AGLG
AUDIT REPORT
AUGUST 21, 2019

AUDITOR GENERAL FOR LOCAL GOVERNMENT

ACCESSIBILITY • INDEPENDENCE • TRANSPARENCY • PERFORMANCE

LOCAL GOVERNMENT'S ROLE IN ENSURING CLEAN DRINKING WATER

TOWNSHIP OF LANGLEY REPORT #1 OF 2

An independent assurance audit carried out by the Auditor General for Local Government of British Columbia

MESSAGE FROM THE AUDITOR GENERAL FOR LOCAL GOVERNMENT

To the Mayor and Council of the Township of Langley,

I am pleased to present this performance audit report on the Township of Langley's drinking water services.

Our performance audits are independent, unbiased assessments, carried out in accordance with professional standards. They aim to determine the extent to which the area being examined has been managed with due regard to economy, efficiency and effectiveness.

We conducted this audit in accordance with the standards for assurance engagements set by the Auditing and Assurance Standards Board of the Chartered Professional Accountants of Canada and under the authority of the *Auditor General for Local Government Act*.

Providing safe drinking water is important to every community, so I hope this report is also of value to many local governments across the province in the work that they do.

This report outlines many of our findings in assessing the Township of Langley's management of its drinking water systems. It deals only with the Township's systems and operations and not those of private wells or other water systems, including the Greater Vancouver Water District, which supplies a portion of the Township's drinking water.

Our audit included four objectives, one of which related to asset management and managing the construction and implementation of the Township's drinking water supply infrastructure to meet its intended objectives. We will report on this area in a subsequent and complementary report.

I was pleased to see that the Township met most of the expectations included in the three audit objectives reported on here and had made considerable effort toward ensuring the sustainability of its drinking water.

There were some areas related to these objectives where the Township should consider improvements to help ensure the success of its drinking water planning and management into the future. The report's recommendations focus on these opportunities.

The result of our performance audit process is this report, which I urge you to read in full, as it identifies good practices in some areas as well as other areas where the Township could make enhancements.

I want to thank the Township of Langley for its cooperation during the performance audit process and its response to our findings and recommendations.

Gordon Ruth, FCPA, FCGA
Auditor General for Local Government
Surrey, B.C.

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LIST OF EXHIBITS

EXECUTIVE SUMMARY

1. We conducted this audit under the authority of the *Auditor General for Local Government Act* and in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada.

2. The overall purpose of this performance audit was to provide an objective, independent examination of the Township of Langley's drinking water services to determine if the local government provides clean and safe drinking water where and when needed.

WHAT WE EXAMINED

3. We examined a range of different factors related to the Township's governance, planning and operation of drinking water services. We examined relevant documentation and data and we held discussions with key management staff, elected officials and a range of stakeholders. We also made observational visits to the Township's water utility.

WHAT WE FOUND

4. The Township met most of the expectations included in our audit objectives and had made considerable effort toward ensuring the sustainability of its drinking water. There were a few areas related to these objectives where the Township should consider improvements to help ensure the success of its drinking water planning and management into the future.

SUPPORTING CLEAN AND SAFE DRINKING WATER WHERE AND WHEN NEEDED

5. For many years previous to and including the period covered by the audit, the Township of Langley focused resources on gaining a sophisticated level of understanding of its groundwater resources and identifying risks and issues related to its groundwater supply.

6. The Township incorporated its knowledge about drinking water into its strategic planning and decision making, and worked to integrate drinking water considerations into land use planning, and address some cross-jurisdictional impacts of land use and water. The Township designated many Development Permit Areas that included guidelines to protect water and the natural environment. Prior to the audit period the Township worked with the Province to develop a plan to reduce overall groundwater extraction from municipal and private well water use; however, the Province did not endorse the plan and the Township was working with the Province to update it to align with new legislation.

7. The Township had identified its own groundwater extraction limits but had not developed a Council-endorsed strategy or policies for current and future drinking water sources, though work was underway relating to supply development options.

8. The Township had a governance structure that supported the provision of clean and safe drinking water and activities that supported meeting the community's demand for water. It had some performance indicators that were reported in its water quality reports and collected some activity-based data related to its conservation and public education initiatives.

9. Although the Township had these processes in place and discussions related to water in Council meetings were documented, management teams did not consistently record minutes of their meetings. The Township also did not conduct work engagement surveys to identify opportunities for workplace improvement at the water services level.

10. Related to risk management, the Township had not formally identified risk and mitigation strategies, did not have a risk register, or an organization-wide process for identifying and managing risks. Similarly, the Township had not fully developed its performance indicators and did not have a comprehensive approach to measuring water utility performance.

11. Through its water rates, the Township generated sufficient revenue to cover its annual expenses but did not have a full cost recovery approach or a complete understanding of the full costs of utilizing groundwater as its drinking water source.

12. The Township had a current Emergency Response Plan and staff told us they extensively tested the action plan while it was being developed. However, the Township had not developed a fulsome business continuity plan to assess and plan for returning water services to full operations following disruption of its water system.

MANAGEMENT TO MEET DEMAND

13. The Township demonstrated numerous efforts to manage drinking water to meet current and anticipated future demand. It had a range of bylaws in place to regulate source water protection and implemented a range of water conservation activities intended to influence behaviour and collected data about these activities.

14. During the audit period, the Township's only specific target was to reduce groundwater use by 30 per cent by 2020 for municipal and private wells under Provincial jurisdiction. Its use of groundwater decreased by 13.2 per cent between 2009 and 2018, however, total water consumption over the same period increased by 15.8 per cent, as the Township's serviced population increased by approximately 33.3 per cent over the same period.

15. The Township did not have an integrated water conservation and demand management plan with identified measures and overall water reduction targets, nor did it evaluate the effectiveness of its conservation activities based on reduced water usage in relationship to longer-term planning, the Township commissioned a study to identify future supply options and staff told us they were working on the next phases of this initiative.

ENSURING SAFETY AND RELIABILITY

16. The Township required and had the approval of Fraser Health Authority to operate its water systems and demonstrated efforts to adopt the Multi Barrier Approach, substantially achieving this.

17. The Township reported no microbiological health risks in its source well water, but had a sample of distribution water test positive for *E. coli* in September of 2017. When this occurred, the Township flushed the systems and re-sampled. Retests came back negative, so it did not issue a water quality advisory, nor did it have any water quality advisories or unplanned water system shut–downs during the period covered by the audit.

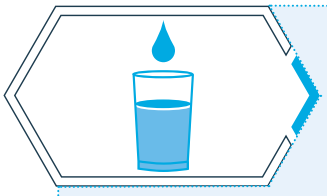
18. The Township's available and on call water operators and utility maintenance workers employed in drinking water services were appropriately trained to the required certification levels. Additionally, the Township had a Cross Connection Control program and a systematic preventative maintenance program customized to each type of infrastructure.

19. The Township minimized the need for water treatment by drawing from wells with better water quality. For water with excessive mineral concentrations, it reduced these to acceptable levels by blending with Greater Vancouver Water District water.

LOOKING AHEAD

20. As the Township further assesses the options for meeting a projected increase in the demand for drinking water, we encourage it to use an integrated planning approach that takes supply options, conservation and demand management strategies and full costs into consideration.

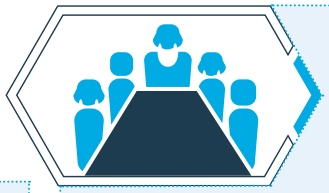
Exhibit 1 – SUMMARY OF RECOMMENDATIONS



PROVIDING CLEAN DRINKING WATER WHERE AND WHEN NEEDED

1. The Township of Langley should consider developing a Council-endorsed strategy or policies for current and future drinking water sources that:

- Builds on and consolidates its considerable studies and practices related to groundwater planning and sustainability
- Includes sustainable withdrawal targets for its groundwater to avoid overuse
- Includes a plan to protect water sources from contamination
- Includes guidance to protect water during development especially in areas dependent on drinking water aquifers and near well capture zones
- Includes tools to share information, assess and manage risks, where neighbouring local governments' land-use or environmental decisions may impact the Township's drinking water
- Explores stormwater/rainwater capture as part of the long-term solution



GOVERNANCE STRUCTURE AND ACTIVITIES SUPPORTING DRINKING WATER SERVICES

2. The Township of Langley should consider a full cost recovery approach as part of its water service planning that:

- Enables the Township to better identify costs associated with delivering water to customers
- Includes long-term financial and capital planning for its water services

3. The Township of Langley should consider developing a formal framework for risk identification, mitigation and reporting that includes regular re-assessment and reporting of organizational risks—including those associated with drinking water—to senior management and Council.

4. The Township of Langley should improve data collection, analysis, monitoring and reporting on its water services as part of a continual improvement process. This should include:

- A performance measurement system for its water services
- Monitoring and measuring progress towards goals and objectives
- Enhanced reporting to Council, senior management and the public on results

5. The Township of Langley should consider improving its tracking and reporting on service requests (including complaints) and enquiries from the public relating to its water systems.

6. The Township of Langley should consider improving the workflow of its water infrastructure work–order system to enhance its efficiency.

7. The Township of Langley should consider retaining a record of all management team meetings in order to track organizational decisions.

8. The Township should consider enhancing its human resource policies by reviewing and updating its ethical policies and by developing a whistle blower policy.

GOVERNANCE STRUCTURE AND ACTIVITIES SUPPORTING DRINKING WATER SERVICES *Continued*

9. The Township of Langley should consider a more formal approach to measuring employee workplace engagement.

10. The Township of Langley should enhance its emergency and business continuity planning by:

- Ensuring that its water utility emergency response plan continues to be regularly updated, tested, and made accessible and familiar to all staff
- Completing business continuity planning for its critical services—including drinking water—to ensure the continuation of service and sustainable infrastructure throughout any potential disruptions

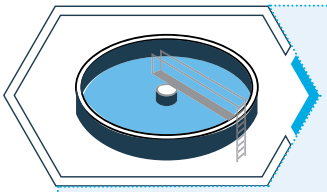
MANAGEMENT TO MEET DEMAND *Continued*

- Considers additional innovative water conservation strategies to conserve and augment existing water supplies (such as fit-for-purpose water management, water re-use and others)
- Considers the role of volume-based water rates and public awareness of the full cost of water services to promote more efficient use of water, which can result in the deferral of capacity expansions and the reduction of costs
- Considers strategies to maximize bylaw compliance
- Includes a Township-wide implementation strategy for its leak detection program, based on the results of its pilot program

MANAGEMENT TO MEET DEMAND

11. The Township of Langley should improve its water conservation and demand-management efforts by developing a long-term approach that:

- Considers customers' water use habits and identifies barriers to behavioral change
- Includes a water conservation framework identifying all relevant cost-effective strategies, across customer sector groups, and objectives with established target outcomes tied to reduced water usage
- Includes drought response planning to manage the potential impact of reduced water supplies
- Includes indicators to identify water supply shortages and response measures



DRINKING WATER TREATMENT AND QUALITY MANAGEMENT

12. The Township of Langley should continue to improve its water quality reporting processes, particularly:

- Verifying the accuracy, validity and completeness of its Annual Water Quality Report
- Reporting on any further investigations and changes in practice resulting from water quality issues

INTRODUCTION

21. This report presents the results of a performance audit conducted by the Auditor General for Local Government of British Columbia (AGLG) under the authority of the *Auditor General for Local Government Act*. The audit was performed in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada (see the "About the Audit" section for more information).

22. We conducted this audit under the audit theme "Environmental Programs and Services." Sound environmental management is of interest to all local governments and the public at large. How local governments use and manage resources for this is a growing area of challenge that affects public health and safety.

23. We initially selected the City of Kelowna and the Regional District of Okanagan-Similkameen to be included in this set of audits and later added the Township of Langley as a third auditee on this topic. These three auditees represent different forms of local government (two municipalities and one regional district), located in two different regions of the province. Some of the water systems in these jurisdictions depend on surface sources, while others depend on groundwater.

24. We may conduct more audits on drinking water services in the future, as this is a major area of local government activity.

25. The overall purpose of this performance audit was to provide an objective, independent examination of the Township of Langley's drinking water services to determine if the local government provides clean and safe drinking water where and when needed.

26. The audit focused on four distinct but connected objectives, three of which are reported in this document. We will report separately on one of the objectives—asset management planning and water supply infrastructure—in a subsequent report for the Township of Langley. Please see the About the Audit section for detailed information on the audit objectives and criteria.

27. In this report, we set out to answer the following questions:

- Did the Township's governance structure and activities support the provision of clean and safe drinking water where and when needed?
- Did the Township manage its drinking water supplies to meet current and expected future demand?
- Did the Township ensure the safety and reliability of drinking water provided through its water utility's treatment and distribution systems?

28. To answer these questions, we examined a range of different factors related to the Township's governance, planning and operation of drinking water services. We examined relevant documentation and data and we held discussions with key management staff, elected officials and a range of stakeholders. We also made observational visits to the Township's water utility.

29. The period covered by the audit is January 1, 2016 through December 31, 2018. In some cases, we reviewed documents created prior to 2016 if they remained current during the audit period. Drinking water quality data from 2015 was included because these data were covered in the Township's 2016 water quality reporting.

WATER CONSUMERS TYPICALLY EXPECT THAT

DRINKING WATER:

Source: Canadian Council of Ministers of Environment: From Source to Tap

WHY CLEAN DRINKING WATER IS IMPORTANT

Local services, agriculture and other businesses and industry that employ British Columbians also need a dependable supply of clean water to operate.

20 to 50 liters
clean water
per day per person

- DRINKING
- COOKING
- PERSONAL CARE

- AGRICULTURE
- BUSINESS/INDUSTRY
- LOCAL SERVICES

900

Estimated **900 million** people globally face serious health consequences due to polluted drinking water

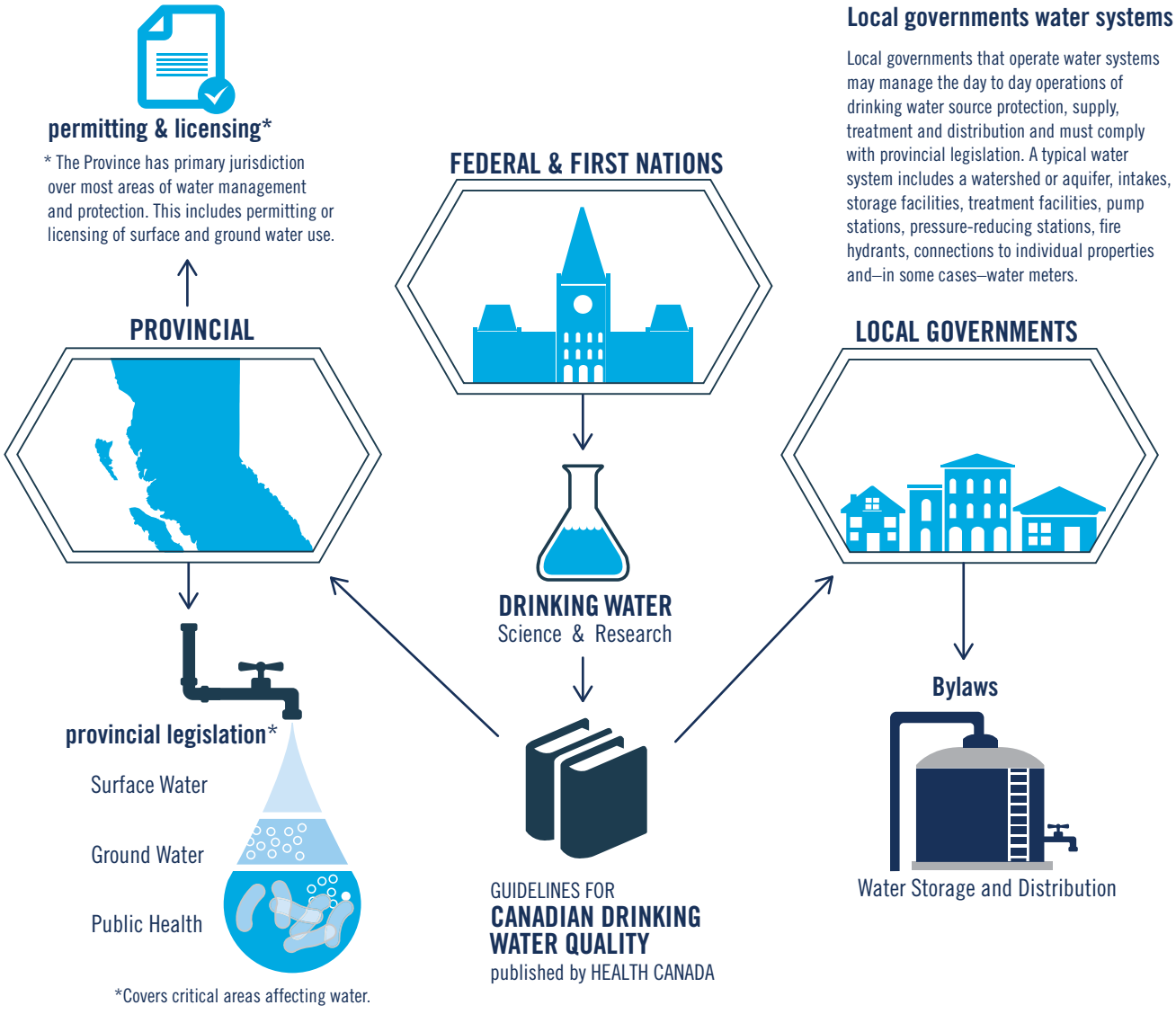
603 BOIL WATER

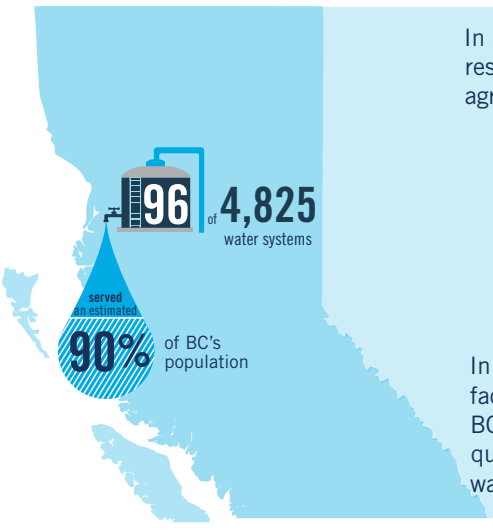
603 notices were in effect across the province as of March 31, 2017

Access to clean drinking water depends on water providers acting appropriately at each stage of the process.

