

Performance Audit of Water Services

Presented To: Audit Committee

Meeting Date: May 31, 2021

Type: Routine Management Reports

Prepared by: Ron Foster
Auditor General

Recommended by: Auditor General

Report Summary

This report provides a recommendation regarding the performance audit of the Water Services Section.

Resolution

THAT the City of Greater Sudbury approves the recommendations as outlined in the report entitled “Performance Audit of Water Services”, from the Auditor General, presented at the Audit Committee meeting on May 31, 2021.

Relationship to the Strategic Plan, Health Impact Assessment and Community Energy & Emissions Plan (CEEP)

This report supports the strategic goal of asset management and service excellence as well as the supporting initiative of optimizing asset service life through the establishment of maintenance plans and demonstrating innovation and cost-effective service delivery.

Financial Implications

No immediate financial implications.

Resources Cited

Report to Council - Asset Management Plan from KPMG LLP

<https://pub-greatersudbury.escribemeetings.com/Meeting.aspx?id=3bd5576a-d93d-4ee6-a7fc-9f075cd0aea6&Agenda=Agenda&lang=English>

Report to Council – Water and Wastewater Long-Range Financial Plan

<https://www.greatersudbury.ca/live/water-and-wastewater-services/projects-plans-reports-and-presentations/water-wastewater-financial-plan/wwwgreater-sudbury-final-report-april-2019-v2-pdf/>

City's Website - Water and Wastewater Master Plan

<https://www.greatersudbury.ca/live/water-and-wastewater-services/projects-plans-reports-and-presentations/water-wastewater-master-plan/>

Performance Audit of
Water Services

May 18, 2021

Final Report



OBJECTIVE

To assess the extent of regard for economy, efficiency and effectiveness within Water Services.

BACKGROUND

Water Services has 22 staff who are responsible for the maintenance and operation of the City's extensive water facilities which include 23 water wells, 12 pumping stations, 9 water storage facilities, 8 metering stations and 2 water treatment plants. The financial results for Water Services are summarized below.

Table 1 - Revenues and Expenses (000s)	Dec 31 2017		Dec 31 2018		Dec 31 2019		Dec 31 2020		2021
	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual	Budget
User Fees	16,024	15,587	17,316	17,255	16,833	16,522	14,040	14,128*	19,163
Other Revenues	100	115	100	161	100	157	110	164	110
Total Revenues	16,124	15,702	17,416	17,416	16,933	16,679	14,150	14,292	19,273
Salaries & Benefits	950	924	965	912	975	940	983	1,013	1,007
Materials	1,832	2,040	1,852	2,173	1,976	2,316	2,015	2,225	2,097
Energy Costs	2,066	1,903	1,961	1,915	2,000	1,868	2,041	1,861	2,083
Purchased Services	1,242	952	1,266	1,118	1,288	1,081	1,303	1,153	1,333
Indirect Costs	2,806	2,566	3,121	3,229	3,582	3,141	3,826	3,815	3,771
Labour Fringes	498	534	513	566	510	563	523	574	543
Engineering Costs	1,096	1,035	1,083	1,070	1,161	1,140	1,205	1,205	1,238
Debt Repayment	354	354	354	354	354	354	354	354	354
Capital Contributions	5,180	5,180	6,159	6,159	4,958	4,958	1,775	1,775	6,710
Internal Recoveries	100	121	142	164	129	156	125	170	137
Total Expenses	16,124	15,609	17,416	17,660	16,933	16,517	14,150	14,145	19,273
Net Revenues (Expenses)	0	93	0	(244)	0	162	0	147	0

*The revenue allocation in 2020 for Water Services was lower as a result of reduced capital contributions.

METHODOLOGY & SCOPE

This audit included staff interviews, site visits, analysis of policies, processes and reports and tests of controls for the period January 1, 2017 to December 31, 2020 but excluded the distribution network in Linear Infrastructure Services.

