, Reclaim Pump, Replace Diesel Fuel Tank	OCWA 2026 – 2030 Recommended Capital/Major Maintenance from 2026-2030	
Replacement	Full Replacement costs have been outlined in the inventory section of this AMP		

10-Year Capital and Operating Costs

- 2026 – 2027 Recommended capital investment required: $115,000
- 2028-2030 Recommended capital investment required: $13,000
- As outlined in the 2026 – 2030 Recommended Capital/Major Maintenance from 2026-2030 from OCWA

Funding Strategy and Resources

- The water rate will increase 5% each year until a reserve has been established
- Water rates do not fund system replacement
- In 2025/2026 Federal and provincial grant partnerships are being used to fund parts of the capital improvements needed for those years with the exception of the back-up well. That will require seeking external funding sources.
- A phased replacement course of action will be taken as suggested by OCWA and based on available funding.