- source water protection
- drinking water systems
- drinking water quality management

RESPONSIBILITY FOR CLEAN DRINKING WATER





In addition to the BC regional districts and municipalities that are responsible for water systems to provide water for domestic, commercial, agricultural and industrial use, water services are also provided by:

- IRRIGATION AND IMPROVEMENT DISTRICTS
- PRIVATE UTILITIES
- FIRST NATIONS
- WATER USERS' COMMUNITIES
- GOOD NEIGHBOUR SYSTEMS

In 2015, the Provincial Health Officer highlighted particular challenges faced by suppliers of drinking water to small or remote communities in BC. These included inadequate treatment, difficulty attracting and retaining qualified operators, difficulty getting access to lab services in a timely way and inadequate financial resources to upgrade their systems.

REGULATION OF DRINKING WATER IN BRITISH COLUMBIA

British Columbia's Ministry of Health is the lead agency responsible for the Provincial Drinking Water Program. In this role, the Ministry works with the Ministry of Environment, Ministry of Forests, Lands and Natural Resource Operations, other ministries, the province's regional health authorities and water system providers across the province, including many local governments.

The Province also deals with drinking water through the regional health authorities that cover the entire province. The health authorities administer regulations by issuing permits and inspecting water systems, including those operated by local governments. The health authorities have drinking water officers and environmental health officers who inspect water systems and track compliance with provincial legislation. Health authorities also track and request publication of water quality advisories, boil water notices and 'do not use' water notices.

DRINKING WATER PROTECTION ACT

- APPOINTMENT OF DRINKING WATER OFFICER
- HEALTH HAZARDS
- MONITORING WATER QUALITY
- EMERGENCY RESPONSE
- CONTINGENCY PLANS

PUBLIC HEALTH ACT

- APPOINTMENT OF PROVINCIAL HEALTH OFFICER
- COMMUNICABLE DISEASE REGULATION
- SEWERAGE SYSTEM REGULATION
- HEALTH HAZARDS REGULATION

WATER SUSTAINABILITY ACT

Since February 2016

BC's Water Sustainability Act came into effect in February 2016, focusing on water use and extending the licensing of surface water to include groundwater (wells).

It recognizes the importance of environmental flows to fish and incorporates the idea of water objectives. When the BC Government establishes water objectives for a body of water, local governments must take them into account when planning for regional growth or land use.

OTHER ACTS AND REGULATIONS

There are other Acts and regulations that may apply to drinking water. For example, the Forest and Range Practices Act and Oil Gas and Activities Act and their regulations protect drinking water from the activities of those industries.

OUR EXPECTATIONS

30. We would expect a local government to effectively manage the water systems for which it is responsible to ensure drinking water safety and reliability over the long-term. To achieve this, we would expect a local government to have an appropriate governance structure and overall organizational activities, including:

- A long-term drinking water strategy that considers affordability, cost-effectiveness, and utilizes an integrated approach to water management
- A robust governance structure, organizational structure, leadership and culture that support its water systems
- Adequate controls to ensure proper operation of systems and to protect access and physical security of operations

31. We would also expect a local government to manage its drinking water supplies to meet current and expected future demand through:

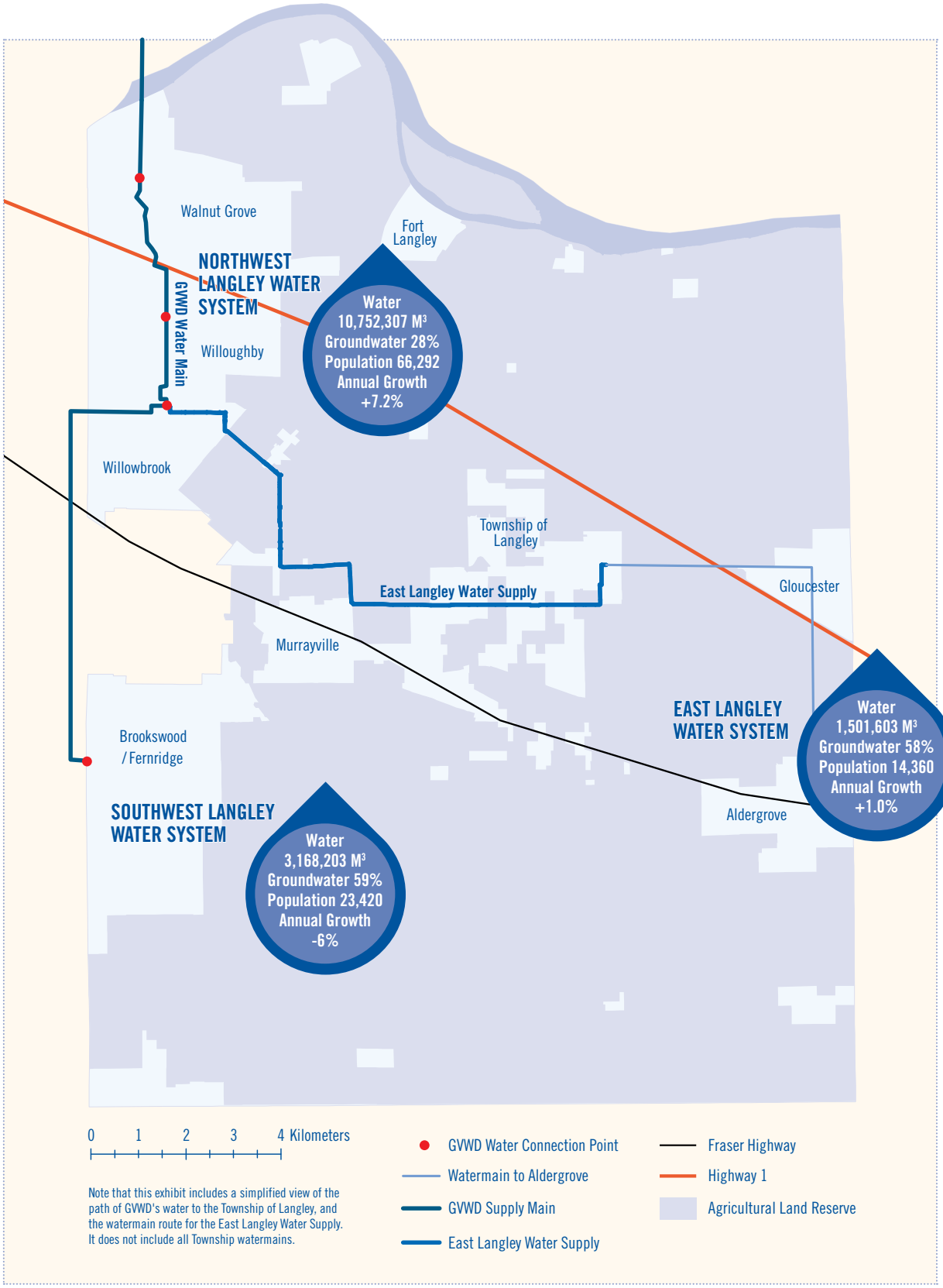
- Effective source water protection plans and bylaws, collaborating where appropriate with other organizations and stakeholders
- Rigorous assessment of available water sources, including alternative sources in case of a primary supply interruption
- Sound water conservation strategies, including demand management measures, targets and evaluation of effectiveness
- The promotion of public awareness and transparency in all aspects of drinking water services

32. We would expect a local government to ensure the safety and reliability of drinking water provided by its treatment and distribution systems through:

- Meeting all permitting and health authority requirements
- Maintaining adequate infrastructure to meet the Drinking Water Treatment Objective, or having plans to achieve this
- Having sufficiently-trained operators to meet all requirements, including ongoing training requirements
- Being prepared to respond to water-related emergencies
- Having business continuity plans that focus on returning water services to full operation during disruptions

CONTEXT

Exhibit 2 – TOWNSHIP OF LANGLEY VISUAL FACTS



TOWNSHIP OF LANGLEY

33. The Township of Langley is one of 27 local governments in British Columbia's Lower Mainland, including numerous municipalities, along with the Metro Vancouver and Fraser Valley regional districts. Incorporated in 1873, the Township covers approximately 317 square kilometres, with a population of 127,290 people (2018 estimate) and a population density of 402 persons per square kilometre.

34. The Township's population grew rapidly in recent years, with annual growth rates of 3.0, 3.3 and 2.1 per cent in 2015, 2016 and 2017 respectively. This made the Township the eighth most populous municipality in B.C. just below the City of Kelowna in population. The number of residents in the Township is projected to reach 211,000 by 2041.

35. Bounded to the south by Canada's border with the U.S.A. and to the north by the Fraser River, the Township borders the City of Langley and Surrey to the west and Abbotsford to the east. The Township also borders on Katzie, Kwantlen, and Matsqui First Nations.

36. The Township is located in a coastal western hemlock zone and receives abundant rainfall and mild temperatures. Bodies of water within the Township's boundaries include the Salmon River, Upper Nicomekl, Little Campbell River, Murray Creek, Bertrand Creek, Kerfoot Creek, Anderson Creek, and some small lakes. Despite wetter than usual winters and springs, the Lower Fraser experienced drought level 4 (extremely dry) at times during the summer and fall of 2015 and 2017.

37. The Township of Langley local government employed a workforce of 1,462 people as of December 2017.

THE TOWNSHIP'S ROLE WITH DRINKING WATER

38. During the period covered by the audit, the Township sourced drinking water from a combination of groundwater wells that it operated, and water purchased from the Greater Vancouver Water District (GVWD). The Township operated 19 public wells, excluding wells used exclusively for park irrigation.

39. As indicated in *Exhibit 3*, the Township operated five distinct water systems in different locations: Northwest Langley, Southwest Langley, East Langley, Tall Timbers and Acadia.

Exhibit 3 – DESCRIPTION OF AUDITED WATER SYSTEMS

WATER SYSTEM (2018)	NORTHWEST LANGLEY	SOUTHWEST LANGLEY	EAST LANGLEY	TALL TIMBERS	ACADIA	TOTAL
Main Populations Served	Total (66,292) Walnut Grove, Fort Langley, Willoughby/ Willowbrook, Milner, Forest Knolls	Total (23,420) Brookswood-Fernridge, Murrayville, High Point	Total (14,360) Aldergrove, Gloucester Industrial Estates, Salmon River Uplands	75 homes	24 homes	approximately 104,386 served
Water Sources	GVWD and wells	Wells and GVWD	Wells and GVWD	Wells	Wells	Wells and GVWD
Number of Township wells	2	5	7	3	2	19
m^3 of Water Supplied (2017)	10,752,307	3,168,203	1,501,603	25,804	8,693	15,456,610
% of Water from Wells	28%	59%	58%	100%	100%	42%
Type of Water Treatment	Chlorine or sodium hypochlorite	Chlorine or sodium hypochlorite	Chlorine or sodium hypochlorite and filtration	Chlorine or sodium hypochlorite	Chlorine or sodium hypochlorite	
km of Mains						524
Infrastructure						12 pump/ booster stations 10 distribution reservoirs 1 treatment plant for East Langley water only

40. In total, the Township provided water to an estimated 104,386 people or approximately 82 per cent of the 127,290 residents of the Township, mostly urban and semi urban. In addition, approximately 5,000 private wells provided water to the remaining residents, predominantly in the community's more rural areas.

INFRASTRUCTURE

41. Two capital projects led to significant water infrastructure changes during the period covered by the audit. In 2016 the East Langley Water Supply project connected East Langley and Salmon River Uplands Water System to water supplied by the GVWD. In 2017 the Township connected the formerly-private Nectar Water System into its existing system and absorbed its customers.

42. *Exhibit 4* shows revenue and expenditure information for the Township's water utility from 2014 to 2017. Staff told us that revenue and expenditure figures fluctuated mainly due to the timing of the East Langley Water Supply project.

Exhibit 4 – TOWNSHIP OF LANGLEY'S WATER SYSTEMS REVENUE AND EXPENDITURES ($000)

	REVENUE	TOTAL EXPENSES	SURPLUS
2014	$20,383	$19,482	$901
2015	$26,032	$17,342	$8,690
2016	$24,137	$16,391	$7,746
2017	$25,458	$18,141	$7,317

Sources: Township of Langley Audited Annual Reports

INTERACTION WITH OTHER AGENCIES/ STAKEHOLDERS/OTHER LEVELS OF GOVERNMENT

43. The Township of Langley's drinking water services relied on working relationships with other organizations and governments. These are shown in *Exhibit 5*.

FIRST NATIONS AND FEDERAL AND PROVINCIAL AGENCIES

44. As mentioned previously, the Township of Langley borders on three First Nations—Katzie, Kwantlen and Matsqui—which fall under federal jurisdiction. The Kwantlen and Katzie First Nations purchased drinking water from the Township during the period of the audit.

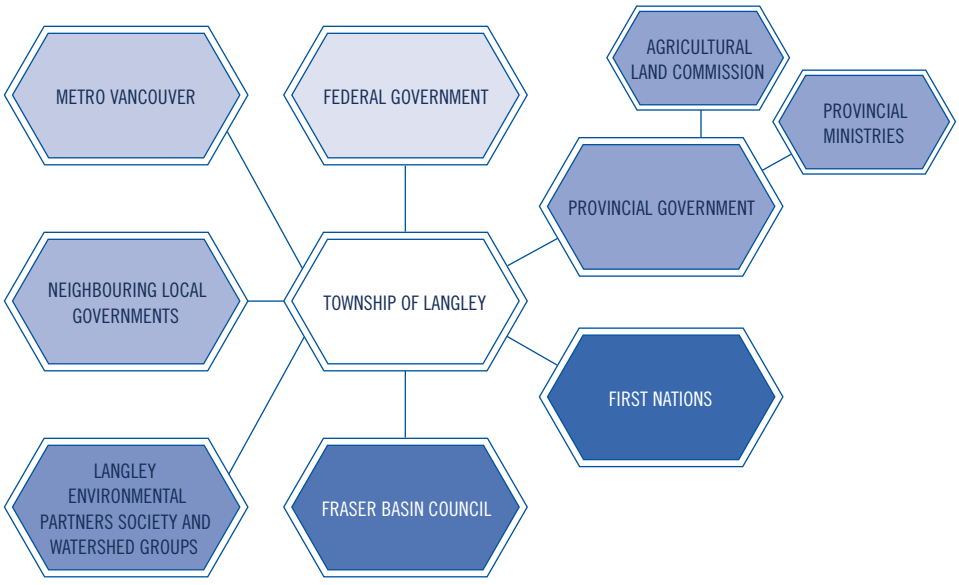
45. As affirmed in the *Water Protection Act*, the Province of B.C. owns all surface and groundwater within its jurisdiction on behalf of the residents of the province. The Province enables local governments to provide services as defined in the *Community Charter* and *Local Government Act*. If the local government provides drinking water it must meet the requirements of the *Drinking Water Protection Act* and Drinking Water Protection Regulation.

46. The provincial Agricultural Land Commission has a regulatory role affecting land located in the Agricultural Land Reserve (ALR), in which farming is recognized as the priority use. Approximately 75 per cent of land in the Township of Langley is included within the ALR. The Agricultural Land Commission supports coordinated and collaborative planning with local governments to ensure the protection of agricultural lands. The Province requires that the Township's bylaws and regulations affecting farming be consistent with the *Agricultural Land Commission Act* and other relevant provincial legislation.

REGIONAL AGENCIES/STAKEHOLDERS

47. As one of Metro Vancouver's 21 member municipalities and a neighbour to municipalities in the Fraser Valley Regional District, the Township of Langley interacts with other local governments on an ongoing basis. The Metro Vancouver Regional District is governed by a board that includes elected directors from each municipality within its boundaries, including the Township of Langley.

Exhibit 5 – TOWNSHIP OF LANGLEY DRINKING WATER AGENCIES/STAKEHOLDERS/OTHER LEVELS OF GOVERNMENT



48. Metro Vancouver provides core utility services such as water, sewerage and drainage and solid waste management, to many of its member municipalities, through four separate corporate entities: Metro Vancouver Regional District, Greater Vancouver Sewerage and Drainage District, Greater Vancouver Water District and Metro Vancouver Housing Corporation. The Township had a contractual agreement in place and purchased approximately 59 per cent of its drinking water from the Greater Vancouver Water District in 2018.

49. The non-profit group Langley Environmental Partners Society (LEPS) was established in 1993 to conserve Langley's streams and natural areas. The Township partners with this organization to deliver public information and education related to drinking water conservation, source water protection and risks associated with source water quality. The Township also contracts with LEPS to deliver water-related programs and provides funding to six different watershed groups for watershed protection initiatives.

50. Fraser Basin Council helps advance sustainability in the Fraser Basin and across B.C. by focusing on environmental issues, such as climate change, supporting source water protection and building sustainable communities. The Township indirectly gains insight from Fraser Basin Council initiatives and studies through its membership in Metro Vancouver, which has representation on the Council.

FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

SUMMARY OF FINDINGS

51. We set out to determine whether—during the period covered by the audit—the Township of Langley[1]:

- Had a governance structure and activities that supported the provision of clean and safe drinking water where and when needed
- Managed its drinking water supplies to meet current and expected future demand
- Ensured the safety and reliability of drinking water provided through its treatment and distribution systems

52. The Township met most of the expectations included in the three audit objectives reported on here and had made considerable efforts towards ensuring the sustainability of its drinking water. There were a few areas related to these objectives where the Township should consider improvements to help ensure the success of its drinking water planning and management into the future.

SUPPORTING CLEAN AND SAFE DRINKING WATER WHERE AND WHEN NEEDED

INTEGRATED WATER PLANNING AND MANAGEMENT

53. For many years previous to and including the period covered by the audit, the Township of Langley focused resources on gaining a sophisticated level of understanding of its groundwater resources and identifying risks and issues related to its groundwater supplies. Prior to the audit period, the Township collaborated with the Province of B.C. to develop a joint Water Management Plan, and since this plan was not committed to by the Province, the Township continued to work with the Province during the audit period to update the plan to align it with changing provincial legislation.

54. The Township incorporated its knowledge about drinking water into its strategic planning and decision-making, addressing water conservation and aquifer protection in its Official Community Plan, Sustainability Charter and Community and Neighbourhood plans.

55. The Township also worked to integrate drinking water considerations into its land use planning. In addition to working with the Province to develop the Water Management Plan (which identified water-related risks associated with private wells, including agricultural users), the Township made efforts to understand and address some cross-jurisdictional impacts of land use and water, including the potential impact on groundwater of the land use decisions of a neighbouring municipality. It also worked to extend outreach and education on groundwater protection and conservation to those private well users who are not customers of the Township's water utility.

56. The Township integrated land use planning and drinking water considerations in a range of other ways, such as incorporating groundwater infiltration considerations into development planning, and developing integrated stormwater management plans with a dual purpose of flood prevention and groundwater recharge. The Township also designated many Development Permit Areas (DPAs) in its community plans that included guidelines to protect water and the natural environment.

57. The Township had identified groundwater extraction limits, however, it had not developed a Council-endorsed strategy or policies for current and future drinking water sources, though work was underway relating to supply development options (discussed in more detail in a following section). In addition, although the Township focused on many aspects of integrated stormwater management and rainwater capture, it had not fully integrated alternative water sources (from reusing water as fit-for-purpose) into a long-term approach to water sustainability.

[1] *The audit of the Township of Langley also included an additional objective, "the Township of Langley managed its water supply infrastructure to meet current and expected future demand." The findings, conclusions and recommendations related to this objective will be reported on in a subsequent report and are not included here.*

GOVERNANCE, ORGANIZATIONAL STRUCTURE AND ACTIVITIES

58. The Township of Langley had a governance structure that supported the provision of clean and safe drinking water and activities that supported meeting the community's demand for water. The Township Council was involved in a range of discussions related to drinking water and had senior management teams that planned for and made decisions related to drinking water. The Township developed five-year operating, capital and water master plans and maintained a capital reserve fund.

59. Additionally, the Township identified water related risks at the utility level, which it documented through a Hazard, Risk and Vulnerability Analysis.

60. The Township reported some performance indicators in its water quality reports and it collected some activity-based data related to its conservation and public education initiatives.

61. Although the Township had these processes in place and documented discussions related to water in Council meetings, management teams did not consistently record minutes of their meetings.

62. Communication at the staff level happened during team meetings and on an as-needed basis, but the Township did not conduct work engagement/work environment surveys, to identify opportunities for workplace improvement or provide the Township with information about staff engagement at the water services level.

63. Related to risk management, the Township had not formally identified risk and mitigation strategies, did not have a risk register, or an organization-wide process for identifying and managing risks. Similarly, the Township had not fully developed its performance indicators and did not have a comprehensive approach to measuring water utility performance.

64. Through its water rates, the Township generated sufficient revenue to cover its annual expenses but did not have a full cost recovery approach or a full understanding of the full costs of utilizing groundwater as its drinking water source.

EMERGENCY RESPONSE AND BUSINESS CONTINUITY

65. In 2018, the Township of Langley had a current Emergency Response Plan, and staff told us they extensively tested the associated action plans while it was being developed in 2017. This plan replaced an outdated plan that was in place through the first two years of the audit period.

66. However, the Township had not developed a fulsome business continuity plan to assess and plan for returning water services to full operations following a disruption of its water system.

MANAGEMENT TO MEET DEMAND

67. The Township of Langley demonstrated numerous efforts during the audit period to manage drinking water to meet current and anticipated future demand. It had a range of bylaws in place to regulate source water protection and water conservation within its jurisdiction.

68. The Township implemented a variety of water conservation activities intended to influence behaviour and collected data about these activities.

69. The Township did not have an integrated water conservation and demand management plan with identified measures, overall drinking water reduction targets, or specific groundwater reduction targets for its municipal wells. During the audit period, the Township's only stated target was to reduce overall groundwater use by 30 per cent, by 2020, which was identified in 2009 in the joint Water Management Plan (developed with the Province of B.C.). The target included municipal and private well users. The plan did not specify the portion that would be achieved by the Township through reduced municipal draws on its wells nor the portion that would be achieved through conservation efforts by private well users.

70. The Township was successful at decreasing its use of groundwater by 13.2 per cent between 2009 and 2018, with annual variations. This decrease was predominantly achieved by increasing the amount of drinking water purchased from GVWD by 51.2 per cent. During the same period, the Township's population increased by 33.3 per cent and daily per capita residential water use decreased by 7.5 per cent. The Township did not

complete analyses to determine which, if any, of the Township's initiatives positively contributed to the decrease in its daily per capita residential water usage.

71. As part of longer-term planning, the Township commissioned a study to identify future supply options and staff told us they were working on the next phases of this initiative.

ENSURING SAFETY AND RELIABILITY

72. The Township of Langley required and had the approval of Fraser Health Authority to operate its water systems and demonstrated efforts to adopt the Multi Barrier Approach, substantially achieving this. Areas that the Township could consider for improvement include: groundwater protection, incident reporting and emergency response plan updates.

73. The Township drew groundwater from provincially-regulated wells. This water met most of the Drinking Water Protection Regulations during the time period reviewed. The Township did not issue any water quality advisories or have any unplanned water system shut-downs and reported no microbiological health risks in its source well water. It did report risks from arsenic, nitrates as nitrogen and aesthetic values, such as iron and manganese, which it dealt with by filtering or diluting via blending with GVWD water.

74. The Township had a sample from the distribution system test positive for *E. coli* in September of 2017. When this occurred, the Township notified the Fraser Health Authority and responded according to its Emergency Response Plan by flushing the systems and re-sampling. Retests for *E. coli* came back negative and, with the Drinking Water Officer's approval, it did not issue a water quality advisory. Although the source of the positive test was not identified, staff told us that, subsequent to this event, the Township took steps to help ensure its processes would not result in contaminated samples.

75. The Township's available and on call water operators and utility maintenance workers employed in drinking water services were appropriately trained to the required certification levels. The Township supported training, including operator upgrades and training specific to new equipment, standards and levels of service.

76. The Township had a Cross Connection Control program and a systematic preventative maintenance program customized to each type of infrastructure. Facilities appeared to be clean and well maintained. The Township minimized the need for water treatment by drawing from wells with better water quality, as determined by well monitoring.

LOOKING AHEAD

77. As the Township is further assessing the options for meeting a projected increase in the demand for drinking water, we hope this audit report, while not providing specific recommendations on which options to choose, will assist by pointing out some areas for the Township to consider related to:

- Determining a supply strategy that includes updated targets for groundwater extraction, source protection and guidance related to drinking water and land-use planning
- Water conservation and demand management planning that include strategies, targets and measuring impact
- Gaining a better understanding of the full costs of providing water from both groundwater and GVWD water sources, to assist with long-term decision-making that includes source water protection considerations

78. Although we provide separate recommendations for each of these individual areas, the Township may benefit from an integrated planning approach that takes supply options, conservation and demand management strategies and full costs into consideration.

79. As discussed earlier, our audit of the Township also included an audit objective related to asset management and managing the construction and implementation of its drinking water supply infrastructure to meet its intended objectives. A specific conclusion on this objective, along with key findings and recommendations for the Township, will be published in a subsequent and complementary report.

PROVIDING CLEAN DRINKING WATER WHERE AND WHEN NEEDED

INTEGRATED WATER PLANNING AND MANAGEMENT

80. Addressing drinking water in a holistic way, from source to tap to drain and back to the environment, can facilitate efficient, equitable and sustainable development and management of limited water resource. An integrated approach to water management that considers multiple stakeholders with shared resources and conflicting demands is critical to ensuring all communities have long-term access to clean and safe, drinking water in the future.

IDENTIFICATION OF GROUNDWATER CONCERNS AND THE WATER MANAGEMENT PLAN

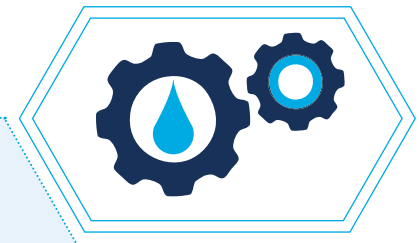
81. The Township of Langley had been aware of concerns regarding several of the groundwater aquifers from which it drew some of its drinking water since prior to 1998, when the Township developed a Water Resources Management Strategy to begin to address these issues. In particular, its Hopington C and Aldergrove AB aquifers were identified to have elevated levels of nitrates and declining water levels that were impacting fish-bearing streams. The strategy provided a 20-year plan for managing groundwater, including eight recommendations and an action plan focused on developing the Township's water resources sustainably for domestic, agricultural, industrial, recreational and environmental uses.

82. Prior to the audit period, the Township built on the Water Resource Management Strategy by working with the Province of B.C. to develop a Water Management Plan in 2009. The Township was the first local government in B.C. designated by the Minister of Environment to do so, through a 2006 Ministerial Order, made at the request of the Township, in an effort to secure provincial resources related to development and implementation of the plan.

83. The plan was endorsed by the Township's Council in 2009 but has not yet been committed to by the Province. It provided 30 recommendations for the Province and the Township and an overall target to reduce groundwater use by 30 per cent, by 2020 from municipal wells and private wells under Provincial jurisdiction. The plan did not specify the portion that would be achieved by the Township through reduced municipal draws on its wells nor the portion that would be achieved through conservation efforts by private well users. The plan's recommendations focused on water quality, quantity, public awareness and actions to protect aquifers from overuse and contamination. The plan identified specific aquifers, such as Brookswood, Hopington C and Abbotsford-Sumas, as being at risk of contamination. The costs of implementing the plan were to be shared between the Township and the Province.

84. The Township's Water Management Plan, and the groundwater studies that informed it, have influenced subsequent planning and activities related to drinking water at the Township. This audit included analysis of the Township's approach to some of the recommendations from the plan where they related to the audit's objectives and criteria.

85. At the time of this report, Township staff told us that they had worked with the Province to update the Plan to a Water Sustainability Plan, an updated equivalent to the original plan that aligns with the new *Water Sustainability Act*.



INTEGRATED WATER MANAGEMENT

Integrated water management includes analyzing and adapting to varying challenges that may threaten current and future water supplies. It considers multiple options when planning for water use, and includes a collaborative, holistic approach to all planning that is affected by or has an impact on water and watersheds.

STRATEGIC PLANNING, COMMUNITY PLANNING AND DRINKING WATER

86. The Township of Langley developed a long-term strategy for the whole organization including its water utility, by developing a hierarchy of plans, as indicated in the following diagram:

Exhibit 6 – TOWNSHIP OF LANGLEY'S PLANS

87. The Township's strategic planning process supported the provision of drinking water and identified guiding principles for community development that considered available municipal water supplies.

SUSTAINABILITY CHARTER

88. The Township's Sustainability Charter defined its vision and principles. It also provided a high-level framework of policy-action integration to provide better alignment of corporate goals, objectives and strategies to sustainability initiatives. Included within the Charter is a sustainability vision for the Township, which outlines 15 goals under the three pillars of sustainability: social-cultural, economic and environmental. Included within the environmental goals were: conservation of water, improvement of storm water quality and protection of rivers and streams.

OFFICIAL COMMUNITY PLAN

89. The goals and policies set in the Sustainability Charter, and the broader planning context of the Metro Vancouver Regional Growth Strategy are reflected in the Township's Official Community Plan (revised in 2017). This plan identified "improve water conservation community wide" as a key objective. The plan included policies to enhance public outreach and education on water conservation and aquifer protection and to implement recommendations in its Water Management Plan.

COMMUNITY AND NEIGHBOURHOOD PLANS

90. The Township also developed a range of strategic and planning documents which were informed and shaped by the broader policy context and aligned with the Township's Official Community Plan. These included neighbourhood plans and various other Township plans, strategies and policies.

91. For example, the Township's Brookswood–Fernridge Community Plan 2017 integrated principles from the Water Management Plan and groundwater best management practices to minimize the impact of new land developments on groundwater quality and quantity.

FUNCTIONAL PLANS AND ANNUAL REPORTS

92. The Township had developed functional plans such as its economic development strategy to inform broader planning processes. These functional plans included the Township's Water Management Plan. Other plans were focused on various specific subject areas.

93. Additionally, the Township reported on strategic objectives and provided examples of achievements in its annual reports. The strategic planning section of the annual reports included broad descriptions of how the Township was working towards the objectives set out in its Sustainability Charter. Some of these included how the new Official Community Plan incorporated environmental protection.

WATER SUPPLY PLANNING

94. The Township had commissioned studies to consider supply options to meet future demand growth in the areas identified in its broader strategic planning process. These are discussed in more detail later in the report. The Township had operational groundwater extraction limits, however, aside from the overarching 30 per cent groundwater reduction target, the Township had not defined any sustainable withdrawal targets as part of a broader long–term supply strategy to maintain groundwater supplies.

REGIONAL DRINKING WATER INITIATIVES

95. In addition to its partnership with the Province to develop the Water Management Plan, the Township also managed its water services through ongoing engagement and collaboration with various stakeholders and other levels of government, as shown in *Exhibit 6*. The Township purchased water from the GVWD and as part of the Metro Vancouver Regional District had representation on the Metro Vancouver and GVWD boards. Additionally, Township staff sat on Metro Vancouver water engineering and conservation committees. Participation enabled the Township to learn from and contribute to regional water planning and coordinate with its neighbours on some regional water initiatives such as lawn watering regulations.

APPROACH TO LAND USE PLANNING AND DRINKING WATER

96. Clean available drinking water is the product of many factors including land use planning and integrated water management. We expected the Township to have policies and practices in place to protect the quality and quantity of its drinking water sources while engaging in community planning and when making land use and development decisions. We also expected the Township to work with others to contribute to source water protection for areas outside its sole jurisdiction.

INTEGRATING LAND USE PLANNING AND DRINKING WATER

97. We expected the Township to incorporate environmental considerations into its land use planning and development decisions through policies in its community and neighbourhood plans to guide, as applicable, the protection of water. This requires inter-departmental coordination, expert input, regulatory bylaws and policies, and the establishment of prerequisites before development and occupancy.

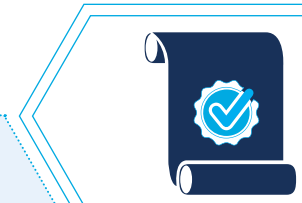
DESIGNATED DEVELOPMENT PERMIT AREAS

98. Designating a Development Permit Area (DPA) is a land use planning tool available for local governments to achieve environmental, conservation and other purposes. The Township of Langley's community plans designated different types of DPAs that included guidelines to protect water and the natural environment.

99. For instance, the Brookswood–Fernridge (2017) Community Plan included DPA guidelines for new developments such as:

- protection of watercourses
- groundwater impact assessments
- maintaining pre-development infiltration rates
- retaining rainwater
- treating contaminated stormwater
- clustering new development
- buffering land next to the ALR and
- promoting green infrastructure

100. The Township's Official Community Plan also included a policy to develop and implement DPAs specifically for energy and water conservation and greenhouse gas emissions reduction in new neighbourhoods. The Brookswood–Fernridge plan included the Township's only DPA designated specifically for energy and water conservation and reduction of greenhouse gas emissions. The audit did not examine how these guidelines were developed or implemented or how the permits granted by the Township aligned with the DPA objectives; however, we observed that the Township integrated aspects of groundwater management, as a necessary condition, into some of its development permits.



DEVELOPMENT PERMIT AREAS

The *Local Government Act* authorizes the designation of Development Permit Areas (DPAs) in communities that need special treatment such as for the protection of the natural environment and promotion of water conservation.

Council may establish conditions under which development may take place. In DPAs, a development permit must first be issued by Council, where a development permit is a prerequisite to a building permit.

CROSS-JURISDICTIONAL IMPACT OF LAND USE ON WATER

101. As some of the aquifers supplying groundwater to the Township of Langley extend beyond the Township's boundaries to neighbouring municipalities such as the City of Surrey, the Township may be impacted by a neighbouring local government's decisions regarding land use and/or drinking water.

102. The Township identified potential conflicts with the South Campbell Heights development in Surrey and groundwater in Brookswood. Local governments have a limited ability to affect decisions made in neighbouring jurisdictions, such as participating in engagement activities with neighbouring municipalities, regional districts and other levels of government. In this case the Township corresponded with the Drinking Water Officer on the matter and, through its representation on the Metro Vancouver board, was able to voice, at the regional level, concerns about groundwater impacts related to zoning decisions.

103. The Township made some specific efforts to control cross-jurisdictional impacts on groundwater. For instance, it undertook a survey to identify flowing artesian wells and we were told it offered incentives to decommission abandoned wells which are under provincial jurisdiction. The Township also offered outreach and education events on source water protection and water conservation to private well users, including education on septic tank and private well maintenance and reducing use of cosmetic pesticides.

STORMWATER MANAGEMENT

104. Rainwater capture and integrated stormwater management has been promoted by Metro Vancouver since 2005. The Township of Langley collaborated with other local governments and watershed enhancement groups to produce several stormwater management plans. Examples of these include Anderson Creek Integrated Stormwater Management Plan (with the City of Surrey), Fernridge Area Integrated Stormwater Management Plan and Upper Nicomekl River Integrated Stormwater Management Plan (with the City of Langley).

105. The Township's Official Community Plan, adopted in 2016 recognized the importance of stormwater management to prevent flooding and minimize erosion, to inhibit pollutants and hydrocarbons from entering streams and to recharge groundwater levels. The plan included an objective for water resources management that rainwater infiltration after construction would replicate pre-development levels. The Township also used green infrastructure on its own properties such as rain gardens, ecological greenways, permeable surfacing in new municipal parking areas and bioswales. However, the Township had not substantially adopted fit-for-purpose strategies such as rainwater harvesting, water re-use at industrial facilities and the use of reclaimed water (for irrigation of parks or golf courses for example) to more fully integrated alternate sources into the long-term water supply solution.

RECOMMENDATION ONE

The Township of Langley should consider developing a Council-endorsed strategy or policies for current and future drinking water sources that:

- Builds on and consolidates its considerable studies and practices related to groundwater planning and sustainability
- Includes sustainable withdrawal targets for its groundwater to avoid overuse
- Includes a plan to protect water sources from contamination
- Includes guidance to protect water during development especially in areas dependent on drinking water aquifers and near well capture zones
- Includes tools to share information, assess and manage risks where neighbouring local governments' land-use or environmental decisions may impact the Township's drinking water
- Explores stormwater/rainwater capture as part of the long-term solution

GOVERNANCE STRUCTURE AND ACTIVITIES SUPPORTING DRINKING WATER SERVICES

106. We would expect the Township of Langley to have a robust governance and organizational structure, a leadership and organizational culture, and activities that support its water systems, service areas and customers. All of these should help the Township achieve its drinking water priorities and objectives.

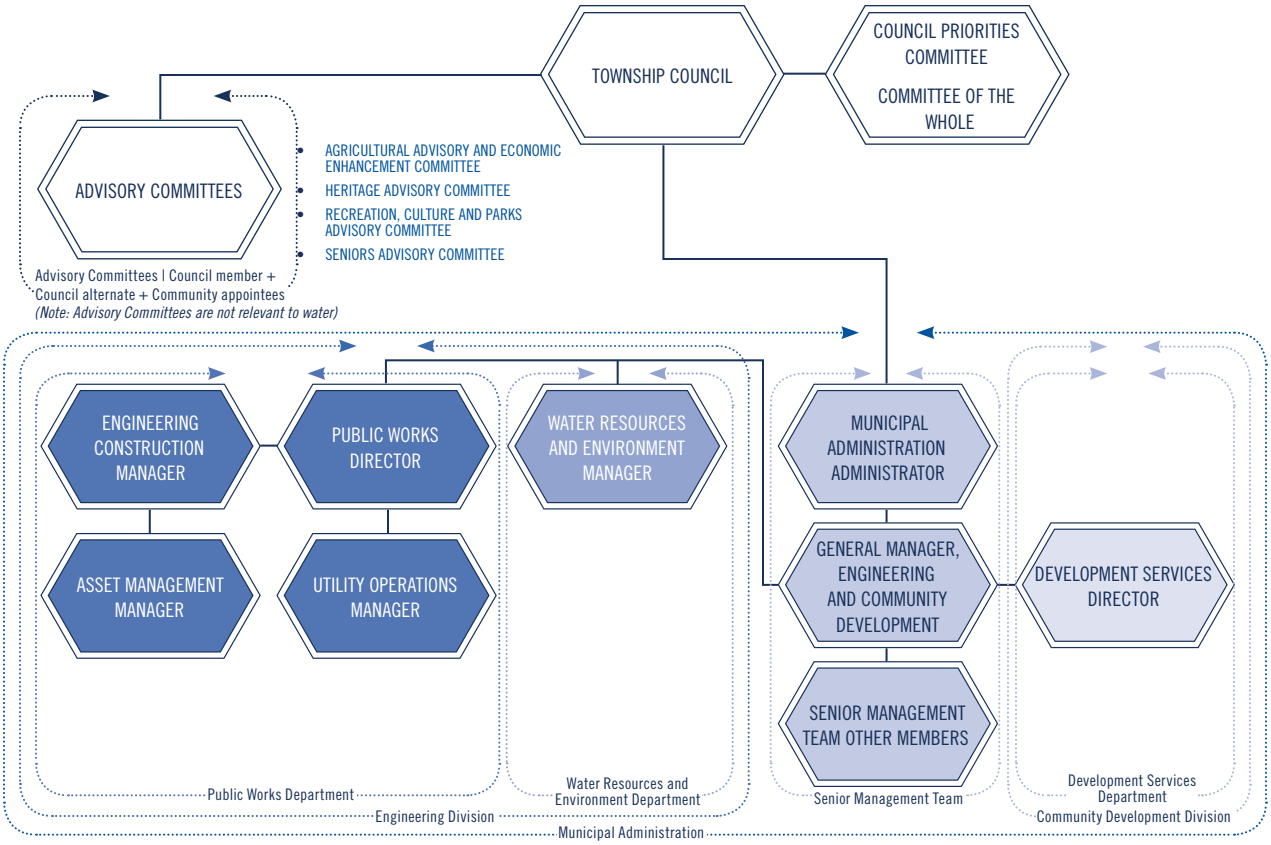
107. The Township's governance and management structure was appropriate to support its provision of drinking water. Council was the top-level decision maker for the water utility and during 2016, 2017 and 2018 discussed drinking water-related issues in approximately 26 per cent, 33 per cent and 28 per cent of regular Council meetings respectively. For example, during the audit period Council discussed: conservation bylaws, water fees, capital projects, watershed issues and other water related issues.

108. Council had a Council Priorities Committee, which provided an opportunity for Council as a whole to discuss priorities and bring forward recommendations to subsequent regular Council meetings. In addition, Council established four advisory committees (see *Exhibit 7*) comprised of citizens and Councillors to inquire into matters requested by Council and report findings and recommendations back to Council. Advisory committees were not involved in decision-making for drinking water.

MANAGEMENT STRUCTURE

109. The Township's administration staff reported to Council through the Administrator. We were told that the Township had a senior management team and an engineering management team. However, since the Township did not record minutes of management team meetings, we could not confirm the structure and configuration of these teams.

Exhibit 7 – EXCERPT OF TOWNSHIP OF LANGLEY GOVERNANCE STRUCTURE (INCLUDES DEPARTMENTS RELATED TO WATER)



110. The Engineering Division managed the Township's water utility, reporting to the General Manager, Engineering and Community Development. The Engineering Division was made up of the Public Works Department which managed water utility operations and was divided into an Engineering and Construction Services section and a Utilities Operations section. The Water Resources and Environment Department managed water utility planning. Land use planning was not part of the Engineering Division but was managed by the Community Development Division from the Development Services Department. Although various groups discussed water-related issues, only Utility Operations recorded meeting minutes.

CAPITAL PLANNING AND RESERVES

111. In British Columbia, the *Community Charter* and the *Local Government Act* require every local government to annually approve a financial plan covering at least a five-year period. Among other things, this plan must set out the funds required for capital purposes.

112. The Township's approach to financial budgeting and long-term financial planning was based on five-year forecasts. Its five-year operating plan informed its five-year budget. It also had a five-year capital plan and a Water Master Plan.

113. The Water Master Plan identified improvements to the water system required to accommodate the Township's growth through 2031. This plan was not linked to the Township's capital reserves and did not account for anticipated capital replacements that would be expected due to age and condition. Staff told us that the plan did not reflect anticipated replacements due to the projected age of assets being too young in 2031 to warrant inclusion.

FINANCIAL RESERVES

114. The Township of Langley had a reserve policy that set guidelines and objectives for its management of reserves and surpluses. The policy recognized that appropriate levels of surplus buffer the impact of unplanned cost increases or revenue reductions.

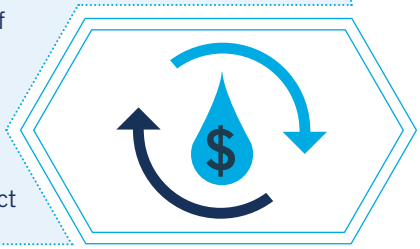
115. The Township's reserve policy identified the establishment of stable and predictable levies as a guiding objective. The Township also had a capital asset infrastructure renewal reserve policy that set the objective of creating a statutory capital reserve with: annual contributions, and a minimum balance of one million dollars. The Township maintained a capital reserve fund that increased from $5.8 million in 2016 to $25.5 million in 2017. Staff told us this significant increase was mainly due to a transfer of accumulated surplus from the Water Operating Fund in 2017. These operating surpluses were a result of budgeted expenditures being delayed due to capital projects not coming on line as fast as anticipated.

FULL COST RECOVERY ACCOUNTING

116. It is important for local governments to have a complete understanding of revenue and expenditures associated with the delivery of their services. Therefore, when setting prices for water, we would expect the Township of Langley to follow a comprehensive process that considers all costs associated with providing clean drinking water.

Full cost accounting for a water utility is a system where user rates and charges generate sufficient revenue to cover all costs associated with the service:

- Operations and maintenance
- Administration
- Research and development
- Financial planning
- Capital works (such as upgrades, rehabilitation and renewals, pilot testing, pre-design, design and land acquisition)
- Decommissioning of disused works
- Water source protection
- External environmental impact

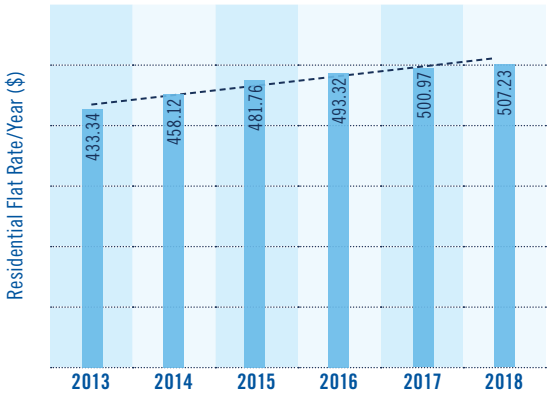


WATER PRICING

117. Township staff told us that its method of determining water rates was a simple approach centered on ensuring user fees covered annual expenses associated with operating the water utility. Each year, the Township collected sufficient funds from user fees to report a surplus. *Exhibit 8* shows the Township's water rate trend from 2013 to 2018.

118. While the Township considered costs associated with water service delivery and generated sufficient revenue through fees to cover its annual expenses it did not have a full cost recovery approach. For example, the Township's water rates did not account for future risks and liabilities such as costs associated with the amortization of tangible capital assets or with meeting future needs and environmental resource costs.

Exhibit 8 – TOWNSHIP OF LANGLEY WATER RATES 2013-2018



COST EFFECTIVENESS ANALYSIS

119. Cost effectiveness refers to economic analysis that assesses the relative costs, outcomes and benefits of different approaches. The Township of Langley periodically assessed water supply options for their cost effectiveness and identified its own supply as a significantly cheaper option compared to purchased water.

Exhibit 9 – TOWNSHIP OF LANGLEY'S GROUNDWATER AND GREATER VANCOUVER WATER DISTRICT WATER COSTS

	WATER COSTS
TOL groundwater ($)	*.085/m^3
GVWD purchased water ($)–off-peak season	.639/m^3
GVWD purchased water ($)–peak season	.792/m^3

*Based on Operations and Maintenance costs only
Source: Township of Langley Groundwater Study

120. The Township used two water sources to supply its customers—Township well water and water purchased from GVWD. The Township calculated that the purchased water cost between 7.5 and 9.3 times more than the well water.