EXECUTIVE SUMMARY

The City's water assets have been managed effectively. To ensure a sustainable and affordable supply of quality drinking water over the long-term, the water/wastewater long-range financial plan should be integrated with the City's enterprise asset management and risk management practices which have been refined in recent years. Water rates should also be restructured to reduce revenue risks and periodic compliance audits should be conducted to ensure adherence to quality management processes.

AUDIT STANDARDS

We conducted our audit in accordance with Generally Accepted Government Auditing Standards which require that we adequately plan audits; properly supervise staff; obtain sufficient, appropriate evidence to provide a reasonable basis for audit findings and conclusions; and document audits. For further information regarding this report, please contact Ron Foster at the City of Greater Sudbury at 705-674-4455 extension 4402 or via email at ron.foster@greatersudbury.ca

OBSERVATIONS AND ACTION PLANS

A. Master Plan and Long-Range Financial Plan

In 2010, a long-term financial plan was prepared for the City's water/wastewater services. To achieve financial sustainability over the next ten years, that plan recommended an annual increase to water and wastewater rates of 7.4 percent. These recommended increases were approved between 2016 and 2019. The annual increases approved between 2011 and 2015 averaged just 3.5 percent. As a result, a significant maintenance backlog had developed for the water assets by 2017 when the last water/wastewater master plan was completed.

In November 2016, an infrastructure maintenance backlog of \$384 million was identified in the City's original asset management plan for water treatment facilities that were at the end of their theoretical useful lives or would be by 2026. Since then, the City has spent just over \$26 million upgrading these assets. While our inspections indicated that it is unnecessary to eliminate the entire backlog by 2026 to maintain reliable water treatment services, some important capital projects identified in the 2017 water/wastewater master plan are likely to be deferred beyond 2026. Table 4 summarizes the status of the upgrades to water assets with higher risks of failure that were identified in that plan.

In 2019, the City engaged consultants to develop a water/wastewater long-range financial plan to provide the City with a realistic view of the operating and capital expenditures needed over time to maintain the integrity of its water/wastewater physical infrastructure and to accommodate growth and new environmental standards. To ensure affordability, the consultants recommended a 20-year phase-in strategy for capital contributions to move toward the recommended annual replacement funding requirements.

This audit determined that the 20-year phase in strategy that was recommended in the 2019 water/wastewater long-range financial plan places insufficient emphasis on the risks of asset failure in the City's aging water facilities. As a result, a number of important capital projects which help to ensure a sustainable supply of quality drinking water across the City have been deferred.

Recommendation

Following the update of the water/wastewater master plan in 2022/2023, the water/wastewater long-range financial plan in 2024 should be integrated with the City's enterprise asset management and risk management practices to ensure a sustainable and affordable supply of quality drinking water across the City.

Management Response and Action Plan

The Long-Range Financial Plan is scheduled to be updated in 2024. Even though the current plan is following a 20-year timeframe, Ontario Regulation requires the plan to be updated no less frequently than every 5 years as part of the drinking water license renewal process. This update could include a recommendation to adjust rate forecasts. If so, an appropriate recommendation would be presented for Council's approval at that time. The 5-year renewal period also allows the identification of future capital needs (as identified in the studies, Class Environmental Assessments, and building condition assessments), new legislation requirements, new technology developments (which may reduce capital expenditures), operational changes, and updated demand data.

Two factors that will have a major impact on the financial plan will be the implementation of the Advanced Meter Infrastructure (AMI) project and the work of the Inflow and Infiltration (I&I) Task Force. The AMI project is

significant and as of mid-2022, we will have more data available about water consumption which will improve forecast quality and reliability. The Infiltration and Inflow (I&I) task force will formulate design plans and produce recommendations that will assist in Council's intent of minimizing the impact of peak weather flow on our Wastewater systems. The data collected between now and 2024 will provide an update to our risk assessments and have an impact on capital allocation that may differ from recommendations in the 2017 Master Plan and the 2019 Long-Range Financial Plan.

We agree with the recommendation that the water and wastewater long-range financial plan be aligned with the enterprise asset management and risk management practices. To better inform our future capital needs, we are engaging in facilities condition assessment with risk assessment as its basis to form all our capital work recommendations. We continue to positively manage risks, through asset renewal with capital projects and by implementing appropriate preventative maintenance practices and equipment replacement on a regular basis.

B. Capacity and Quality Management

The Wanapitei and David Street water treatment plants (Water Treatment Plant) have enough capacity to supply Sudbury for the foreseeable future. These plants are operated at almost half of their capacities because the water demand has decreased over time. Redundancy in the Sudbury water system increases water treatment costs but allows services to continue during repairs.

In 2017, the water/wastewater master plan identified water capacity issues in the Valley. The planning consultants concluded that an additional supply of water would be required to service growth after 2031. The water/wastewater master plan also identified quality issues in Garson that need to be addressed by 2036.

Since 2017, staff has taken steps to schedule condition assessments and repairs to maintain the supply of drinking water at the current level in the Valley. A ground water study is currently underway to assess the adequacy of the aquifer in the Valley. This study will feed the future water/wastewater master plan that will ultimately make recommendations based on forecasted population growth and economic development.

There is an environmental assessment (Environmental Assessment) currently in progress for twining the watermain trunk from the Wanapitei Water Treatment Plant to Sudbury to the safety and redundancy of the water supply. The Val Caron Booster station upgrade is underway and detailed condition assessments will be completed on the remaining booster stations later this year to ensure adequate turnover of water in the Azilda Standpipe. There are also ongoing detailed condition assessments of all water facilities that will identify future capital needs that will form the basis of the updated asset management plan.

Another environmental assessment is underway to address the quality and quantity of water in Garson. Detailed design work is planned in 2022 and construction in 2023. This initiative will have the added benefit of reducing the City's water treatment costs as it will improve the utilization of the Wanapitei Water Treatment Plant.

Recommendation

As the City is a relatively high cost operator, we encourage staff to continue to rationalize the City's extensive water facilities which include 23 water wells, 12 pumping stations, 9 water storage facilities, 8 metering stations and 2 water treatment plants.

Management Response and Action Plan

We agree. The Water and Wastewater Master Plan was developed based on four (04) pillars: Efficiency, safety, regulatory requirement and land development. One of the efficiencies identified in the water system is to supply

Garson with water from Sudbury water system instead of the existing 3 wells. The decommissioning of these water wells, part of the rationalization of water facilities, will eliminate the ongoing operation and maintenance cost of the wells and at the same time enhance the usage of the available water supply capacity. An environmental assessment (Environmental Assessment) is ongoing to address the Garson water supply.

From a safety perspective, having redundancy in the water source, David Water Treatment Plant and Wanapitei Water Treatment Plant, provide the city with a safety factor to supply water during maximum day demand and during maintenance activities at either one of the water facilities or on the Wanapitei water trunk.

The Water and Wastewater Master Plan update will commence by 2022/2023 and we will be looking at finding additional efficiency opportunities within the water system based on future water demand and growth projections while considering the topography and the geography of our serviced communities.

C. User Fees

The City currently uses a hybrid pricing structure for monthly user fees for water. To encourage water conservation, customers are charged a variable fee that is based on the amount of water used each month. Customers are also charged a fixed fee that is dependent upon the size of the water meter used by the customer. The fixed fee is intended to reflect the costs incurred to make the system available for use regardless of how much water each customer consumes. Like any water system, most of the City's costs are for infrastructure and do not change much with the volume of water treated.

This audit determined that only 43% of the fees charged to residential customers are for the recovery of fixed fees. As a result, the City may incur annual deficits if annual water consumption is less than budgeted consumption. Research indicates that implementing tiered water rates is the most efficient and effective way to encourage residents to conserve water.

Recommendation

To achieve a balance between fixed cost recovery and conservation, continue to use a hybrid rate structure with fixed charges and variable fees. To reduce the City's exposure to revenue fluctuations from changes in water demand and to provide more stable funding to the water reserve account, increase the fixed charge component to 50 percent. To support the City's conservation goals, implement a tiered variable fee structure.

Management Response and Action Plan

We agree to the recommendation to the review rate structure in the future as part of the next iteration of the long-term financial plan in 2024. Changes in water billing rate structures are examined as part of this plan and in annual budgets presented to Council. Management will ensure that a rate structure continues to support conservation measures that have proven to be extremely beneficial to the long term sustainability of the water system. In addition, management will ensure that recommendations are made to support appropriate levels of reserves to offset risks created by a variable rate structure.

D. Drinking Water Quality Management Processes

Drinking water quality standards in Ontario are regulated by Ministry of Environment, Conservation and Parks under the Safe Drinking Water Act, 2002. To ensure compliance with these standards, the City prepares annual water quality reports on the City's drinking water systems and obtains an annual audit of its quality management processes. A review of these annual audit reports indicated that periodic compliance audits should be performed

by independent staff or consultants to ensure adherence to the City's drinking water quality management processes. We note that the City invests significant time in networking, professional development, training and exchange of best practices with other municipalities. The City participates within the following peer support programs:

- The Regional Public Works Commissioners of Ontario (RPWCO) is a peer program of Commissioners and General Managers related to all activities in public works among the largest municipalities on Ontario. The RPWCO incorporates a sub-committee of peers focused on common issues within water and wastewater services;
- The Ontario Municipal Water Association is a member association of municipal organizations to consider matters affecting municipalities as relates to municipal water systems. This association has membership from both municipal staff and politicians and provides updates on trends and best practice innovations in the industry as well as a number of training and professional development courses;
- The North East Ontario Water Works Association is an affiliation of the Ontario Water works association and the America Waterworks association. These advocacy and member service organizations provide tremendous support across north America and locally in the form of training, development, member services and advocacy; and
- The Northern City Engineers group is an ad hoc association for the City Engineers of the five largest municipalities in Northern Ontario to discuss common issues. Meetings are held twice annually and attended by General Managers and Directors. Discussion includes all areas of Public Works including Drinking Water Services.

Recommendation

Establish a peer review program to ensure that periodic compliance audits of the City's quality management processes are conducted by qualified professionals who are independent of staff who maintain these processes in the City.

Management Response and Action Plan

We agree. Compliance & Operational Support, which administers the Drinking Water Quality Management System, believes that collaborating with adjacent municipalities could be beneficial to all parties involved. The Quality Management Systems & Training Coordinator will be responsible for establishing these peer relationships.

E. Performance Measurement

Management currently monitors and reports on the following performance measures within annual budgets:

- Total Operating cost of water treatment per megalitre treated of \$591 in 2019 vs. \$357 municipal median;
- 16,500 actual vs. target of 15,000 drinking water samples tested annually for bacteria, lead, sodium, triholomethanes and other prescribed organic and inorganic materials to manage drinking water quality;
- 7,520 of the 7,700 targeted hours of scheduled maintenance hours to provide service level continuity; and
- 100% of the 300 targeted risk management plans and other source protection related documents reviewed and processed to manage significant water treatment risks.

Management participates in annual benchmarking exercises such as the Municipal Benchmarking Network Canada and the National Water/Wastewater Benchmarking Index and provides relevant comparators in the

annual budget package. Management has also introduced a continual improvement initiative to identify opportunities to improve operational efficiency.

As a result, we offer no recommendation for improvement.

F. Significant Accomplishments

The Water Services Section demonstrates a high degree of employee engagement and has achieved zero lost time injuries in over two years of operation. Other significant accomplishments include:

- Commencing implementation of the Advanced Meter Infrastructure (AMI) project to update aging residential water meters and establish enhanced customer service access to water meter and billing information;
- Completing phase one of chemical analysis at the Wanapitei Water Treatment Plant resulting in significant operational savings while maintaining the high quality of water provided to customers;
- Achieving the lowest lead concentrations measured in recent years, confirming that water quality levels are well positioned to meet potential future legislative requirements;
- Establishing real time metering of water delivered from the Vermilion Water Treatment Plant (owned and operated by Vale) to the CGS Vermilion Water Distribution System;
- Collaborating with Infrastructure Capital Planning and Engineering Services to complete capital projects designed to rehabilitate key assets, install additional capacity and address critical operational and environmental risks;
- Completing the water/wastewater master plan and asset management plan that serve as a road map for future capital needs for water assets;
- Managing and operating water assets successfully using a risk-based approach for capital asset renewal;
- Implementing continuous improvement by using new technology in capital projects; and
- Achieving a high degree of regulatory compliance.

G. Risk Management

Risks are uncertain events which can be mitigated by applying controls related to the acquisition and application of human and contract resources; implementation of formal procedures; acquisition, maintenance and utilization of plant, equipment and tools; collection and utilization of relevant information or the acquisition of insurance.

Observations:

Management has taken steps to mitigate the significant risks shown on the next page in Table 3.

Recommendation:

Management should take steps to further mitigate residual risks that are above 10.

Table 2 – Summary of Significant Risks

Risk	Total No. of Risks	Risks (Before Controls)			Residual Risks (After Controls)		
		High (15 to 25)	Med (9 to 14.99)	Low (1 to 8.99)	High (15 to 25)	Med (9 to 14.99)	Low (1 to 8.99)
Reputation (R)	1	1	0	0	0	1	0
Operational (O)	5	5	0	0	0	3	2
Financial (F)	4	4	0	0	0	3	1
Legal (L)	1	1	0	0	0	0	1
TOTAL	11	11	0	0	0	7	4

Table 3 – Significant Risks

Type of Risk	Description of Risk	Risk Before Controls	Residual Risk*
O3	Water assets may not be managed effectively to ensure a long-term sustainable supply of water.	25	13.5
F1/O1	Water assets may not be maintained effectively in accordance with the City's strategic plan and enterprise policies for asset management and risk management.	25	13.5
F3	User fees may not be appropriate to maintain stable revenues and fund reserves.	20	12
F2/O2	Water assets may not be operated and maintained with due regard for efficiency.	20	11
R1	Issues may arise which could damage the City's reputation.	18	9
O4	Illness to the public may arise from failure to follow quality management practices.	20	8.5
F4	Purchases may not be made in accordance with the City's Purchasing By-law and with due regard to economy and effectiveness.	16	8
O5	Serious injuries to staff may arise from failure to follow health and safety practices.	18	7.5
L1	Legal and regulatory obligations may not be managed effectively.	18	7.5

**Note that it is not cost-effective to eliminate all residual risks.*

Management Response and Action Plan

O3 is being managed through the Water/Wastewater Master Plan with ongoing assessments of water supplies based on the amount of water produced at each well and surface water treatment facility in comparison to the limits allowed under the Permit to Take Water which is issued by the Ministry of Environment, Conservation & Parks.

F1/O1 are being addressed through ongoing facility assessments and continued compliance with the provincial mandate of recognizing assets as part of the overall asset management plan. Through these processes, we are able to generate an understanding of the current state of the assets and develop a prioritized capital spending plan over a 5 year period, subject to updates as required.

F3 is considered for change at periods not less than every 5 years and an appropriate rate structure and associated rate adjustments are recommended to Council if required.

O4 presents high inherent risks, but risk management practices have been implemented within capital projects and operations to ensure adherence to the strict public health requirements listed in the Ontario Safe Drinking Water Act. As a result, the residual risk of illness is low.

R1 is mitigated through the Standard Operating Procedures (SOPs) on which all staff are regularly trained. These SOPs serve to minimize situations that may damage the City's reputation.

F2/O2 are continually addressed by the Continual Improvement Program contained within the Drinking Water Quality Management System. Analysis of data is regularly conducted and any recommendations for increased operational efficiencies are implemented.

F4 is mitigated through the use of standard procurement practices and guidelines, and through regular engagement of procurement staff. These actions ensure that all purchases and tenders are made in full compliance with the CGS Purchasing Bylaw.

O5 has been designated a high inherent risk, but field data indicates this risk can be effectively mitigated. Water Treatment has seen Zero Lost Time Injuries over the last 2 years due in large part to the serious manner in which we administer both our employee engagement as well as the robustness of our health and safety program.

L1 is mitigated by our Compliance section which oversees and proactively recommends solutions regarding all legal and regulatory parameters for wastewater.

Table 4 - Status of the Higher-Risk Water Assets Identified in 2017 Master Plan

Facility	Capital Upgrades Recommended and Status Comments	Upgrade Complete	Upgrade In Progress	Study Under Way	Plan In Progress
Wanapitei Water Treatment Plant	1. Wanapitei Water Treatment Plant Filter Assessment Benchmarking. This study should be completed this year. The next step is to implement recommendations.			x	
	2. Wanapitei Water Treatment Plant Valve Upgrades: Detail design for valve automations almost complete. Expect tender for construction this year.			x	
	3. Wanapitei Water Supply Pipeline Condition Assessment. We have completed the inspection of the pipe from the intake to the plant. A proactive and remedial action is sought for one site that may present future challenges. Implementation by this summer. The section of the water trunk from the water treatment plant to Ellis Reservoir is under Environmental assessment (Environmental Assessment) and geotechnical investigation is underway and advancing.			x	
	4. Structural assessment for surge tank upgrades is complete. The procurement phase for hiring a contractor to complete repairs is in progress.		x		
	5. Blower equipment upgrade. This project was successfully completed.	x			
	6. Wanapitei Water Treatment Plant Building Condition Assessment. This is part of the asset management strategy to complete a full detailed condition assessment of the plant including electrical, mechanical and process systems, etc. The study is underway and is expected to be completed this year.			x	
Well J	This well in the valley well presents some water quality concern from the aesthetic perspective (cause stains). A water treatment technology was assessed and selected and the detail design is almost complete. The tender for construction will be issued by this summer.			x	
Maley Booster Station	Some electrical upgrade were completed last year to alleviate immediate needs. This booster station is part of the overall Garson Water Servicing Strategy project. An environmental assessment is underway.		x		
Val Caron Tank	Water tanks project is underway by Landmark. The inspection of the tank is complete. Implementation of recommendations is coming for next phase.		x		
Notre Dame Water Well	This well is part of the Valley water well retrofit project. Construction is underway and is expected to be completed this year.		x		
Philippe Water Well	This well is part of the Valley water well retrofit project. Construction is underway and is expected to be completed this year.		x		

Facility	Capital Upgrades Recommended and Status Comments	Upgrade Complete	Upgrade In Progress	Study Under Way	Plan In Progress
Pharand Water Well	This well is part of the Valley water well retrofit project. Construction is underway and is expected to be completed this year.		x		
Well M	This well in the valley presents some water quality concern from the aesthetic perspective (cause stains). A water treatment technology was assessed and selected. The detail design is almost complete. A tender for construction will be issued this summer.			x	
Azilda Tank	This water tank is part of water tanks inspection and rehab project by Landmark. Rehab work was completed in 2020 for this tank.	x			
Montrose Booster Station	Project detail design and procurement complete. Project construction is expected to start Q2 2021.		x		
Snowdon Booster Station	Procurement for condition assessment for all water booster stations is underway. We expect to complete the condition assessment by the end of the year 2021.				x
Garson 2 Water Well	The building assessment and roof repair is scheduled to take place in coming weeks. This well is part of the overall Garson Water Servicing Strategy project. An environmental assessment is underway. Public consultation is scheduled in the coming weeks.			x	
Garson 1 and 3 Water Well	These wells are part of the overall Garson Water Servicing Strategy project. An environmental assessment is underway. Public consultation is scheduled in the coming weeks.			x	
Centennial Booster Station	Procurement for detailed condition assessment for all water booster stations is underway. The assessment is expected to be complete by the end of the year 2021.				x
David St Water Treatment Plant	Two major projects are underway: <ol style="list-style-type: none"> 1. The Heating Ventilation Air Conditioning system upgrade and full condition assessment. Detail design is at final stage. Tender for construction will be issued by this summer. 2. Process and membrane assessment is scheduled to take place in March. Suez technical staff are coming to the plant March 23 and 24 for the assessment and operator training. 			x x	
Ellis Reservoir	This water tank is part of inspection and rehab project by Landmark. Work completed in 2020 for this tank.	x			
Walden Tank	This water tank is part of inspection and rehab project by Landmark. Work is scheduled to be completed by summer 2021. Coordination with Vale is required.			x	
Deschene Water Well	This valley well is part of the Valley water well retrofit project by PCL. Construction is underway and is expected to be completed this year		x		
Frost Water Well	This well is part of the Valley water well retrofit project by PCL. Construction is underway and is expected to be completed this year		x		

Facility	Capital Upgrades Recommended and Status Comments	Upgrade Complete	Upgrade In Progress	Study Under Way	Plan In Progress
Kenneth Water Well	This well is part of the Valley water well retrofit project by PCL. Construction is underway and is expected to be completed this year		x		
Michelle Water Well	This well is part of the Valley water well retrofit project by PCL. Construction is underway and is expected to be completed this year		x		
Val Caron Booster Station	Project construction is underway by Belanger Construction and is expected to be complete by the end of year.		x		
Falconbridge Tank	This tank is part of the inspection and rehab project by Landmark. Work was completed in 2020 for this tank.	x			
Chelmsford Tank	This tank is part of the inspection and rehab project by Landmark. Work was completed in 2020 for this tank.	x			
Copper Park Booster Station	Procurement for detailed condition assessment for all water booster stations is underway. The assessment is expected to be complete by the end of the year 2021.				x
Falconbridge Wells	A 3-year well rehabilitation program to keep the water wells production capacity at their optimum level is under development. We are expecting to go for prequalification and tender by this summer 2021.				x
Linden Water Well	This well is part of the Valley water well retrofit project by PCL. Construction is underway and is expected to be completed this year.		x		
Chenier Water Well	A 3-year well rehabilitation program to keep the production capacity of the valley water wells at their optimum level is under development. This summer, the prequalification and tender are expected to be issued.				x
Well R	A 3-year well rehabilitation program to keep the production capacity of the valley water wells at their optimum level is under development. Prequalification and tender will be issued this summer.				x
Well rehab program	A 3-year well rehabilitation program to keep the water wells production capacity at their optimum level is under development. Prequalification and tender are expected by this summer.				x
Other Wells condition assessment	There is an ongoing wells upgrade project by PCL. An additional detailed condition assessment is planned this year for the remaining wells.				x
Valley Ground Water Study	Ongoing study on Valley ground water wells capacity and risk assessment by Pinchin Ltd.			x	
Booster stations condition assessment	Three booster stations projects are underway: Val Caron, Montrose and Kingsway. Procurement for detailed condition assessments will be completed for the remaining booster stations later this year.				x
Total		5	12	12	10
Percentage		13%	31%	31%	25%

Impact	Services	Technology	People	Strategic	Legal/Reputational	Financial
Very Minor (1)	<ul style="list-style-type: none"> • Less than 90% of service objectives achieved. 	<ul style="list-style-type: none"> • Minor disruptions of secondary systems or data loss or corruption. 	<ul style="list-style-type: none"> • Minor reportable employee injury. • Increase in number of union grievances. 	<ul style="list-style-type: none"> • Minor instances of actions that are at odds with strategic priorities. 	<ul style="list-style-type: none"> • Small amount of negative media coverage or complaints to City. • Non-lasting damage or no reputational damage • Theft or Fraud under \$1,000. 	<ul style="list-style-type: none"> • Uninsured loss, cost overruns or fines < \$10K • Insured loss < \$100K • Loss of replaceable asset.
Minor (2)	<ul style="list-style-type: none"> • Less than 75% of service objectives achieved. • Unable to perform non-essential service. 	<ul style="list-style-type: none"> • Disruptions of systems or data loss or corruption • Disclosure of non-confidential but embarrassing information. 	<ul style="list-style-type: none"> • Reportable employee injury. • Loss of key staff but able to recruit competent replacements • Significant increase (>10%) in number of union grievances. 	<ul style="list-style-type: none"> • Instances of actions at odds with strategic priorities. 	<ul style="list-style-type: none"> • Complaints elevated to the Director level. • Short-term repairable damage to City's reputation • Public outcry for discipline of employee. • Moderate amount of negative media coverage • Theft or Fraud of \$1,000 to \$10,000. 	<ul style="list-style-type: none"> • Uninsured loss, cost overruns or fines of \$10K to \$100K • Insured loss < \$100K - \$1M • Inefficient processes • City's actions result in reduced economic development.
Moderate (3)	<ul style="list-style-type: none"> • Less than 60% of service objectives achieved. • Unable to perform essential 	<ul style="list-style-type: none"> • Disruptions of significant systems or data loss or corruption 	<ul style="list-style-type: none"> • Multiple employee injuries or long-term disability from one incident. 	<ul style="list-style-type: none"> • Numerous actions are at odds with strategic priorities. 	<ul style="list-style-type: none"> • Public/media outcry for removal of management • Long-term damage to City's reputation 	<ul style="list-style-type: none"> • Uninsured loss, cost overruns or fines of >\$100K to \$1M • Insured loss >\$1M to \$10M • Having to delay payments to contractors/suppliers.

	service but alternatives exist.	<ul style="list-style-type: none"> • Recoverable loss from important system. 	<ul style="list-style-type: none"> • Inability to retain or attract competent staff. • Increase in stress leave, sick leave or WCB claims. • Work-to-rule union disagreement or short-term strike. 		<ul style="list-style-type: none"> • Citizen satisfaction survey indicates unacceptable performance. • Complaints elevated to Council level. • Results inconsistent with commitments made to citizens • Theft or Fraud under \$100,000. 	<ul style="list-style-type: none"> • City's actions results in lost revenue for significant number of City businesses.
Impact	Services	Technology	People	Strategic	Legal/Reputational	Financial
Major (4)	<ul style="list-style-type: none"> • Less than 45% of service objectives achieved. • Unable to perform an essential service where no alternative exists. 	<ul style="list-style-type: none"> • Unrecoverable loss or corruption of data from important system • External exposure of important information • Unavailability of significant systems 	<ul style="list-style-type: none"> • Serious injury of one or more employees • Legal judgment against the City in workplace matter. • Turnover of key employees • Sustained strike of staff. 	<ul style="list-style-type: none"> • Numerous actions are significantly at odds with the strategic priorities. 	<ul style="list-style-type: none"> • Public/media outcry for change in CAO or Council • Public or senior officials charged or convicted • Legal judgment against the City in a workplace matter • Integrity breach resulting in decreased trust in City Council or Administration. • Theft or Fraud >\$100,000 	<ul style="list-style-type: none"> • Uninsured loss, cost overruns or fines of >\$1M - \$10M • Insured loss of >\$10M - \$100M • Unable to pay employees and contractors on time. • City's actions impair local economic conditions.

Extreme (5)	<ul style="list-style-type: none"> • Less than 30% of service objectives achieved. • Unable to perform several essential services where no alternatives exist. 	<ul style="list-style-type: none"> • Unrecoverable loss or corruption of data from critical system • External exposure of confidential information • Unavailability of critical systems 	<ul style="list-style-type: none"> • Death of an employee • Major legal judgment against the City in workplace matter. • Significant turnover of key employees with ELT • Sustained strike of staff supporting key services 	<ul style="list-style-type: none"> • Many actions are significantly at odds with the strategic priorities. 	<ul style="list-style-type: none"> • Public/media outcry for change in CAO or Council • Senior officials criminally charged or convicted • Severe legal judgment against the City in a workplace matter • Major integrity breach resulting in complete loss of trust in City Council or Administration. • Theft/Fraud > \$1,000,000 	<ul style="list-style-type: none"> • Uninsured loss, cost overruns or fines > \$10M • Insured loss > \$100M • File for bankruptcy • Failure to maintain financial capacity to support current demands. • City's actions significantly impair local economic conditions.
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Likelihood	Unlikely (1)	Possible (2)	Probable (3)	Likely (4)	Very Likely (5)
	Less than 20%	>20% but < 40%	>40% but < 60%	>60% but < 80%	80% or more
	Less frequent than every 10 years	May occur in the next 2 years	Will occur this year or next year at least once	May occur regularly this year	Will occur within months may reoccur often