



CITY OF VANCOUVER
INTERNAL AUDIT REPORT
Waterworks Utility Audit

Distribution:

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EXECUTIVE SUMMARY

February 15, 2022

The waterworks utility audit was initiated to provide independent assurance that the existing internal controls and key business processes related to management of the City’s waterworks utility are adequate, effective, and comply with regulatory requirements.

The internal controls related to waterworks utility processes were found to be generally adequate, with some improvements required to enhance business continuity planning and the continued focus on asset management. There are also adequate processes in place for testing and reporting on water quality, to comply with applicable regulatory requirements.

The costs associated with infrastructure renewal along with projected cost increases in the City’s bulk purchases of water will put pressure on the utility and the associated water rates and fees, given that it operates on a cost recovery basis. Initiatives such as water conservation efforts along with a continued focus on asset management will assist the City in managing the increasing costs of providing clean, safe, and accessible drinking water.

The more significant findings and recommendations from this audit are:

E.1 Strengthen emergency response and business continuity planning

Management has committed to ensuring responsibility for emergency response and business continuity planning is clearly defined and assigned to staff. Existing emergency response plans will be revised to ensure they are adequate for business continuity purposes, and periodically reviewed and updated.

E.2 Develop asset management plans for remaining waterworks infrastructure components

As part of the waterworks division’s continued focus on asset management and ongoing infrastructure renewal, asset management plans will be developed covering the remaining components of the water distribution system.

E.3 Address cost recovery for identified “non-billable” properties

To ensure completeness in cost recovery and also aid in the City’s efforts for reduction in water usage at civic facilities, identified non-billable properties should be reviewed and users appropriately billed to reflect their water usage.

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A. BACKGROUND

The City's waterworks utility has a mandate to provide clean, safe, secure and accessible drinking water, to manage assets proactively, to use potable water sustainably and efficiently to extend the life of current water supplies, and to ensure adequate preparation for emergencies.

The Waterworks Bylaw No. 4848 sets out the authorities and responsibilities for the waterworks system, including rates, charges, and conditions of the supply of water.

The City purchases treated water from Metro Vancouver. The delivery of water to end users in Vancouver occurs through 1,500 kilometers of distribution and transmission mains to approximately 101,000 service connections. As reported in the 2020 Waterworks Annual Report, the utility delivered 108.5 billion litres of drinking water throughout Vancouver.

Cost recovery operation

The City's water utility operates on a cost recovery basis whereby water users are either billed a flat rate or a variable rate based on metered water usage. Rates are set to recover the City's costs of water purchases, capital expenditures, and operating costs involved with repair and maintenance of the water system.

The City is moving towards a fully metered water system. All new residential properties and those that have been significantly renovated are required to be set up with metered water service rather than have a flat utility rate applied.

Water conservation

Water conservation efforts are key to managing the projected increases in costs of water purchases, population growth increasing future demand for water, and impacts to the water supply resulting from climate change. Water conservation is an important strategy in dealing with the pressures facing the waterworks utility and also extends to City operations themselves. The City's Green Operations Plan 2.0 September 2020 includes a target reduction of civic water use of 10% by 2030, compared to the 2019 baseline level.

Aging Infrastructure

The waterworks utility's distribution system includes 1,488 km of water mains, 101,354 service connections, 21,868 meters, 6,517 hydrants, 25,000 valves, and 28 pressure reducing valve (PRV) stations.¹ Capital expenditure for the renewal of these assets was projected to be \$31.3 million for 2021. The investment required annually is projected to remain at a significant level in future years due to the current condition of the majority of the assets in the distribution system; many are nearing end of service life. The aging infrastructure also has implications for cost of repairs. Engineering

¹ Waterworks Utility Annual Report 2020.

Services has reported an increase in the number of main breaks of approximately 30% over the past ten years.

B. SCOPE

The waterworks utility audit was initiated to provide independent assurance that the existing internal controls and key business processes related to management of the City's water distribution system are adequate, effective, and comply with regulatory requirements.

The scope of the audit included:

- waterworks utility operational processes;
- asset management;
- business continuity and emergency planning;
- rate setting and budget monitoring; and
- billings and collections.

The audit is not designed to detect fraud. Accordingly there should be no such reliance.

C. CONCLUSION

The internal controls related waterworks utility processes were found to be generally adequate, with some improvements required to enhance business continuity planning and a continued focus on asset management. There are also adequate processes in place for testing and reporting on water quality, to comply with applicable regulatory requirements.

Findings and recommendations have been discussed with appropriate management and responses incorporated in this report.

D. RISK ANALYSIS

The potential significant risks considered if controls were not in place are:

- Impact to service delivery of clean, available drinking water to citizens;
- Infrastructure may not be adequate to support future growth and demand for water in the City;
- Water leakage due to aging and /or faulty water system infrastructure;
- Business or emergency disruption impacting the availability or quality of water;
- Water users may be over or under charged for their consumption;
- Rates set do not reflect the full cost of providing the service;
- Potential billing errors resulting in high level of complaints and staff resources required to investigate; and
- Unauthorized changes to billing data.