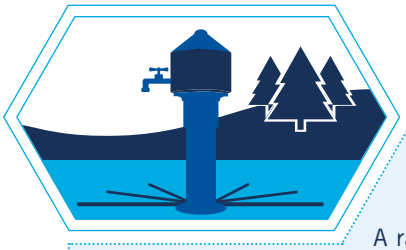
121. As a result of this analysis, the Township blended its well water with purchased water to minimize overall costs while also gaining the benefit of reducing the mineral concentrations in some of its well water.

RECOMMENDATION TWO

The Township of Langley should consider a full cost recovery approach as part of its water service planning that:

- Enables the Township to better identify costs associated with delivering water to customers
- Includes long-term financial and capital planning for its water services

122. By reviewing its options to meet future needs, the Township identified supply options, such as the use of radial collector wells, which it believed could be less expensive than the GVWD—purchased water. However, since the Township did not use full cost accounting to determine the actual cost of using well water over the long-term, it was not able to fully identify the cost of supplying groundwater. Better identification of the costs associated with groundwater would enable a more complete cost comparison with the cost of water from the GVWD.



RADIAL COLLECTOR WELL

A radial collector well is a type of well used to collect water from an aquifer that is connected to a surface water source. Collection wells are drilled horizontally in a spoked fashion from a central collection point and water is drawn from the central collection point.

RISK MANAGEMENT

123. A robust risk management process contributes to good governance by enabling an organization to manage risk across its operations by implementing a common risk management framework. Such a framework typically establishes rules, processes, tools and key personnel for managing and mitigating risk. We would expect the Township of Langley to have a system in place to identify and manage risks across the organization, including its drinking water system.

124. The Township did not have a formal organization-wide process for identifying and managing risk, instead relying on each utility to handle risks in a decentralized way.

125. The Township prepared a hazards, risks and vulnerability report, identifying four hazards associated with its water utility. *Exhibit 10* shows these hazards.

Exhibit 10 – SUMMARY OF HAZARDS IDENTIFIED IN THE TOWNSHIP OF LANGLEY'S HAZARD, RISK AND VULNERABILITY ANALYSIS (HRVA) REPORT

RISK OR HAZARD IDENTIFIED	SCORE MAX 25
Utilities–Water Contamination	1.75
Utilities–Water Outage	4.5
Utilities–Water Reservoir Failure	1.88
Security: Utilities–IT Infrastructure Interruption	1

126. Though the Township had identified some risks related to water emergencies, it had not formally identified risk and mitigation strategies for its water services and did not have a documented risk register.

RECOMMENDATION THREE

The Township of Langley should consider developing a formal framework for risk identification, mitigation and reporting that includes regular re-assessment and reporting of organizational risks—including those associated with drinking water—to senior management and Council.

PERFORMANCE MEASUREMENT, CONTINUAL IMPROVEMENT AND INTERNAL REPORTING

127. Water suppliers can face significant challenges in trying to maintain or improve the quality of water while maintaining reasonable prices. These challenges may include:

- Customer demand for increased levels of service
- Financial constraints
- Ageing infrastructure
- Security and emergency response concerns
- Population growth
- Climate change and pressure to reduce environmental impacts
- Stricter regulatory requirements
- Attraction, retention and succession of qualified personnel
- Loss of corporate knowledge as senior personnel leave

128. By measuring its progress toward meeting these challenges, a local government can take on a more strategic approach to water provision and focus on continually improving its processes. Performance measurement supports planning, informs decision-making and helps demonstrate accountability. It makes it possible for a council/board and senior management to effectively oversee water services beyond budgeting and reviewing reports describing accomplishments.

129. The Township of Langley conducted a service capacity review of its operations in December 2016 to improve service quality, minimize future costs and explore ways to improve efficiency. The review identified service areas that were working well, along with opportunities for improvement. The review included the Township's water utility, its Water Resources and Environment department, Public Works and other Township divisions.

130. The Township identified various goals and performance measures in planning documents such as its Economic Development Strategy (2012) and its Water Management Plan (2009). Its asset management planning documents recommended the development of performance indicators and service levels. Though the Township had developed and reported on some performance indicators in its Water Quality Report such as per-capita water use and pumped volume it had not fully developed its performance indicators and did not have a comprehensive approach to measuring water utility performance.

131. The Township presented some general summary data in the form of infographics in its annual reports and reported some development related statistics in its building statistics monthly reports. In addition, it reported some water usage and water quality statistics in its annual water quality reports and via Metro Vancouver's Biennial Reports. The Township measured and reported attendance and responses to its public budget consultation process. Some results from the Township's Water Wise and Water Weeks campaigns were included in its contractor's annual reports (Langley Environmental Partners Society), however outcome data was not collected or reported. The Township's reporting on performance indicators was not tied to an evaluation framework.

132. The collection of performance data, benchmarking and evaluation can contribute to an organization's evaluative framework to assist with ongoing introspection and improvement. The Township did not have a formal process of continual improvement in use during the audit period.

RECOMMENDATION FOUR

The Township of Langley should improve data collection, analysis, monitoring and reporting on its water services as part of a continual improvement process. This should include:

- A performance measurement system for its water services
- Monitoring and measuring progress towards goals and objectives
- Enhanced reporting to Council, senior management and the public on results

TRACKING SERVICE AND PUBLIC REQUESTS

133. The Township of Langley used website forms, emails and an emergency telephone line to obtain public input. The Township assigned a unique tracking number during the service request process to keep track of each enquiry; however, it did not have a functional tracking form that tracked service request status.

134. The Township used software to track work orders, service requests, create work orders, track project-related costs and schedule staff. We were told that the work process involved a transition from digital work orders to paper work orders and a data entry step back to digital upon completion. Staff identified that, though this did not slow work completion, there were some inefficiencies in this process that could lead to data entry backlogs.

135. The Township did not track or report on the time it took to close service requests. However, we were told it had a process to audit the resolution of each complaint that generated a work order and that these were included in a quarterly review of open work orders and service requests.

RECOMMENDATION FIVE

The Township of Langley should consider improving its tracking and reporting on service requests (including complaints) and enquiries from the public relating to its water systems.

RECOMMENDATION SIX

The Township of Langley should consider improving the workflow of its water infrastructure work-order system to enhance its efficiency.

RECORD KEEPING

136. Good record keeping by local government supports accountability to the public and enables the preservation and future review of decision-making. Township Council meetings were consistently documented: meeting details, minutes, agendas and, in most cases, videos of the meetings were available on the Township's website.

137. The Township's management teams did not consistently record minutes of their meetings. Internal senior management team meetings and engineering management team meetings during the period covered by the audit were not documented and not all departmental meetings had minutes available. For example, while the Utility Operations section recorded and maintained meeting minutes, the Water Resource and Environment team did not.

RECOMMENDATION SEVEN

The Township of Langley should consider retaining a record of all management team meetings in order to track organizational decisions.

CONDUCT POLICIES, INTERNAL COMMUNICATION AND ENGAGEMENT

CONDUCT POLICIES

138. Ethical conduct is essential for those involved in the delivery of public services, such as the provision of safe drinking water. Ethical conduct and behaviour policies encourage, empower and enable employees to handle ethical dilemmas appropriately. We would expect the Township of Langley to have robust ethical conduct policies.

139. The Township had human resources policies, which included a code of ethics, conflict of interest, confidentiality and respectful workplace policies. It lacked a whistle blower policy.

140. The Township last revised its code of ethics, conflict of interest and confidentiality policy for staff in 2008. The policy did not contain a mission statement or core values. Some staff members said they signed off on these policies when hired, however, not all staff were aware of them. The Township lacked a formal process for staff to regularly acknowledge and sign-off on these policies.

141. Council members and appointees also had a code of ethics, conduct, confidentiality and conflict of interest policy, which was last revised in 2016. Part 4 division 6 of the *Community Charter*, which covers conflict of interest, also holds Council accountable for such issues.

INTERNAL COMMUNICATION

142. Township of Langley staff reported that information flowed between all levels of the organization, formally and informally as needed. They told us that, overall, staff and senior management were satisfied with the level of communication. Utility operators met with managers regularly and utility foremen held weekly meetings. Some staff from other departments, such as Water Resources and Environment, attended such meetings.

EMPLOYEE ENGAGEMENT

143. Work environment or employee engagement surveys enable an organization to anonymously measure employee satisfaction, engagement and opinions. Additionally, they provide employees with opportunities to identify areas that may need improvement.

144. Staff indicated that they relied on team meetings and line managers to maintain communication channels between operators and management and to identify opportunities for workplace improvement. The Township did not conduct work environment surveys, such as an employee engagement survey, during the audit period.

RECOMMENDATION EIGHT

The Township should consider enhancing its human resource policies by reviewing and updating its ethical policies and by developing a whistle blower policy.

RECOMMENDATION NINE

The Township of Langley should consider a more formal approach to measuring employee workplace engagement.

EMERGENCY RESPONSE AND BUSINESS CONTINUITY PLANNING

145. Health authorities and the province legally require water utilities to prepare an emergency response plan. Such plans help ensure that staff, who should be trained and familiar with their roles during service disruptions, are ready to respond effectively.

146. In preparation for an emergency, the Township of Langley had backup water supplies available via interconnections with the cities of Langley, Surrey and Abbotsford.

147. However, from early 2016 to the end of 2017, the Township had outdated sections in its water system emergency response plan. The Township developed a revised Potable Water Emergency Response Plan in November 2017 with updated resources, action plans and appendices. The Emergency Response Plan covered 16 different events, examples of which include water main break, microbiological contamination, turbidity and unknown contamination/backflow.

148. Between 2016 and 2018, the Township did not experience any major emergencies affecting water quality or supply. Staff told us they relied on emergency response procedures laid out in its emergency plan to respond to instances of water contamination and high turbidity that did occur.

149. The Township included communication protocols for potable water emergencies in its Emergency Response Plan. In addition, the Township and City of Langley shared the Langley Emergency Program Communications Plan (2017), which defined communication channels, resources, contacts, roles, checklists and other information for use in emergencies.

150. Exercising emergency response plans is critical to test procedures for effectiveness and efficiency and ensure that staff are confident in their roles during emergencies. Tabletop exercises that test various risk scenarios help staff prepare for unexpected disruptions.

TESTING EMERGENCY RESPONSE PLANS

It is important to test and evaluate emergency response procedures on a regular basis. After exercises have been conducted, debriefings should be undertaken and documented to review lessons learned, identify issues and identify corrective action that should be implemented. The emergency plan should be revised to include the lessons learned from the exercises.

151. Staff told us they had extensively tested each action plan in its Emergency Response Plan when they developed it in 2017 and they followed procedures set out in the plan when responding to ongoing service disruptions. The Township also tested its emergency response procedures during a water main break incident in March 2018 and conducted a tabletop mock exercise under a disaster scenario in October 2018.

152. The Township lacked a fulsome business continuity plan dealing with disruption to its water services. While it had considered critical functions, priorities, and staff coverage by preparing a Business Continuation Priority Function List (2016) and holiday closure business continuation plan, the Township had not conducted any business impact analysis relating to emergency disruption of its water system. Such an analysis could assess the impact of potential emergencies on essential services such as drinking water and identify personnel, information, equipment, finances and critical infrastructure that would be required to continue these services during and after a disruption.

BUSINESS CONTINUITY PLANS

Business continuity plans are strategic plans concerned with returning a local government's critical services to full operation as soon as possible following an incident. They address how the local government will manage productivity loss and physical damage while normal services and operations are being restored.

Local governments should prepare business continuity plans to ensure that emergency operations and critical services, such as water, continue despite the loss of power, facilities, infrastructure and/or communication systems.

RECOMMENDATION TEN

The Township of Langley should enhance its emergency and business continuity planning by:

- Ensuring that its water utility emergency response plan continues to be regularly updated and tested, and made accessible and familiar to all staff
- Completing business continuity planning for its critical services—including drinking water—to ensure the continuation of service and sustainable infrastructure throughout any potential disruptions

POWER SUPPLY

153. As drinking water safety and quality relies on systems powered by electricity, we would expect the Township of Langley to ensure it has backup power to keep its water systems running smoothly even during a widespread power failure.

154. The Township had permanent backup power generators for its key infrastructure. It had eleven on-site stationary power generators and three truck mounted generators.

155. The Township had uninterruptable power supplies for field computers and its Supervisory Control and Data Acquisition (SCADA) systems, which were tested and replaced during preventative maintenance. The plan for backup power also included chlorination and treatment capacity to meet the emergency needs identified in the Township's water system response plan.

MANAGEMENT TO MEET DEMAND

SOURCE WATER PROTECTION AND PRESERVATION

156. The Township of Langley had an agreement, entered into in 1989 and amended in 1998, to purchase water from the GVWD. Its purpose in entering into this agreement was to:

- Augment its groundwater to meet demand and help reduce dependence on vulnerable groundwater sources and
- Provide redundancy in case of supply interruption

157. The Township purchased treated water from the GVWD's Main, which runs north-south near the western edge of the Township. It monitored this water for pressure, quantity and quality at each interconnection point.

AQUIFERS AND GROUNDWATER

158. Prior to connecting to GVWD water, the Township depended mainly on groundwater wells. More than a dozen aquifers are located under the Township, some deep and some shallow, some confined and some unconfined. Some of these aquifers may overlap or extend outside Township boundaries. Their characteristics are a matter of continuing investigation, research and modelling.

159. Over the past decade, the Township took steps to mitigate aquifer depletion by limiting some well use and switching to purchased water during higher-demand periods. It also collaborated with the province in building, hosting and monitoring a network of observation wells for aquifers.

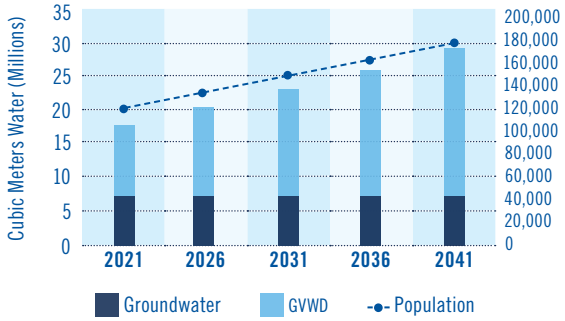
GROUNDWATER SUSTAINABILITY AND FUTURE SUPPLY OPTIONS

160. As a result of its longstanding concerns about regional water sustainability, the Township conducted studies in 2014 that identified two aquifers at risk of depletion: Aldergrove AB and Hopington C. The Township did not develop its own source water protection plan but continued to work with the Province on the water sustainability planning process and identified options for additional groundwater sources.

161. A consultant estimated the capacity of existing wells that would be needed to meet the Township's projected demand to 2041. Overall, the consultant's report determined the existing municipal wells were insufficient to meet the projected demand, even if there was a 15 per cent increase in efficiency of use, and therefore, the Township determined that it would need additional water from the GVWD and/or new groundwater supplies.

162. Based on projected population growth of 65 per cent between 2021 and 2041, the Township calculated it could meet demand by increasing GVWD water use by more than double the current use levels (*Exhibit 11*). To provide redundancy and lower cost, the Township planned to continue using both GVWD and groundwater sources across its large water systems.

Exhibit 11 – PROJECTED WATER USE AND POPULATION



163. In addition, the Township explored the possibility of developing other wells to offset the additional GVWD water required, and contracted for an assessment in 2018 of three future groundwater supply options:

- New conventional groundwater supply wells in other or under-utilized aquifers, or aquifers with a steady recharge source and not subject to development and/or environmental stresses
- Radial collector wells in strategic locations adjacent to surface water bodies
- Aquifer storage and recovery mechanisms to enable continued use of aquifers currently in use by municipal wells or other aquifers suitable for the purpose

164. The assessment recommended, largely due to cost effectiveness considerations, further study and possible future development of conventional wells in Fort Langley aquifer and radial collector wells near the Fraser River. At the time of writing this report, the Township was further assessing these options.

SOURCE WATER PROTECTION IN POLICIES AND BYLAWS

165. Groundwater and surface water (lakes, streams and rivers) in B.C. are under provincial jurisdiction: the use, allocation and licensing of water is regulated by the Province. Development on Agricultural Land Reserve within the Township of Langley is also regulated by the Province. Therefore, the Township has limited authority to act on its own to protect its source water.

166. The Township does, however, have the ability, through its policies and bylaws, to promote and encourage source water protection.

167. The Township developed bylaws to include aspects of source water protection:

- **Official Community Plan Bylaw 1979 (revised 2013 adopted 2016) No. 1842:** Gave the Township the ability to control land uses and development to protect watercourses (streams, rivers), aquifers, environmentally sensitive areas and wildlife habitat
- **Watercourse Protection Bylaw 2012 No. 4964:** Empowered the Township to regulate, prohibit and impose requirements on pollution and obstruction of watercourses, including on private property
- **Subdivision and Development Servicing Bylaw No. 4861:** Enabled the Township to impose requirements on developers on the provision of water services, drainage, sewer, street trees and environmental considerations
- **Development Cost Charges Bylaw No. 4963:** Enabled the Township to impose water-related charges for each type and value of development, thereby generating revenue for the Township's use in protecting source water
- **Langley Waterworks Regulation Bylaw 2008 No. 4697:** Established the Township's protection of the water supply, such as when new water services were connected, or when a private well was decommissioned
- **Stormwater Utility Establishment Bylaw 2003 No. 4232:** Identified the Township's role in controlling stormwater and protecting the water sources
- **Erosion and Sediment Control Bylaw 2006 No. 4381:** Limited the discharge of sediment and defined the process for erosion and sediment control permits, plans, monitoring and reporting

CONTAMINANTS

168. The Township had identified agricultural sources, such as nitrates from fertilizers, as affecting source water and was working with the Province to address the concerns with agricultural contaminants through the Water Management Plan.

169. Municipalities, including the Township, have jurisdiction to regulate the domestic use of cosmetic pesticides for lawns and gardens in non-farm areas. The Township had no bylaw to control pesticide use but had lobbied the Province of B.C. for a more comprehensive ban. The Township also implemented the Grow Healthy Grow Smart program to help address the issue of cosmetic pesticide use.

CONSERVATION AND DEMAND MANAGEMENT STRATEGIES

170. Water demand management is a set of activities aimed at increased water use efficiency. Effective demand management reduces the quantity of water used by customers for particular purposes and increases the ability of a system to withstand drought.

171. The Metro Vancouver Drinking Water Management Plan (June 2011) includes, at a regional district level, a series of goals, strategies and actions to guide municipalities in Metro Vancouver on their water treatment, supply and conservation efforts. Municipalities are responsible for developing and implementing demand management and conservation measures such as land use and environmental protection policies, education and rebate programs, water reuse initiatives as well as regulatory bylaws that align with the broader regional goals.

172. We would expect the Township to have sound water conservation strategies for its water system that include demand management measures and targets and an evaluation of the effectiveness of these strategies.

173. Sound water conservation strategies can lead to cost savings, environmental benefits, usage efficiency and the preservation of supply. Growing communities need to be aware of the impact of development and population growth on water supplies, especially when these are limited. Communities—including those located in areas with above average levels of precipitation—may also be vulnerable to the impact of extreme weather events such as drought. The Lower Fraser Valley experienced drought as recently as 2015, 2017 and 2018.

174. During the period covered by the audit, the Township did not have an integrated water conservation and demand management plan with identified measures, overall drinking water reduction targets, or groundwater reduction targets for its municipal wells.

175. The Township annually conducted numerous public outreach and education activities on water conservation. A work plan with attendance targets was developed each year and accomplishments related to these activities were reported annually by the Township's contractors.

176. Water conservation and demand management strategies the Township had in place prior to and during the audit period included:

- The installation of water meters and a water rate structure consisting of a minimum flat rate and a charge tied to usage (over 110 cubic meters billed semi-annually) for the agricultural, industrial, commercial and institutional sectors.
- Broad general outreach and education events, including education on septic tank and private well maintenance and reducing the use of cosmetic pesticides.
- In 2016 and 2018, the Township adopted more stringent watering restrictions, and in 2018 the Township reduced the allowable days for lawn watering from three to two days per week, which were mandated through its bylaws that aligned with region-wide requirements.
- Landscaping regulations applying to new developments and tree planting requirements on Township properties that reduced or eliminated the need for regular irrigation.
- Sixteen studies of Township facilities for water, energy and sewer use. Staff told us that the Township installed some water efficiency measures in four selected facilities based on these studies' recommendations.
- A washing machine rebate program offered in partnership with BC Hydro Power Smart.
- Staff told us that while the Township stopped selling rain barrels in 2014, it continued to promote their use through door prizes and donations to community groups.

177. The Township did not evaluate or analyze the effectiveness of its conservation activities based on water usage indicators and did not research consumers' water use habits and barriers to behavioral change to improve on its demand management and conservation efforts. The Township collected some survey data regarding water use through its annual door to door Water Wise campaign.

WATER CONSERVATION BYLAWS

178. It is important for a local government to have up-to-date relevant bylaws related to water conservation. Strategically-used bylaws such as standards, regulations, water restrictions and building codes can help promote the use of water-saving technologies and water conservation.

SUSTAINABLE PRACTICES IN WATER CONSERVATION

The Township of Langley's Waterworks Regulation Bylaw had provisions related to Agricultural and Intensive Agricultural water use. The water servicing standards included allowable water usage limits based on land use measurements. The Township staff told us that, to promote water conservation, a flow restriction device based on the measured land area was installed by the Township for all approved applicants.

179. The Township had several water–related bylaws in place that included regulations related to water use, conservation and wastage:

- **Langley Waterworks Regulation Bylaw No. 4697**: This consolidated bylaw regulated the Township's water works system, water supply and rates it charged for the use of potable water. It included clauses to address situations of improper use, wastage or failure to comply with its bylaw.
- **Water Shortage Response Bylaw (No. 4909, 5003, 5184)**: During 2016, the Township amended its regulations supporting water conservation by extending watering restriction dates and adding time restrictions to water exemption permits. These bylaws were repealed in 2018 and replaced by the Township's Drinking Water Conservation Bylaw No. 5321.
- **Drinking Water Conservation Bylaw No. 5321**: This recent bylaw expanded the restriction period from May 1 to October 15 and reduced the allowable days for residential lawn watering. It also added stricter watering restrictions for playing fields. These regulations aligned the Township with Metro Vancouver's region-wide water restriction requirements.
- **Bylaw Notice Enforcement Bylaw No. 4703**: This bylaw provided powers, duties and functions for screening officers and listed positions designated as bylaw enforcement officers. It also included progressive penalties for violation of the Township's watering restrictions.
- **Fees and Charges Bylaw No. 4616**: This bylaw established a schedule of fees and charges for Township services and information.
- **Subdivision and Development Servicing Bylaw No. 4861**: This bylaw imposed metering and servicing requirements on new developments. It also included landscaping regulations for new developments.

180. Prior to the audit period, in 2009 to 2015, the Township implemented a short-term groundwater conservation response strategy by annually triggering Stage 3 watering restrictions during the summer months for water systems in East Langley that relied solely on local aquifers. This strategy was aimed at protecting the drinking water supply for domestic and emergency use.

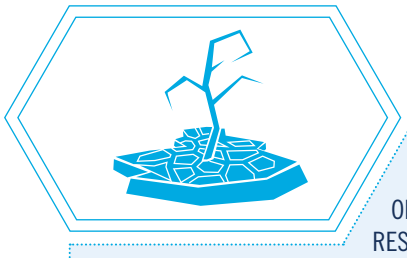
181. Staff told us the Township focused primarily on voluntary compliance through education and outreach events on water conservation.

182. Prior to the audit period, in 2015, the Township issued 42 tickets to residents and industrial, commercial and institutional customers during a Stage 3 watering restriction. In 2016 and 2017, the Township did not issue any water bylaw enforcement tickets. In 2018 the Township issued five tickets. The Township encouraged water bylaw compliance through door-to-door discussions with residents and education and other outreach events with the public.

183. Township staff told us they were aware of areas with low compliance to the water restriction bylaws and had used zone metering to identify residential neighbourhoods with excessive water usage. The Township, however, did not use the progressive sanctions available in its bylaws to reduce water use and promote voluntary compliance with its water restriction bylaws. Instead, staff told us that the Township installed an extra pump for a high-use neighbourhood in order to provide sufficient water to meet consumers' demands.

DROUGHT MANAGEMENT

184. We would expect the Township of Langley to have a drought response plan for all its water systems that identifies actions to be taken before, during and immediately after a drought to reduce its negative impacts.



SOME ELEMENTS OF A DROUGHT RESPONSE PLAN INCLUDE:

- Building a local drought management team
- Documenting the water system profile
- Evaluate the impact of drought on the local economy and environment
- Identify data requirements, frequency of collection and reporting protocols
- Define definitions of local drought stages and corresponding local responses
- Monitoring water supplies and climate
- Identification of streams or aquatic ecosystems of concern,
- Communications plan

Source references: Fraser Basin Council Rethinking Our Water Ways (2011), BC Government: BC Drought Response Plan (2018), BC Government: Dealing with Drought: A Handbook for Water Suppliers in BC (2016)

185. The Township did not have a formal drought management plan. In 2015, the Township completed a risk assessment and concluded that the Lower Mainland is unlikely to face a 'major' drought, given its geographic location. The Township did not consider probability and impact assessments for the classification levels of drought identified by the Province. In addition, the Township had not identified drought or water shortage indicators with associated response triggers.

186. The B.C. government's online Drought Information Portal describes four drought classification levels: Normal, Dry, Very Dry and Extremely Dry.

187. The Lower Fraser region, experienced Level 4 drought conditions (Extremely Dry) from July to September 2015 requiring Stage 3 watering restrictions. In 2017 and 2018, Level 3 drought conditions (Very Dry) occurred across the Lower Fraser region. Stage 1 watering restrictions remained in effect under this advisory.

188. Although the Township did not have a formal plan, staff told us that it continuously monitored its active wells and distribution reservoir levels for potential water shortages. In addition, the Township had some elements of planning in place to address situations of water shortage and emergency. These planning elements were reflected in its Potable Water Emergency Response plan and in its Drinking Water Conservation bylaw.

189. The Township coordinated with Metro Vancouver and municipalities in the region on a consistent approach to watering restrictions as a short–term drought and water conservation response strategy. Township staff told us that it is unlikely to be impacted by a water shortage resulting from drought because it has established a secure water supply from GVWD and that the Metro Vancouver Drinking Water Supply study, completed in 2018, assessed the impacts of predicted climate changes on GVWD water supplies, and determined that the GVWD had sufficient long-term water supplies.

190. While the Township had watering restrictions to curtail short-term water use, these measures would not replace a drought management plan focused on longer-term strategies for its groundwater supplies. Such plans are critical to preparing for and minimizing the negative impacts of prolonged or unexpected drought, including the potential for restricted water supplies from GVWD. They focus on demand management, reducing consumption and improving water use efficiency through fit-for-purpose supply solutions in the long-term.

191. Long-term drought conditions may pose additional risk to particular water systems such as Acadia and Tall Timbers that do not have access to GVWD water as an alternate water supply. The Township had short-term plans to connect the Tall Timbers water system to GVWD water. Drought management planning was identified as an area for improvement by Council in the Service Capacity Review completed by the Township.

WATER METERING, PRICING AND USAGE

192. Setting water consumption targets and tracking water consumption and leakage can help a local government reduce water use and maintain long-term cost effectiveness and sustainable water supplies. Water meters can facilitate demand management by helping track consumption and detect leaks.

193. Water rates can also be an effective demand management tool, as price increases tend to be followed by decreased water usage.

194. Prior to and during the audit period, the Township of Langley used a minimum fixed charge for its residential customers, which were not metered. It used a water rate structure with a minimum fixed rate and a variable charge tied to consumption for its metered customers, which included agricultural, industrial, commercial and institutional sectors.

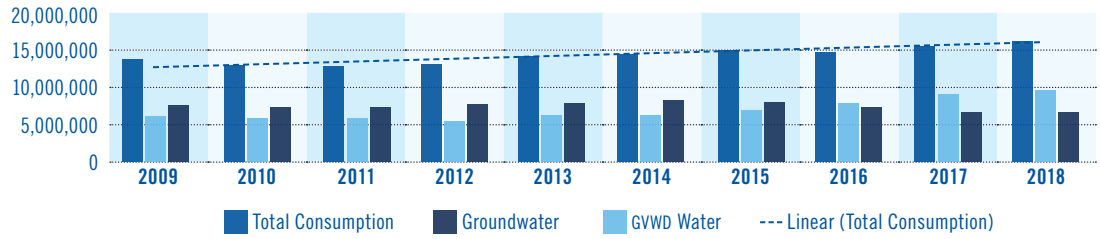
195. The Township increased its water rates by between 1.25 per cent and 5.72 per cent per year between 2012 and 2018, to recover annual expenses associated with operating its water utility and to fund capital projects such as the East Langley Water Supply project. These pricing adjustments were not based on a strategy to reduce water demand through a progressive, conservation-oriented approach to water pricing.

196. Several studies commissioned by the Township (prior to the audit period) recommended that it implement residential metering together with volume-based pricing, to further its water demand management efforts. The Township Council had chosen to not implement this recommendation, and in July 2017, a motion to meter water usage in new homes in the undeveloped areas in Brookswood-Fernridge was defeated by Council.

197. Leakage in water distribution networks indicates inefficiency and may add costs such as the expense of providing additional power to maintain pressure. Proactively applying long-term strategies like system leak detection and repair may conserve water supplies and help maintain water quality by removing points of potential contamination. This can help a local government be environmentally and financially sustainable over the long run.

198. During the audit period, the Township did not offer targeted education and incentive programs to its agricultural and industrial, commercial and institutional customers to reduce water use and promote sustainability. Between 2016 and 2018, the combined water consumption of the Township's metered agricultural and industrial, commercial and institutional sectors increased by over 23 per cent. The majority of this increase in usage was by the agricultural sector. In comparison, residential water consumption increased by nine per cent. Staff told us that the Township postponed an industrial, commercial and institutional water audit and incentive program for the restaurant sector planned for 2017.

Exhibit 12 – ACTUAL WATER CONSUMPTION (IN CUBIC METERS) BY SOURCE (2009–2018)



199. In 2017, the Township began a leak detection pilot program to reduce system-wide leaks and save the expense of wasted water. In order to track water volumes, the Township had installed water meters on production wells, booster pumps and pressure reduction valves. As of the writing of this report, the Township had not fully implemented leak detection as the program had only recently completed its pilot stage.

200. Data provided by the Township shows that between 2009 to 2018, the Township was successful in decreasing its groundwater use by 13.2 per cent. This reduction was predominantly achieved by increasing the volume of water purchased from GVWD by 51.2 per cent to support a 33.3 per cent increase in its serviced population.

201. Data produced by the Township shows that between 2009 and 2018, average daily per capita residential water usage decreased by 7.5 per cent, with annual variations.

PUBLIC OUTREACH, EDUCATION AND ENGAGEMENT

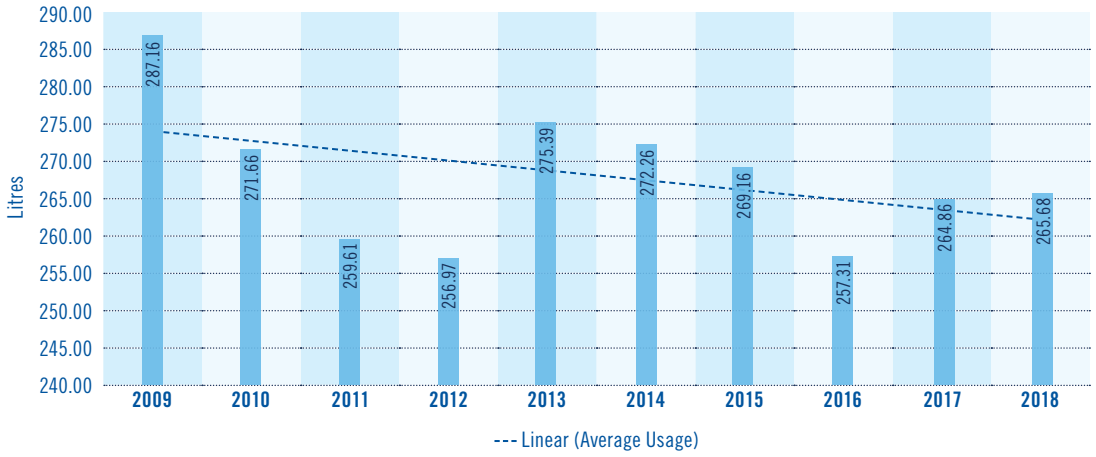
202. Successful engagement with stakeholders can help a local government understand the bigger picture and make better decisions. Engagement activities can increase public awareness of planning activities, facilitate dialogue and form a foundation for accountability.

203. In 2015 and 2016, the Township produced a Public Engagement Strategy followed by a Public Engagement Charter. To produce these guiding documents, the Township consulted with stakeholders to identify areas where it could improve the transparency of its engagement processes. The Township also involved the public in budget decision-making and included interactive online budget tools to facilitate feedback.

204. The Township identified sensitive groundwater areas during the Brookswood-Fernridge community planning process, during which public consultation and community planning led to the inclusion of groundwater policies in the community plan.

205. The Township published information about drinking water in its Annual Water Quality Report, which was accessible to the public through its website. The report included water utility information (including financial), as well as tips on how to improve drinking water quality at home.

Exhibit 13 – AVERAGE DAILY PER CAPITA RESIDENTIAL WATER USAGE (2009–2018)



206. The Township used multiple channels of communication and posted timely news items such as water main breaks and key dates related to service outages and water restrictions on its website news section and often on Twitter and Facebook.

207. Active ongoing education and outreach programs can play a significant role in engaging the community on:

- Why water conservation and source water protection are important
- The specific benefits of these strategies
- How each conservation strategy will promote water savings
- Water-related bylaws
- How residents can support water conservation

208. During the audit period, the Township of Langley promoted public awareness of its water conservation and source water protection strategies using its website and social media and outreach campaigns. The Township also displayed water–themed signage and made educational materials available at its facilities.

209. The Township promoted public awareness of drinking water conservation and source water protection through its Water Weeks and Water Wise programs and ran numerous education and outreach events. It reported that it provided information to thousands of residents during 2016 and 2017 on drinking water sources, water conservation initiatives and environmental stewardship. Some examples of activities and attendance reported by the Township are listed in *Exhibit 14*.

Exhibit 14 – EXAMPLES OF 2016/17 WATER WEEKS AND WATER WISE ACTIVITIES

WATER WEEKS
2016 and 2017

4,700 BC RIVERS DAY
people attended

16 COQUITLAM WATERSHED TOUR
people attended

38 WETLANDS WALK
people attended

25 STREAMSIDE CLEANUP (2 EVENTS)
people attended

180 FILM SCREENINGS
people attended

1,082 SCHOOL PROGRAMS (47 WORKSHOPS)
students participated

65 STREAMSIDE TREE PLANTING
people attended

6,461 TOTAL ENGAGEMENT
residents

WATER WISE
2016 and 2017

26 PROMOTED AT COMMUNITY EVENTS

3,268 PROMOTIONAL MATERIALS DISTRIBUTED

352 BROCHURES DISTRIBUTED

8,063 HOMES VISITED (**2,589** CONVERSATIONS)

207 CONTEST (**179** SIGNED UP)
participants

4,228 SCHOOL THEATRE (**216** TEACHERS)
students

210. The Township undertook various initiatives in collaboration with stakeholders. It provided funding to local watershed groups through the Langley Environmental Partnership Society:

- Nicomekl Enhancement Society
- Salmon River Enhancement Society
- Yorkson Watershed Stewardship Committee
- Glen Valley Watersheds Society
- Bertrand Creek Enhancement Society
- Little Campbell Watershed Society

211. The Township did not share the detailed water usage data it collected, such as peak hour, seasonal, or time of day demand with its stakeholders and undertook minimal communication with the public on the water efficiency improvements it made to four of its facilities.

RECOMMENDATION ELEVEN

The Township of Langley should improve its water conservation and demand-management efforts by developing a long-term approach that:

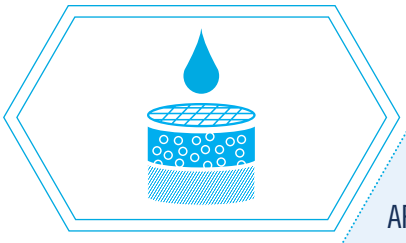
- Considers customers' water use habits and identifies barriers to behavioral change
- Includes a water conservation framework identifying all relevant cost-effective strategies, across customer sector groups, and objectives with established target outcomes tied to reduced water usage
- Includes drought response planning to manage the potential impact of reduced water supplies
- Includes indicators to identify water supply shortages and response measures
- Considers additional innovative water conservation strategies to conserve and augment existing water suppliers (such as fit-for-purpose water management, water reuse and others)
- Considers the role of volume-based water rates and public awareness of the full cost of water services to promote more efficient use of water, which can result in the deferral of capacity expansions and the reduction of costs
- Considers strategies to maximize bylaw compliance
- Includes a Township-wide implementation strategy for its leak detection program, based on the results of its pilot program

DRINKING WATER TREATMENT AND QUALITY MANAGEMENT

212. Managing water quality is complex. In its natural state, water may contain hundreds of organic and inorganic components. Some can be easily seen or tasted, while many others are colourless, tasteless, odourless and impossible to detect without specialized equipment.

213. Human activity can easily—often inadvertently—contaminate water sources. Most contaminants are harmless in small quantities but a few are dangerous, including enteric viruses such as influenza, protozoa such as cryptosporidium and coliforms such as *E. coli*. There are also many possible environmental, commercial, industrial and agricultural contaminants. Pathogens can contaminate water sources as a result of rainfall, floods, surface water movement, backflow, water main breakage or other causes.

214. Piped water for human consumption—generally referred to as drinking water—is usually not delivered separately from water intended for other purposes. As a result, 100 per cent of water in most systems must be sourced, treated and managed as drinkable regardless of how it will be used.



B.C.'S MULTI-BARRIER APPROACH

- Source protection
- Treatment
- Water system maintenance
- Water quality monitoring
- Operator training
- Emergency response training

Source: BC Government, Resources for Drinking Water Operators, Comprehensive Drinking Water Source–To–Tap Assessment Guideline

PERMIT TO OPERATE

215. The Township of Langley required and had the approval of Fraser Health Authority to operate its water systems in each year of the period covered by the audit. The Township had five permits, one for each distribution system, none with conditions attached.

MULTI–BARRIER APPROACH

216. Clean drinking water is the product of a chain of necessary steps from source to tap. Rather than focus entirely on the quality of water from the tap, the Province has adopted the Multi-Barrier Approach with six optimal standards in order to move the focus 'upstream.'

217. The Township demonstrated efforts to adopt the Multi Barrier Approach for its water systems, and substantially achieved this. Areas that still deserved attention or improvement, explained elsewhere in this document, were: groundwater protection, incident reporting and emergency response plan updates.

ALIGNMENT WITH PROVINCIAL REGULATIONS AND OBJECTIVES

218. The Province applies and interprets the federal Guidelines for Canadian Drinking Water Quality through its *Drinking Water Protection Act* and Drinking Water Protection Regulations. To meet these regulations, water providers must manage water quality within certain limitations and conditions. These Regulations are, in part, promoted through the non-regulatory Ministry of Health Drinking Water Treatment Objectives (Microbiological) for Groundwater Supplies in British Columbia (November 2015), which set out specific intended results.

219. The Township of Langley drew groundwater from provincially-regulated wells. As *Exhibit 15* indicates, this water met most of the Drinking Water Protection Regulations during the time period reviewed (2015 through 2018).

Exhibit 15 – TOWNSHIP OF LANGLEY WATER TESTING RESULTS 2015–2018

	***ESCHERICHIA COLI* (*E. coli*)**	**TOTAL COLIFORM BACTERIA (TC)**	**TURBIDITY**	**SAMPLING FREQUENCY**
Measurement	Any detected CFU (Colony Forming Units) per 100 ml [1]	MPN (Most Probable Number) per 100 ml [1]	NTU (Nephelometric Turbidity Units) [2]	Samples per month [3]
Drinking Water Protection Regulation; Drinking Water Treatment Objectives	No detectable *E. coli* *	At least 90% of samples have no detectable TC **AND** no sample has >10 TC *	Fewer than 5% of samples w >1 NTU **AND** samples are not >5 NTU for over 2 days in 12 mo *	Min 91-93 samples per month
Met the Regulation/ Objective	No samples with detectable *E. coli*	Annual % of samples with no detectable TC	Fewer than 5 % of samples with turbidity >1 NTU	Sampling Frequency
2015	✓	✓	✓	✓
2016	✓	✓	✓	✓
2017		✓	✓	✓
2018	✓	✓	✓	✓
Did not initially meet the Regulation/ Objective (but were approved post-investigation by Drinking Water Officer)	Samples with any detected *E. coli* CFU	Samples with Total Coliform >10 MPN	Samples with Turbidity >5 NTU	Sampling Frequency
2015		>10 MPN		
2016			>5 NTU	
2017	4 CFU		>5 NTU	
2018				

* *Any exceedance requires further investigation and reporting to the Drinking Water Officer*

1 Drinking Water Protection Regulation Schedule A (updated 2018) states the treatment target for all water systems is:
No detectable Escherichia coli per 100 ml.
Total coliform bacteria (for more than 1 sample in a 30 day period) at least 90% of samples have no detectable total coliform bacteria per 100 ml and no sample has more than 10 total coliform bacteria per 100 ml

2 NTU (Nephelometric Turbidity Units) The Drinking Water Treatment Objectives consider 1 NTU to be the upper threshold. Turbidity must not exceed 5 NTU for any two days in a 12 month period.

3 Frequency of monitoring samples per month is by population served, as specified in the Drinking Water Protection Regulation Schedule B (updated 2018).

MICROBIOLOGICAL PROBLEMS

220. The Township did not issue any water quality advisories, was not ordered by Fraser Health Authority to issue a water advisory at any time during the 2015 to 2018 period, and did not have any unplanned water system shut-downs. The Township reported no microbiological health risks in its source well water. It did report risks from arsenic, nitrate as nitrogen and aesthetic values, such as iron and manganese, which it dealt with by filtering or dilution via blending, as described in its Annual Water Quality Reports.

221. The Drinking Water Protection Regulation limit is zero detected *E. coli*. Any detection is considered to be a major alert. The Township had a sample test positive for *E. coli* in September of 2017. When this occurred, the Township notified Fraser Health Authority and responded according to its Emergency Response Plan by flushing the systems and re-sampling. Retests for *E. coli* came back negative and, with the Drinking Water Officer's approval, it did not issue a water quality advisory.

222. The Township's investigation into the origin of the *E. coli* was complicated by an error in sample labelling, which resulted in flushing and resampling two locations. Since resampling of both sites came back negative, the Township concluded that the *E. coli* may have been present due to contamination during sampling, but the actual cause could not be verified.

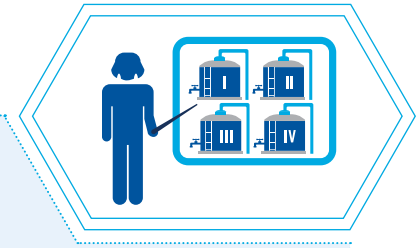
223. Township staff told us that, subsequent to the 2017 *E. coli* event, the Township took steps to prevent any future sample contamination by:

- updating and implementing its Water Sampling Protocol
- providing additional training to its operators
- creating a Water Quality Event Investigation form

RECOMMENDATION TWELVE

The Township of Langley should continue to improve its water quality reporting processes, particularly:

- Verifying the accuracy, validity and completeness of its Annual Water Quality Report
- Reporting on any further investigations and changes in practice resulting from water quality issues



WATER FACILITY CLASSIFICATION

B.C. water facilities are generally classified (Class I-IV) indicating the size and level of complexity of the water system and factors such as flow, analytical laboratory controls and more. Facility classification also highlights the type of certification the facility's water operator needs to hold and the degree of knowledge and training required.

As water providers, local governments are responsible for ensuring operators have the necessary level of certification to match their operating system.

Source: How Drinking Water is Protected in B.C. Government of British Columbia

REPORTING OF ISSUES

224. We would expect the Township of Langley to report on problems in its water systems. The Regulations required further investigation of any water samples where Total Coliforms exceeded ten MPN[2] per 100ml. The Annual Water Quality Report (2015) reported that two of eight samples were above this limit, but the report did not describe any investigation or response.

[2] *MPN (Most Probable Number) is the test value with the highest statistical probability of being correct, since the true value cannot be tested directly.*

225. According to the Ministry of Health Drinking Water Treatment Objectives (Microbiological) for Groundwater Supplies in British Columbia (November 2015), water turbidity may not exceed five NTU for more than two days in a 12-month period without further investigation. However, seven samples from the distribution system during 2016 and 2017 exceeded this objective. The Township's 2016 Annual Water Quality Report provided no details or further investigation for the five occurrences that year. The 2017 report did identify the two high turbidity events that occurred that year and indicated that they might have been the result of water main flushing but was inconclusive.

CERTIFIED OPERATORS AND HUMAN RESOURCES

226. Each B.C. water system faces unique water supply, treatment, and distribution challenges. The Province of B.C. mandates that the Environmental Operators Certification Program (EOCP) classify water distribution systems and water treatment systems by particular standardized levels, to ensure that training requirements are appropriate for the circumstances of each system Province-wide. *Exhibit 16* shows the EOCP classification of each Township of Langley water system as well as its legacy system name.

Exhibit 16 – CLASSIFICATION LEVEL OF EACH TOWNSHIP OF LANGLEY WATER SYSTEM

WATER SYSTEM LOCATION	LEGACY SYSTEM NAME	ENVIRONMENTAL OPERATORS CERTIFICATION PROGRAM CLASSIFICATION
East Langley	Aldergrove Water Treatment Plant	WT Class II
East Langley	Aldergrove Water Distribution System	WD Class III
Southwest Langley	South Langley Water Distribution System	WD Class IV
Northwest Langley	West Langley Water Distribution System	WD Class III
Acadia	Acadia Water Distribution System	WD Class I
Tall Timbers	Tall Timbers Water Distribution System	WD Class I

WT=Water Treatment
WD=Water Distribution

227. The Township's available and on-call water operators and utility maintenance workers employed in drinking water were appropriately trained to the required certification levels. The Township did not have a training plan but did support training, including operator upgrades and training specific to new equipment, standards and levels of service.

228. Staff told us the senior water operator oversaw water sampling. Intermediate and junior water operators as well as utility maintenance workers carried out water quality sampling. The Township told us that increased training for water quality sampling had been provided since the *E. coli* event in 2017 had occurred.

229. The Township had up-to-date class specifications (job descriptions) aligned with the equivalent Metro Vancouver positions.

230. Township staff managed their operational duties using a computerized system of work orders, task tracking, system monitoring and preventative maintenance. The software identified staff hours, assets and budget assignments, among other aspects.

CROSS CONNECTION CONTROL

231. The Township had a Cross Connection Control program, with a coordinator, and maintained test results for 100 per cent of the backflow prevention devices at more than 1,000 municipal and private facilities. The program had a standard operating procedures manual.

BLENDING WATER FOR QUALITY

232. The Township minimized its need for water treatment:

- Where possible, the Township reduced the need for filtration by drawing from wells with better water quality, as determined by well monitoring
- The Township ceased operation of wells with above maximum allowable concentrations for arsenic
- The Township reduced pumping of groundwater with nitrates above maximum allowable concentrations and blended it with GVWD water

233. Many Township wells provided drinking water within the maximum allowable concentrations without treatment, except for chlorination. The Township distributed this water and blended groundwater with GVWD water when it did exceed the limits, with the approval of Fraser Health Authority.

PREVENTATIVE AND ROUTINE MAINTENANCE

234. The Township had a systematic preventative maintenance program customized to each type of infrastructure: booster pumps, pressure reduction valves, generators and distribution reservoirs. The Township regularly monitored and inspected its water system infrastructure. It had written standard operating procedures for maintenance and emergencies, maintained in hard copy on site and in its Emergency Response Plan.

235. The Township maintained its municipal wells and reported it had redeveloped 14 of them since 2000.

236. The Township's water system facilities appeared to be clean and well maintained, with only minor wear visible. For its infrastructure, it had a Water Master Plan from 2008, overdue to be updated, which informed routine and as-needed operations and maintenance.

237. The Township had multiple information systems to help maintain its water infrastructure. Its preventative maintenance program was implemented through the Infor Public Sector system. The Township used this system to schedule core maintenance and to auto-generate work orders based on the preventative maintenance schedule, individual assets and known issues. The Township relied on staff to keep its maintenance system up to date.

238. The Township's Info Water program was another information system with the capability to predict flow, pressure and fire flows. Staff told us they had recalculated the modelling in 2018 and used it to update the Water Master Plan.

239. The Township had a risk assessment tool called the Risk and Criticality Model: Water Sewer, Drainage and Transportation, which it was testing, to inform condition assessments of buried water system assets. The Township was using this software to support its assessment of risk areas for priority repair and replacement.

ABOUT THE AUDIT

240. The office of the AGLG complies with the independence requirements, other ethical requirements and rules of professional conduct of the Chartered Professional Accountants of British Columbia applicable to the practice of public accounting and related to assurance engagements and the standards of conduct of the B.C. Public Service.

241. This audit was performed in accordance with the standards for assurance engagements set out by the Chartered Professional Accountants of Canada in the CPA Handbook—Assurance and Value-for-Money Auditing in the Public Sector, ps 5400, ps 6410, ps 6420 and Canadian Standard on Assurance Engagements 3001—direct engagements. Additionally, the AGLG applies Canadian Standards on Quality Control, CSQC 1.

OBJECTIVE

242. The overall objective of this performance audit was to provide an objective, independent examination of the local government's drinking water services to determine if the local government provides clean and safe drinking water where and when needed.

PERIOD COVERED BY THE AUDIT

243. The audit covered the period of January 1, 2016 through December 31, 2018. Where relevant materials were developed, or events occurred prior to or after this period, we also took them into consideration. We completed our examination work in January 2019.

AUDIT SCOPE AND APPROACH

244. The audit included a review of the Township of Langley's governance of its drinking water operations. The audit also examined the Township's management of its drinking water supply and water conservation activities. In addition, the audit included a review of the safety and reliability of the Township's water and infrastructure. Finally, the audit examined the Township's preparedness for future drinking water requirements.

245. The audit did not include assessment of drinking water services in the region provided by Metro Vancouver or private water purveyors. The audit also did not include other uses of water services, such as for firefighting.

AUDIT CRITERIA

246. Performance audit criteria define the expectations against which we assessed the local government's performance. We identify our criteria before we begin assessing a local government. We intend them to be reasonable expectations for the local government's management of the area being audited in order to achieve expected results and outcomes.

247. We used the following criteria to assess the local government:

AUDIT OBJECTIVES		LINES OF ENQUIRY AND AUDIT CRITERIA
AUDIT OBJECTIVE 1	The Township of Langley's governance structure and activities supported the provision of clean and safe drinking water where and when needed.	**1. Governance and organizational structure** 1.1. The Township's governance structure supported its water system, service area and customers 1.2. The Township's leadership and organizational culture supported the achievement of drinking water priorities and objectives 1.3. The Township's organizational structure supported communication between water system operators and management for informed decision-making and continuous improvement **2. Strategic planning and decision-making** 2.1. The Township developed a long-term strategy related to its drinking water services 2.2. The Township considered affordability and cost effectiveness in its decisions related to drinking water **3. Information and decision support** 3.1. The Township's information management processes supported staff in meeting drinking water service objectives and accountabilities **4. Public reporting, engagement and communication** 4.1. The Township has been appropriately transparent by engaging the public and providing information about drinking water systems related to infrastructure, costs, quality, conservation and improvements 4.2. The Township developed and reported on key performance indicators related to its drinking water services 4.3. The Township promoted public awareness of source water protection 4.4. The Township promoted public awareness of water conservation and demand management 4.5. The Township communicated to its water systems' customers essential information about drinking water safety and reliability
AUDIT OBJECTIVE 2	The Township of Langley managed its drinking water supplies to meet current and expected future demand.	**1. Assessment of drinking water sources** 1.1. The Township assessed available drinking water sources for supply over time 1.2. The Township assessed available drinking water sources for redundancy **2. Source water protection** 2.1 The Township contributed to the development of source water protection management plans 2.2. The Township incorporated source water protection considerations, where relevant, into land use, development and other bylaws 2.3. The Township collaborated with others to protect or enhance source water quality **3. Demand management strategies** 3.1. The Township developed a demand management or water conservation plan or strategies 3.2. The Township developed bylaws to support demand management 3.3. The Township adjusted its pricing strategy when needed to manage demand 3.4. The Township developed a drought management plan **4. Water usage** 4.1. The Township implemented actions identified in its demand management or water conservation plan 4.2. The Township enforced its water related bylaws 4.3. The Township implemented actions identified in its drought management plan 4.4. The Township managed and operated water conservation infrastructure 4.5. The Township contributed to positive results in water conservation

AUDIT OBJECTIVES		LINES OF ENQUIRY AND AUDIT CRITERIA
AUDIT OBJECTIVE 3		Will be reported separately.
AUDIT OBJECTIVE 4	The Township of Langley ensured the safety and reliability of drinking water provided through its treatment and distribution systems.	**1. Water infrastructure** 1.1. The Township's water infrastructure was sufficient to meet drinking water regulations and a multi-barrier approach 1.2. The Township minimized the costs of water infrastructure while meeting regulations and water quality guidelines 1.3. The Township staff kept aware of innovation and research related to water infrastructure 1.4. The Township developed a long-term asset management plan for its water facilities 1.5. The Township maintained its water infrastructure **2. Water operations** 2.1. The Township had sufficient human resources capacity with the right skill level to meet regulations and carry out its multi-barrier approach 2.2. Township staff completed operational duties as their positions required 2.3 The Township ensured business continuity related to drinking water 2.4. The Township developed and effectively utilized mitigation plans to manage, eliminate or reduce water operation risks to an acceptable level 2.5. The Township is prepared to respond to water related emergencies and responded effectively to emergencies in the past

SUMMARY OF LOCAL GOVERNMENT COMMENTS

Township of Langley
Est. 1873

JUL 19 2019

July 15, 2019

File No. 0400-60-031

Mr. Gordon Ruth
Auditor General for Local Government
201 - 10470 – 152 Street
Surrey, BC V3R 0Y3

Dear Mr. Ruth:

Re: Local Government's Role in Ensuring Clean Drinking Water

In August 2017, the Township of Langley (Township) was advised that the Auditor General for Local Government (AGLG) was going to undertake an audit of the Township's water utility. As we understand it, the Township was selected based on risks, potential relevance of findings to other local governments, the size, geographic location and complexity of the Township's water supply system. The overall goal of the audit was identified as providing an objective and independent examination of drinking water services in the Township to determine whether clean and safe drinking water is being provided to the users on the Township's water utility system.

The Township is in receipt of the AGLG's proposed final audit report on "Local Government's Role in Ensuring Clean Drinking Water". This report focussed on three of the four audit objectives, specifically: i) The local government's governance structure and activities supported the provision of clean and safe drinking water where and when needed; ii) The local government managed its drinking water supplies to meet current and expected future demand; and iii) The local government ensured the safety and reliability of drinking water provided through its treatment and distribution systems.

The proposed audit report was received by Mayor and Council at its Special Closed meeting on May 27, 2019, where Council directed staff to undertake a comprehensive review of the Report, including its recommendations, and provide comments as requested.

The Township is pleased with the positive results of the audit as we continuously endeavour to improve the services we provide to our water users. Please accept our appreciation to your office and staff for their diligence and effort in understanding the Township's complex water system and associated programs, and the recommendations on how the Township could consider improvements to help ensure the success of its drinking water planning and management into the future. The Township accepts many of the auditor's recommendations, with some already underway or in the planning stages.

Sincerely,

Mark Bakken
Chief Administrative Officer
Encl.

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TOWNSHIP OF LANGLEY ACTION PLAN

AGLG RECOMMENDATION	STEPS TAKEN	RESOURCES NEEDED	RESPONSIBILITY	TARGET DATE
PROVIDING CLEAN DRINKING WATER WHERE AND WHEN NEEDED				
RECOMMENDATION ONE The Township of Langley should consider developing a Council-endorsed strategy or policies for current and future drinking water sources that:	The Township is currently developing a long term drinking water supply plan to supplement the many existing related programs, plans, studies and strategies related to water conservation, groundwater protection and sustainable water management planning. The Township is currently in discussion with Fraser Health regarding long term source water protection planning.	No new resources required.	Project Managers	TBD
◗ Builds on and consolidates its considerable studies and practices related to groundwater planning and sustainability	See above.			
◗ Includes sustainable withdrawal targets for its groundwater to avoid overuse	See above.			
◗ Includes a plan to protect water sources from contamination	See above.			
◗ Includes guidance to protect water during development especially in areas dependent on drinking water aquifers and near well capture zones	See above.			
◗ Includes tools to share information, assess and manage risks, where neighbouring local governments' land-use or environmental decisions may impact the Township's drinking water	See above.			
◗ Explores stormwater/rainwater capture as part of the long-term solution	See above.			

TOWNSHIP OF LANGLEY ACTION PLAN

AGLG RECOMMENDATION	STEPS TAKEN	RESOURCES NEEDED	RESPONSIBILITY	TARGET DATE
GOVERNANCE STRUCTURE AND ACTIVITIES SUPPORTING DRINKING WATER SERVICES				
RECOMMENDATION TWO The Township of Langley should consider a full cost recovery approach as part of its water service planning that:	The Township has established a water utility reserve fund to address replacement of aging infrastructure and will explore ways to further a full cost recovery approach building on existing practices.	Already resourced.	Finance Division	Underway
◗ Enables the Township to better identify costs associated with delivering water to customers	See above.			
◗ Includes long-term financial and capital planning for its water services	See above.			
RECOMMENDATION THREE The Township of Langley should consider developing a formal framework for risk identification, mitigation and reporting that includes regular re-assessment and reporting of organizational risks—including those associated with drinking water—to senior management and Council.	The Township recently completed a water emergency response plan and commits to regular practice exercise. The Township will also consider conducting a risk hazard assessment related to the municipal water system as it has done with in other areas of the services it provides.	Staff time, budget.	Engineering Division	TBD
RECOMMENDATION FOUR The Township of Langley should improve data collection, analysis, monitoring and reporting on its water services as part of a continual improvement process. This should include:	Township staff currently reports to Council, and the general public on key aspects of its water system, including quantity and quality, with senior management staff fully engaged in the reporting and aware of any concerns. This information is reported annually in the water quality report and is made available on the Townships website. Staff will examine opportunities for improvements related to performance measures, monitoring and reporting.	Already resourced.	Engineering Division	Ongoing
◗ A performance measurement system for its water services	See above.			
◗ Monitoring and measuring progress towards goals and objectives	See above.			
◗ Enhanced reporting to Council, senior management and the public on results	See above.			

AGLG RECOMMENDATION	STEPS TAKEN	RESOURCES NEEDED	RESPONSIBILITY	TARGET DATE
GOVERNANCE STRUCTURE AND ACTIVITIES SUPPORTING DRINKING WATER SERVICES *continued*				
RECOMMENDATION FIVE The Township of Langley should consider improving its tracking and reporting on service requests (including complaints) and enquiries from the public relating to its water systems.	The Township is utilizing a new system for tracking and reporting on service requests. The Township will conduct an evaluation of this system on a regular basis to ensure it is meeting the needs of the municipality and its customers.	Already resourced.	Engineering Division	Ongoing
RECOMMENDATION SIX The Township of Langley should consider improving the workflow of its water infrastructure work-order system to enhance its efficiency.	The Township has a tracking system that helps manage the workflow of the water infrastructure work-order system. The Township is currently exploring alternatives to the current system in order to improve efficiency.	Already resourced.	Engineering Division	Ongoing
RECOMMENDATION SEVEN The Township of Langley should consider retaining a record of all management team meetings in order to track organizational decisions.	Water related departments not already doing so, have implemented recording team meeting minutes as of 2019. Records will be retained.	Already resourced.	Department Managers	Ongoing
RECOMMENDATION EIGHT The Township should consider enhancing its human resource policies by reviewing and updating its ethical policies and by developing a whistle blower policy.	The Township will continue to enhance HR policies, procedures and practices in keeping with the overall goals of the organization, applicable legislation and to ensure employee related issues are appropriately addressed.		Human Resources	Ongoing
RECOMMENDATION NINE The Township of Langley should consider a more formal approach to measuring employee workplace engagement.	The Township will continue to evaluate opportunities for engagement through the involvement of employees in programs and initiatives as appropriate and applicable.		Human Resources	Ongoing

TOWNSHIP OF LANGLEY ACTION PLAN

AGLG RECOMMENDATION	STEPS TAKEN	RESOURCES NEEDED	RESPONSIBILITY	TARGET DATE
GOVERNANCE STRUCTURE AND ACTIVITIES SUPPORTING DRINKING WATER SERVICES *continued*				
RECOMMENDATION TEN The Township of Langley should enhance its emergency and business continuity planning by:	The Township's water emergency response plan was recently completed. The plan will be updated periodically with regular practice to ensure relevant staff are versed and practiced. The Township's Engineering Business Continuation plan was last updated in 2016 and requires updating and enhancing to ensure it is current, relevant and practical in the event of potential disruptions to critical services. The Township will work towards this update as resources permit.	Already resourced.	Engineering Division	Ongoing
❱ Ensuring that its water utility emergency response plan continues to be regularly updated, tested, and made accessible and familiar to all staff	See above.			
❱ Completing business continuity planning for its critical services—including drinking water—to ensure the continuation of service and sustainable infrastructure throughout any potential disruptions.	See above.			
MANAGEMENT TO MEET DEMAND				
RECOMMENDATION ELEVEN The Township of Langley should improve its water conservation and demand-management efforts by developing a long-term approach that:	The Township continues to utilize community based social marketing to identify barriers to water conservation and design programs to reduce overall and per capita water use. Water conservation programs continue to evolve, and the water conservation bylaw is reviewed and revised regularly.	Already resourced.	Engineering Division	Ongoing
❱ Considers customers' water use habits and identifies barriers to behavioral change	See above.			
❱ Includes a water conservation framework identifying all relevant cost-effective strategies, across customer sector groups, and objectives with established target outcomes tied to reduced water usage	See above.			

AGLG RECOMMENDATION	STEPS TAKEN	RESOURCES NEEDED	RESPONSIBILITY	TARGET DATE
MANAGEMENT TO MEET DEMAND *continued*				
› Includes drought response planning to manage the potential impact of reduced water supplies	See above.			
› Includes indicators to identify water supply shortages and response measures	See above.			
› Considers additional innovative water conservation strategies to conserve and augment existing water supplies (such as fit-for-purpose water management, water reuse and others)	See above.			
› Considers the role of volume-based water rates and public awareness of the full cost of water services to promote more efficient use of water, which can result in the deferral of capacity expansions and the reduction of costs	See above.			
› Considers strategies to maximize bylaw compliance	See above.			
› Includes a Township-wide implementation strategy for its leak detection program, based on the results of its pilot program	See above.			
DRINKING WATER TREATMENT AND QUALITY MANAGEMENT				
RECOMMENDATION TWELVE The Township of Langley should continue to improve its water quality reporting processes, particularly:	The Township meets all Fraser Health reporting requirements and continues to endeavor to ensure accuracy and error free reporting. Staff will examine opportunities for improvements related to reporting.	Already resourced.	Engineering Division	Ongoing
› Verifying the accuracy, validity and completeness of its Annual Water Quality Report	See above.			
› Reporting on any further investigations and changes in practice resulting from water quality issues	See above.			

AGLG CONTACT INFORMATION

STAY CONNECTED WITH THE AGLG

The AGLG welcomes your feedback and comments. Contact us via email *info@aglg.ca*, our website at *www.aglg.ca* or follow us on Twitter *@BC_AGLG.*

You may also contact us by telephone, fax or mail:

PHONE: 604–930–7100
FAX: 604–930–7128
MAIL: 201–10470 152nd STREET SURREY B.C. V3R 0Y3