E. AUDIT ISSUES, RECOMMENDATIONS AND MANAGEMENT RESPONSES

E.1 Strengthen Emergency Response and Business Continuity Planning

Business continuity plans are a key aspect of ensuring that City departments are prepared to continue the delivery of critical services at an acceptable level following a business disruption. Departmental risk liaisons within each City department are responsible for the development and

ongoing maintenance of business continuity plans for their department. Due to their size and complexity, large departments such as Engineering Services may require multiple business continuity plans for their individual branches and divisions.

While emergency management and business continuity management may complement each other, a business continuity plan focuses on the key operations and processes needed after a disruption or disaster occurs, rather than the immediate response.

An emergency response plan specific to Waterworks Utility staff and operations is in place, which was last updated in October 2020, and is specific to the Waterworks Utility staff and operations. The plan is comprehensive and sets out roles and responsibilities of management and staff in the event of an emergency, as well as various procedural information. Plans specific to business continuity management have not yet been developed for the waterworks utility. Discussions with management also indicated that this is an area where responsibility is not yet clearly assigned and there is an opportunity to further develop and refine the emergency response plan.

Recommendations:

E.1.1 The Director, Water & Utilities Management should oversee the review and update of the waterworks utility’s emergency response plan and business continuity plan documents. A process should also be in place to ensure that plans are periodically reviewed and updated. This should be in place by December 31, 2022.

E.1.2 The Director, Water & Utilities Management should ensure resources for maintaining the waterworks utility’s emergency response and business continuity planning are identified. Staff responsible for this function should have this clearly defined as part of their annual performance objectives. This should be completed by December 31, 2022.

Management Response:

Agree with the findings

Agree with the recommendations

Disagree with the findings

Disagree with the recommendations

Management Action Plan:

E.2 Develop asset management plans for remaining waterworks infrastructure components

A significant portion of the water distribution system’s assets has been assessed as nearing end of service life and requiring replacement over the next 30 years. Currently, 22% of waterworks assets are rated as being in poor condition, and the remainder are rated as in fair-to-good condition.

To manage the aging infrastructure of the water distribution system, the Waterworks Division has a team dedicated to asset management. Among the team’s various asset management activities and processes in place, an asset management plan has been developed and drafted, which details the current conditions of the numerous assets that comprise the water system. The plan also contains various forecasting analysis scenarios to determine the level of investment and capital replacement required to provide the needed service levels.

While the asset management plan is current and comprehensive, it does not yet include some components: pressure reducing valve (“PRV”) stations, water meters, Dedicated Fire Protection System (DFPS) or SCADA network.

Recommendation:

E.2.1 The Director, Water & Utilities Management should ensure that an asset management plan strategy and schedule is developed and finalized that would include all remaining elements of the water utility system. A draft document should be in place by December 31, 2022.

Management Response:

Agree with the findings

Agree with the recommendations

Disagree with the findings

Disagree with the recommendations

Management Action Plan:

E.3 Address cost recovery for identified “non-billable” properties

The City’s water utility rates, both metered and fixed, are determined on a cost recovery basis. The cost components that are factored into the rate model include the waterworks utility’s operating costs, capital expenditures, and the cost of the bulk purchases of water from Metro Vancouver. The bulk purchase of water makes up the majority (approximately 60%) of the overall cost and is driven by the amount of water consumption across all water users in the City.

Some civic facilities have historically not been billed for their water usage, nor do they have a water meter in place. The Waterworks Design branch has identified a list of these locations and staff are working with the City departments involved to set up water meters and address the departmental budget impacts associated with billing for their water usage.

Records from Waterworks Design indicated that over 300 accounts had been identified for further investigation, with an estimated potential annual billing amount of approximately \$2 million. It has also been noted that some of the identified accounts involve leased sites, which require further investigation to determine responsibility between the City and the tenant for the payment of utilities.

Addressing water usage for these non-billable properties will ensure that all water users are accounted for in water utility rates and are equitably contributing towards the cost recovery of the water utility. Additionally, introducing a financial impact that reflects a facility’s water usage may assist with water conservation efforts and reduce water usage or mitigate wastage.

Recommendations:

E.3.1 The Director, Water & Utilities Management and Director, Engineering Financial Planning & Analysis should ensure that the analysis of non-billable water accounts and engagement with those water users are completed. This should be completed by December 31, 2022.

E.3.2 The Director, Water & Utilities Management and Director, Engineering Financial Planning & Analysis should ensure water usage charges are incorporated and reflected in the 2023 budgeting process. This should be completed by December 31, 2022

Management Response:

Agree with the findings

Agree with the recommendations

Disagree with the findings

Disagree with the recommendations

Management Action Plan: