TOWN OF CANMORE
AGENDA
Regular Meeting of Council
Council Chambers at the Civic Centre, 902 – 7 Avenue
Tuesday, October 3, 2023 at 9:00 a.m.

Times are estimates only.

9:00 – 9:05 **A. CALL TO ORDER AND APPROVAL OF AGENDA**
1. **Land Acknowledgement**
2. **Agenda for the October 3, 2023 Regular Meeting of Council**

9:05 – 10:05 **B. PUBLIC HEARINGS**
1. **Palliser Trail Area Structure Plan Bylaw 2023-22**
   (1) Call to order
   (2) Administration Presentation
   (3) Public Verbal Submissions
   (4) Public Written Submissions
   (5) Closing Comments from Administration
   (6) Council Questions of Administration
   (7) Adjournment of the Public Hearing

C. DELEGATIONS – none

D. APPROVAL OF MINUTES

10:05 – 10:10
1. **Minutes of the September 5, 2023 Regular Meeting of Council**

E. BUSINESS ARISING FROM THE MINUTES – none

F. UNFINISHED BUSINESS – none

G. BYLAW APPROVAL

10:10 – 10:55
1. **Palliser Trail Area Structure Plan Bylaw 2023-22**

   Recommendations:
   (1) That Council give second reading to Palliser Trail Area Structure Plan Bylaw 2023-22.
   (2) That Council give third reading to Palliser Trail Area Structure Plan Bylaw 2023-22.

10:55 – 11:10 **Meeting Break**

11:10 – 11:20
2. **Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31**

   Recommendations:
   (1) That Council give first reading to Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31.
   (2) That Council give second reading to Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31.
   (3) That Council give leave to go to third reading of Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31.

(4) That Council give third reading to Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31.

H. NEW BUSINESS

11:20 – 11:35 **1. Update to the Public Art Policy by adding Micro Grants**

Recommendation: That Council approve the updated Public Art and Micro Grant Policy as amended.

11:35 – 12:00 **2. Enforcement Revenue from Commercial Food Waste Diversion**

Recommendation: That Council repeal motion 69-2003.

12:00 – 12:25 **3. Municipal Election Signage Options**

Recommendations: That Council direct administration to prepare:

(1) an Election Sign Bylaw that restricts municipal election signage to private property; and

(2) an amendment to the Town's Land Use Bylaw to remove the political campaign signs section.

12:25 – 1:25 **Meeting Break**

1:25 – 1:30 **4. Appointment of Code of Conduct Investigator**

Recommendations:

(1) That Council appoint Sage Analytics to perform the duties of Investigator as set out in the Code of Conduct for Elected Officials bylaw 2018-02; and

(2) That Council direct administration to negotiate a non-exclusive service agreement with Sage Analytics that allows for the continued use of the Investigator appointed by resolution 148-2018.

1:30 – 1:35 **5. 2022 Utility Master Plan**

Recommendation: that Council accept the 2022 Utility Master Plan for planning purposes.

I. REPORTS FROM ADMINISTRATION

1:35 – 1:55 **1. Integrated Parking Management Plan Update**

Purpose: To provide Council with a comprehensive review of the first year of the paid parking program in the Town Centre and provide clarity on how program changes will be considered and made.

H. NEW BUSINESS continued

1:55 – 2:25 **6. Paid Parking Revenue Allocation Model (PPRAM) Proposal**

Recommendations:

(1) That Council approve the Paid Parking Revenue Allocation Model (PPRAM) as presented.

(2) That Council direct administration to bring back a revised Reserves Policy (FIN-007) to eliminate the Paid Parking Reserve and to transfer the balance from the Paid Parking Reserve to Asset Replacement/ Rehabilitation Reserve by 2023 year-end.

J. NOTICES OF MOTION – none

K. IN CAMERA – none

2:25 **L. ADJOURNMENT**

TOWN OF CANMORE
MINUTES
Regular Meeting of Council
Council Chambers at the Civic Centre, 902 – 7 Avenue
Tuesday, September 5, 2023 at 9:00 a.m.

COUNCIL MEMBERS PRESENT

Sean Krausert	Mayor
Joanna McCallum	Deputy Mayor
Jeff Hilstad	Councillor
Wade Graham	Councillor
Tanya Foubert	Councillor
Jeff Mah	Councillor
Karen Marra	Councillor

COUNCIL MEMBERS ABSENT
None

ADMINISTRATION PRESENT

Sally Caudill	Chief Administrative Officer
Therese Rogers	General Manager of Corporate Services
Whitney Smithers	General Manager of Municipal Infrastructure
Scott McKay	General Manager of Municipal Services
Cheryl Hyde	Municipal Clerk (recorder)
Lauren Miller	Manager of Planning and Development
Nathan Grivell	Development Planner
Joshua Cairns	Senior Policy Planner
Caitlin Miller	Manager of Protective Services
Andy Esarte	Manager of Engineering

Mayor Krausert called the September 5, 2023 regular meeting to order at 9:00 a.m.

A. CALL TO ORDER AND APPROVAL OF AGENDA

1. Land Acknowledgement

2. Agenda for the September 5, 2023 Regular Meeting of Council

198-2023 Moved by Mayor Krausert that Council approve the agenda for the September 5, 2023 regular meeting.

CARRIED UNANIMOUSLY

B. PUBLIC HEARINGS

1. Silvertip Area Structure Plan Bylaw Amendment 2023-21 Maps

(1) **Call to order**

Mayor Krausert called the public hearing for Bylaw 2023-21 to order at 9:02 a.m.

(2) **Administration Summary**
Administration provided a verbal briefing on their proposed housekeeping amendments to the Silvertip Area Structure Plan intended to adjust the plan's boundary to reflect current planning initiatives and ensure consistency in the administration of the plan.

(3) **Public Submissions**
No members of the public present wished to speak.

(4) **Public Written Submissions**
No written submissions were received.

(5) **Closing Comments from Administration**
None

(6) **Council Questions of Administration**
None

(7) **Adjournment**
Mayor Krausert adjourned the public hearing at 9:07 a.m.

2. Land Use Bylaw Amendment 2023-20 Canmore Planning Commission Authority and Referrals

(1) **Call to order**
Mayor Krausert called the public hearing for Bylaw 2023-20 to order at 9:07 a.m.

(2) **Administration Summary**
Administration provided a verbal briefing on their proposed amendments to the Land Use Bylaw intended to provide clarity on what type of development permit applications are referred to Canmore Planning Commission for decision.

(3) **Public Submissions**
No members of the public present wished to speak.

(4) **Public Written Submissions**
No written submissions were received.

(5) **Closing Comments from Administration**
None

(6) **Council Questions of Administration**
None

(7) **Adjournment**
Mayor Krausert adjourned the public hearing at 9:12 a.m.

Minutes approved by: _____ _____

3. Land Use Bylaw Amendment 2023-24 205 Stewart Creek Rise

(1) **Call to order**

Mayor Krausert called the public hearing for Bylaw 2023-24 to order at 9:12 a.m.

(2) **Administration Summary**

Administration provided a verbal briefing on Canmore Community Housing's application to redesignate 205 Stewart Creek Rise from PD Public Use District and the R3-SC Residential Comprehensive Multiple-Unit Stewart Creek District to R2A-SC Residential Family Low Density District – Stewart Creek District.

(3) **Applicant Summary**

Michelle Ouellette, Executive Director of Canmore Community Housing, provided a verbal briefing summarizing the reasons for their redesignation application.

(4) **Public Submissions**

In favour

Name	Verbal	Written
Kunst, Todd – Sage Bistro		X
Hill, Lawrence		X

Opposed

Name	Verbal	Written
Hyrina, Genya		X
Cavanagh, Sean		X

(5) **Public Written Submissions**

The recording secretary read into the record the names of those who provided written submissions. These submissions are recorded in the list of public submissions above and are published in the record of public submissions for this meeting.

(6) **Council Questions of the Applicant**

The applicant addressed questions of clarification from Council.

(7) **Closing Comments from Administration**

None

(8) **Council Questions of Administration**

None

(9) **Adjournment**

Mayor Krausert adjourned the public hearing at 9:17 a.m.

C. DELEGATIONS – None

Minutes approved by: _____ _____

D. APPROVAL OF MINUTES

1. Minutes of the August 15, 2023 Regular Meeting of Council

199-2023 Moved by Mayor Krausert that Council approve the minutes of the August 15, 2023 regular meeting as presented.

CARRIED UNANIMOUSLY

E. BUSINESS ARISING FROM THE MINUTES – None

F. UNFINISHED BUSINESS

1. Retail Gap Analysis and Light Industrial and Commercial Land Review

Motion 162-2023, postponed at the July 4, 2023 regular meeting, was put on floor for debate and vote.

162-2023 Moved by Mayor Krausert that Council direct administration to return with recommended amendments to the Land Use Bylaw, the Municipal Development Plan, and any other suggested policy amendments to clear up restrictions and conflicting statements and interpretations to allow the provision of housing in industrial districts, propose criteria under which such housing could be considered, and ensure that any residential units are occupied by employees.

DEFEATED
In favour: Foubert, Krausert, Marra
Opposed: Graham, Hilstad, Mah, McCallum

200-2023 Moved by Mayor Krausert that Council direct administration to return with recommended amendments to the Land Use Bylaw and Municipal Development Plan to discourage the provision of employee housing in industrial districts.

CARRIED
In favour: Graham, Hilstad, Mah, McCallum
Opposed: Foubert, Krausert, Marra

201-2023 Moved by Mayor Krausert that Council accept the Retail Gap Analysis and Light Industrial and Commercial Land Review for planning purposes.

CARRIED UNANIMOUSLY

Meeting break 10:10 – 10:30 a.m.

G. BYLAW APPROVAL

1. Silvertip Areas Structure Plan Bylaw Amendment 2023-21 Maps

202-2023 Moved by Mayor Krausert that Council give second reading to Silvertip Area Structure Plan Bylaw Amendment 2023-21 Maps.

CARRIED UNANIMOUSLY

203-2023 Moved by Mayor Krausert that Council give third reading to Silvertip Area Structure Plan Bylaw Amendment 2023-21 Maps.

CARRIED UNANIMOUSLY

Minutes approved by: _____ _____

2. Land Use Bylaw Amendment 2023-20 – Canmore Planning Commission Authority and Referrals and Subdivision Authority, Development Authority, and Municipal Planning Commission Establishment Bylaw Amendment 2023-28 – Development Authority and Canmore Planning Commission

204-2023 Moved by Mayor Krausert that Council give second reading to Land Use Bylaw Amendment 2023-20 Canmore Planning Commission Authority and Referrals.

CARRIED UNANIMOUSLY

205-2023 Moved by Mayor Krausert that Council give third reading to Land Use Bylaw Amendment 2023-20 Canmore Planning Commission Authority and Referrals.

CARRIED UNANIMOUSLY

206-2023 Moved by Mayor Krausert that Council give second reading to Subdivision Authority, Development Authority, and Municipal Planning Commission Establishment Bylaw Amendment 2023-28 Development Authority and Canmore Planning Commission.

CARRIED UNANIMOUSLY

207-2023 Moved by Mayor Krausert that Council give third reading to Subdivision Authority, Development Authority, and Municipal Planning Commission Establishment Bylaw Amendment 2023-28 Development Authority and Canmore Planning Commission.

CARRIED UNANIMOUSLY

208-2023 Moved by Mayor Krausert that Council direct administration to return by June 2024 with options to remove, where feasible, naming of Council and Canmore Planning Commission as the Development Authority from Direct Control Districts within the Land Use Bylaw and replace it with the Development Officer.

CARRIED UNANIMOUSLY

3. Land Use Bylaw Amendment 2023-24 205 Stewart Creek Rise

209-2023 Moved by Mayor Krausert that Council give second reading to Land Use Bylaw Amendment 2023-24 – 205 Stewart Creek Rise.

CARRIED UNANIMOUSLY

210-2023 Moved by Mayor Krausert that Council give third reading to Land Use Bylaw Amendment 2023-24 – 205 Stewart Creek Rise.

CARRIED UNANIMOUSLY

4. Palliser Area Structure Plan Bylaw 2023-22

211-2023 Moved by Mayor Krausert that Council give first reading to Palliser Trail Area Structure Plan Bylaw 2023-22 and schedule a public hearing for October 3, 2023.

CARRIED UNANIMOUSLY

Meeting break 11:50 a.m. – 1 p.m.

5. Bylaw Enforcement Officer Bylaw

212-2023 Moved by Mayor Krausert that Council give first reading to Bylaw Enforcement Officer Bylaw 2023-29.

CARRIED UNANIMOUSLY

Minutes approved by: _____ _____

213-2023 Moved by Mayor Krausert that Council give second reading to Bylaw Enforcement Officer Bylaw 2023-29.

CARRIED UNANIMOUSLY

214-2023 Moved by Mayor Krausert that Council give leave to go to the third reading of Bylaw Enforcement Officer Bylaw 2023-29.

CARRIED UNANIMOUSLY

215-2023 Moved by Mayor Krausert that Council give third reading to Bylaw Enforcement Officer Bylaw 2023-29.

CARRIED UNANIMOUSLY

H. NEW BUSINESS

1. Livability Tax Policy Taskforce Terms of Reference

216-2023 Moved by Mayor Krausert that Council approve the Terms of Reference for the Livability Tax Policy Task Force as presented.

216A-2021 Moved by Councillor Foubert that Council amend motion 215-2023 by amending the Town of Canmore Livability Tax Policy Task Force Terms of Reference within the first bullet of Section 5 under Phase 1: Develop a Plan to Phase Out the Tourist Home Designation by removing the words "and administration".

CARRIED UNANIMOUSLY

215-2023 The vote followed on motion 215-2023 as amended: that Council approve the Terms of Reference for the Livability Tax Policy Task Force as presented, amended as follows:

- amend the Town of Canmore Livability Tax Policy Task Force Terms of Reference within the first bullet of Section 5 under Phase 1: Develop a Plan to Phase Out the Tourist Home Designation by removing the words "and administration".

CARRIED UNANIMOUSLY

217-2023 Moved by Councillor Foubert that Council direct administration to return with recommendations for members of the Livability Tax Policy Task Force at a September 19, 2023 special meeting for Council approval.

CARRIED UNANIMOUSLY

218-2023 Moved by Mayor Krausert that Council appoint three members of council – Mayor Krausert, Councillor Graham, and Councillor McCallum – to participate in the Livability Tax Policy Task Force.

CARRIED UNANIMOUSLY

Meeting break 2:12 – 2:30 p.m.

Minutes approved by: _____ _____

2. 2023 Capital Budget Funding Sources Amendment - Cougar Creek Long-Term Mitigation

219-2023 Moved by Mayor Krausert

1) that Council approve a budget funding source amendment for Cougar Creek Long-term Mitigation capital project (CP#1562) in the amount of $8,300,000 from Future Grant to Reserves drawn as follows:
   - $5,300,000 – Asset Replacement/Rehabilitation Reserve
   - $2,000,000 – General Municipal Capital Reserve
   - $1,000,000 – Flood Mitigation Structure Maintenance Reserve; and

2) that Council direct administration to return during the 2024 budget amendment process with recommendations to cancel or delay $8,300,000 in future or carry forward capital projects to reallocate that funding towards the Cougar Creek Long-Term Mitigation capital project (CP#1562).

CARRIED UNANIMOUSLY

220-2023 Moved by Mayor Krausert that Council direct administration to continue to apply for grant funding, with any approved grants to be utilized to reduce the amount of reserve funding required for this project.

CARRIED UNANIMOUSLY

I. REPORTS FROM ADMINISTRATION – None

J. NOTICES OF MOTION – None

K. IN CAMERA – None

L. ADJOURNMENT

221-2023 Moved by Mayor Krausert that Council adjourn the September 5, 2023 regular meeting at 2:58 p.m.

CARRIED UNANIMOUSLY

_____
Sean Krausert, Mayor

_____
Cheryl Hyde, Municipal Clerk

Minutes approved by: _____ _____

Request for Decision

DATE OF MEETING:	**October 3, 2023**	**Agenda #:** G-1
TO:	Council	
SUBJECT:	Palliser Trail Area Structure Play Bylaw	
SUBMITTED BY:	2023-22 Josh Cairns, Senior Policy Planner	
RECOMMENDATION:	That Council give second reading to Palliser Trail Area Structure Plan Bylaw 2023-22. That Council give third reading to Palliser Trail Area Structure Plan Bylaw 2023-22.	

EXECUTIVE SUMMARY

Palliser Trail Area Structure Plan Bylaw 2023-22 received first reading September 5, 2023 and is the subject of a public hearing on October 3, 2023.

Administration's analysis and position on this matter presented at first reading of this bylaw remains unchanged. Please see Attachment 1 for the Request for Decision and related attachments presented at first reading.

ATTACHMENTS

1) RFD and attachments from the September 5, 2023 council meeting.

AUTHORIZATION

Approved by: Sally Caudill
Chief Administrative Officer Date September 25, 2023

Request for Decision

DATE OF MEETING:	**September 5, 2023**	**Agenda #:** G-4
TO:	Council	
SUBJECT:	Palliser Trail Area Structure Plan Bylaw 2023-22	
SUBMITTED BY:	Joshua Cairns, Senior Policy Planner	
RECOMMENDATION:	That Council give first reading to Palliser Trail Area Structure Plan Bylaw 2023-22 and schedule a public hearing for October 3, 2023.	

EXECUTIVE SUMMARY

An expedited review of the Palliser Trail Area Structure Plan (ASP) was launched in late 2022 for the purpose of updating the plan to ensure it addresses current and emerging community needs. The expedited review resulted in an updated Palliser Trail ASP (Attachment 1), which includes a new land use concept, public realm and transportation network, and supporting policy relating to urban design, housing, green development, environment, ecology, open spaces, and recreation. The updated Palliser Trail ASP is in stronger alignment with the Town's various plans, strategies, Council Strategic Plan, and Municipal Development Plan (MDP). Administration is recommending that Council give first reading to Bylaw 2023-22 and set a public hearing date for October 3, 2023.

RELEVANT COUNCIL DIRECTION, POLICY, OR BYLAWS

In the year 2000, Council adopted the Palliser Trail ASP (Bylaw 34-99). The Palliser Trail ASP is the statutory plan that provides a high-level framework to guide growth and change in the Palliser Trail area.

The expedited review and update of the ASP was informed by Council-adopted strategies and bylaws, including the MDP, Integrated Transportation Plan (ITP), Integrated Parking Management Plan (IPMP), Climate Action Plan, Comprehensive Housing Action Plan, Open Space and Trails Plan, Recreation Master Plan, and Council Strategic Plan (2023-2026).

DISCUSSION

In the year 2000, Council adopted the Palliser Trail ASP (Bylaw 34-99) – a high-level framework to guide growth and change in the Palliser Trail area. The ASP covers an area situated between the Lower Silvertip Wildlife Corridor and the Trans-Canada Highway, consisting of a collection of parcels owned by the Province of Alberta, Canmore Community Housing (CCH), and the Town of Canmore (Figure 1). The ASP was prepared by Southwell Trapp & Associates on behalf of the Alberta Social Housing Corporation and envisioned a mix of highway-oriented tourism and commercial uses with consideration for other uses such as employee housing.

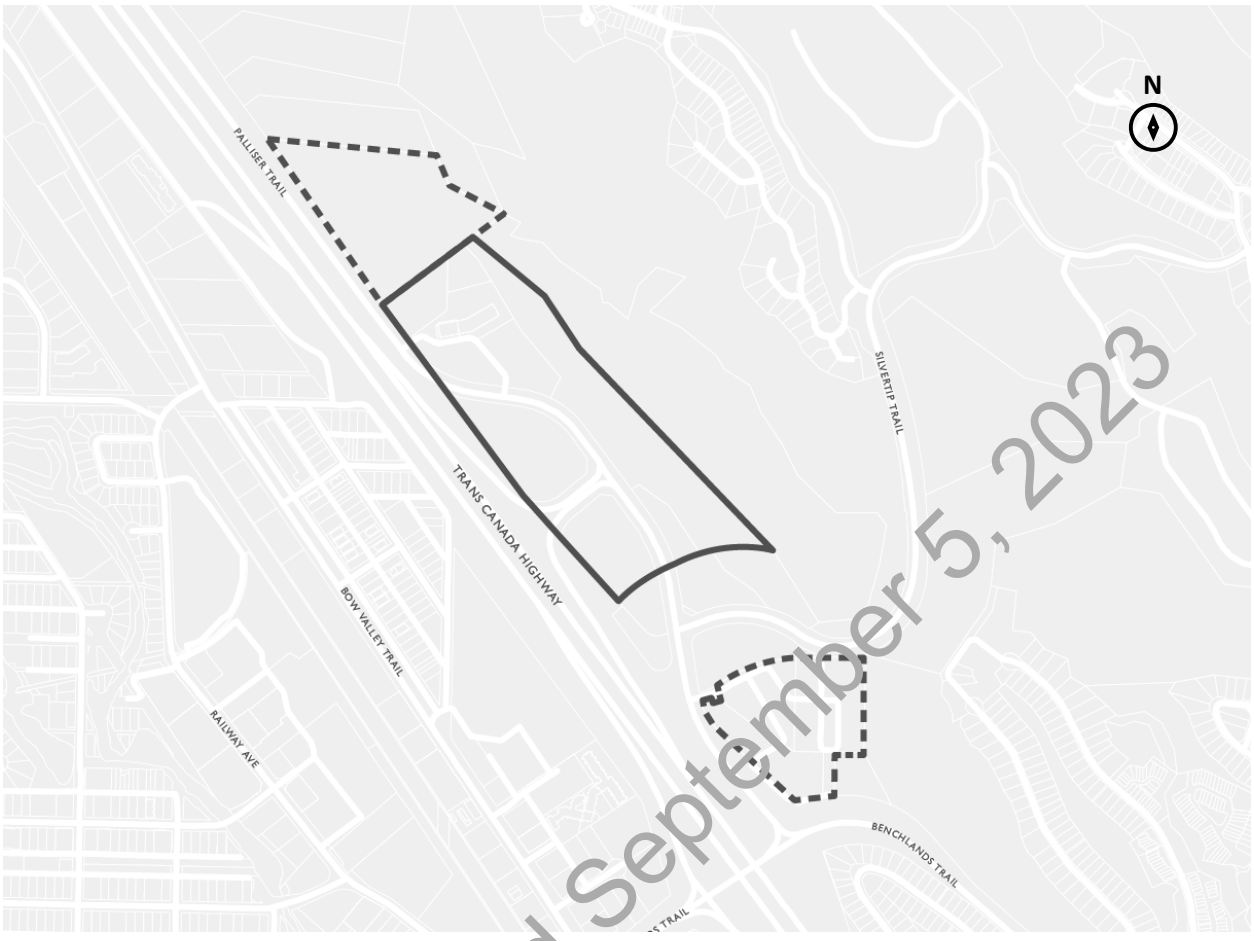

Figure 1: Map showing the original Palliser Trail ASP (2000) boundary (solid line) and the additions as part of the update (dashed line).

In late 2022 in response to the worsening housing crisis, administration began an expedited review of the Palliser Trail ASP to ensure the plan remains relevant in today's context and that future development on remaining undeveloped land will align with Council priorities and objectives. Stakeholder engagement, research, and analysis – including a review of the original ASP, the MDP, current Town strategies, and the Council Strategic Plan – identified four key goals that would inform potential updates to the plan:

1. Prioritizing diverse, affordable, and attainable housing;
2. Encouraging a complete, mixed-use, and walkable neighborhood;
3. Creating new opportunities on Town of Canmore and CCH lands; and
4. Aligning the plan with current community priorities.

Several key policy updates, including new concepts for land use, transportation, and the public realm, were prepared to address gaps in the original ASP and to align the plan with the four goals. In March 2023, administration undertook a three-week community engagement period to seek input and feedback on the key updates being considered. The feedback was analyzed and grouped into corresponding themes, which were used to inform the drafting of the updated plan. At the August 15, 2023 regular council meeting, administration provided a briefing on the draft plan including its alignment with the four key goals and a detailed summary of what we heard through engagement.

The updated Palliser Trail ASP (attachment 1, if approved) replaces the previous ASP adopted by Council in the year 2000 with a revised vision, objectives, and collection of policies that closely align with the Town's current goals and strategies and present an opportunity to meaningfully respond to the worsening housing crisis.

The key components of the updated plan are summarized below.

Land Use Concept

This plan introduces a land use concept that will support the creation of a compact and complete community, offering residents access to their daily needs within short walking distance. The character of the area will be defined by its variety of building types, housing options, land uses, and open spaces – each helping foster a diverse, inclusive, and more equitable community.

The proposed Mixed-Use Areas will serve as the heart of the neighbourhood, providing significant opportunity for local-serving commercial and job space in mixed-use buildings with affordable and attainable housing options located on the upper floors.

The adjacent Residential Areas will provide a mix of housing options, ranging from ground-oriented forms such as townhouses to low- and mid-rise apartment buildings. Building forms will be distributed throughout the plan's sub-areas to avoid the concentration of any single housing option and to provide visual intrigue and a sense of openness for visitors and residents. Building heights will peak at 6 storeys near the centre of the plan's area – ensuring more residents are able to walk to and easily access the shops and services of the Mixed-Use Areas. Away from the centre in the Residential Areas, building heights will be limited to 3 to 5 storeys with localized variations in support of urban design objectives, including sunlight exposure and the creation and preservation of views.

Housing

The MDP targets 20% of new housing to be "residential growth as non-market affordable housing" and encouraged in "a wide range of affordable housing types, tenures and densities" [and] "integrated and distributed throughout Canmore's neighbourhoods" (sections 5.1 and 5.2).

The updated Palliser Trail ASP will enable the creation of up to 1,300 units provided across the housing spectrum with an emphasis on affordable rental and affordable ownership opportunities in townhouse and low- and mid-rise building forms.

A new housing target will ensure at least 75% of all units will be affordable, non-market housing where purchase or rental prices are secured long-term at below-market values. This target reflects the most ambitious housing policy the Town has developed to date and significantly exceeds the MDP's target of 20%. Further, the 75% target reflects a minimum and may be exceeded. The affordable, non-market units will be distributed throughout the plan area and be designed to an architectural and material standard indistinguishable from market units in effort to support diversity, equity, and inclusion in this part of Canmore.

The significant additions the Palliser Trail ASP will make to Canmore's housing stock were informed by and align with the targets identified in the Bow Valley Region Housing Needs Assessment (2019).

Parks and Open Space

An important component of the updated plan is the addition of a public realm network that articulates a clear, coherent vision for a collection of parks and open spaces distributed throughout the Palliser Trail area. New opportunities for playgrounds, plazas, and the creation of a centrally located off-leash dog park have been identified and embedded in policy. These new open spaces will be connected and accessed through a network of trails, pathways, and roadways designed to reflect the unique character and sense of place that will come to define the area.

Further additions to the open space network will be made through Municipal Reserve dedicated at the time of subdivision. In addition to public spaces, the plan supports the provision of privately owned open spaces, acknowledging the important role that privately maintained spaces accessible to the public (e.g., plazas or pedestrian connections between new developments) can play in supporting a vibrant public realm.

The public realm network and supporting policies were prepared to align with the MDP and Open Space and Trails Plan. Implementation will be further informed by these strategies to ensure an effective contribution to the Town's goals for these types of spaces.

Transportation and Mobility

In alignment with the ITP, a multi-modal transportation and mobility network will provide linkages between future development areas and the rest of Canmore while providing more affordable options for residents to travel. New roadways will be provided with walking and cycling facilities (depending on the street classification), while pathways will offer desirable pedestrian routes that connect with the broader trail system. A new grade-separated crossing of the Trans-Canada Highway will provide residents with an efficient and safe way to access destinations west of Palliser Trail. These additions to the transportation and mobility network will be complemented by the expansion of transit service to the Palliser Trail area – providing an affordable option for travel within Canmore, while reducing congestion on roadways for those that need or choose to use a vehicle.

To help mitigate future challenges with congestion and vehicle use, a Transportation Impact Assessment and Parking Opportunities Assessment was completed to test the functionality of the improvements and ensure alignment with the intended modal split targets outlined within the ITP. These assessments validated the proposed network as well as the need for innovative parking policies to meet demand and Town objectives around affordability, livability, and climate action. As a result, the updated plan introduces a modernized approach to parking management that will require a district-scale approach to planning the supply of parking stalls, the sharing of stalls between multiple land uses or buildings, unbundling the purchase or rental of stalls from residential units, and the removal of mandated parking minimums. These parking policies align with the IPMP and will support the efficient supply and distribution of parking, as well as deeper levels of affordability for residents and additional open space for the public realm.

All improvements to the transportation and mobility network will be constructed to the standards outlined in the Engineering Design and Construction Guidelines (EDCG).

Environment, Ecology, and Green Development

The updated Palliser Trail ASP introduces new development policy to support environmentally sensitive development that reduces impacts on natural resources, minimizes ecological impacts, and supports the goals of the Environmental Sustainability Action Plan and Climate Action Plan.

New municipal and non-market affordable housing will be designed to achieve standards that significantly exceed those mandated by the Province, including a near net-zero emissions or similar standard incorporating combined heat and power or district energy systems, as well as solar- and EV-ready infrastructure – thereby implementing the recommendations of the Climate Action Plan.

Given the area's adjacency to the Lower Silvertip Wildlife Corridor, the updated plan incorporates new wildlife protections that implement the recommendations of the Bow Corridor Ecosystem Advisory Group and the draft Long-term Management Plan for the Lower Silvertip Wildlife Corridor. Notable changes from the original Palliser Trail ASP includes an increased building setback of 20 m to the wildlife corridor and an expansion of the area that is protected from future development (to be achieved through future subdivision).

Utilities & Servicing

All development will need to comply with such Town documents as the Land Use Bylaw (LUB), the EDCG, and any applicable provincial policy. New policies encourage best practices that exceed status quo, including the use of Low Impact Development strategies and the application of an Integrated Water Management Approach to site design. These strategies will support the sustainable management of water resources and seek to integrate green infrastructure in the public realm to manage stormwater runoff.

There are no concerns with the ability to achieve efficient delivery of water and utilities, or the ability to effectively move stormwater and wastewater to treatment systems for development in the plan area.

Implementation

The ASP introduces an implementation framework that includes the anticipated phasing of development. Full build out of the area is anticipated to occur within the next 10 to 20 years through phased development and the provision of infrastructure and services. All development will be required to comply with the provisions of other Town documents, including the LUB and EDCG. Risks associated with steep creeks and wildfires will be mitigated to a risk level that is acceptable for development and in accordance with Town policy and guidelines.

Amendments to bylaws, including the LUB, will be required to support future developments and will occur in a subsequent process following adoption of this ASP.

FINANCIAL IMPACTS

Although there are no immediate financial implications for the Town of Canmore to approve this ASP, implementation will include costs associated with infrastructure development, transportation improvements, public realm enhancements, and affordable housing initiatives. The incremental costs associated with these items will be recovered, in part, through off-site levies and sales. Additional funding opportunities, such as grants and contributions from senior levels of government, will be sought as necessary.

STAKEHOLDER ENGAGEMENT

Public engagement served as a critical input that helped shape the updated plan. Broad public engagement was conducted from March 13 - 31, 2023, with a mix of online and in-person opportunities to support accessibility and participation. The purpose of the engagement was to understand community perspectives on proposed key updates to the ASP so that the updated plan would better reflect community priorities and visions for the foreseeable future.

Online Component:

- 1,122 participants were "aware" (visited at least one page) of the project.
- 514 participants were "informed" (interacted with the project site).
- 199 submissions to the online survey were received.

In-person Opportunities:

- Two pop-up events and one open house were held, with approximately 90 people attending in total.

The public engagement period was in addition to engagement with key stakeholders that occurred throughout the planning process. Several collaborative meetings were held with CCH during the exploration, development, and refinement of policy to garner support and ensure the vision and directions of the ASP are aligned and achievable. Further engagement and communication will occur as appropriate during the implementation phase to ensure successful plan execution.

ATTACHMENTS

1) Palliser Trail Area Structure Plan Bylaw 2023-22

Authorization

Submitted by:	Joshua Cairns Senior Policy Planner	Date:	August 1, 2023
Approved by:	Lauren Miller Manager of Planning and Development	Date	August 15, 2023
Approved by:	Whitney Smithers General Manager of Infrastructure	Date:	August 18, 2023
Approved by:	Sally Caudill Chief Administrative Officer	Date:	August 28, 2023

Town of CANMORE

Attachment 1

BYLAW 2023-22

A BYLAW OF THE TOWN OF CANMORE, IN THE PROVINCE OF ALBERTA, TO ADOPT THE PALLISER TRAIL AREA STRUCTURE PLAN

The Council of the Town of Canmore, in the Province of Alberta, duly assembled, enacts as follows:

TITLE

1 This bylaw shall be known as the Palliser Trail Area Structure Plan Bylaw.

PROVISIONS

2 The Palliser Trail Area Structure Plan as set out in Schedule A is hereby adopted.

ENACTMENT/TRANSITION

3 If any clause in this bylaw is found to be invalid, it shall be severed from the remainder of the bylaw and shall not invalidate the whole bylaw.

4 Schedule A forms part of this bylaw.

5 Bylaw 34-99 is repealed.

6 This bylaw comes into force on the date it is passed.

FIRST READING:

PUBLIC HEARING:

SECOND READING:

THIRD READING:

Approved on behalf of the Town of Canmore:

Sean Krausert
Mayor

Date

Cheryl Hyde
Municipal Clerk

Date

Bylaw approved by: _____ _____

Town of CANMORE

PALLISER TRAIL

AREA STRUCTURE PLAN

September 2023

Publishing information

Title

Palliser Trail Area Structure Plan
Bylaw 2023-22

Author

Town of Canmore

Note

The original Palliser Trail Area Structure Plan was prepared by Southwell Trapp and Associates on behalf of the Alberta Social Housing Corporated and was adopted by Council in the year 2000. The Town of Canmore initiated a review and update of the plan in 2022. This document supersedes the original plan.

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01

ADMINISTRATION

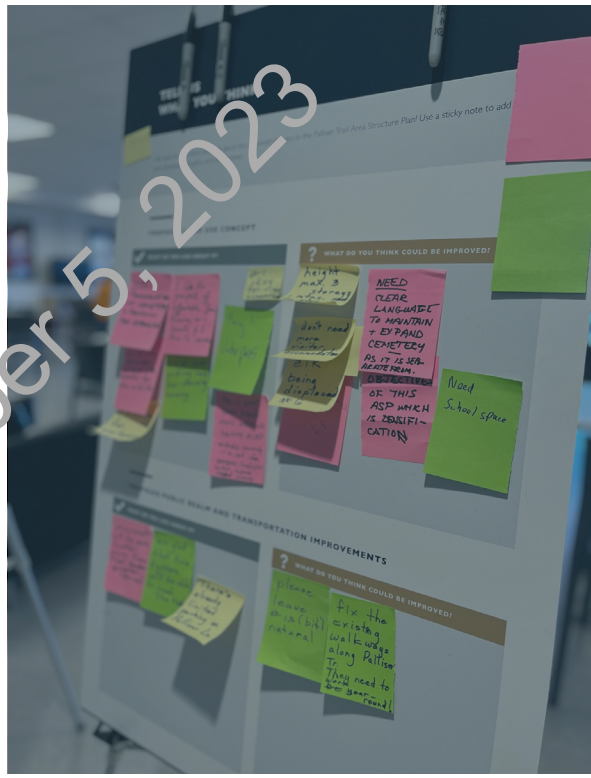
This section provides an overview of administrative components of the plan, including its purpose, authority, timeframe, interpretation, procedures for amendment, and public participation.

1.1 Purpose

The purpose of the Palliser Trail Area Structure Plan (ASP) is to provide a framework to guide subdivision and development in the Palliser Trail area that results in a vibrant, complete neighbourhood with a mix of land uses, housing choices, and connected public spaces.

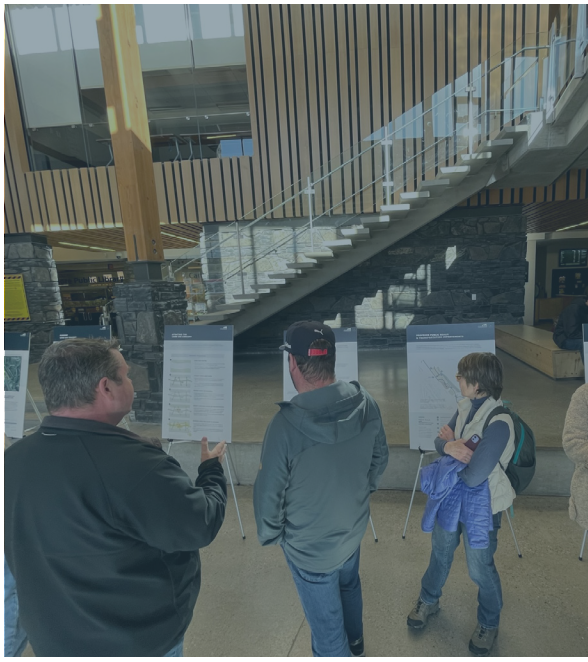
To accomplish this purpose, the plan establishes a future vision supported by an overall land use concept, policies, and implementation plan.

The Palliser Trail ASP was adopted by the Town of Canmore in the year 2000 and subsequently replaced in 2023 to provide an updated land use concept and policies that align with current community priorities.



1.2 Authority

The plan is prepared in accordance with the provisions of the *Municipal Government Act (MGA)* and policy requirements established in the Town of Canmore's *Municipal Development Plan (MDP) Bylaw 2016-03*. The *MDP* indicates that prior to any land use redesignation an ASP shall be approved by Council.



1.3 Public Participation

The updated Palliser Trail ASP (2023) was prepared with input from Council, administration, stakeholders, and the community.

In March 2023, administration engaged the community through two pop-up engagement sessions, an open house event, an online survey, and an online interactive question tool. Nearly 300 members of the community participated in these engagement efforts and took the time to share their thoughts on the proposed updates that were being considered in the updated ASP. Feedback was reviewed in April 2023 and was used to inform the final drafting of the updated plan.

1.4 Timeframe

The developable parcels identified in this plan are anticipated to be constructed over the next 10 to 20 years. Anticipated phasing of development is provided in Section 6.2.

1.5 Limitations

ASPs are long-term plans that provide a high-level vision and supporting policies for a particular area. The policies within this plan should not be interpreted as an explicit approval for a use on a specific site. Detailed site conditions will be assessed on a case-by-case basis as part of subdivision, land use redesignation, or Development Permit.

1.6 Amendments

As full build out of the area is anticipated to take up to 20 years, it is acknowledged that amendments to the ASP may be required to respond to changing conditions, circumstances, and priorities.

Amendments that fundamentally alter the purpose and intent of the ASP must be approved by bylaw in accordance with the *MGA*.

Depending on the nature of the amendment, supporting information considered necessary by the Approving Authority to evaluate the amendment may be required.

1.7 Interpretation

All maps and graphics are for supplemental information. Locations of boundaries, symbols, or other identifying markers should be considered approximate unless explicitly stated otherwise.

Policy has been articulated to an extent deemed suitable for an ASP and in relation to the Palliser Trail area. Where necessary, a reasonable interpretation of policy should be made with consideration for the plan's vision, goals, policies, Town bylaws and strategies. For convenience, terms that are defined in the glossary (Appendix A.1) are underlined the first time they appear on a page in body text.

Policy is considered mandatory. Where words such as "should", "may", or "encourage" are used, the policy must still be considered mandatory except in circumstances where the Approving Authority deems such a requirement is unreasonable, irrelevant, or where alternatives may be deemed as satisfactory.

Requirements may be deferred to a future stage in the approvals process if deemed appropriate by the Approving Authority.

The Approving Authority shall have discretion over the application or interpretation of policy within this plan.

1.8 Supporting Documents

The updates to this plan were informed by the Town's *MDP*, policies, strategies, and bylaws in place at the time of drafting this document, as well as the following studies and reports:

- **Transportation Impact Assessment Update (2023)**
  WSP Canada Inc.
- **Parking Assessment (2023)**
  Victoria Transport Policy Institute
- **Stormwater Feasibility Review (2023)**
  WSP Canada Inc.
- **Utility Assessment for Palliser Trail (2023)**
  CIMA+
- **Canmore Retail Gap Analysis and Light Industrial & Commercial Land Review (2023)**
  Deloitte LLP, Fowler Bauild & Mitchell Ltd.
- **Long-term Management Plan for the Lower Silvertip Wildlife Corridor (2023)**
  Stormy Lake Consulting
- **Lower Silvertip Wildlife Corridor Study (2020)**
  Management and Solutions in Environmental Science
- **Wildlife Corridor and Habitat Patch Guidelines (2012)**
  Bow Corridor Ecosystem Advisory Group (BCEAG)

02

CONTEXT

This section provides relevant context and background information to create an improved understanding of the Palliser Trail area and the plan's vision for how it will evolve over time.

2.1 Location

The Palliser Trail area is located in the northern portion of Canmore, bordered by Silvertip Resort and the Lower Silvertip Wildlife Corridor to the east and the Trans Canada Highway (Highway 1) to the west. It is uniquely situated on the doorstep to Banff National Park and the UNESCO Rocky Mountain World Heritage Site.

The overall ASP area is comprised of approximately 23 hectares (57 acres) of land owned by Canmore Community Housing, the Town of Canmore, and the Province of Alberta.

Map 1 provides an overview of the general Palliser Trail ASP area. Adjacent policy areas are provided in Map 2.

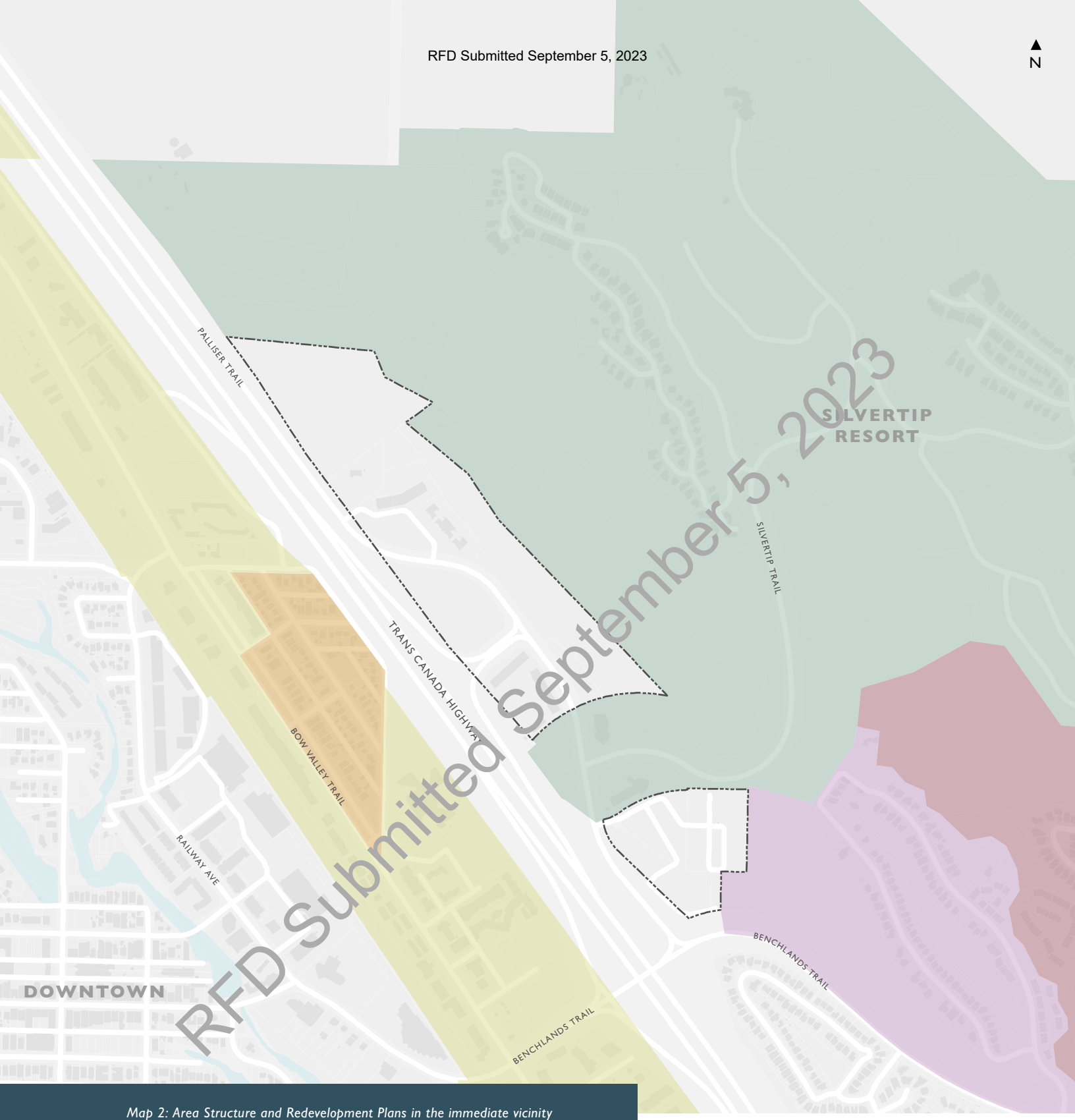
Maps on the following pages are for illustrative purposes only. Boundaries are approximate.

Map 1: Location of the Palliser Trail ASP area and notable features or destinations

LEGEND

- Wildlife Corridor[1]
- Bow Valley Provincial Park boundary
- Palliser Trail ASP boundary
- Elevation contours (5 m)

[1] This plan defines the extent of the Lower Silvertip Wildlife Corridor in accordance with the boundaries approved in the Silvertip Area Structure Plan (2007).



Map 2: Area Structure and Redevelopment Plans in the immediate vicinity

LEGEND

- Silvertip ASP
- Eagle Terrace ASP
- Upper Benchlands ASP
- Teepee Town ARP
- Bow Valley Trail ARP
- Palliser Trail ASP

2.2 Background

In the year 2000, Council adopted an ASP for the Palliser Trail area that was prepared by Southwell Trapp & Associates on behalf of the Alberta Social Housing Corporation. The ASP provided a high-level vision for the area and envisioned a mix of highway-oriented commercial and tourism uses.

Over the following two decades, three parcels were developed with residential buildings and a new firehall was constructed in the area.

In 2022, the Town initiated a review of the ASP to ensure future development on remaining parcels would align with current community priorities. The plan area was expanded to incorporate adjacent Town of Canmore and Canmore Community Housing parcels, and new policy direction was informed by four key goals (Figure 1). A summary of key policy changes is provided in Appendix A.1.

Figure 1: Four key goals that informed policy changes as part of the Palliser Trail ASP update

2.3 Vision

"The Palliser Trail area will become a vibrant mixed-use neighbourhood with a diverse population, accessible housing opportunities, and spaces for local business. It will be defined by its network of attractive public spaces and will demonstrate a commitment to walkability, environmentally sensitive design, and fostering a sense of connection to the surrounding natural environment."

2.4 Goals

The primary goal of the Palliser Trail ASP is to create a complete, compact and sustainable neighbourhood that provides places for people to live across the housing spectrum.

Mixed-use areas will form the heart of the neighbourhood and provide opportunities for social interaction. Cafes, restaurants, markets, offices, and other commercial uses will provide residents with walking access to their daily needs and foster a sense of place.

Adjacent residential areas will be defined by their inclusivity and provide homes for residents at varying income levels, backgrounds, and needs. Non-market units will be indistinguishable from market units, and will be integrated throughout the Palliser Trail area—whether in townhouses, low-rise apartment buildings, or other building forms. These areas will be highly livable, utilizing various strategies to reduce the visual and noise impacts of the Trans-Canada Highway.

People will be able to move easily within the neighbourhood—whether along sanctioned trails, illuminated pathways, or complete streets—and enjoy a network of attractive open spaces that offer views of the mountains and the rest of Canmore.

2.5 Objectives

1. Create a framework for the orderly planning, subdivision, and development of the area.
2. Clearly identify developable and non-developable lands and minimize the environmental impact of any future development.
3. Create an attractive residential and commercial development area that implements the goals and objectives of the *MDP* and provides attainable homes for residents.
4. Provide clear policy direction while allowing flexibility for uses and forms of development that can respond to changing market conditions and community needs.
5. Ensure development and utility servicing is planned and constructed in a logical phased sequence.
6. Preserve the integrity of adjacent land uses and wildlife corridors.
7. Incorporate visual components—including views, architecture, and landscaping–into the overall planning and development of the area.

03

LAND USE CONCEPT

The land use concept provides the overall neighbourhood structure for future change in the area, identifying the desired mix of uses, maximum building heights, and supporting infrastructure and public realm improvements.

3.1 Overview

The land use concept supports the vision, goals, and objectives of the plan. It envisions a centrally located mixed-use area that will form the heart of the neighbourhood, complemented by residential areas that provide a range of housing options capable of supporting a diverse community.

The distribution of land uses and density was informed by several guiding principles (illustrated in Figure 2) that seek to ensure that future development supports a healthy environment, the protection of wildlife, and the well-being of its residents:

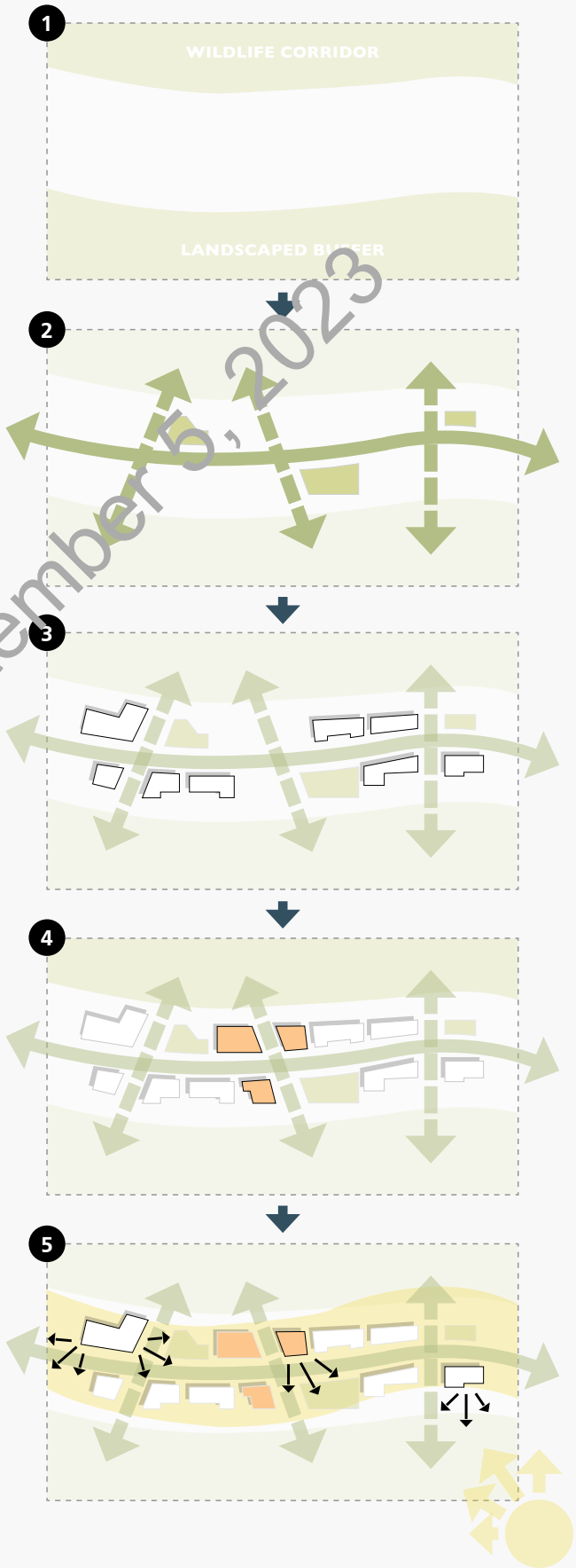
1. *Work with and respect nature*
2. *Connect people and places*
3. *Provide homes for residents*
4. *Create a walkable, mixed-use neighbourhood*
5. *Maximize views and access to sunlight*

The land use concept categorizes parcels into different land use areas (Map 3), supported by several key transportation and public realm improvements (Map 4). Descriptions of each area and relevant land use policy are provided in Sections 3.2 to 3.4. Additional development policy is in Chapter 4.

The land use concept was designed to provide clear direction regarding anticipated land uses and building heights while also allowing for flexibility to respond to changing market conditions, provide public benefits, and achieve an enhanced urban design and public realm.

Locations shown on the following maps are approximate and may be refined through further planning, design, and future development.

Figure 2: Five guiding principles that, layered upon one another, informed the land use concept.

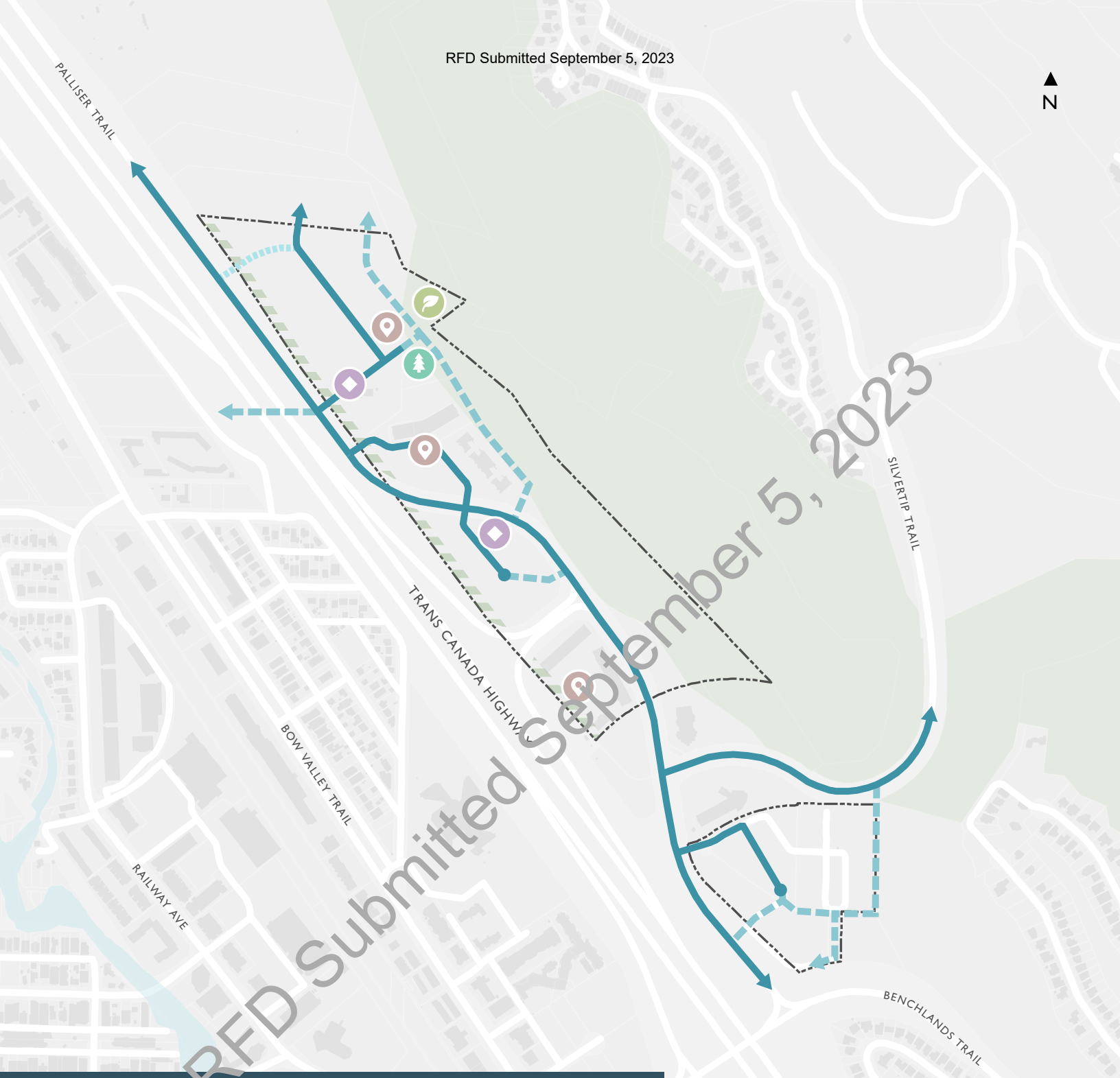


Map 3: Land use concept for the Palliser Trail area

Numbers identify sub-areas referenced in this plan.

LEGEND

- Residential (3 to 5 storeys)
- Residential (up to 6 storeys)
- Mixed-use (3 to 5 storeys)
- Mixed use (up to 6 storeys)
- Civic uses (up to 6 storeys)
- Conservation of Wildlands (Wildlife Corridor)
- Park
- Palliser Trail ASP boundary



Map 4: Key public realm and transportation improvements

LEGEND

- Roadway with walking, cycling, and transit facilities (based on street classification)
- Pathway (walking and cycling connection)
- Secondary access for emergency/transit (pending timing of adjacent development)
- Lower Silvertip Wildlife Corridor
- Palliser Trail ASP boundary
- Plaza
- Open space opportunity
- Park space
- Expansion of protected wildlife corridor area
- Landscaped buffer

3.2 Residential Areas

The residential areas will provide high-quality, safe, and accessible housing options that offer a variety of housing types, sizes, and tenures to meet the needs of individuals and families across a range of incomes. The goal is to create a diverse and inclusive neighbourhood that fosters a sense of community and promotes the health and well-being of its residents.

Applicable sub-areas:

1 2 4 5 6 9 10

Policy

1. Residential areas will generally be accommodated as shown on Map 3.
2. Maximum building heights will be within the height ranges specified on Map 3.
3. All developments should generally align with the projections described in Section 3.5.
4. Residential will be the predominant use throughout the residential areas.
5. Commercial uses will be supported throughout the residential areas to provide flexibility, respond to community needs, and changing market conditions.
6. Low-impact civic uses that will not negatively impact the public realm or wildlife corridor may be considered in sub-area 10.
7. Other uses may be considered by the Approving Authority in limited locations so long as:
   a) the minimum projections for residential units specified in Section 3.5 can be achieved; and,
   b) the proposed uses are compatible with residential development and would not significantly compromise the livability of residential units.
8. A range of dwelling types must be provided throughout the residential areas to provide a balance between lower and higher density forms, such as townhomes and apartments.
9. The placement of lower and higher density forms within each sub-area must be informed by topography, solar access, views, proximity to transit, potential adjacency impacts, and the policies in Section 4.1.
10. A Conceptual Scheme will be required for sub-area 1:
    a) prior to land use designation or subdivision; and,
    b) will be prepared in accordance with the *MDP* and will include anticipated building envelopes, building orientation, use of existing treed areas within proposed parcels, view potential of future developments, parking, and landscaping design.

3.3 Mixed-Use Areas

The mixed-use areas will become an important gathering point for local residents, supporting the creation of a complete neighbourhood that provides access to significant commercial space, a mix of market and non-market affordable housing, a vibrant public realm, and public amenities—all within short walking distance.

Applicable sub-areas:

1 2 7

Policy

1. Mixed-use areas will generally be accommodated as shown on Map 3.
2. Maximum building heights will be within the height ranges specified on Map 3.
3. All developments should generally align with the projections described in Section 3.5.
4. A mix of commercial uses must be provided on a majority of the lower levels of mixed-use buildings with residential or other compatible uses located above.
5. A variety of commercial uses are desired. This could include retail, grocery, food and beverage, personal service, arts and entertainment, office, not-for-profit space, and/or institutional uses.
6. Where appropriate, commercial uses are encouraged on the second floor to further activate the public realm and provide additional opportunities for patio space and outdoor seating.
7. The use of patios, outdoor seating areas, and plazas are encouraged and should be designed for year-round use.
8. Developments exposed to the Trans-Canada Highway shall implement measures to ensure the livability of residential units, including strategic unit orientation and the use of higher-rated STC windows and construction on exterior walls facing the highway.
9. Along the southwestern portion of sub-area 7 where the parcel fronts the Trans-Canada Highway:
   a) a continuous streetwall design will be provided to screen public areas from the highway; and,
   b) a maximum of 4-5 storeys should be provided to help maximize views and solar exposure for public spaces and residential units.
10. Live/work studios are encouraged within mixed-use buildings.
11. Further subdivision will be considered by the Approving Authority. However, further subdivision will require more detailed concept planning with particular attention to building envelopes, building orientation, use of existing treed areas within development parcels, view potential, parking, and landscape design.

3.4 Civic Areas

The civic areas will help support the Town's operations both within and beyond the Palliser Trail area. A range of uses will be supported to ensure there is adequate space and facilities to meet the evolving needs of the community over the long-term.

Applicable sub-areas:

I1 I2 I3

Policy

1. Civic use areas will generally be accommodated in the locations shown on Map 3.
2. Building heights are generally anticipated to be within the height ranges specified on Map 3 but may vary to accommodate specific uses or facilities.
3. A broad range of public and community-oriented uses are supported. This includes recreation facilities, office space, policing or fire facilities, or other uses necessary to support the provision of public services.
4. Using a portion of the existing Municipal Reserve (MR) parcel to the east should be considered to facilitate future development of civic uses.
5. The co-location of multiple uses, facilities, and amenities is strongly encouraged, including the provision of commercial uses on lower levels to activate Benchlands Trail and/or Palliser Trail.
6. Future development shall provide pedestrian access from Benchlands Trail and/or Palliser Trail.
7. The cemetary use will be retained in sub-area 13 and its expansion may be accommodated in sub-area 11.

3.5 Projections by Sub-area

The following table provides an overview of the projected intensification of each sub-area as identified in the land use concept (Map 3) and with consideration for the policies provided in this plan.

Sub-area	Residential Units (minimum)	(maximum)	Non-market Affordable Housing Units (minimum percent of residential units)	Other Uses[c] (minimum)	(maximum)
1	400	600	50%	250 sq. m	1,500 sq. m
2	50	150	100%	0 sq. m	500 sq. m
3[a]	n/a	n/a	n/a	n/a	n/a
5	50	150	100%	n/a	n/a
7	250	350	100%	2,000 sq. m	4,000 sq. m
8[a]	n/a	n/a	n/a	n/a	n/a
10	0	50	100%	0 sq. m	2,000 sq. m
11[a]	n/a	n/a	n/a	n/a	n/a
12[a]	n/a	n/a	n/a	n/a	n/a
13	0	0	n/a	5,000 sq. m	12,500 sq. m
Total	750	1,300	75%[d]	7,250 sq. m	20,500 sq. m
Developed sub-areas[b]					
4	97	97	0%	0 sq. m	0 sq. m
6	60	60	100%	0 sq. m	0 sq. m
9	148	148	27%	0 sq. m	0 sq. m
Total	305	305	32%	0 sq. m	0 sq. m

[a] *Site not identified for future development.*

[b] *Sub-areas developed in accordance with the original Palliser Trail ASP (2000). Numbers reflect the constructed total and are included for reference.*

[c] *Numbers in this column reflect gross floor area and are estimates only (informed by a Retail Gap Analysis, industry targets for supportable retail and office floor area per capita, and building massing explorations). Future development will be assessed for consistency with policies within the plan and may provide more or less floor area for other uses than the anticipated range.*

[d] *Percent of residential units anticipated to be provided as non-market affordable housing. Percentage calculated assuming each sub-area provides median number of units between minimum and maximum values.*

04

DEVELOPMENT POLICY

This section provides guiding policy in several topic areas to ensure future development supports the vision, goals, and objectives of the plan and aligns with the Town's strategies and bylaws.

4.1 Urban Design

Intent

To promote the creation of a functional, attractive, and livable built environment that supports public life and complements the unique location and mountain setting of the Palliser Trail area. These policies are supplemental to Section 11: Community Architectural & Urban Design Standards of the Land Use Bylaw.

Policy

Public Realm

1. The identified public realm opportunities will be implemented as generally shown on Map 4.
2. The open space network will be expanded throughout the plan area consistent with the policies provided in Section 4.6.
3. A vibrant public realm will be created that reflects the unique character of each sub-area:
   a) Mixed-use and civic areas will incorporate hardscaping, public art elements, plazas, and material choices that support higher levels of activity in the mixed-use areas.
   b) Residential areas will emphasize softscaping elements, pathways, open spaces, and naturalized landscaping that foster a sense of respite and connection to nature.
4. Public spaces should incorporate weather protection elements and be designed to support year-round use.
5. Privately owned open spaces that allow for public use, such as plazas, expanded streetscapes, green spaces, and pedestrian connections will be supported.
6. Plazas should be at least 300 sq. m and designed with visual and physical openness and active edges (e.g., patios, retail entrances).
7. Furnishings, such as tables and seating, shall be provided at appropriate locations throughout the area.
8. Exterior lighting must be kept to a pedestrian scale, downward focused, and orientated away from the Lower Silvertip Wildlife Corridor.
9. Signage directly orientated to or legible from the Trans-Canada Highway will not be allowed.

Building Siting & Design

10. Building form and architectural detailing will reflect a mountain aesthetic that incorporates earthy tones, natural materials and textures, and sloping rooflines.
11. High-quality architectural design and materials must be used for all development in response to the area's prominent location and visibility from the Trans-Canada Highway.
12. Existing topography and natural features must inform site planning to support the creation of intriguing view corridors from public spaces.
13. Buildings on sloped sites shall use slope adaptive techniques to limit terrain modification, reduce visual impact, and create more effective access points.
14. A varied streetscape will be created and achieved through assorted building forms, heights, terracing, orientation, density, and architectural detailing (Figure 3).

15. Building siting, orientation, and design must:

    a) optimize sunlight exposure and the creation of views from both the private and public realm;

    b) reduce privacy impacts on existing buildings and maximize privacy for new units; and,

    c) mitigate noise pollution from the Trans-Canada Highway through various strategies (e.g., additional sound proofing, strategic building orientation, or the use of single-loaded corridors).

16. Where new buildings are proposed adjacent to existing residential buildings at the time of ASP adoption, design measures must be used that reduce impacts on privacy, views, and solar exposure.

17. To ensure safety guidelines for development adjacent to the overhead power lines are met, no portion of a building will be permitted within 5.2 metres of the existing powerline right of way unless a reduced setback is deemed appropriate through consultation with AltaLink.

18. Buildings shall incorporate universal design principles to ensure they are accessible and inclusive for people of diverse abilities and needs.

19. At-grade residential units must create active edges with the street through the use of patios, windows, entrances, and landscaping.

20. Market and non-market housing must be indistinguishable and distributed in a manner that ensures equitable access to amenities, views, sunlight, quietness, and open spaces.

21. Commercial unit frontages should:

    a) be human-scaled and not exceed 15 metres in width;

    b) provide space for patios and outdoor merchandising;

    c) wrap building frontages on street corners; and,

    d) provide continuous weather protection.

22. A mix of public benefits, including daycare facilities, will be provided throughout the plan area proportionate to the scale and impact of proposed development. Incentives or relaxations will be considered to facilitate the provision of public benefits.

23. A landscaped buffer must be provided within designated parcels as generally shown on Map 4 and must:

    a) use native species suitable for year-round visual screening and noise buffering; and,

    b) be a minimum of 12 metres in depth in residential areas and 8 metres in depth in mixed-use areas. The depth of the buffer may be reduced at the discretion of the Approving Authority if it unnecessarily constrains a development and when alternative screening measures are utilized.

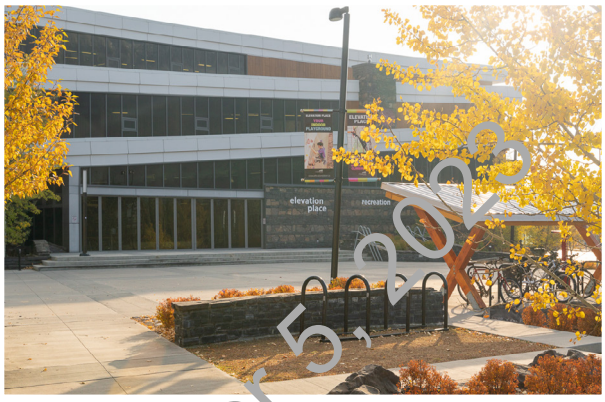
Figure 3: Conceptual illustration showing a desired variation in building forms and heights, with interspersed open spaces that receive sunlight.

The following images demonstrate what the different land use areas could look like in the future and are for illustrative purposes only.

Residential Areas

Mixed-Use Areas

Civic Areas



4.2 Housing

Intent

To create a more diverse and equitable neighbourhood with a range of housing types, tenures, and forms dispersed throughout the plan area.

Policy

1. New residential development shall provide options across the housing spectrum that target a range of individuals and income levels. This includes a mix of rental and ownership housing, and a diverse selection of unit types and sizes.
2. Short-term rentals shall be prohibited throughout the plan area to ensure new housing units are created for residents.
3. At least 75% of all residential units within the Palliser Trail area will be secured as non-market affordable housing. Targets for each sub-area are provided in Section 3.5.
4. In accordance with the *Municipal Development Plan*, the purchase price or rental rates of non-market affordable housing units will be at below-market values and secured for the life of the building through a legal mechanism to the satisfaction of the Town.
5. Accessory Dwelling Units are encouraged within lower-density building forms, such as townhomes.
6. Live/work studios are encouraged throughout the plan area in support of the *Cultural Master Plan.*

4.3 Green Development

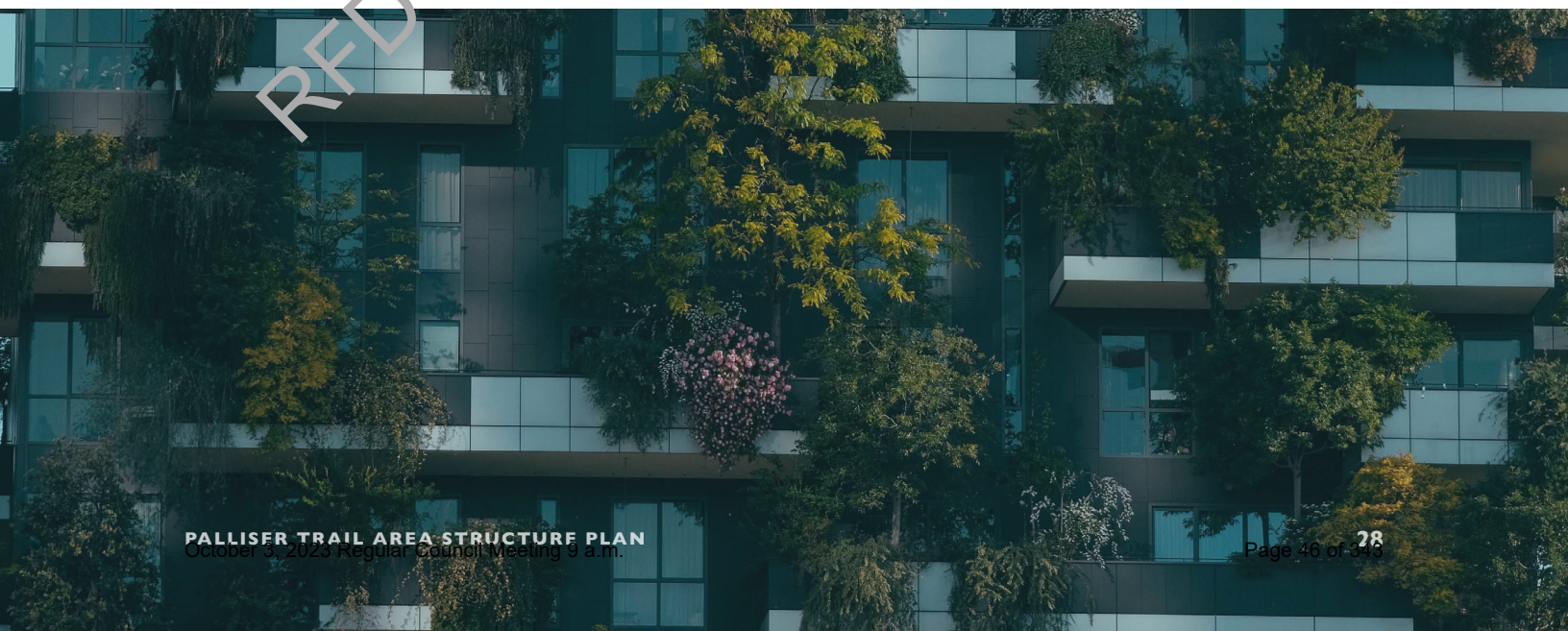
Intent

To promote environmentally sustainable design within the Palliser Trail area that reduces impacts on natural resources and creates a more resilient neighbourhood that supports the goals of the Climate Action Plan and MDP.

Policy

1. In alignment with the recommendations of the *Climate Action Plan*, municipal and non-market affordable housing buildings shall:
   a) achieve near net zero emissions or a similar high green building standard, which should include combined heat and power or district energy systems;
   b) be constructed to be solar ready with building and roof orientations suitable for rooftop and siding solar options; and,
   c) provide the infrastructure necessary to support the transition to widespread electric vehicle adoption.
2. Incentives or relaxations for other forms of development will be considered to achieve the design standards specified in Policy 4.3.1.
3. Strategies should be used to manage water on-site where appropriate and when building and plumbing codes permit. This includes green roofs, purple pipe rainwater reuse systems, and Low Impact Development (LID) treatments.
4. New development shall incorporate design strategies that reduce energy consumption and support the affordability of residential units by reducing ongoing maintenance or operating costs. This should include strategic tree retention or landscaping, building or unit orientation, and seasonal solar exposure.

Additional policy is provided in Section 4.4 (Environment & Ecology).



4.4 Environment & Ecology

Intent

To support environmentally sensitive development within the plan area that minimizes ecological impact and supports the goals of the Environmental Sustainability Action Plan and the recommendations of the Long-term Management Plan for the Lower Silvertip Wildlife Corridor.

Policy

1. New development is prohibited within the boundaries of the Lower Silvertip Wildlife Corridor, as generally shown on Map 1.

2. The Lower Silvertip Wildlife Corridor will be expanded and protected by requiring any portion of land that falls within its boundaries, as shown on Map 1, to be dedicated as Conservation Reserve, Environmental Reserve, or protected through a Conservation Easement at time of subdivision.

3. Developments immediately adjacent to the Lower Silvertip Wildlife Corridor shall:

    a) set back building envelopes a minimum of 20 metres from the boundary of the wildlife corridor, as shown on Map 1;

    b) leave the set back in a naturalized state as appropriate, with the exception of vegetation management as required to reduce fire risk;

    c) use informal, naturalistic planting;

    d) be designed to protect, wherever possible, existing vegetation along the wildlife corridor boundary; and,

    e) demonstrate alignment with the recommendations of the *Long-term Management Plan for the Lower Silvertip Wildlife Corridor.*

4. The long-term use of existing trails through this area will be informed by the *Open Space and Trails Plan* and the *Long-term Management Plan for the Lower Silvertip Wildlife Corridor.*

5. Landowners will be required to provide wildlife fencing in a manner consistent with the recommendations of the *Long-term Management Plan for the Lower Silvertip Wildlife Corridor.*

6. Site planning shall incorporate the recommendations from BCEAG's *Wildlife Corridor and Habitat Patch Guidelines for the Bow Valley* and the *Long-term Management Plan for the Lower Silvertip Wildlife Corridor* that are applicable to development. In cases where the recommendations may conflict with policy within this plan, the policies of this plan apply.

7. Exact boundary locations for future Environmental Reserve or Conservation Reserve will be established at the time of subdivision and land use redesignation.

8. The environmental effects of development must be minimized and mitigation actions, such as controls for erosion and contaminated discharge, should be implemented to reduce impacts during construction.

9. All new planting must use native, non-fruit bearing plant species with low water use requirements. Monocultures will be avoided.

10. As Douglas Fir are native to the Palliser Trail area and offer fire resistant characteristics, all developments shall:

    a) preserve and incorporate existing mature Douglas Fir tree stands into site design; and,

    b) use Douglas Fir as one of the tree species in new plantings.

11. Landscape plans must incorporate FireSmart planting principles and utilize plant species recommended by WildSmart.

12. Developments shall be required to adhere to the applicable policies provided in the *MDP* regarding wildfire risk.

4.5 Open Spaces & Recreation

Intent

To expand and improve access to the open space network within the Palliser Trail area in alignment with the Open Spaces and Trails Plan, Recreation Master Plan, and MDP.

Policy

1. New open space areas will be created throughout the Palliser Trail area on private and public lands. These areas shall include, but are not limited to, the opportunities identified on Map 4.
2. The location, size, type, and configuration of open space areas will be informed by the *Open Spaces and Trails Plan* and the *Recreation Master Plan.*
3. Open space areas will be connected by pathways, trails, and roadways as appropriate. New pathways and trails should consider the conceptual alignments provided in the *Long-term Management Plan for the Lower Silvertip Wildlife Corridor.*
4. Playground facilities, designed in collaboration with the Town of Canmore, will be required in sub-areas 1, 5, and 9.
5. MR location and distribution will be established at time of Conceptual Scheme preparation in consultation with the Town of Canmore and considering, but not bound by, the public realm opportunities identified on Map 4.
6. Sub-area 1 shall provide a 10% allocation toward MR. Preferential locations may include adjacent to sub-area 3 to facilitate the co-location of a small neighbourhood park or recreation uses.
7. The Town will provide an off-leash dog park in the existing MR parcel as identified in sub-area 3 (Map 3), and will explore opportunities to integrate a neighbourhood park within this MR parcel or on lands dedicated from sub-areas 1 or 2.

05

TRANSPORTATION & SERVICING

This section provides policies to ensure the creation of a more equitable and resilient multi-modal community that prioritizes sustainable choices and the efficient provision of critical infrastructure.

5.1 Transportation & Mobility

Intent

To provide for a safe, convenient, and sustainable transportation network that supports the goals and mode share targets of the Town's Integrated Transportation Plan (ITP), aligns with the results of the Transportation Impact Assessment, and contributes to the overall affordability of living in the Palliser Trail area.

Policy

1. An integrated, multi-modal transportation network will be provided as generally shown on Map 4.
2. The design and layout of roadways and pathways must be consistent with the *Engineering Design and Construction Guidelines (EDCG)* and *ITP*, and be a primary consideration in the design of future subdivisions.
3. Pedestrian connectivity will be improved throughout the neighbourhood with linkages to key destinations, open spaces, and authorized trails as identified in the *Long-term Management Plan for the Lower Silvertip Wildlife Corridor*.
4. Pedestrian, cycling, and transit facilities will be developed along Palliser Trail in accordance with the *EDCG*.
5. A connection for walking and cycling will be provided across the Trans-Canada Highway to improve safety, achieve mode-share targets, and support commercial development in the Palliser Trail area.
6. The transportation network will be designed to meet accessibility guidelines for all ages and abilities. For locations where this is not possible, alternative connections shall be provided.
7. Curvilinear streets and sidewalks should be used to minimize grades and improve walkability.
8. An Activity Street will be provided in sub-area 7 that supports walkability, safety, and the provision of significant public space.
9. Additions to the transportation network will be designed to efficiently integrate with the broader network outside the Palliser Trail ASP area.
10. Quality transit service will be provided at the outset of new development and in support of parking and transportation policy.
11. The Town will develop and implement effective transportation and parking strategies that align with the *Integrated Parking Management Plan*, the recommendations of the *Parking Opportunities Assessment* and *Transportation Impact Assessment*, and the Town's affordability and climate action goals, including the:
    a) removal of minimum parking requirements to prevent the oversupply of parking;
    b) regulation of on-street parking supply, including timing, usage, and pricing controls that reduce subsidies and optimize the supply of parking;
    c) provision of user information tools that support the utilization of parking spaces; and,
    d) improvement and expansion of active transportation infrastructure.
12. All new development shall prepare and implement an integrated parking management strategy that:
    a) unbundles the supply and cost of parking from residential units;
    b) provides shared parking facilities between uses (e.g., residential and commercial) or multiple buildings;
    c) supports the provision of carshare services by dedicated parking spaces for this use;
    d) addresses potential overflow or spillover parking problems, including demand during peak periods and enforcement of unauthorized parking on private property; and,

e) utilizes other tools, as appropriate, to support affordability, climate action, and the goals of the *ITP* and *Integrated Parking Management Plan (IPMP)*.

13. A district-scale approach to parking management will inform the Conceptual Scheme or Subdivision phase of planning.

14. Residential parking must be located underground or within building envelopes and accessed from the lane to support an enhanced public realm.

15. Surface parking will be permitted for lower-density buildings, such as townhouses, where residential parking spaces can be accommodated within driveways or a limited number of surface parking stalls.

16. Surface parking, or a combination of underground and surface parking, may be considered for higher-density development at the discretion of the Town if:

    a) unforeseen circumstances or geophysical constraints necessitate surface parking; or,

    b) the extent of land required for surface parking is deemed to be minimal and will not adversely impact the public realm.

17. Where surface parking is provided, the parking area must:

    a) be located at the rear or side of buildings and screened from the street or public spaces with landscaping; and,

    b) incorporate LID treatments such as bioswales and permeable pavement to reduce peak flows and improve water quality.

18. Traffic-calmed street designs will be implemented in a manner consistent with the *EDCG* to reduce traffic speeds and enhance pedestrian safety.

19. The Town will request improvements to the Trans-Canada Highway that improve safety, livability, noise, and wildlife protection in the Palliser Trail area through measures such as reduced maximum speed limits, noise barriers, landscaping, or wildlife fencing.

20. Transportation planning and design will be in a manner consistent with the *ITP, EDCG,* and *IPMP* unless otherwise approved or specified by the Town.

5.2 Servicing

Intent

To support an integrated water management approach for the Palliser Trail area and the efficient provision of water and sanitary services.

Policy

1. Subdivisions shall apply an integrated water management approach to overall site design that supports the sustainable management of water resources and the integration of green infrastructure in the public realm.
2. Stormwater runoff must be managed through infiltration. Each development parcel shall host facilities to fully manage runoff on-site up to the 1:100 year event.
3. Naturalized methods, such as natural wetlands and bioswales, should be used to mitigate effects of stormwater runoff and contribute to the overall design of the public realm.
4. Utility rights-of-way, easements and public utility lots should be provided to accommodate municipal utilities where appropriate.
5. All development within the Palliser Trail area will be serviced with municipal water and sanitary sewer.
6. The location, size and general standards of these services will be in conformity with the *EDCG* unless otherwise approved by the Engineering Department.
7. Stormwater management plans will be required for each parcel at the Development Permit stage, including geotechnical studies to assess infiltration capacity and groundwater levels.
8. Provision must be made through the Palliser Trail area for the extension of utility services to service areas to the west.
9. Shallow utilities will be accommodated in a municipal road right of way or within a shallow utility right of way on private property.

06

IMPLEMENTATION

The vision, goals, and objectives of the Palliser Trail Area Structure Plan will be implemented and realized over a period of 10 to 20 years.

This section provides information on the anticipated phasing of development and next steps for Town Administration.

6.1 Plan Implementation

Intent

To provide a general framework for implementation of the plan.

Policy

1. Amendment(s) to the *Land Use Bylaw* and/or the *MDP* may be required to facilitate the forms of development identified in this plan.
2. Standard Town procedures for subdivision and permits in accordance with the *MGA* will apply.
3. Subject to the provisions of the *MGA*, all new developments may be required to:
   (a) dedicate and construct new public rights-of-way, incorporating the appropriate treatments and design standard;
   (b) reconstruct public rights-of-way adjacent to the development, incorporating appropriate treatments and design standard, and/or;
   (c) provide land for public open spaces in accordance with this plan and other Town plans and bylaws.
4. Portions of land are within the Stoneworks Creek Hazard Zone (Map 5). A planned mitigation project is intended to address moderate and localized high/extreme hazard zones within the developable lands to protect existing and accommodate future development. Future development will require consideration of residual hazards and risks, as outlined in the *Land Use Bylaw* and *EDCG*.

6.2 Development Phasing

Intent

To provide greater certainty regarding the anticipated phasing of development in the Palliser Trail area with respect to the efficient provision of municipal infrastructure, public services, and amenities.

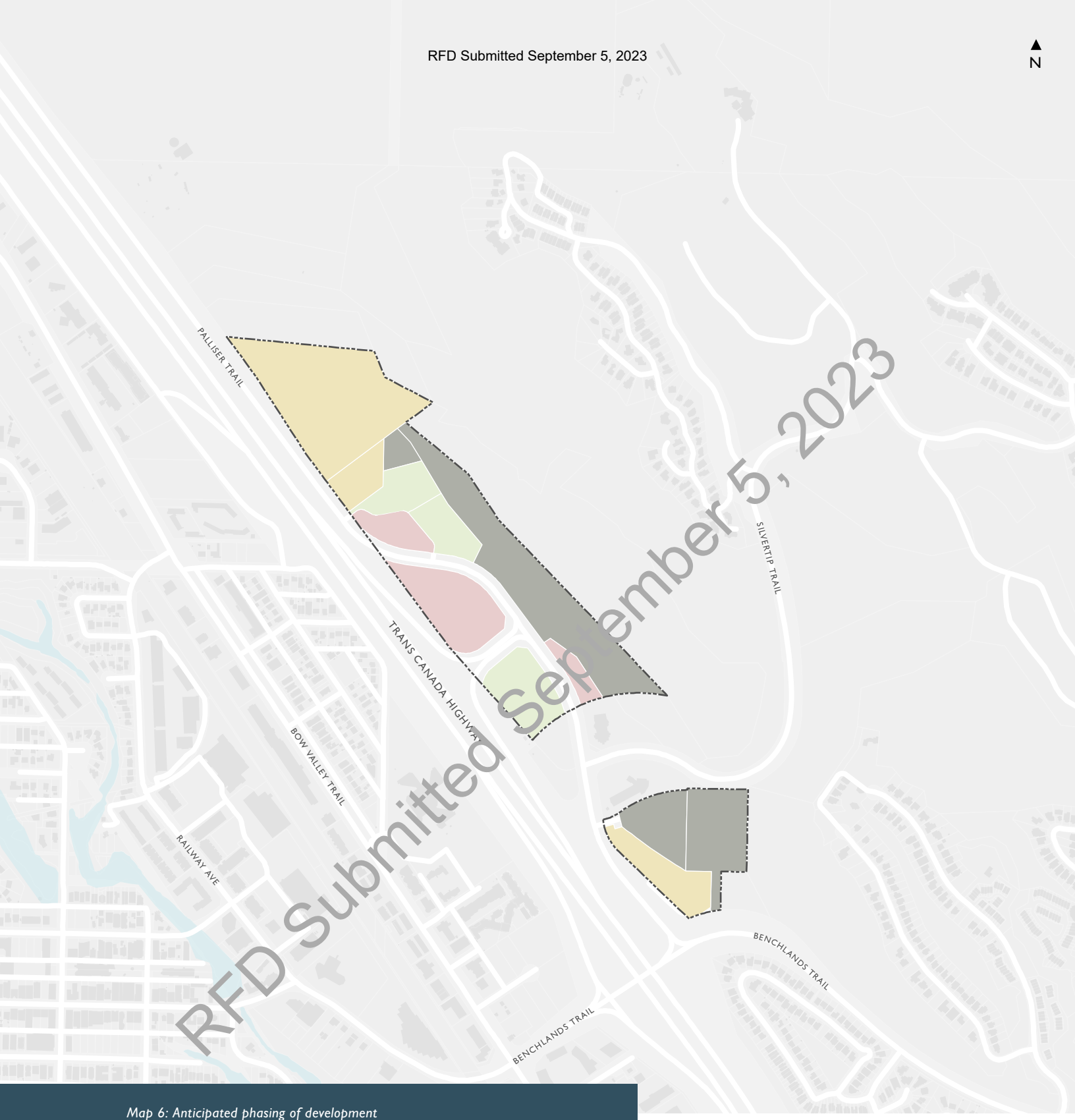
Policy

1. The conceptual phasing plan for Palliser Trail is provided on Map 6.
2. Development in the Palliser Trail area should generally occur in a logical sequence that reflects the availability and extension of the required infrastructure.
3. The phasing of development may vary from the conceptual phasing plan so long as the proposed development is otherwise in alignment with policy.

Map 5: Steep Creek Hazard Zones

LEGEND

- Extreme/High
- Medium
- Low
- Palliser Trail ASP boundary



Map 6: Anticipated phasing of development

LEGEND

- Phase 1
- Phase 2
- Completed
- No Development Anticipated
- Palliser Trail ASP boundary

A

APPENDIX

This section provides supplementary materials relevant to the plan.

A.1 Glossary of Terms

The definitions below are provided for terms referenced within this plan that may not be defined in the *Municipal Development Plan*, *Land Use Bylaw*, or other statutory document, or in cases where the interpretation of the term in this plan warrants further explanation. For convenience, terms defined in the glossary are underlined the first time they appear within body text on a page.

Approving Authority	The designated body or individual responsible for granting approvals, subdivisions, or permissions related to land use, development, or construction projects as the context implies.
Area Structure Plan (ASP)	A statutory, high-level land use plan as defined in the *MGA* that provides an area specific framework for future subdivision and development. It identifies a conceptual layout for general land uses, utility infrastructure, roads, public spaces and recreation.
Low Impact Development (LID) tools	A set of design and management practices that aim to minimize the environmental impact of land development and improve the overall sustainability of the built environment. LID tools are designed to mimic the natural hydrologic functions of the site and promote the use of green infrastructure to manage stormwater runoff.
Municipal Development Plan (MDP)	A comprehensive strategic document that outlines the long-term vision, goals, and policies for guiding the physical, social, and economic development of a municipality or local government jurisdiction. For the purposes of this plan, it refers to the Town of Canmore's *Municipal Development Plan*.
Municipal Government Act (MGA)	A legislative framework that governs the establishment, organization, powers, and duties of municipalities in the province, providing guidelines for local governance and decision-making.
Mixed-use	While the *MDP* provides a definition for mixed-use, for the purposes of this plan it refers to development where two or more uses are provided within the same building, where at least one of those uses is residential.
Near net zero	A building with low energy usage such that it approaches the annual energy consumption of Net Zero Energy buildings, and, with additional measures, could produce nearly as much renewable energy as it uses on an annual basis. A near net zero building should meet or exceed Tier 4 (60% reduction in energy consumption) of the National Energy Code of Canada for Buildings (2020) and be designed to be solar-ready.

Non-market affordable housing	As defined in the *Municipal Developent Plan* and updated from time to time.
Open space	A publicly accessible area designed or preserved for recreational, environmental, or aesthetic purposes. These spaces can include parks, plazas, or other undeveloped or landscaped areas that contribute to the overall livability and quality of the urban environment and public realm.
Plaza	A pedestrian-oriented open space designed for public interaction, social gatherings, recreation, and community events, often featuring elements such as seating, landscaping, public art, and amenities to enhance the public realm and overall urban experience.
Privately owned open spaces	Land or areas, such as plazas and pedestrian connections, that are owned and maintained by individuals, organizations, or entities in a non-public capacity but are accessible to the public for recreational, aesthetic, or leisure purposes.
Public benefit	A facility, service, or feature that is provided and accessible to the general public, enhancing quality of life and contributing to the well-being of the community.
Public realm	The space around, between and within buildings that are publicly accessible, including streets, plazas, parks and open spaces.
Tenure	The legal or contractual rights and arrangements that determine the occupancy status of a building, such as ownership, co-operative, leasehold, or rental agreements.


RFD Submitted September 5, 2023
Town of
CANMORE
Planning & Development Department
902 7th Avenue, Canmore, AB

Request for Decision

DATE OF MEETING: October 3, 2023 **Agenda #:** G-2

TO: Council

SUBJECT: Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31

SUBMITTED BY: Adam Driedzic

RECOMMENDATION: That Council give first reading to Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31.

That Council give second reading to Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31.

That Council give leave to go to third reading of Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31.

That Council give third reading to Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31.

EXECUTIVE SUMMARY

Bylaw 2020-05 (attachment 1) is road closure bylaw. The Town needs a clerical rectification to Bylaw 2020-05 to obtain registration of this bylaw in the Land Titles system to complete the Railway Court land transaction as approved by Council. Council should pass Revising Bylaw 2023-31 (attachment 2) through three readings at one meeting without holding a hearing.

RELEVANT COUNCIL DIRECTION, POLICY, OR BYLAWS

On January 14, 2020, Council approved the land transaction for the sale of a portion of a road allowance on 12th Street and 3rd Avenue (Railway Court) by directing administration to enter into the contract through resolution 10-2020. Council also directed the sale proceeds to the General Capital Reserves through resolution 11-2020.

The road closure is needed to create the parcel to be transferred. Section 22(1) of the MGA requires a bylaw to close a road under municipal control. Section 22(2) of the MGA requires a public hearing before second reading of the bylaw. Council held a public hearing on June 2, 2020. Section 22(3) of the MGA requires the bylaw to approved by the provincial Minister of Transportation before second reading. Minister Williamson (insert name) provided approval on October 7, 2020. Council passed Bylaw 2020-05 through second and third readings on November 3, 2020. The process for making Bylaw 2020-05 met the requirements of the MGA.

The parties' lawyers submitted the land transaction documents for registration in August of 2023. In September of 2023, the Land Titles Office deemed Bylaw 2020-05 to be deficient for not describing the closed area through a survey plan or alternatively through a written "metes and bounds" description.

The Land Titles Office requires a revised bylaw under section 63 of the MGA to correct the description of the area in the bylaw to clearly reference a survey plan prepared for this purpose. The Land Titles Office has also advised that the current description used in the bylaw must be supplemented with the words "as shown as Area A on Plan _____". This advice is based on the Land Titles Procedures Manual.

Section 63(2)(g) of the MGA provides that revising bylaws may:

> 63 (g) make changes, without materially affecting the bylaw in principle or substance,
>
> (i) to correct clerical, technical, grammatical or typographical errors in a bylaw,

Section 65 of the MGA provides that:

> 65 A bylaw made in accordance with section 63 and the resulting revised bylaw are deemed to have been made in accordance with all the other requirements of this Act respecting the passing and approval of those bylaws, including any requirements for advertising and public hearings.

Section 63(4) of the MGA requires written certification by the CAO that a revising bylaw has been prepared in accordance with Section 63 before the bylaw receives first reading. The CAO's certificate is attached to this report.

DISCUSSION

The lawyers acting on a land transaction typically rectify deficiencies in documents for registration. This rectification requires a Council decision because the document to be registered is a bylaw, and the MGA provides that only Council can make bylaws.

The process for revising bylaws provided by section 63 of the MGA allows for rectification of clerical deficiencies in bylaws without repeating the entire process through which the original bylaw was made. This revising bylaw fits section 63(2)(g)(i) of the MGA. Its purpose is to correct clerical and technical content and it has no material effect on the principle or substance of the bylaw. Revising the Road Closure Bylaw is necessary to complete the land transaction.

It is recommended that Council revise Bylaw 2020-5 by passing Revising Bylaw 2023-31 through three consecutive readings at the meeting of October 3, 2023 without any amendments or public hearings. The CAO has provided the section 63 certificate (attachment 3) and section 65 will deem all other MGA requirements for making the bylaw to have been met.

ANALYSIS OF ALTERNATIVES

None.

FINANCIAL IMPACTS

The cash to close the land transaction is being held in trust, to be released to the Town after registration.

STAKEHOLDER ENGAGEMENT

None.

ATTACHMENTS

1) Road Closure 12 Street and 3rd Avenue Railway Court 2020-05– redline
2) Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31
3) CAO's certificate (MGA section 63)

AUTHORIZATION

Submitted by:	Adam Driedzic Town Solicitor	Date:	September 25, 2023
Approved by:	Sally Caudill Chief Administrative Officer	Date:	September 25, 2023

REVISED BYLAW 2020-05

A BYLAW OF THE TOWN OF CANMORE, IN THE PROVINCE OF ALBERTA FOR THE CLOSURE OF A PUBLIC ROAD

WHEREAS, pursuant to the provisions of the Municipal Government Act and amendments thereto, public roads may be closed;

AND WHEREAS, application has been made to the Town of Canmore Council to have the roadway closed;

AND WHEREAS, the subject lands have never been used for public travel and are no longer required for public travel;

AND WHEREAS Council of the Town of Canmore deems it appropriate to have the public road closed, and dispose of same as titled land;

NOW THEREFORE the Council of the Town of Canmore, in the Province of Alberta, duly assembled, does hereby close to public travel for the purpose of disposing the Road, subject to right of access granted by other legislation:

INTERPRETATION

1. In this bylaw:
   (a) "Road" means a portion of the lands located in the Town of Canmore described as 12th Street and 3rd Avenue, comprised of approximately ~~0.076 hectatres~~758 ~~m²~~, as shown as Area A on Plan _____ in the attached Schedule "A" to this bylaw, excepting thereout all mines and minerals.

PROVISIONS

2. The Road is hereby closed to public travel pursuant to s. 22 of the Municipal Government Act, RSA 2000 c.M-26.

ENACTMENT/TRANSITION

3. If any clause in this bylaw is found to be invalid, it shall be severed from the remainder of the bylaw and shall not invalidate the whole bylaw.

4. Schedule A forms part of this bylaw.

FIRST READING APPROVED THIS 7th DAY OF April, 2020

_____

John Borrowman, Mayor

_____

Cheryl Hyde, Municipal Clerk

APPROVED THIS _____ DAY OF _____, 2020

_____

Minister of Transportation

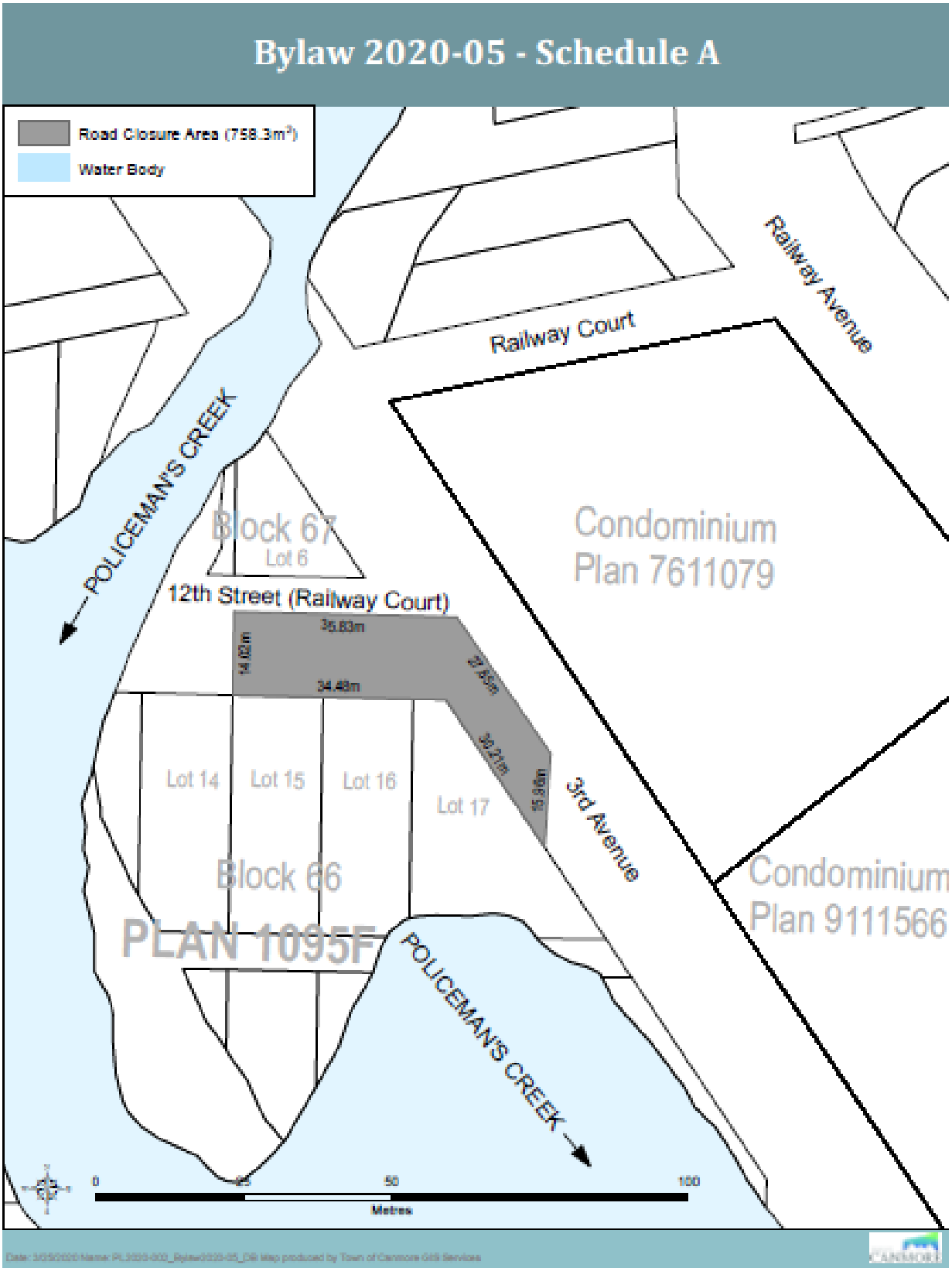
SECOND READING: November 3, 2020

THIRD READING: November 3, 2023

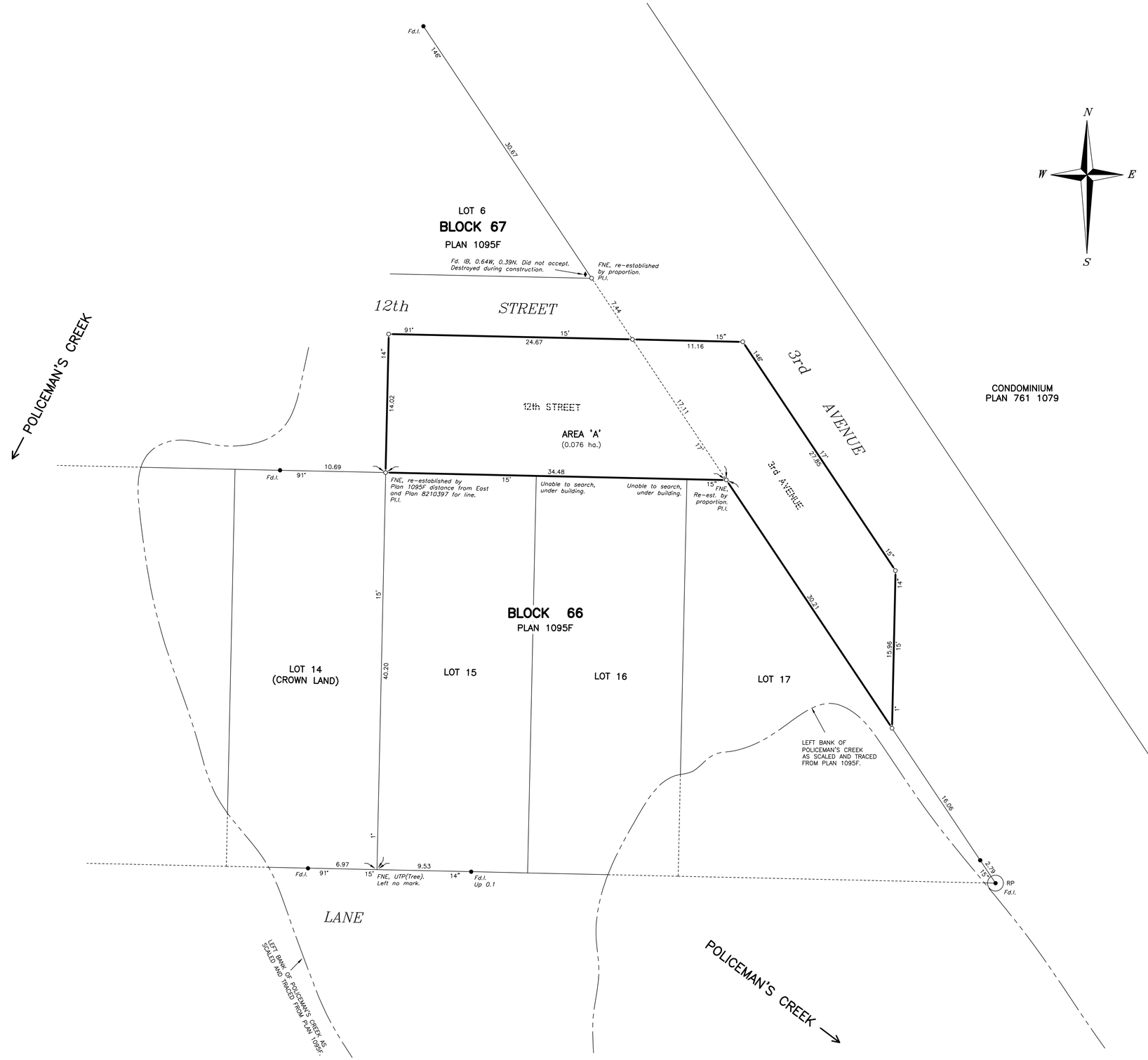
DATE IN FORCE: November 5, 2020

John Borrowman Mayor	Date
Cheryl Hyde Municipal Clerk	Date

DELETE SCHEDULE 'A' AND REPLACE WITH SCHEDULE A SURVEY PLAN



Bylaw approved by: _____ _____



LAND TITLES OFFICE

PLAN NO. _____

ENTERED AND REGISTERED

ON _____

INSTRUMENT NO : _____

A.D. REGISTRAR

CANMORE, AB

PLAN OF SURVEY SHOWING AREA REQUIRED FOR ROAD CLOSURE PURPOSES AFFECTING PART OF ROAD, SUBDIVISION PLAN 1095F WITHIN THE N.E.1/4 SEC.32, TWP.24, RGE.10, W5M.

BY: GARRET DILLABOUGH, 2022

SCALE = 1:200

5 4 3 2 1 0 5 10 20 METRES

LEGEND:

STATUTORY IRON POSTS FOUND SHOWN THUS	● *Fd.I.*
STATUTORY IRON POSTS PLANTED SHOWN THUS	O *Pl.I.*
FOUND NO EVIDENCE	*FNE*
LEFT NO MARK	*Left No Mk.*
UNABLE TO POST	*UTP*
RE–ESTABLISHED	*Re–est.*
SECTION	SEC.
TOWNSHIP	TWP.
RANGE	RGE.
MERIDIAN	M.
HECTARE	ha.
GEO–REFERENCE POINT	◯ RP

NOTES:

DISTANCES SHOWN ARE IN METRES AND DECIMALS THEREOF AND ARE BETWEEN SURVEY MONUMENTS UNLESS SHOWN OTHERWISE.

BEARINGS ARE GRID, BASED ON NAD83(CSRS EPOCH 2002.0) DATUM, 3°TM PROJECTION, REFERENCE MERIDIAN 114° WEST LONGITUDE AND ARE DERIVED FROM GNSS.

A COMBINED SCALE FACTOR OF 0.999808 CAN BE APPLIED TO REDUCE DISTANCES TO MEAN SEA LEVEL AND THE PROJECTION PLANE FOR CALCULATION OF 3°TM COORDINATES.

STATUTORY IRON POSTS PLANTED MARKED 'P057'.

AREA AFFECTED BY THE REGISTRATION OF THIS PLAN SHOWN BOUNDED THUS: ——— AND CONTAINS: 0.076 ha.

THE 3°TM COORDINATES OF THE GEO–REFERENCE POINT ARE:
NORTHING: 5662629.16
EASTING: –95193.99

SURVEYOR:

NAME: GARRET DILLABOUGH, A.L.S.

SURVEYED BETWEEN THE DATES OF JUNE 7, 2019 AND JANUARY 24, 2023 IN ACCORDANCE WITH THE PROVISIONS OF THE SURVEYS ACT.

ALBERTA LAND SURVEYORS' ASSOCIATION PERMIT NUMBER P057 McElhanney Land Surveys (Alta.) Ltd.

SURVEY PLAN REQUESTED BY:

TOWN OF CANMORE
PURSUANT TO SECTION 81(2) OF THE LAND TITLES ACT.

McElhanney
Land Surveys (Alta.) Ltd.
203 – 502 BOW VALLEY TRAIL, CANMORE, ALBERTA T1W 1N9
PH (403) 678–6363; FAX (855) 407–3895

FILE: 18–285	18–285RC.DWG
DRAWN BY: J.P.	DATE PLOTTED: JULY/07/2022

BYLAW 2023-31

A BYLAW OF THE TOWN OF CANMORE, IN THE PROVINCE OF ALBERTA, TO REVISE ROAD CLOSURE BYLAW 2020-05

The Council of the Town of Canmore, in the Province of Alberta, duly assembled, enacts as follows:

TITLE

1 This bylaw shall be known as Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31.

INTERPRETATION

2 Words defined in 2020-05 shall have the same meaning when used in this bylaw.

PROVISIONS

3 Bylaw 2020-05 is revised by this bylaw.

4 The word "Revised" is hereby added to the start of the title to Bylaw 2020-05.

5 The words "758 m²" in Section 1(a) of Bylaw 2020-05 are hereby deleted and replaced with "0.076 hectares".

6 The words "as Area A on Plan _____" are hereby added after the words "as shown" in Section 1(a) of Bylaw 2020-05.

7 Schedule A in Bylaw 2020-05 is hereby deleted and replaced with the new Schedule A attached as Schedule A to this bylaw.

ENACTMENT/TRANSITION

8 If any clause in this bylaw is found to be invalid, it shall be severed from the remainder of the bylaw and shall not invalidate the whole bylaw.

9 Schedule A forms part of this bylaw.

10 This bylaw comes into force on the date it is passed.

FIRST READING:

SECOND READING:

THIRD READING:

Approved on behalf of the Town of Canmore:

Sean Krausert
Mayor

Date

Cheryl Hyde
Municipal Clerk

Date

SCHEDULE A

LAND TITLES OFFICE

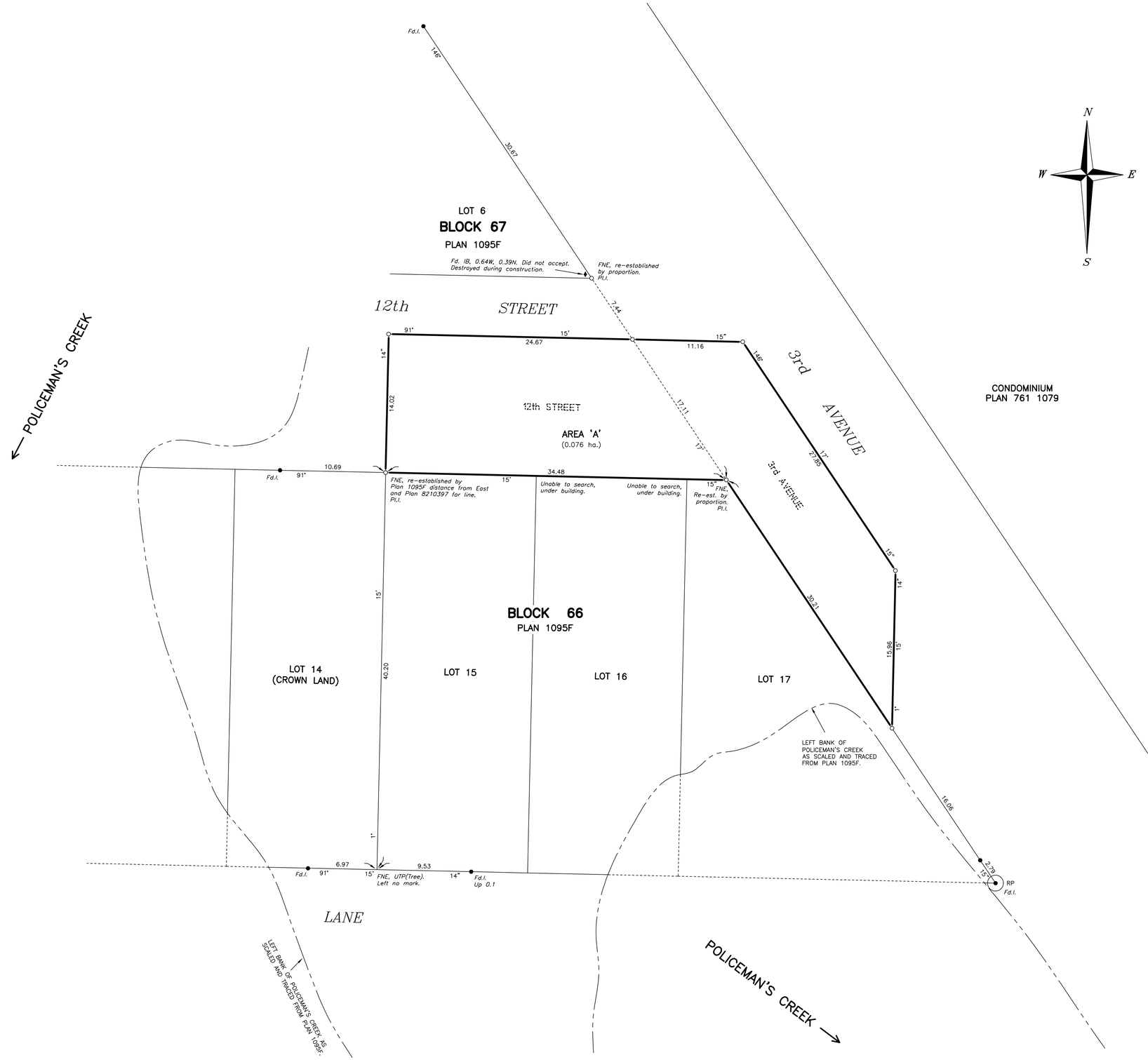
PLAN NO. _____

ENTERED AND REGISTERED

ON _____

INSTRUMENT NO : _____

A.D. REGISTRAR



CANMORE, AB

PLAN OF SURVEY
SHOWING AREA REQUIRED
FOR
ROAD CLOSURE PURPOSES
AFFECTING PART OF
ROAD, SUBDIVISION PLAN 1095F
WITHIN THE
N.E.1/4 SEC.32, TWP.24, RGE.10, W5M.

BY: GARRET DILLABOUGH, 2022

SCALE = 1:200

5 4 3 2 1 0 5 10 20 METRES

LEGEND:

STATUTORY IRON POSTS FOUND SHOWN THUS	● Fd.I.
STATUTORY IRON POSTS PLANTED SHOWN THUS	○ Pl.I.
FOUND NO EVIDENCE	FNE
LEFT NO MARK	Left No Mk.
UNABLE TO POST	UTP
RE-ESTABLISHED	Re-est.
SECTION	SEC.
TOWNSHIP	TWP.
RANGE	RGE.
MERIDIAN	M.
HECTARE	ha.
GEO-REFERENCE POINT	◯ RP

NOTES:

DISTANCES SHOWN ARE IN METRES AND DECIMALS THEREOF AND ARE BETWEEN SURVEY MONUMENTS UNLESS SHOWN OTHERWISE.

BEARINGS ARE GRID, BASED ON NAD83(CSRS EPOCH 2002.0) DATUM, 3°TM PROJECTION, REFERENCE MERIDIAN 114° WEST LONGITUDE AND ARE DERIVED FROM GNSS.

A COMBINED SCALE FACTOR OF 0.999808 CAN BE APPLIED TO REDUCE DISTANCES TO MEAN SEA LEVEL AND THE PROJECTION PLANE FOR CALCULATION OF 3°TM COORDINATES.

STATUTORY IRON POSTS PLANTED MARKED 'P057'.

AREA AFFECTED BY THE REGISTRATION OF THIS PLAN SHOWN BOUNDED THUS: ——— AND CONTAINS: 0.076 ha.

THE 3°TM COORDINATES OF THE GEO-REFERENCE POINT ARE:
NORTHING: 5662629.16
EASTING: −95193.99

SURVEYOR:

NAME: GARRET DILLABOUGH, A.L.S.

SURVEYED BETWEEN THE DATES OF JUNE 7, 2019 AND JANUARY 24, 2023 IN ACCORDANCE WITH THE PROVISIONS OF THE SURVEYS ACT.

ALBERTA LAND SURVEYORS' ASSOCIATION
PERMIT NUMBER
P057
McElhanney Land Surveys (Alta.) Ltd.

SURVEY PLAN REQUESTED BY:

TOWN OF CANMORE
PURSUANT TO SECTION 81(2) OF THE LAND TITLES ACT.

McElhanney
Land Surveys (Alta.) Ltd.
203 – 502 BOW VALLEY TRAIL, CANMORE, ALBERTA T1W 1N9
PH (403) 678-6363; FAX (855) 407-3895

FILE: 18-285	18-285RC.DWG
DRAWN BY: J.P.	DATE PLOTTED: JULY/07/2022

Town of CANMORE

Certification

I, Whitney Smithers, certify that the proposed revisions in Road Closure 12 Street and 3rd Avenue Railway Court Revising Bylaw 2023-31 presented to Council for first reading on October 3, 2023 have been prepared in accordance with section 63 of the Municipal Government Act.

Whitney Smithers
Acting Chief Administrative Officer

Sept. 27/2023
Date

Request for Decision

DATE OF MEETING:	**October 3, 2023**	**Agenda #:** H-1
TO:	Council	
SUBJECT:	Update to the Public Art Policy by adding Micro Grants	
SUBMITTED BY:	Eleanor Miclette, Manager of Economic Development	
RECOMMENDATION:	That Council approve the updated Public Art and Micro Grant Policy as amended.	

EXECUTIVE SUMMARY

The proposed Public Art Policy updates include a Micro Grant Program which has been developed in alignment with the Cultural Master Plan. The policy looks to support opportunities for arts and culture sector development and build capacity within equity-seeking groups who might not qualify for other funding opportunities.

RELEVANT COUNCIL DIRECTION, POLICY, OR BYLAWS

107-2020: Council accepted the Cultural Master Plan as presented for planning purposes.

196-2021: Council approved Public Art Policy (AE-001) as amended.

DISCUSSION

Grant Program Overview

The Cultural Master Plan recommended the development of an artist and arts organization grant program (micro grants) targeting emerging artists, Indigenous, racialized, and marginalized communities, as well as supporting grassroots organizations that are often too small or informally constituted and, as such, don't qualify for larger granting opportunities. The Arts and Culture Micro Grant Program will provide funding to promote a strong and vibrant arts and cultural sector, build capacity, and support cultural expression, practice, and connectedness. The grant program will enable individual artists, artist collectives, and organizations to take advantage of opportunities that may otherwise remain unattainable.

The Cultural Advisory Committee worked collaboratively to develop this policy. To ensure what was developed will allow funding to reach the audiences identified in the policy, the Cultural Advisory Committee welcomed a series of speakers from various backgrounds to understand where barriers could be removed. Speakers came from the Indigenous community, neuro diverse community, and various equity-seeking groups and, as part of their presentations, provided feedback regarding the Arts and Culture Micro Grant Program. These learnings have been incorporated into the proposed policy and would be considered when grant application procedures are established.

The grant program focuses on four areas:

1. Individual or Organizational Development
2. Sector Development
3. Community Development
4. Right Relations, Equity, Diversity, and Inclusion

At its core, the grant program aims to support cultural expression and practices, build a strong and vibrant cultural sector, and encourage community connection, interaction, and engagement. It will further the Town's commitment to right relations and inclusivity and ensure opportunities exist for currently underrepresented groups. Applications can be made for the following:

1. Up to $1,000 for individual artists or artist collectives, two or more artists working on a joint project.
2. Up to $3,000 for Arts and Cultural Organizations, an established not-for-profit art and/or cultural organization.

Funding:

The Public Art Policy (AE-001) guides contributions to the Art Trust Fund, a reserve used to fund the public art and related programs. In 2021 Council amended the Public Art Policy to create the opportunity for the development of a micro granting program. The intent is to increase contributions to the Art Trust Fund by $2 per capita (increased from $3 to $5 per capita), or approximately $32,000 per year based on Canmore's current population, and that this additional contribution fund a grant program. Due to the pandemic and position vacancies in the Arts and Events Department, the creation of the micro grant program was delayed and the additional $2 per capita has not been requisitioned since the Public Art Policy was updated in 2021. The approved 2024 budget includes $32,000 for the micro grant program.

Capitalization:

Updating the policy provided the opportunity to capitalize all defined terms, something that was not done in the previous version. This change has been made, but administration did not use tracked changes as it is a simple housekeeping matter, is not the focus or purpose of the policy update and could make the tracked changes version difficult to read.

ANALYSIS OF ALTERNATIVES

None.

FINANCIAL IMPACTS

If approved, the $2 per capita will remain in the 2024 budget and be part of the annual per capita allocation to the Art Trust Fund. If not approved, administration will recommend to Council that the $2 per capita be removed from the 2024 budget during budget deliberations.

STAKEHOLDER ENGAGEMENT

The Public Art and Micro Grant Policy was developed by the Arts and Events Department in partnership with the Cultural Advisory Committee.

ATTACHMENTS

1) Public Art Micro Grant Policy redline
2) Public Art Micro Grant Policy clean

AUTHORIZATION

Submitted by:	Eleanor Miclette Manager of Economic Development	Date:	September 11, 2023
Approved by:	Palki Biswas Manager of Finance	Date:	September 12, 2023
Approved by:	Scott McKay General Manager, Municipal Services	Date:	September 13, 2023
Approved by:	Sally Caudill Chief Administrative Officer	Date:	September 25, 2023

Town of CANMORE	**Council Policy**
Policy Title:	**Public Art and Micro Grant**
Policy Number:	AE-001
Date in Effect:	August 17, 2021
Current as of:	August 17, 2021

POLICY STATEMENT

1. Canmore's Public Art program supports excellence in Public Art by emerging and established Artists, in new and traditional media, through commissions and projects. The Micro Grant program is established to provide funding to promote a strong and vibrant arts and culture sector, build capacity, and support cultural expression, practice, and connectedness.

~~1.~~2. The Town is committed to supporting Acquisition and maintenance of a Public Art Collection that:

a) develops Canmore as an increasingly vibrant place in which to live, work and visit,

b) adds to the identity and quality of the civic landscape,

c) enriches people's experience of Public ~~spaces~~Places,

d) contributes to community pride, and

e) enhances Canmore's cultural assets.

PURPOSE

~~2.~~3. This policy articulates the intention of the municipality to make art a permanent part of everyday life and a legacy for future generations, contributing to foster a sense of place, and increase the livability and artistic richness of the community through funding, Acquisition, care and maintenance, and Deaccession of Public Art and enabling individual Artists, Artist Collectives, and Organizations to take advantage of opportunities that may otherwise remain unattainable.

DEFINITIONS

~~3.~~4. In this policy:

a) Acquisition means the process of accepting Artwork into the Town's Public Art Collection;

b) Activities means the item, project, or pursuit to which Micro Grant money will be directed;

~~a)~~c) Art Trust Fund means a program-specific reserve established by and subject to Reserves Policy FIN-007;

Policy approved by: _____ _____

d) Artist means the designer/creator of an Artwork who has completed specialized training in their artistic field or is recognized by their peers as such; is committed to their artistic activity; and, has a history of public presentation;

~~b)~~c) Artist Collective means an informal group comprised of two or more individual Artists whose creation and public presentation of art is their primary activity;

~~c) Artist and Arts Organization grant program means a funding program for cultural development designed to build the capacity of the sector by supporting the development of projects that connect community. This program will focus on artistic creation/practice, funding micro grants for artists that support community art initiatives; cultural organizations that miss out on grants because they are too small; and new initiatives that fill a gap in community offerings;~~

f) Arts and Culture Administrator means a professional who is paid a wage to plan, organize, direct, control, coordinate, and promote artistic and cultural policies, programs, projects, and services;

~~d)~~g) Artwork means a tangible creation by an Artist;

h) Canmore Based means the main place or area in which Artists, Artist Collectives, and Organizations reside, create, live or do business is in the Town of Canmore;

~~e)~~i) Conservation means all actions aimed at safeguarding Public Art for the future; including examination, documentation, maintenance, preservation, and restoration;

~~f)~~j) Deaccession means the act of legally ending the Town's responsibility for Artworks within the Public Art Collection;

k) Micro Grant means a small payment intended to build capacity and support cultural expression, practice, and connectedness;

~~g)~~l) Organization means a group of individuals who come together to develop and share Artistic and/or cultural creation;

~~h)~~m) Public Art means any visual Artwork planned and executed specifically for siting or staging in a Public Place;

~~i)~~n) Public Art Collection means all works of art owned by the Town that are site specific, part of a portable collection, or documentation of works of specific duration; ~~and~~

~~j)~~o) Public Place means any land owned or leased by the Town, other than a highway, that the public is ordinarily entitled or permitted to use and includes~~;~~

i) parks, as defined by the Parks Bylaw, as amended,

ii) parking lots, and

iii) land developed, used, or managed by the Town for public utilities;

~~k)~~p) Treaty--7 Based means applicants who are a member of and reside in Treaty 7 nations of the Blackfoot Confederacy, the Iyahre Nakoda, and Tsuu'tina Nations as well as Metis Nation 3.

Policy approved by: _____ _____

FUNDING

4.5. A sustainable funding model that aligns with Canadian municipal best practices is set out as follows:

a) A $5 per capita annual contribution to the Art Trust Fund in accordance with the Reserves Policy; and

b) Allocation of 0.5% of the average of the preceding five-year period's annual approved budgets' tax contribution to municipal infrastructure capital projects, excluding all utilities projects, subject to the following:

i) the allocation will be determined at the time of budget preparation,
ii) grant funding of a capital project is not considered as part of the contribution, and
iii) the allocation may be limited by overall available funds.

5.6. Funds in the Art Trust Fund are allocated as follows:

a) 60% of the per capita funding to design and commission, Acquisition, site preparation, installation, maintenance, and conservation of Public Art, and

b) 40% of the per capita funding to the Artist and Arts Organization grant program.

c) 100% of the capital project allocation to design and commission, Acquisition, site preparation, installation, maintenance, and conservation of Public Art.

6.7. 10% of the value of the Public Art Collection must be in the Public Art Trust at the beginning of each calendar year to fund maintenance, repair, and conservation.

7.8. Eligible capital projects include tax funded:

a) new municipal buildings,

b) non-utility facility expansions or upgrades,

c) new park development projects,

d) major street rehabilitation or streetscape improvements,

e) new bridges, bridge replacements, and interchanges, and

f) new Public Places such as squares and plazas.

8.9. Funds derived from capital project allocations may be allocated to the specific project from which they are sourced or may be combined with other funds to either enhance a more prominent capital project or to support a non-contributing project.

Policy approved by: _____ _____

GUIDING PRINCIPLES FOR THE PUBLIC ART PROGRAM

~~9.~~10. The Public Art program aligns with the planning framework set out in the 2020 Cultural Master Plan:

a) Leadership – The Town of Canmore Public Art Program adheres to recognized professional standards and promotes excellence in artistic practice and aims to elevate the role of culture in community building.

b) Inclusion – The Public Art Program works to advance right relations, promote cultural equity and expression, and increase community access to culture. The Public Art Collection will be comprised of Artworks that reflect the diversity present in our community and across Canada.

c) Space – Ensure town spaces and places reflect the community's shared history and advance local culture. The public shall have free and unobstructed access to art in Public ~~spaces~~Places.

d) Investment – The Town recognizes the contribution made by arts and culture as an economic driver and community builder and works to strengthen the sector and support and promote traditional and diverse forms of cultural expression.

PUBLIC ART ACQUISITION

~~10.~~11. Administration is authorized to acquire Public Art~~-~~ through commission, purchase, donation, loan, partnership with an external party, or lease.

~~11.~~12. Any person involved in a decision to acquire Public Art~~-~~ must comply with the Town's Purchasing Policy and Code of Conduct Policy.

~~12.~~13. Public Art~~-~~ purchased by the Town must be unencumbered and acquired through a full transfer of ownership from the Artist to the Town; the Artist will retain any and all copyright and moral and intellectual rights to the Artwork.

~~13.~~14. Acquisitions must be accompanied by a maintenance plan and a deaccession plan.

PUBLIC ART COLLECTION CRITERIA

~~14.~~15. The Public Art collection:

a) provides a sense of place, community pride and identity through the creation of new works across all mediums and in a variety of Public ~~space~~Places,

b) reflects community and regional diversity, values, history, nature, and culture,

c) is built in collaboration and partnership with Indigenous and multicultural communities as well as the private sector, internal and external stakeholders,

d) creates opportunities, challenges, and encouragement for all types of artists and artistic expression, and

Policy approved by: _____ _____

e) is comprised of relevant art that inspires people and is an expression of the time.

PUBLIC ART SITE SELECTION CRITERIA

~~15.~~16. Public Art is intended to compliment current and future municipal development and infrastructure and enhance Public ~~spaces~~Places. Site selection will include a public engagement process that puts signage in a potential location for a minimum of three weeks with an opportunity for the public to provide comment. Sites will be selected using the following criteria:

a) Accessibility – Public Art shall be located in areas that provide the public a free and unobstructed experience of the piece, with a preference given to sites offering the greatest opportunities for interaction and safe access for all;

b) Visibility – preference shall be given to sites that are primarily visible to pedestrians and cyclists and that also considers a secondary audience of motorists, including public transit users;

c) Discovery – use of sites where Public Art is unexpected or discovery by the viewer is encouraged;

d) Project Specific – use of a site that lends itself to a specific project, audience, or desired art form may be considered;

e) Environment - the environmental impact of the Public Art and its maintenance will be considered including wildlife attractants or entrapments, habitat preservation, and pollutants; and

f) Municipal access – the site must be accessible to emergency services, property maintenance services, and the services related to maintenance, repair, and conservation of the Public Art.

PUBLIC ART COLLECTION MANAGEMENT

~~16.~~17. Town staff maintains a Public Art ~~-~~inventory and provides safekeeping for records related to the selection, Acquisition, maintenance, conservation, and deaccession of Public Art.

~~17.~~18. The Town provides insurance for all Public Art in its custody and control, regardless of whether the art is owned or not.

~~18.~~19. Where Public Art is commissioned, the Artist shall be required to provide a maintenance manual prior to receiving final payment for the project.

~~19.~~20. Maintenance, repair, and conservation, including storage, of Public Art shall be carried out by Town staff.

~~20.~~21. Deaccessioning of Public Art may be approved by Council only if one or more of the following conditions apply:

Policy approved by: _____ _____

a) It is no longer deemed morally or ethically accepted by current standards,

b) It possesses faults of design, workmanship or materials that result in excessive or unreasonable maintenance, a threat to public safety, and for damage to the extent where repair is unreasonable, impractical or the Artwork is beyond restoration,

c) Imminent changes to the site threaten the integrity and safety of the work,

d) It is fraudulent, not an authentic work, or there is a valid challenge to title; and/or,

e) Council determines that there is an exceptional and unforeseen reason for removing the Artwork from its current site, and no other suitable site can be found.

~~21.~~22. Deaccessioning shall not serve as a means for generating funds; any and all funds received through deaccessioning activities will be deposited into the Public Art Trust.

MICRO GRANT AREAS OF FOCUS

23. Activities funded through the Arts and Culture Micro Grant Program must fall within one or more of the following areas of focus:

a) Individual or Organizational Development

Activities that:

- build individual or Organizational capacity,
- support cultural expression and practices, and/or
- build business acumen.

b) Sector Development

Activities that:

- promote a strong and vibrant cultural sector.

c) Community Development

Activities that:

- encourage community connection, interaction, and engagement.

d) Right Relations, Equity, Diversity, and Inclusion

Activities that:

- support Canmore's diverse culture and values, and
- include underrepresented communities.

MICRO GRANT ELIGIBILITY

24. Eligible applicants include:

a) Canmore Based Artists, Artist Collectives, and arts and culture Organizations, and

Policy approved by: _____ _____

b) Treaty-7 Based Artists, Artist Collectives, and arts and cultural Organizations whose artistic creation is intended to be shared with/in the Canmore community.Ineligible applicants include:

c) individuals or Organizations who have already received the maximum funding amount allowable under the Arts and Culture Micro Grant Program within the previous 12 months,

d) individuals or Organizations who have overdue reports related to prior Town of Canmore grant funding, and

e) Arts and Culture Administrators.

RESPONSIBILITIES

~~22.~~25. The Cultural Advisory Committee is responsible for:

a) advising administration on the Acquisition of Public Art,

b) monitoring administrative practices related to planning, Acquisition, placement, maintenance, and deaccessioning to ensure a high standard is maintained, and

c) making recommendations to Administration for amendments to this policy.

~~23.~~26. Administration is responsible for:

a) preparing a five-year Public Art capital plan,

~~a)~~b) overall management of the Micro Grant program,

~~b)~~c) bringing policy updates to Council, and

~~c)~~d) making the final decision on Acquisition and site selection.

~~24.~~27. Council is responsible for:

a) Approving the Public Art and Micro Grant Policy and any amendments to the policy as needed,

b) Approving expenditures from the Public Art Trust through the budget process, and

c) Approving annual contributions to the Public Art Trust based on the funding model detailed in this policy.

POLICY REVIEW

~~25.~~28. This policy will be reviewed by Council ~~on or before August 30, 2025~~within the next four years.

RELATED DOCUMENTS

Policy approved by: _____ _____

~~26.~~29. 2020 Cultural Master Plan
30. Public Art Procedure
~~27.~~31. Micro Grant Procedure
~~28.~~32. Cultural Advisory Committee Terms of Reference
~~29.~~33. Reserves Policy FIN-007
~~30.~~34. Purchasing Policy FIN-006
~~31.~~35. Code of Conduct Policy HR-002

ATTACHMENTS

None

REPEALS POLICY: Public Art Policy AE-001 approved June 15, 2010.

AUTHORIZATION:

Sean Krausert~~John Borrowman~~ Mayor	Cheryl Hyde Municipal Clerk

REVISION HISTORY

Action	Date	Council Motion	Notes
Approved	2021-08-17	196-2021	
Amended	2023-10-03		Amended to include the Micro Grant

Policy approved by: _____ _____

Town of CANMORE	**Council Policy**
Policy Title:	**Public Art and Micro Grant**
Policy Number:	AE-001
Date in Effect:	August 17, 2021
Current as of:	August 17, 2021

POLICY STATEMENT

1. Canmore's Public Art program supports excellence in Public Art by emerging and established Artists, in new and traditional media, through commissions and projects. The Micro Grant program is established to provide funding to promote a strong and vibrant arts and culture sector, build capacity, and support cultural expression, practice, and connectedness.

2. The Town is committed to supporting Acquisition and maintenance of a Public Art Collection that:

   a) develops Canmore as an increasingly vibrant place in which to live, work and visit,

   b) adds to the identity and quality of the civic landscape,

   c) enriches people's experience of Public Places,

   d) contributes to community pride, and

   e) enhances Canmore's cultural assets.

PURPOSE

3. This policy articulates the intention of the municipality to make art a permanent part of everyday life and a legacy for future generations, contributing to foster a sense of place, and increase the livability and artistic richness of the community through funding, Acquisition, care and maintenance, and Deaccession of Public Art and enabling individual Artists, Artist Collectives, and Organizations to take advantage of opportunities that may otherwise remain unattainable.

DEFINITIONS

4. In this policy:

   a) Acquisition means the process of accepting Artwork into the Town's Public Art Collection;

   b) Activities means the item, project, or pursuit to which Micro Grant money will be directed;

   c) Art Trust Fund means a program-specific reserve established by and subject to Reserves Policy FIN-007;

Policy approved by: _____ _____

d) Artist means the designer/creator of an Artwork who has completed specialized training in their artistic field or is recognized by their peers as such; is committed to their artistic activity; and, has a history of public presentation;

e) Artist Collective means an informal group comprised of two or more individual Artists whose creation and public presentation of art is their primary activity;

f) Arts and Culture Administrator means a professional who is paid a wage to plan, organize, direct, control, coordinate, and promote artistic and cultural policies, programs, projects, and services;

g) Artwork means a tangible creation by an Artist;

h) Canmore Based means the main place or area in which Artists, Artist Collectives, and Organizations reside, create, live or do business is in the Town of Canmore;

i) Conservation means all actions aimed at safeguarding Public Art for the future; including examination, documentation, maintenance, preservation, and restoration;

j) Deaccession means the act of legally ending the Town's responsibility for Artworks within the Public Art Collection;

k) Micro Grant means a small payment intended to build capacity and support cultural expression, practice, and connectedness;

l) Organization means a group of individuals who come together to develop and share Artistic and/or cultural creation;

m) Public Art means any visual Artwork planned and executed specifically for siting or staging in a Public Place;

n) Public Art Collection means all works of art owned by the Town that are site specific, part of a portable collection, or documentation of works of specific duration;

o) Public Place means any land owned or leased by the Town, other than a highway, that the public is ordinarily entitled or permitted to use and includes

   i) parks, as defined by the Parks Bylaw, as amended,

   ii) parking lots, and

   iii) land developed, used, or managed by the Town for public utilities;

p) Treaty-7 Based means applicants who are a member of and reside in Treaty 7 nations of the Blackfoot Confederacy, the Iyahre Nakoda, and Tsuu'tina Nations as well as Metis Nation 3.

FUNDING

5. A sustainable funding model that aligns with Canadian municipal best practices is set out as follows:

   a) A $5 per capita annual contribution to the Art Trust Fund in accordance with the Reserves Policy; and

b) Allocation of 0.5% of the average of the preceding five-year period's annual approved budgets' tax contribution to municipal infrastructure capital projects, excluding all utilities projects, subject to the following:

i) the allocation will be determined at the time of budget preparation,
ii) grant funding of a capital project is not considered as part of the contribution, and
iii) the allocation may be limited by overall available funds.

6. Funds in the Art Trust Fund are allocated as follows:

a) 60% of the per capita funding to design and commission, Acquisition, site preparation, installation, maintenance, and conservation of Public Art, and

b) 40% of the per capita funding to the Artist and Arts Organization grant program.

c) 100% of the capital project allocation to design and commission, Acquisition, site preparation, installation, maintenance, and conservation of Public Art.

7. 10% of the value of the Public Art Collection must be in the Public Art Trust at the beginning of each calendar year to fund maintenance, repair, and conservation.

8. Eligible capital projects include tax funded:

a) new municipal buildings,

b) non-utility facility expansions or upgrades,

c) new park development projects,

d) major street rehabilitation or streetscape improvements,

e) new bridges, bridge replacements, and interchanges, and

f) new Public Places such as squares and plazas.

9. Funds derived from capital project allocations may be allocated to the specific project from which they are sourced or may be combined with other funds to either enhance a more prominent capital project or to support a non-contributing project.

GUIDING PRINCIPLES FOR THE PUBLIC ART PROGRAM

10. The Public Art program aligns with the planning framework set out in the 2020 Cultural Master Plan:

a) Leadership – The Town of Canmore Public Art Program adheres to recognized professional standards and promotes excellence in artistic practice and aims to elevate the role of culture in community building.

b) Inclusion – The Public Art Program works to advance right relations, promote cultural equity and expression, and increase community access to culture. The Public Art Collection will be comprised of Artworks that reflect the diversity present in our community and across Canada.

c) Space – Ensure town spaces and places reflect the community's shared history and advance local culture. The public shall have free and unobstructed access to art in Public Places.

d) Investment – The Town recognizes the contribution made by arts and culture as an economic driver and community builder and works to strengthen the sector and support and promote traditional and diverse forms of cultural expression.

PUBLIC ART ACQUISITION

11. Administration is authorized to acquire Public Art through commission, purchase, donation, loan, partnership with an external party, or lease.

12. Any person involved in a decision to acquire Public Art must comply with the Town's Purchasing Policy and Code of Conduct Policy.

13. Public Art purchased by the Town must be unencumbered and acquired through a full transfer of ownership from the Artist to the Town; the Artist will retain any and all copyright and moral and intellectual rights to the Artwork.

14. Acquisitions must be accompanied by a maintenance plan and a deaccession plan.

PUBLIC ART COLLECTION CRITERIA

15. The Public Art collection:

a) provides a sense of place, community pride and identity through the creation of new works across all mediums and in a variety of Public Places,

b) reflects community and regional diversity, values, history, nature, and culture,

c) is built in collaboration and partnership with Indigenous and multicultural communities as well as the private sector, internal and external stakeholders,

d) creates opportunities, challenges, and encouragement for all types of artists and artistic expression, and

e) is comprised of relevant art that inspires people and is an expression of the time.

PUBLIC ART SITE SELECTION CRITERIA

16. Public Art is intended to compliment current and future municipal development and infrastructure and enhance Public Places. Site selection will include a public engagement process that puts signage in a potential location for a minimum of three weeks with an opportunity for the public to provide comment. Sites will be selected using the following criteria:

    a) Accessibility – Public Art shall be located in areas that provide the public a free and unobstructed experience of the piece, with a preference given to sites offering the greatest opportunities for interaction and safe access for all;

    b) Visibility – preference shall be given to sites that are primarily visible to pedestrians and cyclists and that also considers a secondary audience of motorists, including public transit users;

    c) Discovery – use of sites where Public Art is unexpected or discovery by the viewer is encouraged;

    d) Project Specific – use of a site that lends itself to a specific project, audience, or desired art form may be considered;

    e) Environment - the environmental impact of the Public Art and its maintenance will be considered including wildlife attractants or entrapments, habitat preservation, and pollutants; and

    f) Municipal access – the site must be accessible to emergency services, property maintenance services, and the services related to maintenance, repair, and conservation of the Public Art.

PUBLIC ART COLLECTION MANAGEMENT

17. Town staff maintains a Public Art inventory and provides safekeeping for records related to the selection, Acquisition, maintenance, conservation, and deaccession of Public Art.

18. The Town provides insurance for all Public Art in its custody and control, regardless of whether the art is owned or not.

19. Where Public Art is commissioned, the Artist shall be required to provide a maintenance manual prior to receiving final payment for the project.

20. Maintenance, repair, and conservation, including storage, of Public Art shall be carried out by Town staff.

21. Deaccessioning of Public Art may be approved by Council only if one or more of the following conditions apply:

    a) It is no longer deemed morally or ethically accepted by current standards,

b) It possesses faults of design, workmanship or materials that result in excessive or unreasonable maintenance, a threat to public safety, and for damage to the extent where repair is unreasonable, impractical or the Artwork is beyond restoration,

c) Imminent changes to the site threaten the integrity and safety of the work,

d) It is fraudulent, not an authentic work, or there is a valid challenge to title; and/or,

e) Council determines that there is an exceptional and unforeseen reason for removing the Artwork from its current site, and no other suitable site can be found.

22. Deaccessioning shall not serve as a means for generating funds; any and all funds received through deaccessioning activities will be deposited into the Public Art Trust.

MICRO GRANT AREAS OF FOCUS

23. Activities funded through the Arts and Culture Micro Grant Program must fall within one or more of the following areas of focus:

a) Individual or Organizational Development
Activities that:
- build individual or Organizational capacity,
- support cultural expression and practices, and/or
- build business acumen.

b) Sector Development
Activities that:
- promote a strong and vibrant cultural sector.

c) Community Development
Activities that:
- encourage community connection, interaction, and engagement.

d) Right Relations, Equity, Diversity, and Inclusion
Activities that:
- support Canmore's diverse culture and values, and
- include underrepresented communities.

MICRO GRANT ELIGIBILITY

24. Eligible applicants include:

a) Canmore Based Artists, Artist Collectives, and arts and culture Organizations, and

b) Treaty-7 Based Artists, Artist Collectives, and arts and cultural Organizations whose artistic creation is intended to be shared with/in the Canmore community.

Policy approved by: _____ _____

25. Ineligible applicants include:

    a) individuals or Organizations who have already received the maximum funding amount allowable under the Arts and Culture Micro Grant Program within the previous 12 months,

    b) individuals or Organizations who have overdue reports related to prior Town of Canmore grant funding, and

    c) Arts and Culture Administrators.

RESPONSIBILITIES

26. The Cultural Advisory Committee is responsible for:

    a) advising administration on the Acquisition of Public Art,

    b) monitoring administrative practices related to planning, Acquisition, placement, maintenance, and deaccessioning to ensure a high standard is maintained, and

    c) making recommendations to Administration for amendments to this policy.

27. Administration is responsible for:

    a) preparing a five-year Public Art capital plan,

    b) overall management of the Micro Grant program,

    c) bringing policy updates to Council, and

    d) making the final decision on Acquisition and site selection.

28. Council is responsible for:

    a) Approving the Public Art and Micro Grant Policy and any amendments to the policy as needed,

    b) Approving expenditures from the Public Art Trust through the budget process, and

    c) Approving annual contributions to the Public Art Trust based on the funding model detailed in this policy.

POLICY REVIEW

29. This policy will be reviewed by Council within the next four years.

RELATED DOCUMENTS

30. 2020 Cultural Master Plan
31. Public Art Procedure

Policy approved by: _____ _____

32. Micro Grant Procedure
33. Cultural Advisory Committee Terms of Reference
34. Reserves Policy FIN-007
35. Purchasing Policy FIN-006
36. Code of Conduct Policy HR-002

ATTACHMENTS

None

REPEALS POLICY: Public Art Policy AE-001 approved June 15, 2010.

AUTHORIZATION:

Sean Krausert Mayor	Cheryl Hyde Municipal Clerk

REVISION HISTORY

Action	Date	Council Motion	Notes
Approved	2021-08-17	196-2021	
Amended	2023-10-03		Amended to include the Micro Grant

Policy approved by: _____ _____

Request for Decision

DATE OF MEETING:	**October 3, 2023**	**Agenda #:**	H-2
TO:	Council		
SUBJECT:	Enforcement Revenue from Commercial Food Waste Diversion		
SUBMITTED BY:	Palki Biswas, Manager of Finance Caitlin Miller, Manager of Protective Services		
RECOMMENDATION:	That Council repeal motion 69-2023.		

EXECUTIVE SUMMARY

In April 2023, Council directed administration to return with a process and recommendation for directing revenue from fines issued under the Recyclables and Waste Disposal Bylaw related to commercial waste infractions to the WildSmart program. Based on an analysis of using fine revenue in this manner along with the extensive administrative process of tracking these fines, and the precedence this direction could set for future fines and enforcement actions, the recommendation is to maintain status-quo and to not direct these fines to fund specific programs.

RELEVANT COUNCIL DIRECTION, POLICY, OR BYLAWS

Motion 69-2023: On April 4, 2023, Council directed administration to return with a process and recommendations for directing revenue resulting from enforcement from the specified fines except for sections 4.7(a) and 7.1 in Bylaw 2023-25 to the WildSmart Program.

DISCUSSION

At the regular business meeting of Council on April 4, 2023, the Recyclables and Waste Disposal Amendment 2023-15 Food Waste Bylaw was approved. Schedule C of the bylaw lists the minimum specified penalties as follows:

Minimum Penalty: $250 unless otherwise specified below.

Section	Description	Minimum Specified Penalty
4.7a	Disposal of demolition, renovation, or construction waste	$400
6.2.1	Failure to dispose of food waste generated by a food establishment and recyclables in the containers provided for those materials in accordance with section 6.2	First offence $1,000 Second offence $5,000 Third offence $10,000
6.2.2	Failure to locate used cooking oil container in animal-proof enclosure or used oil container enclosure	First offence $1,000 Second offence $5,000 Third offence $10,000
6.3	Failure to maintain animal-proof container or enclosure in such a manner that it remains animal-proof, serviceable and sanitary	First offence $1,000 Second offence $5,000

		Third offence $10,000
6.3.1	Failure to maintain animal-resistant carts located on premises in manner that it remains animal-resistant, serviceable, and sanitary	First offence $1,000 Second offence $5,000 Third offence $10,000
6.4	Failure to remove overflowed waste or recyclables from animal-proof container, enclosure, or cart	First offence $1,000 Second offence $5,000 Third offence $10,000
7.1	Disposal of dangerous goods	$1,000

The fines specified in the motion (6.2 to 6.4) relate to wildlife accessing commercial waste and products. These fines were increased for explicit discouragement of specific activities and rationalize penalties for non-compliance and to ensure they provide a sufficient deterrent for non-compliance. Since this bylaw has been approved, proactive patrols and extensive education is being done within the Canmore business community. The Town is seeing businesses comply with the revised changes in the bylaw.

Motion 69-2023 is to direct these fines annually to the WildSmart program. The Biosphere Institute of the Bow Valley implements WildSmart in close collaboration with Alberta Environment and Parks, Town of Canmore, and the Municipal District of Bighorn. WildSmart is a proactive conservation program that encourages efforts by Bow Valley communities to reduce negative human-wildlife interactions and teach residents and visitors to live smart with wildlife. The annual funding provided by the Town to the Biosphere Institute is as follows:

	2021 Actual	**2022 Actual**	**2023 Actual**	**2024 Approved Budget**	**2025 Plan**	**2026 Plan**
Biosphere – Core Funding	$73,427	$75,629	$77,898	$80,235	$82,642	$85,121
Biosphere - WildSmart	**66,413**	**68,406**	**70,458**	**72,572**	**74,749**	**76,991**
Biosphere – Sustainable Action Canmore	25,000	25,750	26,523	27,319	28,138	28,982

The commercial food waste bylaw fines are municipal (not provincial) in nature. From 2017 to 2022, there have been a total of 45 citations with 34 warnings and 11 tickets. For the fines specified in the Council motion, it was a total of 8 tickets over the last six years. In 2023, there have been 13 warnings given related to commercial waste infractions and 8 tickets issued. The increase in tickets issued in 2023 is attributed to more proactive patrols and complaints received regarding commercial waste not being disposed of in properly maintained animal proof bins in response to the increased bear activity observed within the municipality in 2022. With the recent work being done collaboratively between the Solid Waste Services, Environment and Sustainability, and the Municipal Enforcement departments on commercial waste, including food waste, more attention has been given to educate and enforce the Recyclables and Waste Disposal bylaw to ensure compliance and protect wildlife.

Tickets with higher fines are the ones that are most likely to be contested in court. Additional legal expenses are then incurred by the Town and it is a time-consuming process. It may take days/months for it to be

resolved and the fines disbursements to be received by the Town. All Municipal Enforcement fines disbursement are lumped together when received by the Town monthly. It will be a significant administrative task to manage and monitor these specific fines and set them aside annually into its own reserve. This includes creating processes in both Finance, Municipal Enforcement, and with the Town Solicitor to track when these tickets have been issued, track the legal costs associated should they proceed to court instead of being paid, and to determine total amounts to be transferred minus the legal costs and any other disbursements. This warrants creation and maintenance of a new reserve just for this purpose. Based on the policy, Council will then be required to authorize the transfers and draws to/from this reserve to fund other programs.

The Municipal Enforcement Department's goal is to gain compliance with established bylaws. Keeping fines in general revenues means that bylaw enforcement remains neutral with no additional motivating factors when conducting enforcement action. Having specific fines fund special interest programs may lead to a perception of bias regarding enforcement of bylaws. As the specified fines identified in the motion are already purposefully high to encourage compliance and match the severity of the bylaw infraction, they may be contested more often in court. By specifying where the fine revenue from the infractions will be going, the discretion of the enforcement officer may be questioned should their ticket be contested in court. These infractions are often complex enforcement cases that require a lot of engagement with the property owner to ensure future compliance is ongoing. Since compliance with the bylaw is the goal, fine revenues should remain general and not be used for specific programs.

ANALYSIS OF ALTERNATIVES

Council could choose to direct more Town funds to the Biosphere Institute to support the WildSmart program. This can be considered in 2024 for the 2025-2026 budget cycle.

FINANCIAL IMPACTS

Best practice says that in any organization a reserve should be established to cover the normal operating costs of the organization should an unexpected funding shortfall occur and to keep aside to meet unforeseen / extraordinary future financial obligations. Funding for these reserves should be based on budgeted operating dollars, surplus from annual operations or one-time/extraordinary revenues. Funding should not be contingent on fines or penalties when residents are not complying to a bylaw. Fines and penalties are one of the few revenue generating tools available to municipalities. It would not be fiscally prudent to rely on unpredictable and irregular enforcement fines to build up a reserve to support an ongoing program.

STAKEHOLDER ENGAGEMENT

The Town will continue with the proactive patrols and extensive education within the Canmore business community to ensure compliance with the bylaw.

ATTACHMENTS

Recyclables and Waste Disposal Bylaw 2016-11 consolidated

AUTHORIZATION

Submitted by:	Palki Biswas Manager of Finance	Date:	September 6, 2023
Submitted by:	Caitlin Miller Manager of Protective Services	Date:	September 6, 2023
Approved by:	Therese Rogers, General Manager of Corporate Services	Date:	September 7, 2023
Approved by:	Scott McKay General Manager of Municipal Services	Date:	September 14, 2023
Approved by:	Sally Caudill Chief Administrative Officer	Date:	September 25, 2023

BYLAW 2016-11
Office Consolidation Current as of April 6, 2023

A BYLAW OF THE TOWN OF CANMORE, IN THE PROVINCE OF ALBERTA, TO REGULATE DISPOSAL OF RECYCLABLES AND WASTE

The Council of the Town of Canmore, in the Province of Alberta, duly assembled, enacts as follows:

1: TITLE

1.1. This bylaw shall be known as the "Recyclables and Waste Disposal Bylaw."

2: PURPOSE

2.1. The purposes of this bylaw are

a) To provide for safe disposal and collection of recyclables and waste, and to provide mechanisms to address damage and/or misuse of recyclables and waste infrastructure;
b) To reduce animal attractants within the townsite;
c) To support recycling; and
d) To regulate residential and commercial recyclables and waste collection.

2.2. Revenue collected in accordance with this bylaw shall be dedicated to operating, maintaining, and enhancing the recyclables and waste disposal and collection system.

3: INTERPRETATION

3.1. Words which have been defined in the *Municipal Government Act*, and/or the *Interpretation Act* as amended shall have the same meaning when used in this bylaw unless otherwise defined in section 3.2.

3.2. In this bylaw,

"animal-proof container" means a receptacle designed in accordance with the Town of Canmore's Engineering Design Standards for the storage of waste between collection times;

"animal-proof enclosure" means a structure designed in accordance with the Town of Canmore's Engineering Design Standards for the storage of waste between collection times;

"animal-resistant cart" means a receptacle certified as a Bear-Resistant Product by the Interagency Grizzly Bear Committee (IGBC);

"commercial premises" includes any building, structure or premises which is not used for residential purposes, and for greater certainty, but not to be restricted to the generality of the foregoing, any building, structure or premises which is used by any Business or non-profit-organization, or for any professional, institution, industrial, commercial, retail, restaurant or worship purpose;

"dangerous goods" are those goods defined in the Province of Alberta *Dangerous Goods Transportation and Handling Regulation*, as amended;

"dwelling" means any building or place including the land upon which the building or place is located, which is occupied or used as a place of abode;

"food establishment" means any place, vehicle, business or institutional facility that serves, sells, dispenses, vends, prepares, creates, makes, holds, stores, manufactures, packages or otherwise deals with food, food items, drinks, or meals, regardless of whether consumption is on or off the premises of the place and regardless of whether there is a fee for the food, food items, drinks or meals. For the purposes of this bylaw, this includes but is not limited to

any place where food is provided or served to the public,

eating and drinking establishments, which includes but is not limited to restaurants, drive-ins, cafes, coffee shops, bakeries, catering kitchens, food concessions, food trucks, any other mobile food restaurant, theatres, cafeterias, and rental halls,

commercial accommodations with food services, which includes but is not necessarily limited to hotels, motels, bed and breakfasts, camps or other places of nightly accommodations,

retail businesses that sell goods directly to a consumer, including but not limited to grocery stores, butchers, bakeries, gas stations, pharmacies, convenience stores, liquor stores, and cannabis stores,

educational, recreational and health-care operations, which deal with food, which may include schools, day care centers, summer camps, senior housing facilities, substance abuse treatment facilities, and hospitals,

places of food and beverage manufacturing,

any other facilities providing commercial food services;

"food waste" means any material identified as acceptable by the Town in accordance with Schedule D;

"household waste" means solid waste generated by or discarded as refuse from a dwelling and does not include waste generated on a commercial premises or through activities related to construction, demolition, and renovation;

"large item cleanup program" means the municipal service where residents of Canmore can schedule the pickup of large items for disposal. These large items can include, but are not limited to furniture and large appliances;

"occupier" means the person residing in or in apparent possession or control of the premises, which may but not necessarily include the owner, a renter, a tenant or a lessee of the premises;

"owner" means

in the case of land registered under the *Land Titles Act*, the owner of a fee simple estate or registered leasehold interest in a parcel of land, or

a person residing in or in possession or control of the premises, and

in the case of personal property, the registered owner, and

in the case of unregistered personal property, any person with lawful possession and control over the property;

"pedestrian waste" means any waste or refuse generated or discarded by a person while that person is travelling by foot or non-motorized means within the town other than when indoors. Pedestrian waste includes but is not limited to food wrappers, beverage containers, fruit peels or cores and waste originating from any animal;

"person" means any individual, firm, partnership, association, corporation, or other legal entity;

"premises" includes any real property that may be owned, occupied, managed, or controlled by an owner or occupier, including parcels of land, any subdivisions of land or units of real property, and any structures that may be owned, occupied managed or controlled by an owner or occupier;

"recyclables" means any material accepted by the Town of Canmore in accordance with Schedule B;

"recycling container" means a container used for the storage of recyclables material between collection times;

"recycling depot" means a facility operated by the Town for the purpose of collecting recyclables;

"structure" means any building, extension from a building, garage, shed, shelter, fence, or other thing erected or placed in, on, over, or under land, whether or not it is movable or affixed to the land;

"toxic round-up" means a Town sponsored event for the collection of dangerous goods from residential areas and commercial premises;

"used cooking oil" means spent cooking oil from a commercial kitchen deep fryer;

"used cooking oil container enclosure" means a structure designed in accordance with the Town of Canmore's Engineering Design Standards for the storage of used cooking oil between collection times;

"violation tag" means a municipal tag or similar document issued by a peace officer in relations to an offence under this bylaw;

"violation ticket" means a ticket issued pursuant to the Provincial Offences Procedures Act, as amended, and the regulations thereunder;

"waste" means any material that would normally be discarded as garbage and does not include recyclables or food waste.

2023-15

4: GENERAL DISPOSAL

4.1. Unless otherwise permitted by this bylaw, no person shall dispose of waste or food waste anywhere in the town other than in

a) an animal-proof container, or

b) an animal-proof enclosure.

2023-15

4.2. Unless otherwise permitted by this bylaw, no person shall store waste outside.

2023-15

4.2.1 An owner or occupier shall store waste on the premises from which it was generated.

2023-15

4.2.2 A person shall not deposit waste in a container or bin without the consent of

a) the owner of the container or bin,

b) the owner of the property where the container or bin is located, or

c) the occupier of the property where the bin is located.

2023-15

4.3. No person shall provide a container or enclosure meant for the collection of waste or food waste that does not meet the Town of Canmore's Engineering Design and Construction Guidelines, as amended.

4.4. No person shall dispose of waste or food waste in such a manner as to prevent an animal-proof container or animal-proof enclosure from securely closing.

4.5. No person shall place ashes in an animal-proof container unless the ashes are quenched and have been contained within a securely fastened bag.

4.6. No person shall place damaged fluorescent lighting or gas filled electric discharge tubes in an animal-proof container unless the item has been crushed and is contained within a securely fastened, puncture-proof container.

4.7. No person shall place any of the following in an animal-proof container signed as being provided for household waste or pedestrian waste

a) waste generated by demolition, renovation, or construction,

b) waste generated on a commercial property,

c) any object longer than 1 metre,

d) hypodermic needles,

e) liquids, and

f) recyclables.

4.8. Unless otherwise permitted by this bylaw, no person shall dispose of recyclables anywhere in the town other than in

a) a recycling depot, or

b) a recycling container signed for collection of the recyclables being disposed of.

4.9. Notwithstanding section 4.8, no person shall dispose of materials at a recycling depot or in a recycling container unless

a) the materials are listed in Schedule B, and

b) the materials have been prepared for disposal in accordance with Schedule B.

4.10. No person shall permit a recycling container to remain uncovered or otherwise open in a fashion that allows the contents of the container to escape.

4.11. No person shall convey recyclables, food waste, or waste in a vehicle unless the load is secured in such a way as to prevent the recyclables or waste from escaping from the vehicle.

2023-15

4.12. No person shall dispose of food waste into any outdoor container or structure for the purpose of composting.

2023-15

4.13. No person, other than a person authorized by the Town, shall remove or interfere with recyclables, food waste, or waste after it has been deposited in an animal-proof container, animal-proof enclosure, animal-resistant cart, or recyclables container.

2023-15

4.14. No person shall affix, mark, damage, or alter an animal-proof container, animal-proof enclosure, animal-resistant cart, or recyclables container.

2023-15

4.15. No person shall place or keep an animal-proof container, animal-resistant cart, or recyclables container on or encroaching on public property unless authorized in writing to do so by the chief administrative officer.

2023-15

4.16. No person shall impede, obstruct, or hinder any Town of Canmore employee or agent, or any peace officer, while that employee, agent, or peace officer is performing or executing duties pursuant to this bylaw.

5: DISPOSAL IN RESIDENTIAL AREAS

5.1. Sections 5.2 through 5.6 apply only to the disposal and collection of waste in residential areas, whether on public or private property.

2023-15

5.2. Notwithstanding section 4.1, no person shall dispose of household waste in any bin other than an animal-proof container or animal-proof enclosure signed as being for the collection of household waste.

5.3. No person shall dispose of household waste in an animal-proof container unless the waste is contained within a securely fastened bag.

5.4. No person shall place any object or material that interferes with the use or servicing of the containers within 7 metres of any animal-proof container or recyclables container.

5.5. Where an animal-proof container, animal-proof enclosure, or community recycling container is located on private residential property, the owner or occupier of the property or their agent shall

a) remove or cause to be removed any recyclables or waste placed on top of or beside, or which has overflowed from, any animal-proof container, animal-proof enclosure, or community recycling container located on that premises,

b) remove or cause to be removed any vehicle parked within 7 metres of the container or enclosure,

c) remove or cause to be removed any object or material that interferes with the use or servicing of the containers placed within 7 metres the container or enclosure,

d) remove or cause to be removed any ice or snow from the area in front of or within 7 metres of the side of the container or enclosure within 48 hours after the ice or snow was formed or deposited.

2023-15

5.6. No person shall operate a service for the collection, removal, or disposal of recyclables or waste from residential areas unless authorized in writing to do so by the chief administrative officer.

6: DISPOSAL ON COMMERCIAL PREMISES

6.1. Notwithstanding section 4.1, no person shall dispose of waste generated on a commercial premises in any location other than the animal-proof bin or animal-proof enclosure associated with that premises.

6.1.1 No person shall dispose of food waste from a food establishment in a container provided for the collection of waste or recyclables.

2023-15

6.2. Every owner of a commercial premises where any of the following are produced shall provide for the separate storage and removal of

a) waste, and

b) food waste generated by a food establishment.

2023-15

6.2.1 Every owner or occupier of a commercial premises shall dispose of food waste generated by a food establishment and recyclables in the containers provided for those materials in accordance with section 6.2.

2023-15

6.2.2 If an owner of a commercial premises provides for the separate collection of used cooking oil, the owner must locate the container inside an animal-proof enclosure or used cooking oil container enclosure.

2023-15

6.3. Every owner and occupier of a commercial premises shall maintain any animal-proof container or animal-proof enclosure located on that premises in such a manner that it remains animal-proof, serviceable and sanitary.

6.3.1Every owner of a commercial premises where one or more commercial food service establishments are located shall maintain any animal-resistant cart located on that premises in such a manner that it remains animal-resistant, serviceable, and sanitary.

2023-15

6.4. Every owner and occupier of a commercial premises shall remove, or cause to be removed, any recyclables, food waste, or waste placed on top of or beside, or which has overflowed from, any animal-proof container, animal-proof enclosure, animal-resistant cart, or commercial recycling container located on that premises.

2023-15

6.4.1 The chief administrative officer may grant an exemption pursuant to section 6.2 upon written request of the owner if the chief administrative officer is satisfied that the premises does not routinely generate food waste.

2023-15

7: DISPOSAL OF DANGEROUS GOODS

7.1. No person shall dispose of a dangerous good anywhere in the town unless it is disposed of in accordance with a collection program and/or at a specific location authorized by the chief administrative officer.

8: EXEMPTIONS

8.1. Persons shall be exempt from the provisions of sections 4.1 and 4.2 when

a) storing waste outdoors that is scheduled for pick-up by the Town of Canmore's large item cleanup program and is stored no longer than 24 hours prior to the scheduled pick-up time;

b) storing an appliance outdoors provided:

i) all doors with a latching mechanism have been removed or secured so as to prevent the opening of a door, and

ii) the item has been scheduled for pick-up by the Town of Canmore's large item clean-up program and is stored no longer than 24 hours prior to the scheduled pick-up time.

c) providing a container for the collection of waste at a special event approved by the Town, and disposing waste generated at the special event in that container;

d) providing a container for the collection of construction, renovation, and demolition waste, and disposing of waste produced by the construction, renovation or demolition in that container.

e) storing waste leaves, grass, shrubs, and brush outside, provided the waste is

i) stored on private property,

ii) stored in a manner which prevents it from escaping the private property, and

iii) not stored for longer than 30 days.

9: FEES

9.1. All owners of residential and commercial property shall pay the fees set out in Schedule A of this bylaw from the date an occupancy certificate is issued, unless otherwise authorized by the chief administrative officer.

10: DELEGATION OF AUTHORITY

10.1. Without restricting any other power, duty or function granted by this bylaw the Town of Canmore's chief administrative officer shall

a) oversee the collection, removal, and disposal of recyclables and waste;

b) approve the location and construction of animal-proof containers, animal-proof enclosures, animal-resistant carts and recyclables containers;

c) authorize collection and disposal of hazardous goods;

d) carry out any inspection to determine compliance with this bylaw;

e) take any steps or carry out any actions required to enforce this bylaw;

f) take any steps or carry out any actions required to remedy a contravention of this bylaw;

g) establish forms for the purpose of this bylaw;

h) issue approvals with such terms and conditions as are deemed appropriate; and

i) delegate any powers, duties or functions under this bylaw to an employee of the Town of Canmore.

2023-15

11: ENFORCEMENT AND PENALTIES

11.1. Any person who contravenes any provision of this bylaw is guilty of an offence and shall be liable for a minimum penalty in accordance with Schedule C of this bylaw, and not exceeding $10,000.

11.2. Any person who contravenes any provision of this bylaw for which a penalty is not set out in Schedule C of this bylaw is liable to a minimum penalty of $250.

11.3. For the purposes of this bylaw, an act or omission by an employee or agent of a person is deemed also to be an act or omission of the person if the act or omission occurred in the course of the employee's employment with the person, or in the course of the agent exercising the powers or performing the duties on behalf of the person under their agency relationship.

11.4. If a partner in a partnership is guilty of an offence under this bylaw, each partner in that partnership that authorized the act or omission that constitutes the offence or assented to or acquiesced or participated in the act or omission that constitutes the offence is guilty of the offence

11.5. A peace officer is hereby authorized and empowered to issue a violation tag to any person, who a peace officer has reasonable and probable grounds to believe has contravened any provision of this bylaw.

11.6. A violation tag may be issued to such person:

a) either personally; or

b) by mailing a copy to such person at their last known address.

11.7. The violation tag shall be in a form approved by the peace officer and shall state:

a) the name of the defendant;

b) the nature of the offence;

c) the appropriate penalty for the offence as specified in the bylaw;

d) that the penalty shall be paid within 14 days of the issuance of the violation tag; and

e) Any other information as may be required by the peace officer.

11.8. Where a contravention of this bylaw is of a continuing nature, further violation tags may be issued by the peace officer, provided however, that no more than one violation tag shall be issued for each day that the contravention continues.

11.9. The person to whom a violation tag is issued may, in lieu of being prosecuted for the offence, pay to the Town of Canmore the penalty specified on the violation tag.

11.10. If the penalty specified on a violation tag has not been paid within the prescribed time, then a peace officer is hereby authorized and empowered to issue a violation ticket pursuant to the *Provincial Offences Procedure Act*, as amended.

11.11. Notwithstanding section 11.5 of this bylaw, a peace officer is hereby authorized and empowered to immediately issue a violation ticket pursuant to the *Provincial Offences Procedure Act*, as amended, to any person who a peace officer has reasonable grounds to believe has contravened any provision of this bylaw.

12: ENACTMENT/TRANSITION

12.1. If any clause in this bylaw is found to be invalid, it shall be severed from the remainder of the bylaw and shall not invalidate the whole bylaw.

12.2. Schedules A - Fees, B – Acceptable Recyclables Materials, and C – Penalties form part of this bylaw.

12.3. Bylaw 09-2001 and its amendments are repealed.

12.4. This bylaw comes into force on the date it is passed.

FIRST READING: August 16, 2016

SECOND READING: August 16, 2016

THIRD READING: August 16, 2016

DATE IN FORCE: August 18, 2016

OFFICE CONSOLIDATION

This document is a consolidation of a bylaw with one or more amending bylaws. Anyone making use of this consolidation is reminded that it has no legislative sanction. Amendments have been included for convenience of reference only. The approved bylaws should be consulted for all purposes of interpreting and applying the law.

Bylaws included in this consolidation:

2016-11	Recyclables and Waste Disposal Bylaw
2016-31	Amending Bylaw 2017-2018 Rates REPEALED
2018-30	Amending Bylaw 2019-2021 Rates REPEALED
2021-26	Amending Bylaw 2022 Rates REPEALED
2022-30	Amending Bylaw 2023-2024 Rates
2023-15	Amending Bylaw Food Waste

SCHEDULE A

Amended December 20, 2022 by Bylaw 2022-30

2023 and 2024 Rates for Recyclables and Waste Collection

Residential Collection	**2023**	**2024**
Recyclables	$17.34 / Residential Unit / Month	$18.21 / Residential Unit / Month
Waste	$19.77 / Residential Unit / Month	$20.76 / Residential Unit / Month

Commercial Collection	**2023**	**2024**
Recyclables	$25.31 / Commercial Unit / Month	$26.58 / Commercial Unit / Month

SCHEDULE B

Acceptable Recyclables Materials

The following materials are acceptable for recycling in Canmore provided that they are prepared for recycling in the manner described below and placed in the container that is designated for the particular recyclables:

Material	Acceptable	Required Preparation
Batteries	• Automotive batteries • Household batteries	• Undamaged • In a plastic bag if damaged
Bicycle Tires	• Bicycle tires	• No automotive tires
Bulbs	• Fluorescent tubes • Compact fluorescent bulbs • High pressure sodium & metal halide bulbs	• No damaged bulbs
Electronics	• Monitors, keyboards and CPU towers • Televisions, media players • Microwaves • Small appliances(toaster, hair dryer, lamps) • Cellular phones and accessories	
Glass	• Clear, amber & green bottles and jars • Window, automotive & broken glass	• No light bulbs, mirrors, Pyrex, china & porcelain • Remove labels and lids from bottles & jars • Thoroughly rinse bottles & jars clean • No refundable containers
Glycol	• Glycol (antifreeze)	
Leaves & Grass	• Leaves • Grass • Garden waste	• No construction waste or pressure treated wood • Loose without bags
Metal	• Tin and aluminum food and beverage cans	• No appliances • Rinse cans thoroughly and remove labels
Mixed Paper	• Newspaper and inserts • Magazines • Newsprint & glossy flyers • All corrugated cardboard (boxes having a wavy or corrugated section between 2 flat layers) • Paper egg cartons • Boxboard (cereal & cracker type boxes) • Office, computer & fax paper	• Break down and flatten all boxes • Remove all plastic wrappings and Styrofoam inserts • Shredded paper in a paper bag • Clean product only(no food scraps, oil stains)

Material	Acceptable	Required Preparation
	• Paper bags	
Oil products	• Used motor oil • Used oil filters • Used oil 1-20 litre plastic containers	• No non-oil related products • Remove lids from 20 litre containers
Paint & Household Hazardous Waste	• Aerosols • Paint, varnish, lacquer, etc. • Pesticides and Herbicides • Poison • Propane/butane cylinders • Solvents and Cleaners	• Large commercial loads may be saved for the Toxic Roundup
Plastics	• All rigid plastic containers with a Mobius loop symbol	• No plastic bags/film or styrofoam • Thoroughly rinse containers
Scrub & Brush	• Branches • Twigs	• No construction waste or pressure treated wood • Loose without bags
Textiles	• Clean and reusable clothing	• Secured in a plastic bag
Refundable Beverage Containers	• Polycoat containers (juice boxes, milk, cream, rice and soya cartons, etc.) • Plastic drink bottles (water, juice, soft drink, etc.) • Plastic jugs and bottles (clear, coloured and opaque plastic drink containers) • Aluminum cans (soft drink, juice, "energy" drink, beer, etc.) • Bag-in-a-box (wine) • Juice pouches and poly cups • Glass bottles (wine, juice, soft drink, beer, etc.) • Bi-metal cans (tomato juice, apple juice, coconut milk, etc.)	• Deposit in plastic/metal containers • Glass bottles can only be deposited in specific refundable beverage collection containers. Do not deposit in the Glass container.

SCHEDULE C
Amended April 6, 2023 by Bylaw 2023-15

Penalties

Minimum Penalty: $250 unless otherwise specified below.

Section	Description	Minimum Specified Penalty
4.7a)	Disposal of demolition, renovation, or construction waste	$400
6.2.1	Failure to dispose of food waste generated by a food establishment and recyclables in the containers provided for those materials in accordance with section 6.2	First offence $1,000 Second offence $5,000 Third offence $10,000
6.2.2	Failure to locate used cooking oil container in animal-proof enclosure or used oil container enclosure	First offence $1,000 Second offence $5,000 Third offence $10,000
6.3	Failure to maintain animal-proof container or enclosure in such a manner that it remains animal-proof, serviceable and sanitary	First offence $1,000 Second offence $5,000 Third offence $10,000
6.3.1	Failure to maintain animal-resistant carts located on premises in manner that it remains animal-resistant, serviceable, and sanitary	First offence $1,000 Second offence $5,000 Third offence $10,000
6.4	Failure to remove overflowed waste or recyclables from animal-proof container, enclosure, or cart	First offence $1,000 Second offence $5,000 Third offence $10,000
7.1	Disposal of dangerous goods	$1,000

2023-15

SCHEDULE D
Amended April 6, 2023 by Bylaw 2023-15

Food Waste

Acceptable	Not Acceptable
• Fruits & vegetables • Pits, peelings, rinds, tops, cores and husks • Rice, breads, cereal, noodles, toast, tortillas, baked goods, pastries, pies, etc. • Pumpkins • Coffee grounds and filters • Tea bags and leaves • Dairy products • Paper soiled with food • Egg & eggshells • Popsicle and stir sticks (wooden only) • Meat, fish & bones • Certified compostable foodware	• Plastic • Elastics • Twist ties • Stickers • Plastic labels • Fabrics • Pet waste

Request for Decision

DATE OF MEETING:	**October 3, 2023**	**Agenda #:**	H-3
TO:	Council		
SUBJECT:	Municipal Election Signage Options		
SUBMITTED BY:	Anika Drost, Development Planner		
RECOMMENDATION:	That Council direct administration to prepare: 1. an Election Sign Bylaw that restricts municipal election signage to private property; and 2. an amendment to the Town's Land Use Bylaw to remove the political campaign signs section.		

EXECUTIVE SUMMARY

Council directed administration to review options to manage and/or regulate municipal election signs placed on municipally owned land to reduce the proliferation of election signage. Administration has reviewed the approaches used in other municipalities to regulate election signs and has identified that the most common ways to regulate this type of signage are either through Land Use Bylaw provisions or through a separate municipal election signage bylaw.

RELEVANT COUNCIL DIRECTION, POLICY, OR BYLAWS

On December 7, 2021, Council approved motion 251-2021 "that Council direct administration to return to Council by December 31, 2022, with a report on options for regulating or managing election signage on municipal property".

Due to capacity constraints and competing priorities, administration was not able to bring back a report in 2022. On December 6, 2022, Council approved motion 285-2022 to have this report come back to Council by December 2023.

DISCUSSION

Council expressed concerns around election signage used during the 2021 municipal election. The concerns revolved around the unsightly proliferation of election signage on Town land, the financial barrier created for candidates when large amounts of election signage are needed, how the number of signs did not dictate the results of the election, and that election signage can be viewed as a single use plastic item. Council directed administration to explore options to better regulate this matter and report back to Council.

As part of administration's review, administration looked at what current provisions the Town has that regulate election signage and what approaches other municipalities are using to regulate this matter. Administration is recommending a land use bylaw amendment to remove the political campaign signage section and create a separate Election Sign Bylaw.

Current State

Signage within the Town is regulated under section 9 of the Land Use Bylaw (LUB). "Political Campaign Signs" are classified as "Temporary Signage" under section 9.12 and subsequent section 9.12.6. These signs are not required to adhere to the "General Signage Regulations" that require raised or recessed letters or relief. They are also exempt from requiring a development permit or a certificate of signage conformance under sections 9.12 and 9.14 if they conform with the requirements of section 9.12.6:

9.12.6 Political Campaign Signs

9.12.6.1 Signs may be installed on public or private property.

9.12.6.2 The Sign shall have a maximum overall area of 0.5 m² when installed on public property.

9.12.6.3 There is no maximum area for Signs installed on private property.

9.12.6.4 The Sign may be designed with plastic material.

9.12.6.5 Signs shall not interfere with the safety and convenience of pedestrians, cyclists or motorists, or other uses of public sidewalks, streets, boulevards or property.

9.12.6.6 Signs shall be removed within 48 hours of the closing of the polls following the election.

This section stipulates that election signage is permitted to be placed on private and municipally owned land. Signs placed on municipally owned land are allowed to be up to 0.5 m².

If a sign complies with the sizing requirements and does not interfere with the safety and convenience of users of public sidewalks, street, boulevards, and other municipal property, signs may be erected at any location on privately owned (assuming permission by the property owner) or municipally owned land, and in any quantity desired by the campaigning candidates, unless the private landowner has expressed a limitation on signage.

Mobile signs were observed in the previous municipal election. A mobile sign is defined within the LUB as "*a Sign that is not permanently attached to the ground or other permanent structures or a sign designed to be transported on wheels, or a Sign attached to or painted on a vehicle parked and visible from a public right-of-way, unless such a vehicle is used in the normal day-to-day operations of that business.*" Mobile signs for election sign purposes are not permitted.

As these signage provisions are currently located within the LUB, the enforcement of such provisions falls with the Planning and Development Department. A violation tag and/or ticket may be issued in the amount of $50 for the first offence within the calendar year, $100 for the second offence within the calendar year, followed by $250 for the third and subsequent offences within the calendar year. As per current standard operating procedure, enforcement measures are pursued on a complaint basis.

If desired, the Town has the authority to regulate election signage components such as sign size, quantity, and location. Prohibiting the location of election signage on municipally owned land could reduce the signage needs of individual candidates, which in turn would reduce visual clutter, waste, and improve safety.

Other Municipal Approaches to Regulate Municipal Election Signage

The Town of Banff regulates election signage within their land use bylaw signage section. Election signage is exempt from requiring a development permit, provided that it is located on private property and adheres to stipulated size requirements.

The City of Airdrie also regulates election signage through their land use bylaw signage section. No development permit is required if the signage complies with the land use bylaw provisions. In addition to setbacks from curbs, intersections, size, and other criteria, they also regulate signage on public property. Specifically, they allow election signs to be placed on public property that does not contain a municipally owned or operated building. This would permit municipal election signage on municipal land such as road rights-of-way, parks, plazas, etc.

Strathcona County has taken a very prescriptive approach to regulating election signage, all of which is regulated within their land use bylaw. Election signs are categorized by sign type, areas within the municipality, and sign size. They have incorporated specific setbacks (i.e., 10 m from an intersection) and separation requirements (i.e., 15 m from another election sign of the same candidate, 5 m from other signs). The provisions also limit election signs to public property that does not contain any municipally owned or occupied facilities and restricts the placement of signage along specific road rights-of-way. A development permit is required to receive approval for election signage. A staff complement dedicated to election signage processes applications during the election period.

The City of Wetaskiwin adopted an election signage bylaw in 2017. The bylaw stipulates the duration of election signage as well as the size and type of signage. The bylaw also includes a schedule of applicable fines and wording to ensure that the signage is protected from damage and disrepair. The bylaw contains a complete prohibition of municipal election signage on municipally owned land.

The City of Camrose adopted an election sign policy on August 14, 2023. The policy acts as a separate document to regulate election signage. Key components of the policy include prohibition of election signs on public roadways, a required side yard setback on private property, and a set timeframe for removal of signage. Their land use bylaw contains an election sign section that refers the reader to the election sign policy.

Within their land use bylaw, the City of Lethbridge clarifies that election signs that are removed within three (3) days after the election do not require a development permit. Additional election signage provisions are located within their "Election Sign Guidelines". The guidelines act as a separate document that outlines the requirements for election sign installation within the road right-of-way, on private property, and provides a list of safety requirements. Although placement of signage within road rights-of-way is permitted, exclusions include signage placed on roadways (including paved shoulders), centre medians, traffic islands, and roundabouts. There are no prohibitions on other municipally owned lands such as parks.

Based on this review, the placement of municipal election signage can and has been prohibited on municipally owned land in other communities. Two of the above approaches provide enforceable ways to prohibit or manage signs on municipal property, either by full prohibition, or through additional specifications to reduce the amount of signage (e.g., addition of setback requirements for signs of the same candidate, restriction of signage to specific road rights-of-way within Town). These approaches could address Council's concerns about election signage, with minimal impact to internal capacity.

Next Steps

The LUB predominantly provides direction for development on private property that is more permanent in nature (including business signage). The LUB addresses signage on private property in a detailed manner but speaks less to signage on public lands. Election signage differs from other signage in the LUB, due to its temporary, time-bound nature that results in a proliferation of signage throughout Town. Although there is value in maintaining signage regulations in one document, administration believes that election signage could be dealt with more effectively through a separate municipal election sign bylaw.

A separate election sign bylaw would strictly deal with election signage and its unique nature. This could include provisions regarding sign placement, sign size, enforcement, and penalties for offences. If Council pursues this approach a subsequent LUB amendment would be required to remove any existing election signage regulations within the LUB to streamline the regulations and minimize confusion.

As a stand-alone bylaw, enforcement would be conducted through Municipal Enforcement rather than through Planning and Development. Municipal Enforcement is already out patrolling areas and could quickly spot non-compliant signs. Currently, Municipal Enforcement only proactively enforces a limited number of bylaws (e.g., at-large (off-leash) dog patrols, wildlife attractant patrols, and occasionally commercial waste patrols). Due to the time-sensitive nature of the enforcement required for election signage, enforcing this within current resourcing capacity would require a reprioritization of what gets proactively enforced by Municipal Enforcement during that period.

ANALYSIS OF ALTERNATIVES

An LUB amendment could be made to prohibit elections signs from being placed on any municipally owned properties.

Regulating municipal election signage within the LUB allows the provisions to be enforceable under the same bylaw as other signage within Town. Enforcement would remain within the Planning and Development Department, with a minimal impact on the existing processes. Land use enforcement is currently carried out on a complaint basis and evidence is typically required prior to an enforcement action being taken. This approach may not be the most conducive due to the short length of the election season, where enforcement would require immediate action. While enforcing the signage could be done using current resources, it would require staff to temporarily redirect their attention from other time-sensitive department tasks (i.e., permit processing).

Both the proposed approach and the alternative could reduce how many signs candidates feel they need to purchase to support their campaign and thus reduce some costs, but they will not impact the actual cost of producing individual signs.

FINANCIAL IMPACTS

There are no significant financial impacts expected, as a change would likely shift resources temporarily, rather than require additional resources.

STAKEHOLDER ENGAGEMENT

The Municipal Enforcement Department was consulted on the proposed recommendation and is prepared to advance the next steps associated with the recommended approach.

ATTACHMENTS

None.

AUTHORIZATION

Submitted by:	Anika Drost Development Planner	Date:	August 31, 2023
Approved by:	Lauren Miller, RPP, MCIP, ACIP Manager, Planning and Development	Date	September 25, 2023
Approved by:	Whitney Smithers General Manager, Municipal Infrastructure	Date:	September 26, 2023
Approved by:	Sally Caudill Chief Administrative Officer	Date:	September 26, 2023

Request for Decision

DATE OF MEETING:	October 3, 2023	**Agenda #:**	H-4
TO:	Council		
SUBJECT:	Appointment of Code of Conduct Investigator		
SUBMITTED BY:	Adam Driedzic, Town Solicitor		
RECOMMENDATION:	That Council appoint Sage Analytics to perform the duties of Investigator as set out in the Code of Conduct for Elected Officials Bylaw 2018-02; and That Council direct administration to negotiate a non-exclusive service agreement with Sage Analytics that allows for the continued use of the Investigator appointed by resolution 148-2018.		

EXECUTIVE SUMMARY

Council should appoint a second Investigator under the Code of Conduct to cover the unavailability of the regular Investigator.

RELEVANT COUNCIL DIRECTION, POLICY, OR BYLAWS

Section 16.1 of the Code of Conduct for Elected Officials (Bylaw 2018-02) provides for Council to appoint a person to act as an Investigator. Section 16.2 provides that this person cannot be a municipal employee or members of a councillors' families. Council appointed Barbara McNeil as the Investigator on June 19, 2018 by resolution 148-2018.

DISCUSSION

The process provided by the Code of Conduct depends on the position of Investigator being filled. The Investigator appointed by resolution 148-2018 is not always available. Administration recommends creating a roster of more than one investigator.

The current Investigator has recommended three firms to act as Investigator when she is unavailable:

- Method work investigations – Deborah Prowse
- Sage Analytics – Shari-Anne Doolaege
- ADR Education

The Town Solicitor contacted all three of the above firms to assess their qualifications. Method and Sage Analytics are both qualified. ADR Education had no alternate investigator located in Alberta at this time. Administration recommends Sage Analytics.

If Council wishes to discuss the material details of the firms' proposals, then this should go in-camera under sections 16(1) and 25(1)(c) of the *Freedom of Information and Protection of Privacy Act.*

ANALYSIS OF ALTERNATIVES

None.

FINANCIAL IMPACTS

The main financial impact of appointing an Investigator is the Investigator's fees. The regular Investigator does not charge fees unless there is an investigation. Administration will seek the same arrangement with any investigator on a roster.

STAKEHOLDER ENGAGEMENT

None.

ATTACHMENTS

1. Code of Conduct for Elected Officials Bylaw 2018-02

AUTHORIZATION

Submitted by:	Adam Driedzic Town Solicitor	Date:	September 25, 2023
Approved by:	Sally Caudill Chief Administrative Officer	Date:	September 25, 2023

Town of CANMORE

BYLAW 2018-02

A BYLAW OF THE TOWN OF CANMORE, IN THE PROVINCE OF ALBERTA, TO ESTABLISH A CODE OF CONDUCT FOR ELECTED OFFICIALS

The Council of the Town of Canmore, in the Province of Alberta, duly assembled, enacts as follows:

1: TITLE

1.1. This bylaw shall be known as the "Council Code of Conduct Bylaw."

2: SCOPE

2.1. The Council Code of Conduct Bylaw is intended to address matters of conduct not already addressed in the Municipal Government Act or the Local Authorities Election Act.

2.2. In the event of a conflict between this bylaw and provincial legislation, the provincial legislation takes precedence.

3: REPRESENTING THE MUNICIPALITY

3.1. In addition to the responsibilities established in the Municipal Government Act, the distinct charge of council is to work collaboratively, with the benefit of individual knowledge, experience, and community connections, to make balanced decisions to sustain and uphold community values for the betterment of the Town of Canmore.

3.2. Council members must not attempt to disguise or mislead as to their identity or status as an elected representative of the Town.

4: COMMUNICATING ON BEHALF OF THE MUNICIPALITY

4.1. Unless Council directs otherwise, the mayor is Council's official spokesperson.

4.2. Council members must not purport to speak on behalf of Council unless authorized by Council to do so.

4.3. Council's official spokesperson must ensure their comments accurately reflect the official position of Council as a whole, even when the official spokesperson disagrees with that position.

4.4. Council members must not publish anything that is intentionally dishonest, untrue, unsubstantiated, or misleading in any way.

5: RESPECT FOR THE DECISION-MAKING PROCESS

5.1. Council members must not purport to bind Council, either by publicly expressing their personal views on behalf of Council when not authorized to do so or by giving direction to employees, agents, contractors, consultants, or other service providers of the Town.

5.2. Council members shall accept and accurately communicate the decisions of Council even when they disagree with Council's decision.

6: ADHERENCE TO POLICIES, PROCEDURES, AND BYLAWS

6.1. Council members shall read, understand, and comply with all policies, procedures, and bylaws that apply to their duties as elected officials.

7: RESPECTFUL INTERACTIONS

7.1. Council members shall demonstrate respect for process, each other, and members of the public.

7.2. Council members must not maliciously or falsely injure the professional or ethical reputation of any Town employee.

7.3. Council members shall read, understand, and comply with Respectful Workplace Policy HR-009.

8: CONFIDENTIAL INFORMATION

8.1. Confidential information means information that a council member has a legal duty not to disclose.

8.2. Council members will collect, use, retain, and disclose information only for purposes consistent with the use for which it was collected.

8.3. Council members must not disclose confidential information, including to Town employees and members of the public, except as authorized by Council or a Town employee authorized to approve disclosure.

8.4. Council members must protect confidential information from inadvertent disclosure, and take reasonable care to prevent examination of confidential information by unauthorized persons.

8.5. Council members must not use confidential information with the intent to cause harm or detriment to Council, the Town, or any other person or body.

8.6. Council members must not take personal advantage of, or use for their own benefit, corporate or financial opportunities learned about through access to confidential information.

9: CONFLICTS OF INTEREST

9.1. A council member must abstain from voting on a matter before council if the member has a conflict of interest that is a pecuniary interest as set out in the Municipal Government Act.

9.2. A council member is not permitted to abstain from voting on a matter before council if they have a conflict of interest that is not pecuniary; this would be where a member believes a non-pecuniary personal or private interest may influence their vote, or where a member believes another person may perceive that a member's non-pecuniary personal or private interest may influence their vote.

9.3. In the event a council member believes they have a conflict of interest that is not pecuniary, or where they believe another person may perceive them to have a conflict of interest that is not pecuniary, the council member may declare the interest before they vote on the matter, and that

declared interest will be recorded in the minutes of the meeting.

9.4. Council members will not accept or provide any gift, benefit, or favour in exchange for special consideration or influence, or where it may be perceived by a reasonable person to be in exchange for special consideration or influence.

9.5. Council members may accept a token or gift that is:

a) Part of the normal exchange of hospitality among persons doing business such as a lunch or event ticket;

b) A small holiday gift showing appreciation (e.g., cards, cookies, chocolates);

c) Advertising material (e.g., calendars, note pads, pens, caps);

d) A corporate discount available to all Town employees;

e) A protocol item (e.g., symbolic or ceremonial gifts);

f) A conference door prize.

9.6. Council members may not accept cash or gift cards/certificates that have a monetary value, with the exception of donations made to support a charitable cause.

10: IMPROPER USE OF INFLUENCE

10.1. Council members must not use the influence of their office for any purpose other than for the exercise of their official duties.

10.2. Council members must not use, or attempt to use, their authority or influence for the purpose of directing the work of any Town employee.

10.3. Council members must not act as a paid agent to advocate on behalf of any individual, organization, or corporate entity before Council, a committee of Council, or any other body established by Council.

10.4. Council members shall not attempt to influence members of any adjudicative body regarding any matter before it relating to the Town.

10.5. Council members must not ask any Town employee to undertake personal or private work on their behalf, or accept such work from a Town employee.

11: USE OF MUNICIPAL ASSETS AND SERVICES

11.1. Council members are required to care for Town assets, which includes all property, equipment, software, and information.

11.2. Council members must not use, or permit the use of, Town land, facilities, equipment, supplies, services, employees or other resources for activities other than Town business, subject to the following exceptions:

a) Municipal property, equipment, service, supplies, and staff resources that are available to the general public may be used by Council members for personal use under the same terms and conditions as apply to the general public, including booking and payment of fees or charges;

b) Electronic communication devices supplied to Council members by the Town, including but not limited to desktop computers, laptops, tablets and smartphones, may be used by Council members for personal use, with the caveat that the devices and all information contained on them remain the property of the Town.

11.3. Council members must not use any facilities, equipment, supplies, services, municipal logo, or any other resources of the Town for any election campaign or campaign-related activity.

12: ORIENTATION AND OTHER TRAINING ATTENDANCE

12.1. Unless excused by Council, Council members must attend:

a) Orientation training offered by the municipality in accordance with the Municipal Government Act; and

b) Any training organized at the direction of Council or mandated by the Province of Alberta.

13: COMPLAINTS

13.1. Any person who has witnessed or experienced conduct by a council member which they believe to be in contravention of this bylaw may address the contravention by submitting a complaint to the Investigator in accordance with this bylaw.

13.2. Complaints submitted to the Investigator must:

a) Be made in writing and include the date and the name and signature of an identifiable individual;

b) Be addressed to the Town of Canmore Investigator; and

c) Set out reasonable and probable grounds for the complaint.

13.3. A complaint is considered received when the Investigator personally receives it.

13.4. Upon receipt of a complaint, the Investigator shall determine whether the conduct described is within the Investigator's authority to consider and whether the information given in the complaint provides reasonable grounds for believing that a violation of this bylaw may have occurred.

13.5. The Investigator may request further information from the person who submitted the complaint before determining whether or not there are reasonable grounds for believing a violation of this bylaw may have occurred.

13.6. If the Investigator, on receipt of the complaint or at any time thereafter, is of the opinion that:

a) The matter is not within the Investigator's authority to investigate, or

b) There are no grounds or insufficient grounds for conducting an investigation, or

c) The complaint is frivolous, vexatious, or not made in good faith,

The Investigator shall not conduct an investigation, or shall terminate an investigation that has already started, shall advise the person who submitted the complaint in writing, setting out the reasons, and shall close the file.

13.7. If a complaint is dismissed pursuant to section 13.6, the fact of the complaint shall not be reported to council, other than in the form of statistics.

13.8. If a complaint is not dismissed pursuant to section 13.6, the Investigator shall:

a) Within 10 days of receiving the complaint, notify the council member who is the subject of the complaint, either personally or by email, that an investigation has been initiated and provide the council member with:

i) The written complaint and

ii) The name of the person who submitted the complaint; and

b) Take such steps as the Investigator considers appropriate to investigate the complaint.

13.9. Notwithstanding section 13.8 (ii), the Investigator will not disclose the name of the person who submitted the complaint if the Investigator determines such disclosure could reasonably be expected to threaten anyone else's safety or mental or physical health, or interfere with public safety.

13.10. In the course of an investigation, the Investigator is authorized to speak to anyone, access and examine any records in the custody and control of the Town, and enter any Town work location relevant to the complaint.

13.11. When the Investigator is of the opinion there are reasonable grounds to believe a violation of this bylaw has occurred, the Investigator may attempt to resolve the complaint through mediation with the person who submitted the complaint and the council member who is the subject of the complaint.

13.12. If a complaint is resolved through mediation, the Investigator shall:

a) Terminate the investigation,

b) Provide written notice of the termination of the investigation to the person who submitted the complaint and the council member who is the subject of the complaint, and

c) Close the file.

13.13. If a complaint is resolved through mediation, the fact of the complaint shall not be reported to council, other than in the form of statistics.

13.14. When a complaint cannot be resolved through mediation, the Investigator shall proceed with the investigation and shall provide the findings along with any recommendations, in writing, to the person who submitted the complaint and the council member who is the subject of the complaint no later than 90 days after receiving the complaint.

13.15. Where the Investigator finds no violation of this bylaw has occurred, the fact of the investigation shall not be reported to Council, other than in the form of statistics.

13.16. Where the Investigator finds a complaint to be substantiated, in whole or in part, the Investigator shall:

a) Allow the council member who is the subject of the complaint fourteen days from the date the notice under section 13.14 was provided to submit a response, either in person or in writing, on the proposed finding and recommended sanction, if any, and

b) Report the findings, the council member's response, and any recommendations to Council within the two regularly scheduled business meetings following the deadline for the council member's response.

13.17. A report made under section 13.16(b) shall include the name of the person who made the complaint unless determined otherwise by the Investigator.

13.18. If the Investigator finds a complaint to be substantiated, in whole or in part, but finds the Council member took all reasonable steps to prevent the contravention, or that it was trivial or committed through inadvertence or genuine error of judgment, the Investigator shall recommend that no sanction be imposed.

13.19. Upon receipt of a report made under section 13.16(b), council shall determine which, if any, sanctions will be imposed.

14: SANCTIONS

14.1. If the Investigator finds that a Council member has failed to adhere to this bylaw, Council may impose one or more of the following sanctions:

a) A letter of reprimand addressed to the Council member;

b) A request that the Council member issue a letter of apology;

c) Publication of a letter of reprimand or request for apology and the Council member's response;

d) A requirement to attend training;

e) Suspension or removal of the appointment of a Council member as the deputy chief elected official under section 152 of the Municipal Government Act;

f) Suspension or removal of the chief elected official's presiding duties under section 154 of the Municipal Government Act,

g) Suspension or removal from some or all council committee and bodies to which council has the right to appoint members;

h) Reduction or suspension of remuneration as defined in section 275.1 of the Municipal Government Act corresponding to a reduction in duties, excluding allowances for attendance at council meetings.

15: COMPLAINT PARAMETERS

15.1. In the period ninety days prior to the date of a municipal election, the Investigator may suspend any investigation underway or decline to commence an investigation.

15.2. The Investigator may reject any complaint received:

a) More than 180 days after the date of the alleged bylaw contravention; or

b) More than 180 days after the person submitting the complaint became aware of the alleged bylaw contravention; or

c) After the date of a municipal election which intervenes between the alleged bylaw contravention and the date the Investigator receives the complaint.

16: INVESTIGATOR

16.1. Council shall appoint a person to act as the Investigator.

16.2. The following persons are not eligible to act as the Investigator:

a) a council member, a council member's spouse or adult interdependent partner, a council member's children or the children's spouse or interdependent partner, the parents of a council member, and the parents of a council member's spouse or interdependent partner;

b) a Town employee.

16.3. The records in the custody and control of the Investigator are considered property of the Town and so are subject to the Freedom of Information and Protection of Privacy Act and Town information governance policies.

17: ENACTMENT/TRANSITION

17.1. Council shall review this bylaw, at a minimum, once every four years or when relevant legislation is amended.

17.2. If any clause in this bylaw is found to be invalid, it shall be severed from the remainder of the bylaw and shall not invalidate the whole bylaw.

17.3. This bylaw comes into force on the day it is passed.

FIRST READING: April 3, 2018

SECOND READING: April 3, 2018

THIRD READING: April 3, 2018

Approved on behalf of the Town of Canmore:

John Borrowman
Mayor

April 5, 2018
Date

Cheryl Hyde
Municipal Clerk

April 4, 2018
Date

Bylaw approved by: CB JB

Request for Decision

DATE OF MEETING:	**October 3, 2023**	**Agenda #:**	**H-5**
TO:	Council		
SUBJECT:	2022 Utility Master Plan		
SUBMITTED BY:	Andreas Comeau, Manager of Public Works		
RECOMMENDATION:	That Council accept the 2022 Utility Master Plan for planning purposes.		

EXECUTIVE SUMMARY

The Town completes a Utility Master Plan (UMP) update typically every 5-6 years to ensure there is adequate capacity within the water and wastewater systems to accommodate growth and corresponding demand. The list of recommended projects included in a UMP update allows the Town to develop a long-term plan to meet demand and pressures on the utility, specifically around reserve balances, capital funding and utility rates.

The UMP also reviews each project to determine the percentage of a project that is related to growth – to ensure growth pays for growth. These details are used to update to the Off-Site Levy Bylaw to ensure development fees are transparent and appropriate.

ATTACHMENTS

1) Briefing and attachments from the May 16, 2023 Committee of the Whole meeting.

AUTHORIZATION

Approved by: Sally Caudill
Chief Administrative Officer Date September 25, 2023

Briefing

DATE OF MEETING:	**May 16, 2023**	**Agenda #:** D-2
TO:	Committee of the Whole	
SUBJECT:	2023 Utility Master Plan Update	
SUBMITTED BY:	Andreas Comeau, Manager of Public Works	
PURPOSE:	To provide the Committee of the Whole with a summary of the updated Utility Master Plan.	

EXECUTIVE SUMMARY

The Town completes a Utility Master Plan (UMP) update typically every 5-6 years to ensure there is adequate capacity within the water and wastewater systems to accommodate growth and corresponding demand. The list of recommended projects included in a UMP update allows the Town to develop a long-term plan to meet demand and pressures on the utility, specifically around reserve balances, capital funding and utility rates.

The UMP also reviews each project to determine the percentage of a project that is related to growth – to ensure growth pays for growth. These details are used to update to the Off-Site Levy Bylaw to ensure development fees are transparent and appropriate.

BACKGROUND/HISTORY

The Town completes a Utility Master Plan (UMP) every 5-6 years to ensure it can provide for future demand while planning its capital plan to ensure reserve balances, funding and rates are appropriate. The last review was completed in 2017. The current UMP update was delayed due to COVID and the uncertainty around development. The delay has allowed for the evaluation of the Wastewater Treatment Plan as part of the proposed changes to the Town's Approval to Operate to be included in the UMP update.

DISCUSSION

The UMP update can best be summarized into two categories: Growth and Regulatory. Historically, growth and its impact on the Town's water and wastewater systems has been the main driver for identifying projects, however the Town is undergoing a significant renewal of its Approval to Operate with the Province so more analysis was required.

GROWTH

The development of a UMP update includes the following four main steps:

1. Growth assumptions: Determine where and when growth is projected to occur in the short, mid, and long term.
2. Validate water and wastewater models: Ensure models mirror the systems.
3. Run growth assumptions through models: Determine areas of the system that cannot meet demand (producing a list of recommended upgrade projects).

4. Detail projects: Include high level detail, project triggers, recommended date, a high-level budget (+/- 40%) and any costs share details (if applicable).

BOWDA is a key stakeholder with the UMP update as UMP projects feed the Off-Site Levy Bylaw, impacting development fees. Administration has increased the level of engagement with BOWDA over the past two updates. BOWDA reviewed the 2017 UMP final draft, and it was agreed that the next update should engage them at the outset of the process, including reviewing the approach, assumptions and cost share scenarios earlier. The Town also committed to ensuring agreements affecting the update such as the servicing agreement with Dead Man's Flats be included. The Town appreciates the feedback and robust review provided by BOWDA. The UMP is a better document through their involvement.

REGULATORY

New to this update is the requirement to meet changes to the conditions being placed on the Town as part of the Approval to Operate renewal from the Province, which occurs every 10 years. The main change is more stringent conditions for phosphorous removal from 1.00 mg/L to 0.50 mg/L and the addition of a Total Nitrogen limit of 15 mg/L prior to 2031. The Wastewater Treatment Plant (WWTP) is currently 26 years old and will be unable to achieve these limits without a significant upgrade and potentially a change in secondary treatment technology. The WWTP evaluation of alternatives is part of the UMP update and included as an appendix.

FINANCIAL IMPACTS

There are no specific financial impacts as part of this briefing report. Administration will be inputting the recommended capital projects into a draft capital plan and updating the Utility Rate Model, to better understand the long-term impact on reserves, debentures and rates.

STAKEHOLDER ENGAGEMENT

Internal stakeholders were the Engineering, Finance, and Planning & Development departments. External stakeholders included EPCOR and BOWDA, who had a more robust involvement in the update including the stages to review the development projections, individual projects, cost share and reviewing the final draft.

ATTACHMENTS

1) 2023 Utility Master Plan
2) 2023 WWTP Capacity Evaluation

AUTHORIZATION

Submitted by:	Andreas Comeau Manager of Public Works	Date:	April 27, 2023
Approved by:	Whitney Smithers General Manager of Municipal Infrastructure	Date:	April 27, 2023
Approved by:	Sally Caudill Chief Administrative Officer	Date:	May 8, 2023

Town of Canmore
2022 Utility Master Plan
CAP 7203 C04-00496

May 2023

Town of Canmore

2022 Utility Master Plan

CAP 7203 C04-00496

Prepared by: _____
Jamie Purdy, CET.

_____
Steven Dawe, P. Eng.

#300 6815 8 St NE, Calgary, AB
Canada T2E 7H7

CIMA+ file number: C04-00496
May 2, 2023 – Review FINAL

Confidentiality and ownership

Review and submission register			
Review No.	Reviewed by	Date	Description of the change or submission
DRAFT	JP / SD / CC / DL / NN	Jan. 19 2023	Draft report
FINAL	JP / SD	May 2, 2023	Final Report

Executive Summary

Introduction

In March 2022, the Town of Canmore retained CIMA+ to prepare an updated Utility Master Plan (UMP). This Utility Master Plan update will encompass a review of the water and wastewater infrastructure under existing conditions and constraints, as well as under future demands at growth projections of 5, 15, and 25 years.

This Utility Master Plan will assess the following infrastructure elements:

- Wastewater collection and transmission
- Water supply, treatment, storage and distribution

This report was developed to assist the Town's administrators to direct and plan for development, improve system utilization and plan for future upgrades. This study will also assist the Town's Administrators to develop projects that will apply to the Town's Offsite Levy Model.

A collection of existing infrastructure plans, studies and planning documents have been reviewed and incorporated into this study.

The stated objectives of the Utility Master Plan are as follows:

- To conduct a detailed assessment of the existing water and sanitary systems' capacities. This will be done using real and historical data collected from the Town of Canmore's facilities and networks.
- To identify system deficiencies and provide recommendations for system improvements.
- To develop a servicing strategy for future growth and development for the 5 Year, 15 Year, and 25 Year growth scenarios.
- To develop a list of capital projects that serve to improve system resiliency and facilitate development. The list will include a high–level estimated cost, an approximate timeline for implementation over the planning period, and inform on the application of these projects to the Town's Offsite Levy Model.

Methodology

The following methodology was used to meet the objectives of the UMP:

- Work with the Town of Canmore's to establish the projected growth in the Town over the next 25 years and delineate the expected locations and gross developable area of the projected growth. These growth projections needed to align with the Town's Offsite Levy Model, with discrete growth in each of the 17 Offsite Levy Areas in the Town.
    - Participate in round-table meetings with members of BOWDA (Bow Valley Builders and Developers Association). This input was taken into consideration when preparing the Growth Projections and Design Basis Memo
- Collect and review historical data and onsite measurements. SCADA logs of facility were collected and processed to extract data-driven demand information used to populate the hydraulic models.

- Analyze customer water meter demands for periodic demand information and assign water model demands to the specific locations throughout the Town.
- Review lift station draw down tests, water distribution meter data, water service meter data, meter reading routes and other available data.
- Install a total of 5 temporary wastewater flow monitors, which in tandem with lift stations with flow meters, were used to chart the flows in the wastewater system during dry weather and wet weather / high groundwater periods.

+ Create/update hydraulic models for the water and wastewater systems that reflect the existing systems. This was completed using information from the Town's previous water model, the Town's GIS system and record drawings.
  - New in this version of the Utility Master Plan - the wastewater hydraulic model was updated to an extended period simulation to better account for inflow and infiltration's affect on the Town's existing system.
+ Conduct a capacity evaluation of the Wastewater Treatment Plant to inform this Utility Master Plan on any limitations of the existing facility to service future populations, performed as a separate submission.
+ Evaluate the existing systems against design criteria established with the Town and utility operators to identify deficiencies.
+ Expand the hydraulic model to service future developments and identify utility improvements required to support for growth and development
+ Provide a prioritized list of required projects along with cost estimates, project triggers, and forecasted need.

Water System

The Town of Canmore has two primary water sources; two deep wells which supply ground water to the Pumphouse 1 Treatment Plant, and surface water from the Rundle Forebay which supplies the Pumphouse 2 Treatment Plant.

The treated water is then stored and distributed from five storage reservoirs and five pump stations / booster stations. The distribution system is divided into three supply areas: Western, Central, and Eastern.

The distribution system can be further divided into a total of 18 pressure zones, which are controlled through Pressure Reducing Valves (PRVs) and pump stations.

Wastewater System

The existing wastewater infrastructure has four main components; gravity (manholes and pipes), pumping (lift stations), pressure (forcemains) and treatment. These four systems all operate in conjunction to collect and treat the wastewater at the wastewater treatment plant and ultimately discharge clean water to the Bow River.

The first component of the system is the gravity system which collects the wastewater from its many sources (residential, institutional, commercial and industrial). The gravity system starts at the private property line where services are collected and conveys it through a pipe and manhole system to a lift station at the low point. The gravity pipes are mostly PVC with some sections of concrete, steel and unknown (unconfirmed) materials. The pipe diameters range from 100mm to 600mm.

In addition to the gravity collection system, there are a number of low pressure forcemain systems with individual grinder pumps at each service. These low pressure systems typically discharge into the gravity collection system.

The second component of the piped system are the forcemains. The forcemains convey the wastewater from a series of lift stations to the wastewater treatment plant. The forcemains are mostly made of PVC and HDPE pipe, though some sections of forcemain are unknown (unconfirmed). The size of the forcemains range in diameter from 100 mm to 500 mm.

The third component of the wastewater system are the 13 lift stations operated by the Town of Canmore.

The final component of the wastewater system is wastewater treatment plant. A full wastewater treatment plant assessment and capacity evaluation was performed in tandem with the UMP.

To determine wastewater flow generation rates, diurnal usage patterns, and assess groundwater infiltration and rainfall derived infiltration, a flow monitoring program was developed. Inline flow monitors were installed in key locations.

A total of 5 flow monitors were installed across the Town of Canmore, which in tandem with lift stations that have flow meters installed on their discharge, was used to chart the flows in the wastewater system during dry weather and wet weather periods. The flow monitors were in place from April 12, 2022 to July 20, 2022.

Generally, it was observed that the Town is split into two areas with different wet weather influences. The valley bottom, generally bounded by the Bow River to the southwest, and Highway 1 to the northeast, is influenced through inflow and infiltration into the system by ground water, which raises significantly during the spring snow melt.

The valley slopes, generally bounded by being southwest of the Bow River, and northeast of Highway 1, have minimal groundwater influence. Inflow and infiltration would be caused by rain events, with runoff water entering the system through manholes and some pipe infiltration from local soil saturation.

Water System Projects

A total of 16 water system projects were identified to meet the Town's service criteria, support future growth, or will need to be replaced due to aging infrastructure. They are summarized as follows:

Projects recommended to meet recommended service criteria:

- EX W1 – Grassi Booster Station Capacity Upgrade (Phase 1)
- EX W2 – WTP2 Upgrades. Backwash Water Reuse
- W1 – TeePee Town Water Line Upgrade

- W3 – Canyon Ridge Booster Station Decommissioning

Projects recommended to support growth and development:

- W2 – Smith Creek Reservoir and Booster Station
- W4 – Silvertip Trail Looping
- W6 – Grassi Booster Station Waterline Twinning
- W7 – Grassi Storage Reservoir Capacity Upgrade
- W8 – Grassi Booster Station Capacity Upgrade (Phase 2)
- W9 – Smith Creek Booster Station Upgrade (Phase 2)

Projects recommended due to end of estimated service life:

The following project were identified because the pipes will exceed the anticipated 75-year life span before the 25-year horizon considered in this report.

- EX W3 – PumpHouse #1 Gas Chlorine Disinfection Replacement to Liquid Chlorine
- W10 – South Canmore Waterline Replacement
- W11 – Downtown Canmore Waterline Replacement
- W12 – 7th Avenue Waterline Replacement
- W13 – Rundle Waterline Replacement
- W14 – TeePee Town / Railway Ave Waterline Replacement

Wastewater System Projects

A total of 11 wastewater system projects were identified to meet the Town's service criteria, support future growth, or will need to be replaced due to aging infrastructure. They are summarized as follows:

Projects recommended to meet recommended service criteria:

- EX S1 – Lift Station 3 Replacement

Projects recommended to support growth and development:

- S1 – Bow Valley Trail Sewer Upgrade
- S2 – Lift Station Upgrade Phase 1
- S3 – Lift Station 8 Upgrade
- S4 – Lift Station 10 Upgrade
- S5 – Lift Station 11 Upgrade

Projects recommended due to end of estimated service life:

- S6 – South Canmore Sewer Line Replacement
- S7 – Downtown Canmore Sewer Line Replacement
- S8 – 7th Avenue Sewer Line Replacement
- S9 – Rundle Sewer Line Replacement

- S10 – TeePee Town / Railway Ave / Bow Valley Trail Sewer Line Replacement

Previous UMP Projects

The following major projects have been completed or are currently underway since identified in the 2016 Utility Master Plan.

- Project WW1 – LS2 Upgrade
- Project WW2 – LS6 Upgrade
- Project WW10 – BVT at Benchlands Trail
- Project W1 and W2 – Pumphouse 2 Upgrade
- Project W7 – South Bow River Loop
- Project W8 – Spring Creek Loop
- Project W9 – Hubman Water Pressure / PRV

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1. Introduction

1.1 Authorization and Terms of Reference

In March 2022, the Town of Canmore retained CIMA+ to prepare an updated Utility Master Plan (UMP). This Utility Master Plan update will encompass a review of the water and wastewater infrastructure under existing conditions and constraints, as well as under future demands at growth projections of 5, 15, and 25 years.

This Utility Master Plan will assess the following infrastructure elements:

+ Wastewater collection and transmission
+ Water supply, treatment, storage and distribution

1.2 Background

This report was developed to assist the Town's administrators to direct and plan for development, improve system utilization and plan for future upgrades. This study will also assist the Town's Administrators to develop projects that will apply to the Town's Offsite Levy Model.

A collection of existing infrastructure plans, studies and planning documents have been reviewed and incorporated into this study.

1.3 Objectives

The stated objectives of the Utility Master Plan are as follows:

+ To conduct a detailed assessment of the existing water and sanitary systems' capacities. This will be done using real and historical data collected from the Town of Canmore's facilities and networks.
+ To identify system deficiencies and provide recommendations for system improvements.
+ To develop a servicing strategy for future growth and development for the 5 Year, 15 Year, and 25 Year growth scenarios.
+ To develop a list of capital projects that serve to improve system resiliency and facilitate development. The list will include a high–level estimated cost, an approximate timeline for implementation over the planning period, and inform on the application of these projects to the Town's Offsite Levy Model.

2. Growth and Development Analysis

In order to assist the development of the Utility Master Plan, a technical memo outlining the growth projections and water and wastewater demands design basis was prepared and finalized in May 2022. The full memo can be found in Appendix A – Growth Projections and Design Basis Memo.

2.1 Summary of Existing Planning Documents

CIMA+ reviewed available planning documents and discussed growth goals with Town staff to better understand the development goals for the study area. The following planning documents and studies were reviewed:

+ Town of Canmore UMP Report Final (EPCOR- December 2010)
+ Town of Canmore UMP Report 2016 (CIMA+)
+ Town of Canmore Sanitary Master Plan (Stantec - June 2010)
+ Municipal Census (various years)
+ Town of Canmore – Engineering Design & Construction Guidelines
+ Area Structure Plans
  - Stewart Creek
  - Indian Flats
  - Silvertip
  - Three Sisters Village
  - Smith Creek
+ Area Restructure Plans
  - Bow Valley Trail
  - Spring Creek
  - TeePee Town

2.2 Growth Areas and Projections

CIMA+ worked with the Town of Canmore's planning staff to establish the anticipated growth in the Town over the next 25 years and delineate the expected locations and gross developable area of the projected growth. The growth projections are intended to be very high level and are not intended to anticipate the precise locations of growth in each Offsite Levy Area.

These growth projections align with the Town's Offsite Levy Model, with discrete growth in each of the 17 Offsite Levy Areas in the Town.

Growth was divided into three horizons, 5 Years, 15 Years, and 25 Years.

The projected growth is established as units of the following land use types:

+ Industrial, Commercial, Institutional (ICI)
+ Hotels
+ Low Density Residential
+ Medium / High Density Residential

ICI and Hotel land uses do not have a population equivalent assigned to them, and as such water and wastewater demands will be assigned on a per unit basis.

Residential land uses are assumed to have 2.5 people per unit, which is consistent with the previous UMP and previous planning directives from the Town. This includes non-permanent occupancy along with full time residents. Water and wastewater demands for these land uses will be assigned on a per capita basis.

Each land use type has an associated per unit density, in order to determine the gross developable area. The densities, in units per hectare, are as follows:

Table 2-1 Land Use Unit Densities

Land Use	Units Per Hectare
Industrial, Commercial, Institutional (ICI)	37
Hotels	109
Residential - Low Density	14
Residential - Medium / High Density	43

The following table shows the projected growth for each land use type, for each growth horizon. The projected growth in each offsite levy area can be found in Appendix A – Growth Projections and Design Basis Memo.

Figures showing the projected growth in each offsite levy area for each growth horizon can be found in Appendix B – Figures G1 to G3

Table 2-2 Growth Projections Summary

Land Use	5 Year	15 Year	25 Year
	Units	Units	Units
ICI	319	575	938
Hotels	1,104	2,325	3,545
Residential - Low Density	186	478	770
Residential - Medium / High Density	1,060	2,499	3,937
Total	**2,669**	**5,877**	**9,190**

The gross developable areas for each land use type, under each growth horizon, are summarized in the following table:

Table 2-3 Gross Developable Area Summary

Land Use	5 Year	15 Year	25 Year
	Area (ha)	Area (ha)	Area (ha)
ICI	8.5	16.8	25.1
Hotels	10.1	21.3	32.5
Residential - Low Density	13.1	33.7	54.2
Residential - Medium / High Density	24.5	57.7	90.9
Total	**56.2**	**129.5**	**202.7**

2.3 Development Community Engagement

To facilitate consensus on the growth projections and design basis with the Canmore area development community, CIMA+ and the Town of Canmore held roundtable meetings with members of BOWDA (Bow Valley Builders and Developers Association).

In these discussions, the methodology of developing the growth projections and design basis was outlined to BOWDA, whose members provided feedback and comments. This input was taken into consideration when preparing the Growth Projections and Design Basis Memo.

2.4 Offsite Levy Cost Allocation Methodology

To determine cost allocation for projects recommended in the UMP which feed into the offsite levy model, a cost allocation strategy needed to be created. This should account for projects that are initiated by development, whether existing areas benefit directly from the upgrades, and the impact that remaining lifecycle of existing infrastructure has on the cost allocation.

The two primary project elements are:

+ Facilities, such as wastewater lift stations, and water pump stations
+ Linear infrastructure, such as wastewater lines, water lines, and related appurtenances

The cost sharing methodology will have two components when an asset is considered for replacement due to growth. The first component will consider the costs of replacing an existing asset, like for like, and will be known as the "Base Cost". This involves performing a residual value calculation based on remaining asset lifecycle. The reasoning behind this is that without growth triggering an asset replacement, the Town would not have to incur any capital costs until the end of its lifecycle. The newer the asset is, the larger the share of the cost of replacement should be borne by developers. Facilities are estimated to have a total life cycle of 50 years. Linear infrastructure has a lifecycle of 75 years.

The residual value of the asset is ratio of the service life remaining to the life span of the asset, multiplied by the base cost, and is the developers share of the cost. The inverse of this is the Town's share.

The second component will consider the full upgrade cost of the asset, and will be known as the "Upgrade Cost". The difference between the Town's share of the Base Cost, and the Upgrade Cost, will be fully borne by developers. The reasoning behind this is that these are costs that would not need to be incurred by the Town without growth.

The formula for the cost sharing methodology is as follows:

$$UpgradeCost\ -\left(1-\frac{ServiceLifeRemaining}{LifeSpan}\right)*Basecost=DeveloperCost$$

Calculation Example

A 25 year old 200 mm water line is recommended to be upgraded to 300 mm in order to service future growth. A direct replacement with a new 200 mm water line is estimated to cost $1,000,000, and the upgraded 300 mm water line is estimated to cost $1,200,000. With a 75 year life cycle, the water line would have 50 years of service life remaining.

$$\$1{,}200{,}000-(1-\frac{50}{75})*\$1{,}000{,}000=\sim\$870{,}000$$

As the water line still has the majority of it's service life remaining, it has a high residual value, and as such a lower Town's share of the cost. In this example, the residual value of the asset would be approximately $670,000 and Town's share would be approximately $330,000. Subtracting the Town's share from the upgrade cost of $1,200,000 results in a developers share of approximately $870,000.

3. Water System

3.1 System Characterization

The Town of Canmore has two primary water sources; two deep wells which supply ground water to the Pumphouse 1 Treatment Plant, and surface water from the Rundle Forebay which supplies the Pumphouse 2 Treatment Plant.

The treated water is then stored and distributed from five storage reservoirs and five pump stations / booster stations. The distribution system is divided into three supply areas: Western, Central, and Eastern.

The distribution system can be further divided into a total of 18 pressure zones, which are controlled through Pressure Reducing Valves (PRVs) and pump stations. The Pressure zones can be seen in Appendix C – Figure W1

3.1.1 Pipe Diameters, Material and Age

The water mains in Canmore consist of approximately 65% PVC and 30% ductile iron. The average age of the water lines in the system are approximately 30 years old. The following tables show the distribution by age, diameter, and pipe material of Canmore's water system. The existing water system can be seen in Figure W2 (Appendix C)

Table 3-1 Water Pipe Age

Age	Length (km)	% of Total
>50 Years	11.9	10%
41-50 Years	9.9	8%
31-40 Years	20.9	18%
21-30 Years	39.5	34%
11-20 Years	22.9	19%
0-10 Years	10.5	9%
Unknown	2.0	2%
Total	**118**	**100%**

Table 3-2 Water Pipe Materials

Material	Length (km)	% of Total
PVC	76.2	65%
DI	35.4	30%
PE	1.5	1%
CON	0.1	0.1%
UNK	4.4	4%
Total	**118**	**100%**

Table 3-3 Water Pipe Diameters

Diameter (mm)	Length (km)	% of Total
<100/Unknown	3.3	3%
100	0.8	1%
150	30.8	26%
200	31.5	27%
250	12.1	10%
300	16.1	14%
350	10.2	9%
400	11.3	10%
450	1.6	1%
Total	**118**	**100%**

3.1.2 System Elevations and Pressure Zones

Due to large elevation differences across the Town of Canmore, the water distribution system is divided into multiple pressure zones to deliver normal water pressures are sustained across the Town's distribution system.

In total, there are 18 pressure zones, named from Zone 2 to Zone 19, with Zone 1 not currently in use. Zone 18 was a recent addition, with three new PRVs installed near Miskow Close and Our Lady of the Snows school, creating a new pressure zone along Hubman Landing, and Zone 19 was created when the WWTP was connected to the new South Bow River Loop.

There are a total of 40 PRVs across the Town, with two of them considered to be private, two inactive and one closed.

Table 3-4 PRV Settings

Label	Description	Elevation (m)	HGL Setting (m)	Pressure Setting (kPa)
PRV 1	Above 100 Grassi	1345.29	1381.81	358
PRV 2	West side Benchlands, #126	1389.13	1430.68	407
PRV 3	East side Benchlands near 210 Benchlands Terrace	1380.88	1421.73	488
PRV 4	Benchlands Reservoir	1394.95	1454.81	586
PRV 5	Glacier Dr. and Sandstone Terrace (Glacier Dr.) - East	1332.43	1381.72	483
PRV 6	Boulder Crescent and 200 Glacier Dr. - West	1332.08	1381.38	486
PRV 8	Homesteads Phase I, Mountain Greens Emergency Rd. (14 205 Carey)	1332.99	1364.49	308
PRV 9	Homesteads Phase I (177 Carey near the intersection of Carey and Three Sisters)	1342.50	1384.75	414
PRV 10	Homesteads Phase II Upper (167 McNeil Dr.)	1346.03	1384.75	379
PRV 11	Highway 1A (Near 516 Bow Valley Trail)	1309.36	1362.00	515
PRV 12	Alley off of Rundle Crescent (Mount Rundle Penstock Station)	1312.25	1355.00	489

PRV 13	Olympic Dr. Rundle View	1346.12	1364.49	180
PRV 14	Near 16 Prospect Heights	1316.34	1364.49	471
PRV 15	Pump House 1 - West Feed	1309.68	1362.00	512
PRV 17	Silvertip - Block 7 (Blue Grouse and Silvertip Rd.)	1395.11	1472.57	759
PRV 19	Three Sisters Dr. and 200 Grassi Pl.	1330.26	1364.49	335
PRV 20	Outside Three Sisters Booster Station	1383.70	1417.49	331
PRV 21	Lions Park CTFM	1312.73	1362.00	482
PRV 22	Behind Recreation Centre CTFM	1312.96	1355.00	480
PRV 23	On the line from Grassi Reservoir to Miskow	1384.46	Inactive	Inactive
PRV 24	Cairns on the Bow Three Sisters Parkway	1323.78	1371.06	482
PRV 25	Three Sisters Mountain Village (Fitzgerald)	1345.16	1372.97	272
PRV 26	Ridge Rd and Elkrun Blvd (Modelled as Closed)	1357.80	Closed	Closed
PRV 27	Near 561 Silvertip road	1457.80	1510.68	518
PRV 28	Not modelled- considered a private PRV	1340.43	-	-
PRV 29	Not modelled- considered a private PRV	1340.48	-	-
PRV 30	Montane Rd. near Lincoln Park	1324.47	1361.90	367
PRV 31	Bow Valley Trail (near Ray McBride St. CTFM)	1315.90	1362.00	451
PRV 32	Palliser Trail By Cross Z ranch	1326.70	1389.94	656
PRV 33	Near Spring Creek Gate. (Currently inactive)	1307.31	Inactive	Inactive
PRV 34	Branched off from Grassi line near Miskow Close	1359.80	1395.01	405
PRV 35	Branched off from Grassi line near Hubman Landing	1362.00	1409.89	469
PRV 36	Near Stewart Creek Dr and Our Lady of the Snows school	1366.00	1401.21	345
PRV DMF	Dead Man's Flats	1295.30	1362.20	655
PRV T1	Morris and Van Horne Intersection	1316.54	1364.49	469
PRV WWTP	Wastewater Treatment Plan off of South Bow River Loop	1303.96	1367.34	621
PRV SBL	Off of South Bow River Loop near Montane Road	1321.45	1389.76	707

A number of the PRV settings were revised within the model during the calibration process of the 2020 Water Model Update performed by CIMA+, where hydrant flow tests were performed across the Town. The PRV settings were changed within the model in order to have the model results match real world observations.

3.1.3 Raw Water Supply

The Town has two primary raw water supplies, which supply the Town's two water treatment plants: Pumphouse 1 and Pumphouse 2. Pumphouse 1 is supplied through two deep groundwater wells, and Pumphouse 2 is supplied with surface water from the Rundle Forebay.

Pumphouse 1 has a maximum annual diversion of 2,121,965 m^3 at a combined maximum rate of 589.5 L/s. Diversion from Well #2 under license 31682 is subject to instream flow objectives in the Bow River. Flow objectives are stated on a weekly basis.

Table 3-5 Pumphouse 1 Licenses

License #	31681	31682	**Total**
Description	Well #1	Well #2	
Point of Diversion	SW33-024-10-W5		
Source		Policeman Creek	
Max Annual Diversion (m3)	1,195,620	926,345	2,121,965
Max Rate of Diversion	49.5 L/s	540 L/s	589.5 L/s
Notes		Instream Objectives – License Amendment 2	

Pumphouse 2 has a maximum annual diversion of 2,994,329 m^3, and a combined maximum diversion rate of 760 L/s as stated on the two licenses. However, during the design process of Pumphouse 2 treatment upgrades, it was discovered that there is a superseding agreement with TransAlta, who provided the original licenses for diversion from the Rundle Forebay for the Town. In those agreements, there is a maximum stated diversion rate of 6 cubic feet per second (cfs), or 170 L/s.

In discussions with TransAlta, it was determined that the limitations from this earlier license agreement still stand, and as such the maximum diversion rate is capped at 170 L/s. There were no limitations on annual diversion volume in this agreement, and as such the annual volumes on the current licenses still stand.

Table 3-6 Pumphouse 2 Licenses

License #	31000	31001	356706	Total
Description			For use by Canmore and Deadman's Flat	
Point of Diversion	SW30-022-10-W5 and re-diverted at SE31-024-10-W5 (Rundle Forebay)			
Source	Spray River through the works of TransAlta Utilities Corporation			
Max Annual Diversion (m3)	1,110,134	1,554,195	280,000	2,944,329
Max Rate of Diversion	363 L/s	380 L/s	17 L/s	760 L/s
Notes	Due to superseding Transalta Agreement, Max diversion rate from Rundle Forebay is capped at 6 cfs (170 L/s)			

Licenses 30999 and 31682 were originally intended to supply water to the wastewater treatment plant through a well on the plant site. The wastewater treatment plant has since been connected to the Town's water distribution network through the South Bow River Loop project, and as such these licenses are not actively being drawn against. Transferring these licences to be utilized by Pumphouse 1 should be investigated.

Table 3-7 WWTP Supplemental Licenses

License #	30999	31682	Total
Description	Wastewater Plant Well	Wastewater Plant Supplemental Flow	
Point of Diversion	SW28-24-10-W5		
Source	Bow River		
Max Annual Diversion (m3)	3,700	71,300	75,000
Max Rate of Diversion	3 L/s	3 L/s	3 L/s
Notes	Instream Objectives – License Amendment 2		

The following table shows the summary of the active licenses in the Town, and their respective withdrawal rates.

Table 3-8 Water Licenses Summary

License Use	Total Annual Diversion (m^3)	Average Daily Diversion (m^3)	Max Daily Diversion (m^3)
Pumphouse 1	2,121,965	5,814	50,933
Pumphouse 2	2,944,329	8,067	14,705
WWTP Supplemental	75,000	205	259

3.1.4 Water Treatment Systems

Water is treated at Pump House 1 by adding gas chlorine to the well water and then storing it in a contact tank. After sufficient contact time, treated water is pumped into the distribution system.

Pump House 2 is a direct filtration treatment plant that treats water from Rundle Forebay. The plant's treatment processes include coagulation, filtration, chlorination and UV disinfection systems.

Pumphouse 1 has a treatment capacity of approximately 93 L/s, and Pumphouse 2 has a current treatment capacity of approximately 94 L/s.

There are current plans to upgrade the Pumphouse 2 treatment capacity to 170 L/s, with construction occurring in 2023.

Table 3-9 Existing Water Treatment System

Facility	Pumphouse 1	Pumphouse 2
Treatment Process	Disinfection by Chlorination	+ Coagulation and flocculation + Rapid Sand Filtration + Four filters for a total rate of 94 L/s + Disinfection by ultraviolet (UV) light. Limited to 126 L/s maximum through each of two reactors + Disinfection by chlorination
Treatment Rate	8,000 m3/day (92.6 L/s) based on 2010 / 2016 UMP	+ Four filters for a total rate of 94 L/s + UV process limited to 126 L/s maximum through each of two reactors. + Existing Limit: 94 L/s
Treatment Levels	+ 4-Log reduction for viruses + 3-Log reduction for Giardia and Cryptosporidium	

3.1.5 Potable Water Storage

There are a total of five potable water storage reservoirs in the Town of Canmore.

+ Pumphouse 1 – Primarily serves the Central and Eastern supply zones
+ Benchlands Reservoir - Primarily serves the Central and Eastern supply zones. Is typically filled by Pumphouse 1, however the South Bow River Loop PRV, which was recently commissioned, can fill Benchlands using a flow control valve on the PRV.
+ Silvertip Reservoir – Primarily serves the Eastern supply zone. It is filled from Benchlands
+ Pumphouse 2 – Primarily services the Western and Central supply zones, can service the Eastern supply zone up to Benchlands
+ Grassi Reservoir – Primarily Services the Western and Central supply zones. It is filled by an inline booster station that is supplied by Pumphouse 2.

Table 3-10 Potable Storage Reservoirs

Facility	Supply Zone	Volume (m^3)
Pumphouse 1	Central, East	166
Pumphouse 2	West, Central	1,100
Benchlands	East, Central	7,300
Silvertip	East	5,400
Grassi	West, Central	5,000
Total		**18,966**

Previous documents reported that Benchlands Reservoir had a volume of 11,200 m^3. However, a review of the original design drawings indicated the total active volume of the reservoir is calculated to be 7,300 m^3.

3.1.6 Water Distribution Systems

The Town operates six water distribution facilities. Four of them are pump stations, and two of them discharge through gravity. The following table summarizes these facilities.

Table 3-11 Distribution Facility Summary

Facility	Treatment	Distribution Type
Pumphouse 1	Yes	Pump
Pumphouse 2	Yes	Pump
Benchlands Reservoir	No	Pump and Gravity
Silvertip Reservoir	No	Gravity
Grassi Reservoir	No	Gravity with booster fill
Pumphouse 5 (Canyon Ridge Booster Station)	No	Pump

3.1.6.1 Pumphouse 1

Pumphouse 1 has six vertical turbine pumps that pump water from the clear well into the distribution system.

Table 3-12 Pumphouse 1 Existing Pump Summary

Pump	Manufacturer	Model	Motor HP	Design Flow
1	Grundfos		30	16.2
2	Grundfos		30	16.2
3	Grundfos		30	16.2
4	Floway	10 LKM	50	28.1
5	Floway	10 LKM	50	28.1
6	Floway	10 LKM	50	28.1

The pumps at Pumphouse 1 are staged off and on according to the water level in Benchlands Reservoir. The pump staging set points for the distribution pumps, as reproduced from the PH1 Control Philosophy Revision H, are listed in the table below:

Table 3-13 Pumphouse 1 Pump Staging Set Points

Pumps In Order of sequence	Distribution Pump Start Level Set Point	Distribution Pump Stop Level Set Point
1st	3.65 meters	3.80 meters
2nd	3.49 meters	3.80 meters
3rd	3.35 meters	3.60 meters
4th	3.20 meters	3.55 meters
5th	3.04 meters	3.55 meters
6th	2.90 meters	3.45 meters

A PRV located in the pump station controls the pressure entering the Central Supply Zone / downtown area, ensuring appropriate pressures are maintained.

3.1.6.2 Pumphouse 2

Pump House 2 has three vertical turbine pumps that pump water from the clear well into the distribution system. The pump station discharges at approximately 165 kPa because it is located at a high elevation in its pressure zone. These three pumps are also used to backwash the filters at Pump House 2.

Pumphouse 2 has planned pump capacity upgrades, where the pumping capacity will be increased to approximately 200 L/s (300 L/s with Backwash pumps discharging into the distribution header). The pump capacity upgrades are planned to be constructed in 2023.

Table 3-14 Pumphouse 2 Existing Pump Summary

Pump	Manufacturer	Model	Motor HP	Design Flow
1	Aurora	12RM	15	66.3
2	Aurora	12RM	15	66.3
3	Aurora	12RM	15	66.3

3.1.6.3 Benchlands Reservoir

The Benchlands Reservoir has three vertical turbine pumps which supply water to the Silvertip reservoir, the Silvertip area, and areas around the Benchlands reservoir, where a PRV is used to maintain service pressures. The reservoir also backfeeds water through the supply line, providing water to the lower elevation areas that Pumphouse 1 also distributes to.

Table 3-15 Benchlands Pump Summary

Pump	Manufacturer	Model	Motor HP	Design Flow
1	Peerless	12 LTD	100	39.7
2	Peerless	13 LTD	100	39.7
3	Peerless	14 LTD	100	39.7

3.1.6.4 Silvertip Reservoir

The Silvertip Reservoir distributes water through gravity, by being at a higher elevation than the downstream service area. Water from this reservoir is supplied by the Benchlands Reservoir pump station. Water from Silvertip is distributed to the downstream system utilizing the same supply line. Due to the facility configuration at Benchlands, water cannot be transferred from Silvertip back to Benchlands.

3.1.6.5 Grassi Reservoir

The Grassi reservoir supplies water to the same areas as Pumphouse 2, and serves to provide fire flows and fire storage. The Grassi reservoir is filled by a booster station near Grassi Peaks, along Peaks Dr.

Table 3-16 Grassi Reservoir Booster Existing Pump Summary

Pump	Manufacturer	Model	Motor HP	Design Flow
1	Grundfos	CR60-30U	15	20.2
2	Grundfos	CR60-30U	15	20.2

3.1.6.6 Pumphouse 5 (Canyon Ridge Booster)

Pumphouse 5, also known as the Canyon Ridge Booster Station, has three inline booster pumps which provide water to its own pressure zone in a higher elevation area. This booster station can be supplied water from both Pumphouse 1 and the Benchlands Reservoir gravity line.

Table 3-17 Pumphouse 5 Existing Pump Summary

Pump	Manufacturer	Model	Motor HP	Design Flow
1	Peerless	C-610-AMBF	5	3.2
2	Peerless	C1215-AMBF	15	12.6
3	Peerless	4AE11	ENGINE	69.4

3.2 Design Criteria

This section outlines the criteria that will be used to evaluate the current and future systems and details the evaluation of each component of the system. The design criteria are based on the mso trecent version of the Canmore Engineering Design and Construction Guidelines (EDCG) and Alberta Environment and Protected Areas (AEPA) Standards and Guidelines.

3.2.1 Water Demands Criteria

Existing average day water demands were developed by assessing the total volume of water distributed to the Town over a period of several years, and reviewing SCADA data and daily water distribution records.

Future water demands will be based on the unit rates established in the EDCG, the 2017 Utility Master Plan, analysis of consumption rates by land use, and the projected growth for each growth scenario and horizon. The water demands were updated to include unit rates for ICI and Hotel land uses, which were previously only present in the Wastewater portion of the EDCG The ICI landuse area based unit rates were updated, as the unit density was assessed against unit consumption, and was shown to be significantly higher than the EDCG. The Hotels land use consumption rates were also updated from that shown in the EDCG, following an analysis of water demands by land use performed by the Town of Canmore.

Table 3-18 Water System Unit Demands

Demand Type	Rate	Units
Water Treatment Plant Production (composite rate)	360	L/c/d
Residential	250	L/c/d
Hotels	700	L/unit/d
ICI	30 810	m^3/ha/d L/unit/day
Maximum Day Demand Peaking Factor (per EDCG)	2 x ADD	PF
Peak Hour Demand Peaking Factor (per EDCG)	4 x ADD	PF

3.2.2 Water Supply Requirements

Alberta Environment and Protected Areas requires that a community's water supply must be capable of the maximum day demand (MDD).

Water supply will be assessed individually at each of Pumphouse 1 and Pumphouse 2. Deficits at Pumphouse 1 water supply can be supported by Pumphouse 2, as the Western supply zone can feed into the Central supply zone.

3.2.3 Level of Service Criteria

One of the intentions of the master plan is to maintain an adequate level of service for the existing and future systems. The level of service criteria has been set in accordance with the Canmore EDCG, which are in line with the recommendations from the AEPA Standards and Guidelines.

The service pressure in the Town should be between 350 kPa (50 psi) and 620 kPa (90 psi). The Town may accept minimum pressures of 280 kPa (40 psi) when it is clearly demonstrated that the target minimum pressure of 350 kPa cannot be achieved due to existing boundary conditions.

The maximum pressure in the Downtown pressure zone should not exceed 496 kPa (72 psi)

Table 3-19 Level of Service Summary

Parameter	Design Criteria
Minimum Pressure in Distribution System	350 kPa (50 psi)
Maximum Pressure in Distribution System	620 kPa (90 psi)
Maximum Pressure in Downtown Pressure Zone	496 kPa (72 psi)
Maximum Allowable Velocity in Distribution System	3.0 m/s

3.2.4 Available Fire Flow Criteria

The Municipal Government Act does not categorize Fire Protection as a core service. Therefore, it is at the discretion of municipalities to choose to provide the service or not, and if so to what level. There are many guidelines throughout North America, the basic precept is that a municipality chooses a level of service for Fire Protection and then ensures they meet or exceed that level.

The fire flow requirements that were developed were based on land use designation and building type. The required fire flows for large residential, commercial or industrial developments shall be determined in accordance with the latest edition of the Fire Underwriters Survey Guide to Recommended Practice. However, the required fire flows shall not be less than those specified for general land use categories or types of development indicated in Table 3-20.

Table 3-20 Available Fire Flow Requirements

Land Use Category or Development Type	Fire Flow (L/s)	Design Criteria Time)
Detached and Duplex Residential	85 L/s	2 h
Multi-Family, Small to Medium Size Units	120 L/s	2 h
Commercial, Institutional, Industrial – adequately separated, 3 floors or less	200 L/s	2.5 h
Multi-Family, Medium Density (4-plex to 6-plex)	200 L/s	2.5 h
High Density, Multiple Closely Spaced or Contiguous Buildings of 3 or More Floors	300 L/s	3.5 h

The available fire flow is calculated in the hydraulic model by assessing how much water can be pulled from each system node, before another system node reaches 140 kPa (20 psi).

3.2.5 Water Distribution / Pumping Requirements

Alberta Environment and Protected Areas requires that a water distribution pumping system should be able to provide the greater of PHD or MDD + Fire Flow.

AEPA also requires that the water distribution system facility be designed to deliver maximum design flow with the largest pump out of service to maintain system redundancy.

As the Town for Canmore has several reservoirs that are filled and supported by pump stations, the pump stations should also be able to provide MDD to the reservoirs and their associated service areas.

3.2.6 Water Storage Requirements

AEPA guidelines recommend the storage requirements where the supply of treated water is only capable of satisfying the maximum daily design flow.

For a storage facility to meet these recommendations it must be sufficiently sized to store the sum of the following, using the formula S= A + B + C

- A - Fire storage (As per fire flow requirements)
- B - Equalization storage (25% MDD)
- C - Contingency storage (15% ADD)

3.3 Water Demand Analysis

3.3.1 Existing Water Demands

Average daily water demands were developed by assessing the total volume of water distributed to the Town over the past four years. These were assigned to the hydraulic model through geolocated customer water meters data, which has been scaled such that the total volume of consumption is equivalent to the total volume of distribution. This accounts for any water losses in the water distribution system, or any unaccounted for flows, and ensures appropriate distribution of water demands.

Maximum daily water demands were developed by reviewing SCADA data and daily water distribution records to find the day with the highest volume of water distributed. This maximum day, divided by the average day, will determine the Maximum Day Demand peaking factor for the existing system and will only be applied to existing demands. Peak hour demands will be assumed to be 2x Maximum Day Demands, in line with the EDCG.

The following table shows the annual water consumption as recorded by customer water meters, versus the annual water distribution volumes. The loss factor is the ratio between the two total volumes, and can be comprised of system losses, fire hydrant operations, and unmetered water connections that the Town might control. In total, approximately 30% of the water distributed in Canmore is unmetered.

Table 3-21 Water Consumption Versus Distribution

Year	Consumption (m^3)	Distribution (m^3)	Loss Factor
2018	1,814,544	2,724,788	1.50
2019	1,787,659	2,589,814	1.45
2020	1,827,189	2,512,425	1.38
2021	1,912,420	2,749,175	1.44
Average	1,843,365	2,670,847	1.45

Using the annual water distribution volumes, average day demands were determined for each year. Daily water distribution records and SCADA data were then reviewed to determine the maximum daily demand for each year. The ratio between these are the MDD peaking factors. These values were averaged across the four years to determine the overall systems ADD, MDD and peaking factor.

2021 had a significantly higher max day than previous years due to a high turbidity event which required extensive water line flushing across the system.

Table 3-22 Annual ADD and MDD

Year	ADD (m^3)	MDD (m^3)	Pf
2018	7,465	11,007	1.47
2019	7,095	12,169	1.72
2020	6,865	11,364	1.66
2021	7,532	14,767	1.96
Average	**7,239**	**12,327**	**1.70**

The following table shows the summary of the existing system water demands.

Table 3-23 Existing Water System Demand Summary

Demand Scenario	Demand (L/s)
ADD	84
MDD	143
PHD	285

3.3.2 Future Water Demands

The future water demands are determined by applying the unit rates to the projected growth, in units, for each land use. The units were distributed as shown in the Growth Projections and Design Basis Memo. There are three growth horizons, 5 years, 15 years, and 25 years, and two separate growth scenarios. MDD Peaking factor is 2x ADD, and PHD is 4x ADD, as per the design criteria.

Dead Man's Flats was projected as linear growth, where the 25 Year Horizon maxes out the current Memorandum of Agreement for water supply, which is 8.8 L/s ADD and 17.6 L/s MDD. The existing ADD is approximately 1 L/s.

The following are the system wide demands for each growth horizon, which represents the full projected growth across 25 years.

The following table shows the system wide demands for the 5 Year

Table 3-24 5 Year Horizon Water Demands

Land Use	ADD (L/s)	MDD (L/s)	PHD (L/s)
Existing	83.8	142.7	285.3
Commercial	1.9	3.9	7.7
Hotels	8.9	17.9	35.8
Residential - Low Density	1.3	2.7	5.4
Residential - Medium / High Density	7.7	15.3	30.7
Dead Man's Flats	1.6	3.2	6.4
Total	**105**	**186**	**371**

The following table shows the system wide demands for the 15 Year Horizon.

Table 3-25 15 Year Horizon Water Demands

Land Use	ADD (L/s)	MDD (L/s)	PHD (L/s)
Existing	83.8	142.7	285.3
Commercial	5.2	10.5	21.0
Hotels	18.8	37.7	75.3
Residential - Low Density	3.5	6.9	13.8
Residential - Medium / High Density	18.1	36.1	72.3
Dead Man's Flats	4.7	9.4	18.7
Total	**134**	**243**	**486**

The following table shows the system wide demands for the 25 Year Horizon.

Table 3-26 25 Year Horizon Water Demands

Land Use	ADD (L/s)	MDD (L/s)	PHD (L/s)
Existing	83.8	142.7	285.3
Commercial	8.6	17.1	34.2
Hotels	28.7	57.4	114.9
Residential - Low Density	5.6	11.1	22.3
Residential - Medium / High Density	28.5	57.0	113.9
Dead Man's Flats	8.8	17.6	35.2
Total	**164**	**303**	**606**

3.3.3 Water Demands Summary

The following is a summary of the system wide water demands for each growth scenario.

Table 3-27 Water Demands Summary

Demand Scenario	Existing	5 Year Horizon (l/s)	15 Year Horizon (L/s)	25 Year Horizon (L/s)
ADD	84	105	134	164
MDD	143	186	243	303
PHD	285	371	486	641

3.4 Hydraulic Model Development

3.4.1 Existing Water Model Update

In 2020/2021 CIMA+ updated the Town's hydraulic water model from the one developed for the 2016 UMP using the software Bentley WaterCAD. Water system assets were updated using the most recent GIS provided by the Town, including water lines, PRVs, and pumping stations. Asset information such as pipe diameters and materials were updated, and new assets were included.

Pump curves for pumping and booster stations, PRV settings and reservoir elevations were carried over from the previous model and verified against record information.

Hydrant flow testing was performed by AltaWest in 9 different locations throughout Canmore, distributed to capture major pressure zones in each supply area. The model was then calibrated against the hydrant flow tests, and PRV settings were adjusted as needed to match the field tests.

The water demands were updated by taking the previous three years of geolocated customer water meters that were scaled to equal the total water distribution volume using the loss factor of 1.45 as discussed in Section 3.3. These were assigned to the nearest node in the water model. This results in proportional demands across the system according to water usage, that sum to the system wide ADD of 84 L/s.

ADD, MDD and PHD demand scenarios were established, using the existing system peaking factors.

3.4.2 Future Water System

The growth projections have individual projections for each of the OSL areas for all the land uses. The breakdown for each of the OSL areas can be found in Appendix B. The unit demands described in Section 3.2.1 were set up in the hydraulic model. Six demand scenarios were developed, covering the three growth horizons for each of the growth projection options.

Approximate water networks were added for the major ASP / ARDP areas according to their servicing drawings, including the following:

+ Three Sisters Village
+ Smith Creek
+ Spring Creek Mountain Village
+ Silvertip

As the exact phasing of the future development areas are unknown, the full buildout network of each ASP area will be assumed for all growth horizons. Developers will be required to validate the level of service each phase of development will provide on a case by case basis.

Under each growth horizon, the number of units for each land use were added into the model at the boundaries of the existing system. The unit counts and unit demands added into the model results in the ADD, as per the locations shown in Appendix B – Growth Figures.

Peaking factors for future demands were 2x ADD for MDD, and 4x ADD for PHD.

3.5 Existing System Evaluation

3.5.1 Water Supply Analysis

The water supply analysis was performed at each of the water treatment plants individually, as they tend to operate independently. Maximum day demand and annual demand was determined by reviewing annual water reports from 2018 – 2021, which records the water distributed from each plant. The average of these four years was used for this analysis.

Table 3-28 Pumphouse 1 & 2 Annual Demands

Year	Pumphouse 1 (m^3/year)	Pumphouse 2 (m^3/year)	Total (m^3/year)	PH2/Total
2018	758,455	1,885,914	2,644,369	0.71
2019	819,398	1,770,416	2,589,814	0.68
2020	1,047,926	1,428,552	2,476,478	0.58
2021	1,181,917	1,516,778	2,698,695	0.56
Average	**951,924**	**1,650,415**	**2,602,339**	**0.63**

Table 3-29 Pumphouse 1 & 2 Maximum Day Demands

Year	Pumphouse 1 MDD (m^3/day)	Pumphouse 1 MDD (L/s)	Pumphouse 2 MDD (m^3/day)	Pumphouse 2 MDD (L/s)
2018	3,734	43	7,273	84
2019	5,296	61	6,873	80
2020	5,044	58	6,320	73
2021	7,208	83	7,559	87
Average	**5,321**	**62**	**7,006**	**81**

Pumphouse 1 has an annual diversion of 951,924 m^3, and a maximum diversion rate of 62 L/s. Pumphouse 2 has an annual diversion of 1,650,415 m^3, and a maximum diversion rate of 81 L/s.

Pumphouse 1 has a total annual licensed diversion of 2,121,965 m^3, at a maximum rate of 589.5 L/s over two licenses. However, the license for Well #2, which accounts for 44% of the total annual diversion, and 92% of the maximum diversion rate, is subject to instream objectives. If the instream objectives are not met, Well #2 cannot be relied upon. On-going analysis of water from Well #2 will be presented to AEPA in 2023 and if found not to be GWUDI (ground water under direct influence of surface water) then the expectation is that the instream objective limitation will be removed.

Table 3-30 Pumphouse 1 Water Supply Analysis

	Current Demand	License (Well #1)	License (Well #2)	License (Total PH1)
Annual Demand (m^3/year)	951,924	1,195,620	926,345	2,121,985
Maximum Day Demand (L/s)	62	50	540	589.5

With Well #2 not operating, either due to instream objectives or operational issues, Pumphouse 1 may not meet the water supply criteria

Pumphouse 2 has a total annual licensed diversion of 2,944,329 m^3 over three licenses, and a maximum diversion rate of 170 L/s, as per the standing restrictions from the TransAlta agreement which supersedes those stated on the newer licenses.

Table 3-31 Pumphouse 2 Water Supply Analysis

	Current Demand	License (Total)
Annual Demand (m^3/year)	1,650,415	2,944,329
Maximum Day Demand (L/s)	81	170

Pumphouse 2 meets the water supply criteria and has the capacity to supplement Pumphouse 1 in instances of Well #2 not meeting instream objectives, or during operational challenges. This ability to supplement Pumphouse 1 was further reinforced by the recent completion of the South Bow River Loop project, which connects into the Central supply zone southeast of Kananaskis Way.

3.5.2 Water Treatment Analysis

As defined in the design criteria, a water treatment plant should be able to supply a community with its maximum day demand. The maximum day demand for each pumphouse is shown in Table 3-32 and Table 3-33.

Pumphouse 1

Pumphouse 1 has a treatment capacity of approximately 8000 m^3 per day, or 92.6 L/s. This value is based on the 2010 Canmore UMP Update report, which states: "A review of operational data from the last few years suggests that the maximum capacity for Pump House 1 is approximately 8,000 m^3/day."

Table 3-32 Pumphouse 1 Water Treatment Analysis

	Current Demand	Treatment Capacity
Maximum Day Demand (L/s)	62	92.6
Maximum Day Demand (m^3/day)	5,321	8,000

Pumphouse 1 is currently using approximately 70% of it's available treatment capacity on a max day, as calculated over the past four years. However, in August 2021 there was a turbidity event which required significant system flushing, resulting in an abnormally high period of water usage. The max day during that event was still within the treatment capacity, and occurred during the August long weekend, which is typically the period of highest water usage each year.

Pumphouse 2

Pumphouse 2 has a treatment capacity of approximately 94.4 L/s, or 360 m^3/hour. The treatment is currently limited by the filtration system, with the next bottleneck being the UV system, with a capacity of 126 L/s.

Table 3-33 Pumphouse 2 Water Treatment Analysis

	Current Demand	Treatment Capacity
Maximum Day Demand (L/s)	81	94
Maximum Day Demand (m^3/day)	7,006	8,156

Pumphouse 2 is currently using approximately 86% of it's available treatment capacity on a max day, as calculated over the past four years. Pumphouse 2 also experienced an abnormally high max day in August 2021 due to the noted turbidity event, however the increase was measurably less than at Pumphouse 1, as the majority of the flushing occurred in the Central and Eastern supply zones.

Pumphouse 2 has a treatment capacity upgrade planned for 2023 or 2024, which will increase the capacity up to 170 L/s.

3.5.3 Level of Service Analysis

Figure W3 (Appendix C) shows the hydraulic model results for the existing system at Peak Hour Demand. Pressure nodes that are below the standard minimum pressure requirement of 350 kPa (50 psi) as set out in the design criteria are shown in orange. Pressures below the conditional minimum pressure of 280 kPa (40 psi) are shown in red. Pressures above the 625 kPa (90 psi) limit are shown in purple.

In total there are four areas that fall below the conditional minimum pressure of 280 kPa (40 psi), which would have an impact on the level of service.

+ Coyote Way
+ Downstream of Pumphouse 5
+ Northwest Extent of Silvertip Trail
+ Olympic Drive and Prendergast Place
+ Canmore Nordic Centre

Coyote Way

The northeast corner of Coyote Way has a minimum pressure of approximately 245 kPa (36 psi), which is below the Town's minimum.

The 2016 UMP recommended a project (Water Project 10) which created a new pressure zone for the Coyote Way and Kodiak Road area, by connecting it to Pressure zone 5 which is supplied by the Benchlands pump station and installing a PRV along Cougar Creek Drive.

There is no record of customer complaints of low service pressure in that area, so the Town may find it acceptable to leave the system in that area as is.

Downstream of Pumphouse 5

The water line on the downstream end of Pumphouse 5, along Elk Run Blvd, has a minimum pressure of approximately 200 kPa (29 psi). There are no services directly connected to this low pressure area, however there have been incidences of the booster pumps at Pumphouse 5 crashing or being unable to maintain pressure during high flow events nearby, such as during water line flushing, or fire events.

The 2016 UMP recommended a project (Water Project 10) which, along side the Coyote Way improvement, created a new pressure zone for the Canyon Road and Lady MacDonald areas by connecting it to Pressure zone 5, decommissioning Pumphouse 5, and installing a PRV along Lady MacDonald Road.

Further review of Water Project 10 from the 2016 UMP indicates that the project might not be the best avenue for overall system reliability and operational costs, as it removes the northern connection of the Avens area across Cougar Creek from Pumphouse 1 and the Benchlands gravity line. If there were a failure or operational issue with the southern crossing of Cougar Creek, adjacent to Highway 1, the entirety of the Avens neighbourhood would be reliant on the Benchlands pump station.

An alternative to the proposed Water Project 10 that can still allow for the decommissioning of Pumphouse 5 would be to connect pressure zone 5 directly to the inlet side of Pumphouse 5 with a new water line crossing Cougar Creek, along the same alignment as the current crossing on Elk Run Blvd. The additional costs of crossing Cougar Creek would likely be offset by only requiring one new PRV, instead of the three or four that would be needed in the previously proposed project.

This would maintain the current system redundancy, with the trade off that current Coyote Way pressures would be maintained.

Northwest Extent of Silvertip Trail

The northwest extent of Silvertip Trail has a minimum pressure of approximately 220 kPa (32 psi). As this is at the extent of the system, and pressures are currently bounded by the height of the Silvertip reservoir, there is no practical way to increase pressures to that area through changes to the existing system.

Development at or past that extent may require a booster station to provide adequate service pressures.

Olympic Drive and Prendergast Place

The area along Olympic Drive and Prendergast Place, downstream of PRV 13, has a minimum pressure of approximately 180 kPa (26 psi) immediately downstream of the PRV, and 255 kPa (37 psi) where services tie in.

Inspection reports from EPCOR of PRV 13 indicate a downstream pressure of 320 kPa (50 psi), however this does not line up with field observations. During the 2021 Water Model Update, a hydrant test was performed along Van Horne and Prospect Heights, which is in the same pressure zone as Prendergast Place. The observed static pressure was 65 psi, and all PRV settings for the pressure zone were adjusted to a set point that result in that pressure (1364.49 m Hydraulic Grade Line). If PRV 13 were operating at the 320 kPa (50 psi) set point as noted, the residual measured at the hydrant would be approximately 590 kPa (85 psi).

The pressures at Prendergast Place are marginally below the conditional minimum of 280 kPa (40 psi). As there are no records of complaints from the public regarding low service pressures, the Town can consider leaving the pressures as it. However, if public complaints do arise, the Town could consider increasing the pressure set point for PRVs 8, 13, 14, 19 and T1.

This would increase the pressures zone 8 on the west side of the Bow River, and have a minimal impact on the Downtown portion of zone 8. This is due to the long 150 mm pipe along Rundle Place that connects this portion of zone 8 to Downtown. Pressures drop rapidly in long portions of small diameter pipe, and would have a negligible impact on the pressures in Downtown.

Canmore Nordic Center

The custody transfer point for the Canmore Nordic Centre water supply has a minimum pressure of approximately 200 kPa (29 psi). The Nordic Centre is supported by a booster station that fills an on site reservoir.

The existing pressures appear to be adequate for the current booster station set up, however if upgrades to the booster station are required in the future for further servicing, the lower supply side pressures will need to be considered.

3.5.4 Fire Flow Analysis

Figure W4 (Appendix C) shows the hydraulic model results for the MDD+ Fire Flow scenario. The water model was used to calculate the available fire flow at each node while maintaining at least 138 kPa (20 psi) residual at every point in the distribution system. The nodes are color coded corresponding to whether or not the fire flow requirements were met, based on the surrounding land use.

There are five main areas in the existing system that are not meeting the fire flow requirements according to their land use:

+ Bow Valley Trail northwest of 15th Street
+ Elk Run Industrial Area
+ Railway Ave adjacent to the rail line
+ Industrial Place / 8th Avenue
+ Hospital

There is a single node in the water model that has a significant impact on the available fire flow for the existing system, which is very sensitive to the discharge pressure from Pumphouse 2. It is on the service line that leads to the Canmore Nordic Center. Due to the high elevation on the end of the line, its connection to the cross town feeder main, and the low discharge pressure of Pumphouse 2, high flows out of Pumphouse 2 can drop the hydraulic grade line low enough for that service line to go below the minimum pressure requirements during fire flow runs. If this service line were to be ignored in the modelling, the fire flow results in the affected areas increase dramatically, however this would impact the service to the Nordic Center.

The proposed distribution capacity upgrade to Pumphouse 2 resolves this issue, and allows the first three affected areas to meet the design criteria for fire flow.

The hospital has an available fire flow of approximately 160 L/s along the 150 mm line that services it, when 200 L/s is required. This is largely due to the small pipe size of the line, as the connection points on Hospital Place and Bow Valley Trail have available fire flows above the requisite 200 L/s. It may not be worth the risk of service disruption to the hospital to facilitate a moderate increase in fire flows to the hospital, however when the water main servicing it is nearing its lifecycle, it should be replaced with a larger diameter pipe.

The fire flow capacity of the existing system is otherwise adequate and meets the design criteria. There are some other minor areas that do not meet the fire flow targets, however these are largely along dead end lines from small diameter pipes, which would not be practical to loop or to upsize.

Figure W5 shows the available fire flow after the Pumphouse 2 distribution capacity upgrade has been implemented.

3.5.5 Water Distribution Analysis

Pipe Lifecycle

The Town of Canmore's water distribution system contains aging water distribution infrastructure, particularly in the Downtown area. The service life of water mains, as per Canmore's asset management standards, is 75 years.

Currently there are pipes dating back to 1965, making the oldest pipes in the system approximately 58 years old. Figure W6 (Appendix C) shows the pipes according to age.

Currently no pipes in the system are approaching the end of their lifecycle, however replacement programs should be considered in the future when pipe lifecycle is approaching its end.

Pipe Turbidity

In August 2021, there was a significant turbidity even that occurred around Kananaskis Way, Cougar Creek and Avens neighbourhoods. This turbidity event occurred during the commissioning of the South Bow River Loop. It was suspected that the high flows through the pipe disturbed settled material in pipes that were previously experiencing low flows.

Historically Canmore has not had an active pipe flushing program, and when low velocity flushing was performed during the turbidity incident, and follow up high velocity flushing, significant turbidity was encountered. This indicates that deposited material is likely an issue across the Town's water network, particularly in older areas like Downtown.

The Town should develop an active pipe flushing program to mitigate future turbidity risks.

3.5.6 Pump Station Analysis

The level of service analysis and available fire flow analysis demonstrate that the Town's water distribution system can provide adequate service pressures during PHD and available fire flow during MDD, however these scenarios have gravity assisted reservoirs supplementing flows into the system.

An investigation into the ability for the Town's system to fill the storage reservoirs while providing MDD to the reservoirs and their associated service areas is also necessary to ensure adequate and reliable service.

Currently there are three storage reservoirs which are filled by pump stations, and supply the system with water through gravity or pumping:

+ Grassi Reservoir
+ Benchlands Reservoir
+ Silvertip Reservoir

SCADA data of the reservoir levels was reviewed to determine approximately the observed fill rate of each of the reservoirs.

The MDD of each reservoir was determined in the model by running each demand scenario without the reservoirs being filled. The modelled discharge from each reservoir represents the reservoir's MDD.

Table 3-34 Existing System Pump Station Analysis – Reservoir Demands

Reservoir	Required MDD (L/s)	Available MDD (L/s)
Grassi	30	20
Silvertip	3	70
Benchlands + Silvertip	28	50

Grassi Reservoir

The Grassi reservoir is supplied by a booster station on Peaks Drive, south of Lawrence Grassi Ridge. The booster station is in turn supplied by Pumphouse 2.

The Grassi booster station is noted as having two pumps, each of which have a capacity of approximately 20 L/s. The SCADA data indicates that Grassi has two different fill rates. It regularly fills at approximately 15 - 20 L/s, and after high demand periods fills at roughly 30 L/s with both pumps running.

With both pumps running, the booster station for the Grassi reservoir would not meet the design criteria for pump stations, where the largest pump should be considered offline for the purpose of redundancy. An upgrade to the booster station, with a redundant pump or higher pumping capacity should be considered, and should cover up to the 15 Year horizon, which as shown in Section 3.6.6.2, is a rate of approximately 80 L/s. The existing booster station also is noted as not having a backup generator, and the nearby PRV 20 is noted as needing repairs. These should be included in the booster station upgrade.

With the booster station operating at 30 L/s in the MDD scenario, Pumphouse 2 is able to provide adequate water to the station and maintain the required level of service for the rest of its service area.

Silvertip Reservoir

The Silvertip reservoir is filled by the Benchlands pump station. Modelling predicts that Benchlands can fill it at a rate of approximately 80 L/s, and SCADA data indicates a fill rate of approximately 70 L/s.

The current demand on the reservoir is quite low, with a total pumping requirement of 5 L/s to serve the ADD and MDD of the Silvertip area. During ADD, benchlands also has a demand of 5 L/s to the area directly supported by it. As such, it should be capable of a minimum of 10 L/s in order to fill the Silvertip reservoir, which it is more than capable of.

Benchlands Reservoir

The Benchlands reservoir is supplied by Pump Station 1. Pumphouse 1 fills benchlands reservoir by staging pumps on and off depending on the reservoir level. Modelling predicts that Pumphouse 1 can fill it at a rate of approximately 50 L/s, and the SCADA indicates a fill rate of approximately 50 L/s.

For MDD there were 2 small pumps online and 5 L/s from the SBRL PRV. The MDD also included the demands from Silvertip.

According to both the SCADA fill rates, and the modelled fill rates, Pumphouse 1 has sufficient pumping capacity to fill Benchlands reservoir while still supplying an adequate level of service to its service area.

3.5.7 Water Storage Analysis

The Town's water system is a dynamic network where pressure zones can be serviced from multiple storage reservoirs at once. In order to simplify these interactions, the distribution system is divided into three supply areas; Western, Central, and Eastern.

The ADD and MDD of each supply zone was determined by summing up the demands in the model.

Table 3-35 Existing Supply Zone Demands

Supply Zone	ADD (L/s)	MDD (L/s)
Western Supply Zone	13.6	23.2
Central Supply Zone	45.5	77.3
Eastern Supply Zone	21.7	33.7
Silvertip	1.9	3.2
Total	**82.7**	**137.4**

The Western supply zone relies solely on Pumphouse 2 and Grassi Reservoir, and as such the volume required for the Western supply zone will be reserved from those reservoirs in this analysis.

The Central supply zone and portions of the Eastern supply zone can be supported by Pumphouse 2, Grassi Reservoir and Benchlands, however with Grassi and Pumphouse 2 reserved, the majority of the storage will come from Benchlands. Any remaining capacity in the Western supply zone can be attributed to the Central and Eastern supply zones.

The Silvertip area is part of the Eastern supply zone, and can be supplied by both Benchlands and Silvertip, but the Silvertip reservoir has no practical way to transfer water back into Benchlands. As such, the Silvertip area will be considered separately.

Table 3-36 Existing System Water Storage Analysis

	Western Supply Zone	Central and Eastern Supply Zone	Silvertip
ADD (m^3/day)	1,177	5,803	164
MDD (m^3/day)	2,002	9,866	279
Fire Storage (300 L/s for 3.5 hours)	3,780	3,780	3,780
Equalization Storage - 25% MDD (m^3/day)	500	2,466	70
Emergency Storage - 15% ADD (m^3/day)	177	870	25
Recommended Storage (m^3)	4,457	7,117	3,874
Available Storage (m^3)	6,100	7,300	5,400

Overall, all supply zones have adequate water storage. The Central and Eastern zones are approaching the limit of the Benchlands reservoir, however since the Central and Eastern Zones can be supported by the Western supply zone, which has approximately 1,350 m^3 excess capacity, this can be added to the 7,300 m^3 storage capacity of Benchlands.

3.6 Future System Evaluation

3.6.1 Water Supply Analysis

Future water demands were divided between the two water treatment plants dependant on what supply zone the demands fall in. Demands in the Western supply zone, which represent the bulk of the growth in Canmore, were assigned to Pumphouse 2. Demands in the Central and Eastern Supply Zones were assigned to Pumphouse 1.

Table 3-37 Future System Annual Demands

Horizon	Pumphouse 1 ADD (m^3/day)	Pumphouse 1 Annual Consumption (m^3/year)	Pumphouse 2 ADD (m^3/day)	Pumphouse 2 Annual Consumption (m^3/year)
5 Year Horizon	3,796	1,385,544	5,307	1,937,235
15 Year Horizon	4,654	1,698,665	6,870	2,507,406
25 Year Horizon	5,559	2,029,005	8,519	3,109,397

Table 3-38 Future System Maximum Day Demands

Horizon	Pumphouse 1 MDD (m^3/day)	Pumphouse 1 MDD (L/s)	Pumphouse 2 ADD (m^3/day)	Pumphouse 2 MDD (L/s)
5 Year Horizon	7,697	89	8,578	99
15 Year Horizon	9,412	109	11,702	135
25 Year Horizon	11,222	130	15,001	174

5 Year Horizon

Under typical conditions, Pumphouse 1 meets the water supply criteria under the 5 Year Horizon, however if instream objectives are not met for Well #2 during a maximum day event, Pumphouse 1 would not be able to receive adequate water supply.

Table 3-39 5 Year Horizon Pumphouse 1 Water Supply Analysis

	5 Year Demand	License (Well #1)	License (Well #2)	License (Total PH1)
Annual Demand (m^3/year)	1,385,544	1,195,620	926,345	2,121,985
Maximum Day Demand (L/s)	89	50	540	589.5

Pumphouse 2 meets the water supply criteria under the 5 Year Horizon, and has enough additional spare capacity to support Pumphouse 1 during events where Well #2 cannot be relied on.

Table 3-40 5 Year Horizon Pumphouse 2 Water Supply Analysis

	5 Year Demand	License (Total)
Annual Demand (m^3/year)	1,937,235	2,944,329
Maximum Day Demand (L/s)	99	170

15 Year Horizon

Under typical conditions, Pumphouse 1 meets the water supply criteria under the 15 Year Horizon, however if instream objectives are not met for Well #2 during a maximum day event, Pumphouse 1 would not be able to receive adequate water supply.

Pumphouse 2 no longer has the spare capacity to support Pumphouse 1 during these events. Prior to the 15 year horizon, the Town should consider investigating increasing the maximum allowable flow from Well #1, or constructing a new well that would not be subject to instream flow objectives.

The alternative is to have Pumphouse 2 support Pumphouse 1, however limitations in the maximum withdrawal rate by the previous TransAlta agreement means that is not feasible until those limitations are renegotiated.

Table 3-41 15 Year Horizon Pumphouse 1 Water Supply Analysis

	15 Year Demand	License (Well #1)	License (Well #2)	License (Total PH1)
Annual Demand (m^3/year)	1,698,665	1,195,620	926,345	2,121,985
Maximum Day Demand (L/s)	109	50	540	589.5

Pumphouse 2 meets the water supply criteria under the 15 Year Horizon, however it no longer has enough additional spare capacity to support Pumphouse 1 during events where Well #2 cannot be relied on. Pumphouse 2 is nearing the annual withdrawal limit of the existing licenses.

Table 3-42 15 Year Horizon Pumphouse 2 Water Supply Analysis

	15 Year Demand	License (Total)
Annual Demand (m^3/year)	2,507,406	2,944,329
Maximum Day Demand (L/s)	135	170

25 Year Horizon

Under typical conditions, Pumphouse 1 meets the water supply criteria under the 25 Year Horizon, however if instream objectives are not met for Well #2 during a maximum day event, Pumphouse 1 would not be able to receive adequate water supply. The annual withdrawal limits are at approximately 95% of capacity.

Table 3-43 25 Year Horizon Pumphouse 1 Water Supply Analysis

	25 Year Demand	License (Well #1)	License (Well #2)	License (Total PH1)
Annual Demand (m^3/year)	2,029,005	1,195,620	926,345	2,121,985
Maximum Day Demand (L/s)	130	50	540	589.5

Pumphouse 2 does not meet the water supply criteria under the 25 Year Horizon, with both the annual withdrawal limits and the maximum rate of withdrawal. In order to support the 25 year horizon, additional water licences may have to be acquired, and the existing withdrawal limit under the TransAlta agreement would have to be extended. However, these deficiencies are very minor, and should be re-examined when further development in Canmore has occurred, allowing for better water demand projections.

Table 3-44 25 Year Horizon Pumphouse 2 Water Supply Analysis

	25 Year Demand	License (Total)
Annual Demand (m^3/year)	3,109,397	2,944,329
Maximum Day Demand (L/s)	174	170

3.6.2 Water Treatment Analysis

As defined in the design criteria, a water treatment plant should be able to supply a community with its maximum day demand. The maximum day demand for each pumphouse and each growth horizon was shown in Table 3-38.

Pumphouse 1

Pumphouse 1 currently has a treatment rate of approximately 8,000 m^3/day, or 92.6 L/s.

According to the way demands were distributed for future growth, Pumphouse 1 will exceed it's treatment capacity shortly after the 5 year horizon. Pumphouse 2 will be able to supplement Pumphouse 1 with spare capacity in its treatment rate past the 15 year growth horizon. By the end of the 25 year horizon, Pumphouse 2 will no longer be able to make up this treatment deficit.

Table 3-45 Future System Water Treatment Analysis for Pumphouse 1

	Future Demand	Treatment Capacity
5 Year -Maximum Day Demand (L/s)	89	93
15 Year - Maximum Day Demand (L/s)	109	93
25 Year - Maximum Day Demand (L/s)	130	93

Pumphouse 2

Pumphouse 2 is slated to have the treatment capacity upgraded to 170 L/s in the near future and is assumed to be complete for the future system evaluations.

Pumphouse 1 has a 37 L/s deficit for treatment in the 25 year horizon, so if Pumphouse 1 were to remain as-is, Pumphouse 2 would need to be capable of treating that alongside its max day demand, for a total of 211 L/s. Pumphouse 2 was initially planned to have a treatment rate of 225 L/s, but was reduced to 170 L/s in accordance with the licence limitations. If that withdrawal rate is ever increased, the Pumphouse 2 design will be able to accommodate an additional filter, which could bring the treatment rate up to 225 L/s. However this space could be used for the proposed backwash reuse system, which would serve to reduce the overall raw and treated water demands.

Table 3-46 Future System Water Treatment Analysis for Pumphouse 2

	Current Demand	Treatment Capacity
5 Year -Maximum Day Demand (L/s)	99	170
15 Year - Maximum Day Demand (L/s)	135	170
25 Year - Maximum Day Demand (L/s)	174	170

25 Year Horizon Water Treatment Deficit Options

The following are some potential options to address the treated water deficit for the 25 year horizon. A water supply and treatment study should be performed prior to the 15 year horizon in order to determine the best course of action for the Town.

+ Increased withdrawal from the Rundle Forebay and additional treatment at Pumphouse 2
  - Withdrawal rates from the Rundle Forebay are currently constrained by a third party. At this time it does not seem likely that the third party would allow the increase.
+ Additional Storage
  - In order to supplement the peak demands that are higher than the treatment rate, additional storage could possibly be used. No design criteria has been defined for this use case, however a conservative approach would be to allow for at least two consecutive max days of water demand. This would mean additional storage equal to two times the current max day deficit of 40 L/s, which equals a volume of approximately 7,000 m^3. This would be a significant increase in the required storage volume in the Town, and would be reflected by a very high capital cost.
+ Pumphouse 1 Upgrades
  - Pumphouse 1 could possibly be upgraded to increase the treatment capacity. If the water supply can be officially designated as not under the direct influence of surface water, which is supported by a report being submitted to Alberta Environment, then the treatment system of chlorine contact time can remain the same. Pumphouse 1 is nearing life cycle, so the upgrade would likely involve a completely new treatment plant. A new raw water well would also likely be required.

3.6.3 Level of Service Analysis

Figures W7 – W9 (Appendix C) shows the hydraulic model results for each of the future growth horizons at Peak Hour Demand. Pressure nodes that are below the standard minimum pressure requirement of 350 kPa (50 psi) as set out in the design criteria are shown in orange. Pressures below the conditional minimum pressure of 280 kPa (40 psi) are shown in red. Pressures above the 625 kPa (90 psi) limit are shown in purple.

The full buildout network for the growth areas has been implemented for all growth horizons.

5 Year Horizon

The five year horizon contains two major modifications to the Canmore water distribution system; Pumphouse 2 upgraded to >225 L/s distribution capacity, and Pumphouse 5 (CRBS) decommissioned and its service area connected to Pressure zone 5, which is supported by Benchlands.

Modifying Pressure Zone 8 was also investigated in order to raise the service pressure at Prendergast Place, as noted in Section 3.5.3. It was found that this encouraged flows into Downtown through the communities along Rundle Drive, instead of the crosstown feeder through PRV 12. If PRV 12 were adjusted upwards to promote flows through it, a marked increase in the Downtown pressures was observed. As such, it is recommended that the PRVs be maintained at their current pressure set points, barring any customer complaints from the low-pressure area in Prendergast Place.

The pressures along Elk Run Blvd in the existing line that previously connected to the CRBS are still below the 40 psi minimum, however there is no longer any service connected to in in the low pressure area. Down the hill along Lady McDonald Dr, enough elevation is lost to maintain adequate service pressures. The areas that were served by the CRBS now have consistent, adequate service pressures with the booster station decommissioned.

15 Year Horizon

The fifteen-year horizon contained no major modifications to the Town's water distribution system, and the only deficient areas were the ones originally indicated in the existing system analysis.

25 Year Horizon

The twenty-five-year horizon contained no major modifications to the Town's water distribution system, and the only deficient areas were the ones originally indicated in the existing system analysis.

3.6.4 Fire Flow Analysis

Figures W10 – W13 (Appendix C) shows the hydraulic model results for the MDD+Fire Flow scenario for each of the growth horizons. The water model was used to calculate the available fire flow at each node while maintaining at least 138 kPa (20 psi) residual at every point in the distribution system. The nodes are color coded corresponding to whether or not the fire flow requirements were met, based on the surrounding land use.

The full buildout network for the growth areas has been implemented for all growth horizons. All growth areas were assumed to have a 200 L/s fire flow requirement.

5 Year Horizon

The 5 year horizon included the following upgrades to the Town's water distribution system and network:

+ Pumphouse 2 upgraded to 225 L/s capacity
+ CRBS decommissioned and supply area connected to Pressure zone 5
+ Bow Valley Trail water line upgraded to 250 mm up to Hospital Place

In addition to these upgrades, the TeePee town area also has a land use change to high density according to the growth projections, and as such has the available fire flow requirement increased to 200 L/s. Previously available fire flows were at approximately 120 L/s in the area and met the fire flow requirements. With the density increase, an upgrade to the main waterline along 1 Ave from 150 mm to 250 mm will be required. This has been implemented for the analysis.

The southeast extent of the Smith Creek development does not meet the estimated 200 L/s available fire flow. This is in part due to the assumed pressure zone distribution, with the high level network in the ASP this area is serviced off of a single line from the new reservoir as is not a looped system. That is likely the creating the limitation in available fire flow This will have to be a consideration when developers begin designing the neighbourhood.

15 Year Horizon

The fifteen year horizon contained no major modifications to the Town's water distribution system, and the only deficient areas were the ones originally indicated in the existing system analysis.

25 Year Horizon

The twenty five year horizon contained no major modifications to the Town's water distribution system, and the only deficient areas were the ones originally indicated in the existing system analysis.

3.6.5 Water Distribution Analysis

The lifecycle of pipes are approximately 75 years in the Town. Pipes approaching the 75 year lifecycle should be considered for replacement.

5 Year Horizon

No pipes are approaching their lifecycle in the 5 year horizon.

15 Year Horizon

By the end of the 15 year horizon, the earliest recorded pipes in the water network (Installed in 1965) are approaching their end of their lifecycle, however no replacement programs are required under this growth horizon.

25 Year Horizon

A replacement program should be developed for pipes installed between 1965 and 1972, to be executed starting from the end of the 15 year horizon and replacing sections of pipe each year. This would ensure that there are no assets older than the 75 year lifecycle by the end of the 25 year horizon, and are represented by pipes that are currently older than 50 years.

There are approximately 12 km of water lines older than 50 years. They are primarily located in the Downtown area, Railway Ave, TeePee town, and Rundle Drive.

150 mm pipes should be replaced with 200 mm pipes where possible. 150 mm pipes are hydraulically restrictive, and generally can't provide the required fire flows needed for future densification.

The replacement program will be broken out into five separate areas, for the purposes of project time lines and cost estimates. They are as follows:

+ South Canmore (6th Street to 3rd Street) – 2 km
+ Downtown (6th Street to 10th Street) – 3 km
+ 7th Avenue (10th St to Industrial Place) – 2.5 km
+ Rundle (Bridge Road to Three Sisters Drive) – 2 km
+ Teepee Town / Railway Ave – 1.5 km

3.6.6 Pump Station Analysis

Along with the three existing reservoirs assessed in Section 3.5.7 for the existing system, the proposed Smith Creek reservoir was also assessed in the future system evaluation.

The MDD of each reservoir and its associated service area was determined in the model by running each demand scenario without the reservoirs being filled. The modelled discharge from each reservoir represents the reservoir's MDD.

The Grassi and Smith Creek reservoirs are fully reliant on Pumphouse 2 to deliver water to them, with daisy chained booster stations required to fill Smith Creek reservoir.

In order to consider the impacts of Dead Man's Flats with consideration for existing infrastructure agreements, the Grassi Booster Station was additionally reviewed with no contribution from Dead Man's Flats.

3.6.6.1 5 Year Horizon

The following are the MDD demands of each of the reservoirs under the 5 year horizon.

Table 3-47 5 Year Horizon Pump Station Analysis

Reservoir	Required MDD (L/s)	Available MDD (L/s)
Grassi + Smith	47	80
Grassi + Smith (No DMF)	44	80
Silvertip	8	80
Benchlands + Silvertip	39	50
Smith Creek	6	0

Grassi Reservoir

The Grassi booster station needs a pumping capacity of 47 L/s to support the Grassi and Smith Creek reservoirs. The existing system identified the Grassi booster station as not meeting standards and it is recommended that the pump station be upgraded to satisfy the 15 year horizon., which has a pumping rate of 80 L/s. Without demands from Dead Man's Flats, 44 L/s pumping capacity would be required.

With the booster station operating at 80 L/s, Pumphouse 2 is able to provide adequate flow to the system during MDD, and the pump stations are able to maintain adequate levels of service.

Smith Creek Reservoir

The Smith Creek reservoir will require a booster station to fill it. The need for the booster station and reservoir is dependent on development staging and the elevations that phases are being built at, however it is assumed that the reservoir will be required at the start of development for the portion of Smith Creek that is on the east side of the cross valley corridor.

Initially a booster station in Smith Creek capable of 6 L/s is required to support the Smith Creek reservoir. However, construction of the booster to support up to the 15 Year horizon, for a capacity of 20 L/s, is recommended.

With the Smith Creek booster station operating at 20 L/s, the Grassi booster upstream can provide adequate flow to the system, and the pump stations are able to maintain adequate levels of service.

Silvertip Reservoir

During MDD, the Silvertip reservoir can fill at a rate of 80 L/s from the Benchlands pump station, satisfying the MDD requirements of 8 L/s.

Benchlands Reservoir

The operating conditions for Benchlands for each demand scenario were as follows. For ADD there was two small pumps online at Pumphouse 1 and the new PRV from the South Bow River Loop (SBRL) online with a flow control valve set to 5 L/s in place. For MDD there were 2 small pumps online and 5 L/s from the SBRL PRV. MDD also included the demands from Silvertip.

In the reservoir filling scenario, Benchlands fills at a modelled rate of 50 L/s, which satisfies the MDD requirement of 39 L/s.

3.6.6.2 15 Year Horizon

The following are the ADD and MDD demands of each of the reservoirs under the 15 year horizon.

Table 3-48 15 Year Horizon Pump Station Analysis

Reservoir	MDD (L/s)	Available MDD (L/s)
Grassi + Smith	78	80
Grassi + Smith (No DMF)	68	80
Silvertip	17	81
Benchlands + Silvertip	49	50
Smith Creek	18	20

Grassi Reservoir

The Grassi booster station needs a pumping capacity of 78 L/s in order to support the Grassi and Smith Creek reservoirs. The existing system evaluation identified the Grassi booster station as not meeting standards, and it is recommended that the pump station be upgraded to 80 L/s to satisfy this 15 year horizon. Without demands from Dead Man's Flats, 68 L/s pumping capacity would be required.

With the booster station operating at 80 L/s, Pumphouse 2 is able to provide adequate flow to the system during MDD, and the pump stations are able to maintain adequate levels of service.

Of the 80 L/s required pumping capacity, 30 L/s is from the existing system, 38 L/s is from OSL areas 13 and 14, and 10 L/s is from Dead Man's Flats.

Smith Creek Reservoir

The Smith Creek booster station needed a pumping capacity of 18 L/s in order to support the Smith Creek reservoir, and was recommended in the 5 year horizon to be constructed to support up to 20 L/s. With the booster station operating at 20 L/s, the Grassi booster upstream is able to provide adequate flow to the system, and the pump stations are able to maintain adequate levels of service.

Silvertip Reservoir

During ADD, the Silvertip reservoir fills at a modelled rate of 80 L/s from the Benchlands pump station, satisfying the MDD requirements of 17 L/s.

Benchlands Reservoir

The operating conditions for Benchlands for each demand scenario were as follows. For ADD there was two small pumps online at Pumphouse 1 and the new PRV from the South Bow River Loop (SBRL) online with a flow control valve set to 5 L/s in place. For MDD there were 2 small pumps online and 5 L/s from the SBRL PRV. MDD also included the demands from Silvertip.

In the reservoir filling scenario, Benchlands fills at a modelled rate of 50 L/s, which satisfies the MDD requirement of 49 L/s.

3.6.6.3 25 Year Horizon

The following are the MDD demands of each of the reservoirs under the 25 year horizon.

Table 3-49 25 Year Horizon Pumping Analysis

Reservoir	MDD (L/s)	Available MDD (L/s)
Grassi -+ Smith Creek	133	80
Grassi + Smith (No DMF)	115	80
Silvertip	27	80
Benchlands + Silvertip	59	50
Smith Creek	45	20

Grassi Reservoir

The Grassi booster station needed a pumping capacity of 133 L/s in order to support the Grassi and Smith Creek reservoirs and will require an upgrade. Without demands from Dead Man's Flats, 115 L/s pumping capacity would be required, which will still result in an upgrade. 135 L/s is the recommended upgrade target, an increase of 55 L/s.

Of the 55 L/s upgrade, 47 L/s is from OSL areas 13 and 14, and 8 L/s is from Dead Man's Flats.

With the booster station operating at 135 L/s, an adequate level of service is not able to be maintained. The draw to fill both Grassi and Smith Creek reservoirs at max day demand creates low pressures along Three Sisters Drive, and is a result of the headlosses created by the high flows from Pumphouse 2 along Three Sisters Drive.

Increasing the pumping capacity at Pumphouse 2 does not resolve this, and as such the upgraded pumping capacity at Pumphouse 2 is adequate. The main issue is that the discharge pressure out of Pumphouse 2 is too low to combat the headlosses created during this high flow event.

Dependant on its risk Tolerance, the Town may want to consider only filling one of the Grassi or Smith Creek reservoirs at a time, or filling them at a maximum rate of less than MDD, such as 1.5 times ADD. However this does result in the potential for the reservoirs to trend downwards in volume during abnormally high demand periods.

In order to meet these design criteria, one of the following would need to be implemented:

+ Higher Discharge Pressure – Pumphouse 2 would have to discharge at ~5 psi higher than it currently is to match the pressure losses caused during peak demand and meet the minimum level of service. This does not resolve low pressures on the suction side of the Grass booster station, and would have to be a consideration in its design, and the accompanying PRV.
+ New water line from Pumphouse 2 to Grassi Booster – A new water line which would connect Pumphouse 2 to the Grassi booster, effectively twinning the existing water line, would reduce the headlosses from the high flow scenario dramatically, and resolve what is currently a long single point of failure in the water network. Everything supplied by the Grassi reservoir is reliant on the water line that runs along Spray Lakes Rd and Three Sisters Dr.

While increasing the discharge pressure out of Pumphouse 2 would be the simplest solution, a new water line from Pumphouse 2 to the Grassi Booster would provide the best balance between resolving the level of service and improving system redundancy, and when implemented allows enough flow to reach the Grassi booster to supply it at the needed fill rate.

As the proposed water line would have the benefit of redundancy for the Town as a whole, a benefitting areas assessment was performed as an alternative to the cost allocation methodology. This compares the existing developed area to the gross developable area at the 25 year growth horizon for all offsite levy areas with projected growth. The following table shows the benefitting area and their relative percentages of the total area, which can be attributed to cost allocation.

Table 3-50 Grassi Reservoir Twinned Line Benefitting Areas

OSL Zone	Area (ha)	% of Total
Existing	750.0	73.1%
1	21.7	2.1%
2	20.5	2.0%
6	8.4	0.8%
7	3.0	0.3%
9	10.5	1.0%
10	5.3	0.5%
13	56.9	5.5%
14	70.1	6.8%
15 (DMF)	75.0	7.3%
16	2.3	0.2%
17	2.7	0.3%
Total Growth	**276.2**	**26.9%**
Total Area	**1026.2**	

Smith Creek Reservoir

The Smith Creek booster station needed a pumping capacity of 45 L/s in order to the Smith Creek reservoir. The booster station, which was recommended to be designed to service up to the 15 year horizon, would need to be upgraded.

With the booster station operating at 45 L/s, the Grassi booster upstream is able to provide adequate flow to the system, and the pump stations are able to maintain adequate levels of service, when the proposed water line from Pumphouse 2 to Grassi booster is implemented.

Silvertip Reservoir

During ADD, the Silvertip reservoir fills at a modelled rate of 80 L/s from the Benchlands pump station, satisfying the MDD requirements of 27 L/s.

Benchlands Reservoir

The operating conditions for Benchlands were as follows. For MDD there were three small pumps online and 5 L/s from the SBRL PRV. The MDD also included the demands from Silvertip.

In the reservoir filling scenario, Benchlands fills at a modelled rate of 50 L/s, which does not satisfy the MDD requirement of 59 L/s.

Adjusting the flow rate at the Flow Control Valve on the SBRL PRV was investigated, and modelling indicated it could provide a maximum of 30 L/s.

Pumphouse 1 may be able to achieve the required flow rates by raising the discharge pressure out of the station. The current set point is 120 psi, increasing this to 125 psi would allow for sufficient flow to fill the Benchlands reservoir at the required MDD. Testing would need to be performed to ensure the pumps are capable of this, however that flow rate and discharge pressure does fall on the current pump curves.

3.6.7 Water Storage Analysis

In addition to the three supply zones previously analysed in the existing system, a new reservoir will be required to support the growth in the Smith Creek development. This new reservoir will be sized and assessed separately from the Western supply zone.

The ADD and MDD of each supply zone was determined by summing up the demands in the model for the supply area, including the future demands for each growth horizon.

Table 3-51 Future Supply Zone Demands

Supply Zone	Demand Scenario	5 Year Horizon	15 Year Horizon	25 Year Horizon
East	ADD (m^3/day)	2,126	2,424	2,769
	MDD (m^3/day)	3,689	4,285	4,976
Central	ADD (m^3/day)	4,638	4,792	4,946
	MDD (m^3/day)	8,098	8,407	8,714
West	ADD (m^3/day)	1,963	3,525	5,091
	MDD (m^3/day)	3,573	6,697	9,828
Smith Creek	ADD (m^3/day)	129	389	648
	MDD (m^3/day)	259	777	1,296
Silvertip	ADD (m^3/day)	227	633	1,039
	MDD (m^3/day)	454	1,266	2,077

The Western supply zone relies solely on Pumphouse 2 and Grassi Reservoir, and as such the volume required for the Western supply zone will be reserved from those reservoirs in this analysis.

The Central supply zone and portions of the Eastern supply zone can be supported by Pumphouse 2, Grassi Reservoir and Benchlands, however with Grassi and Pumphouse 2 reserved, the majority of the storage will come from Benchlands. Any remaining capacity in the Western supply zone can be attributed to the Central and Eastern supply zones.

The Silvertip area is part of the Eastern supply zone, and can be supplied by both Benchlands and Silvertip, but the Silvertip reservoir has no practical way to transfer water back into Benchlands. As such, the Silvertip area will be considered separately.

5 Year Horizon

Under the five-year horizon, all the supply zones have adequate storage when considering the dynamic system. The Eastern and Central supply zones have a storage volume requirement greater than just Benchlands reservoir, however Grassi and Pumphouse 2 have sufficient spare capacity to supplement those areas.

Table 3-52 5 Year Horizon Water Storage Analysis

	Western Supply Zone	Central and Eastern Supply Zone	Silvertip
ADD (m^3/day)	1,963	7,216	391
MDD (m^3/day)	3,573	12,691	733
Fire Storage (300 L/s for 3.5 hours)	3,780	3,780	3,780
Equalization Storage - 25% MDD (m^3/day)	893	3,173	183
Emergency Storage - 15% ADD (m^3/day)	294	1,082	59
Recommended Storage (m^3)	4,968	8,035	4,022
Available Storage (m^3)	6,100	7,300	5,400

The Central and Eastern zones are above the limit of the Benchlands reservoir, however since the Central and Eastern Zones can be supported by the Western supply zone, which has approximately 1,100 m^3 excess capacity, this can be added to the 7,300 m^3 storage capacity of Benchlands for an available storage of approximately 8,400 m^3.

15 Year Horizon

Under the 15 year horizon, there is no longer adequate storage across the supply zones. The Western supply zone is approaching the limit of the available storage, and can no longer spare sufficient capacity to supplement the Eastern supply zone

Table 3-53 15 Year Horizon Water Storage Analysis

	Western Supply Zone	Central and Eastern Supply Zone	Silvertip
ADD (m^3/day)	3,525	7,216	797
MDD (m^3/day)	6,697	12,691	1,545
Fire Storage (300 L/s for 3.5 hours)	3,780	3,780	3,780
Equalization Storage - 25% MDD (m^3/day)	1,674	3,173	386
Emergency Storage - 15% ADD (m^3/day)	529	1,082	120
Recommended Storage (m^3)	5,983	8,035	4,286
Available Storage (m^3)	6,100	7,300	5,400

Ultimately an expansion to the existing reservoirs should be constructed to support the future growth in Canmore. An expansion of the Grassi reservoir would have the greatest impact, as it has the capability to support all of the supply zones.

In the interim, a new water line along Silvertip Trail can be constructed, connecting pressure zones 3 and 4 together. This would allow the system to utilize the remaining capacity in the Silvertip reservoir and defer the Grassi reservoir expansion.

With the pressure zones connected along Silvertip Trail, the design criteria for water storage can be met. There is approximately 1,100 m^3 excess capacity in the Silvertip reservoir, allowing for an available storage in the Central and Eastern zones of 8,400 m^3.

25 Year Horizon

In the 25 Year Horizon, there is insufficient storage capacity in both the Western and Central/Eastern supply zones.

Table 3-54 25 Year Horizon Water Storage Analysis

	Western Supply Zone	Central and Eastern Supply Zone	Silvertip
ADD (m^3/day)	5,091	7,716	1,203
MDD (m^3/day)	9,828	13,690	2,242
Fire Storage (300 L/s for 3.5 hours)	3,780	3,780	3,780
Equalization Storage - 25% MDD (m^3/day)	2,457	3,423	560
Emergency Storage - 15% ADD (m^3/day)	764	1,157	180
Recommended Storage (m^3)	7,001	8,360	4,521
Available Storage (m^3)	6,100	7,300	5,400

Prior to the buildout of the 25-year horizon, an expansion to the Grassi Reservoir will be required to service the Town's supply zones.

Overall, approximately 2,000 m^3 of additional storage is required to meet the design criteria for water storage.

The storage expansion will be required once the MDD of the Western supply zone reaches approximately 40 L/s, which is projected to occur shortly after the 15-year horizon.

In order to account for Dead Man's Flats contribution to the additional storage requirement, following table shows the storage needed for the Dead Man's Flats 25 Year demands. No fire storage was considered, as that was allocated in the existing system.

Table 3-55 25 Year Dead Man's Flats Storage Requirements

	Dead Man's Flats
ADD (m^3/day)	760
MDD (m^3/day)	1520
Equalization Storage - 25% MDD (m^3/day)	380
Emergency Storage - 15% ADD (m^3/day)	114
Storage Required (m^3)	494

This shows that Dead Man's Flats accounts for approximately 25% of the total volume of additional recommended storage.

Smith Creek Reservoir

To support the Smith Creek development area, a new reservoir will be required to service the higher elevation portions of the ASP area.

Table 3-56 Smith Creek Reservoir

	5 Year	15 Year	25 Year	Full Buildout
ADD (m^3/day)	129	389	648	1,800
MDD (m3/day)	259	777	1,296	3,600
Fire Storage (300 L/s for 3.5 hours)	3,780	3,780	3,780	3,780
Equalization Storage - 25% MDD (m^3/day)	65	194	324	900
Emergency Storage - 15% ADD (m^3/day)	19	58	97	270
Recommended Storage (m^3)	3,864	4,033	4,201	4,950

The water network has a hydraulic grade line of approximately 1398 m near Dead Man's Flats. Therefore, the highest elevation that can be developed from the existing network while maintaining a minimum service pressure of 320 kPa (50 psi) is approximately 1360 m.

The reservoir should be located at an elevation such that it can provide adequate service pressures to the development area. The highest point in the Smith Creek ASP area is approximately 1400 m, so a gravity reservoir should be placed at a point higher than approximately 1435 m to provide a minimum of 50 psi to the highest points of the network.

The ASP has a full buildout population of approximately 4,500 people, and 20 ha of ICI for an approximate ADD of 1,800 m^3 per day. The reservoir should be sized to accommodate the full buildout of the ASP area. As per the reservoir design criteria, this is a reservoir of approximately 5,000 m^3 in volume.

3.7 Water Projects

3.7.1 EX W1 – Grassi Booster Station Capacity Upgrade (Phase 1)

Formerly part of UMP2016 – Project W3

Project Description

Upgrade the Three Sisters / Grassi Booster Station to have a firm pumping capacity that meets both existing and 15 Year Horizon demands, for a firm pumping capacity of approximately 80 L/s.

Project Rationale

Currently the booster station utilizes both pumps present in the station to achieve higher flow rates for filling the Grassi reservoir. This is not in line with the design criteria for pump stations, which dictates that the largest pump should be considered offline for the purpose of redundancy.

The booster station should be upgraded so that it's firm pumping capacity (with one pump offline) can meet the existing and 15-year demands.

Upgrading the booster station would likely involve new electrical equipment, process equipment, and standby generator, and could be considered a full replacement.

Considerations should be made that would allow for upgrading to the full buildout pumping requirements.

Project Details

- Upgrade to firm pumping capacity of 80 L/s
- New electrical and process equipment
- New standby generator
- New building, if additional space is required

Project Trigger

- Triggered by existing conditions
- Triggered by growth in OSL Zone 13, 14 and 15
- Recommended Project Year – 2024-2025

Project Cost

Engineering	$	233,000.00
Implementation	$	1,550,000.00
Contingency	$	530,000.00
Total	**$**	**2,310,000.00**

Project Cost Sharing

This project is necessary for both existing and growth-related conditions.

Facilities have an estimated life cycle of 50 years. The recorded installation date for the booster station is 1997, resulting in a remaining lifecycle of 25 years. As per the cost allocation methodology, the formula is as follows:

$$UpgradeCost - \left(1 - \frac{ServiceLifeRemaining}{LifeSpan}\right) * Basecost = DeveloperCost$$

Where:

- Base Cost = $1,950,000
- Upgrade Cost = $2,310,000
- Service Life Remaining = 25 Years
- Life Span = 50 Years
- $\$2{,}310{,}000 - (1 - \frac{25}{50}) * \$1{,}950{,}000 = \$1{,}335{,}000$ developer cost

Using the cost sharing methodology, 58% of the total cost should be borne by development, and 42% of the cost should be borne by the Town of Canmore.

Of the recommended 80 L/s pumping capacity, 48 L/s is attributable to growth. Of that, 38 L/s is from OSL Areas 13 and 14, and 10 L/s is from OSL Area 15 (DMF)

- 79% of developer cost (46% of project cost) should be borne by OSL Areas 13 and 14 ($ 1,057,000)
- 21% of developer cost (12% of project cost) should be borne by OSL Area 15 ($280,000)

3.7.2 EX W2 – Pumphouse 2 Upgrades Backwash Water Reuse

New

Project Description

Add a clarifier for WTP2 backwash water treatment. Provide associated piping and pumping to add the treated backwash water upstream of Direct Filtration Trains.

Project Rationale

The existing water diversion license limits the instantaneous flow to WTP2

WTP2 filtration system utilizes 6 – 8% of the treated water for filters backwash. The backwash water is stored on site and slowly released to the Town sewer system.

A backwash reuse system may by designed to recover and reuse between 50 to 80% of the backwash water. Therefore, up to 5% of raw water diversion volume could potentially be saved.

Project Details

- Install a clarifier with approximately 17 L/s flow (10% of the total WTP2 capacity)
- Add a small pump to Backwash Tank
- Piping, flowmeters and control valves to supply clarified water to the upstream of Direct Filtration Trains.
- Electrical. Controls

Project Trigger

- The Maximum Daily Flow reaches the capacity of WTP2
- Recommended Project Year – 2035

Project Cost

Engineering	$	150,000.00
Implementation	$	1,000,000.00
Contingency	$	350,000.00
Total	**$**	**1,500,000.00**

Project Cost Sharing

This project will initially be considered 100% borne by the Town, however this project could assist with growth related conditions. Cost allocation will be further considered in the propose Water Treatment and Supply Study. . Potential to explore governmental grant programs for water reuse.

3.7.3 EX W3 – Pumphouse 1 Gas Chlorine Disinfection Replacement to Liquid Chlorine

New

Project Description

Existing Pumphouse #1 uses gas chlorine for disinfection. Gas chlorine is potentially dangerous to handle and store.

Chlorination can be accomplished with liquid chlorine (Sodium Hypochlorite) which is safer.

Project Rationale

Pumphouse #1 is located in Canmore downtown. Any incident with gas chlorine storage on site may require evacuation of the surrounding communities.

Additionally, the Water Treatment Plant #2 after the upgrade will use Sodium Hypochlorite for disinfection. Bulk liquid chlorine delivery to both WTP2 and PH1 by the same tanker truck will make the chemical delivery cheaper.

Project Details

+ Add a room to existing PH1 for Sodium Hypochlorite storage
+ Provide storage and day tanks, metering and transfer pumps
+ Remove existing gas chlorine injection equipment and scrubber

Project Trigger

+ The project can be initiated when the existing gas chlorine equipment require lifecycle replacement.

Project Cost

Engineering	$	100,000.00
Implementation	$	700,000.00
Contingency	$	200,000.00
Total	**$**	**1,000,000.00**

Project Cost Sharing

This is existing infrastructure and is 100% attributable to the Town of Canmore.

3.7.4 W1 – TeePee Town Waterline Replacement

New

Project Description

Upgrade approximately 750 m of existing water line from 150 mm to 250 mm along 1st Ave, connecting to Bow Valley Trail.

This project was assumed to be coordinated with a roadworks program, and only captured deep utility installation costs.

Project Rationale

Redevelopment of Teepee town is projected in the next 5 years, with Medium-High density residential development units projected. Due to the land use change, higher available fire flows will be required to service the area. To achieve these higher fire flows, an upgrade to the existing pipe size will be required.

Project Details

- 750 m of 150 mm to 250 mm water pipe upgrade

Project Trigger

- This project should be completed prior to redevelopment of Teepee town, and before any roadworks programs
- Triggered by growth, OSL Zone 7
- Recommended Project Year – 2024

Project Cost

Engineering	$	90,000.00
Implementation	$	600,000.00
Contingency	$	210,000.00
Total	**$**	**900,000.00**

Project Cost Sharing

This project is necessary for growth-related conditions.

Deep utility assets have a prescribed life cycle of 75 years. The recorded installation date for the water lines is 1966, resulting in a remaining lifecycle of 19 years.

As per the cost allocation methodology, the formula is as follows:

$$UpgradeCost - \left(1 - \frac{ServiceLifeRemaining}{LifeSpan}\right) * Basecost = DeveloperCost$$

Where:

- Base Cost = $870,000
- Upgrade Cost = $900,000
- Service Life Remaining = 19 Years
- Life Span = 75 Years
- $\$900{,}000 - (1 - \frac{19}{75}) * \$870{,}000 = \$250{,}000$

Using the cost sharing methodology, 27% of the total cost should be borne by development, and 81% of the cost should be borne by the Town of Canmore.

3.7.5 W2 – Smith Creek Reservoir and Booster Station

Formerly UMP2016 – Project W6

Project Description

Construct a new 5000 m^3 storage reservoir and a booster station capable of being upgraded to 45 L/s, which can support the full 25-year growth horizon.

Initial stages of the booster station would require a flow rate of 20 L/s to fill the reservoir and support the surrounding area while filling, which would fulfill the requirements up to the 15 year horizon.

Project Rationale

The Smith Creek ASP area has areas that are higher elevation than what can be serviced off the existing system. A new reservoir and supplementary booster station will be required to service the full development area.

Project Details

- 5000 m^3 storage reservoir
- Booster station capable of 20 L/s, upgradeable to 45 L/s
- All requisite mechanical, electrical, and process equipment

Project Trigger

- This project should be completed prior to development of Smith Creek ASP area
- Triggered by growth, OSL Zone 14
- Recommended Project Year – 2027

Project Cost Sharing

This is new infrastructure, and is 100% attributable to growth

Project Cost

Engineering	$	1,283,000.00
Implementation	$	8,550,000.00
Contingency	$	2,950,000.00
Total	**$**	**12,780,000.00**

3.7.6 W3 – Canyon Ridge Booster Station Decommissioning

Formerly part of UMP2016 – Project W10

Project Description

Decommission the Canyon Ridge Booster Station (Pumphouse 5) and connect the service area to pressure zone 5. This connection would completed by drilling a new water line underneath Cougar Creek, along Elk Run Blvd.

Project Rationale

The CRBS currently only operates on a narrow band of pressure on the suction side of the booster station and has crashed during recent high flow events when the suction side pressure has dropped too low. To remove the reliance on the booster station, the area that it currently services can be adequately serviced by connecting it to pressure zone 5.

Project Details

- 220 m of 200 mm water line, tunnelled or directional drilled underneath Cougar Creek
- One new PRV
- Decommissioning of existing booster station

Project Trigger

- This project resolves an existing deficiency, and should be completed in the next 5 years
- Recommended year of construction: 2026-2027

Project Cost

Engineering	$	120,000.00
Implementation	$	800,000.00
Contingency	$	280,000.00
Total	**$**	**1,200,000.00**

Project Cost Sharing

This is existing infrastructure, and is 100% attributable to the Town of Canmore

3.7.7 W4 – Silvertip Trail Looping

Formerly UMP2016 – Project W5

Project Description

Connect Pressure Zone 2 to Pressure Zone 4 by installing a new water line and PRV along Silvertip Trail.

Project Rationale

The net water storage for the central supply area will be running low by the 15-year horizon. Connecting the Silvertip reservoir in the Eastern Supply Zone to the Central Supply Zone will expand the available capacity available to the system and delay the need for significant reservoir upgrades.

Project Details

- 400 m of 300 mm water line along Silvertip Trail
- One new PRV

Project Trigger

- Development of the following number of units in the Central Supply Zone (Based on 5-year growth horizon):
  - 110 ICI Units
  - 680 Hotel Units
  - 560 Medium / High Density Residential Units
- MDD of 12,700 m^3/day on the Central and Eastern Supply Zone
- Recommended Project Year: 2027-2028
- Triggered by OSL Zones 2, 6, 7, 9, 10, 16 and 17

Project Cost

Engineering	$	129,000.00
Implementation	$	860,000.00
Contingency	$	300,000.00
Total	**$**	**1,290,000.00**

Project Cost Sharing

This is new infrastructure that is 100% attributed to growth.

3.7.8 W5 – Grassi Booster Station Waterline Twinning

New

Project Description

Construct a new water line, from Pumphouse 2 to the Grassi booster station, that effectively twins the existing water line. The line would follow the alignment of Spray Lakes Rd / Three Sisters Parkway.

Project Rationale

To support the peak flows seen during a reservoir filling scenario for Grassi and Smith Creek reservoirs, an additional water line should be constructed. The high flows needed to support the upgraded Grassi booster result in low pressures downstream of it, particularly on Three Sisters Drive. A new waterline would reduce the headlosses seen during high flows and increase system redundancy.

Project Details

- 2,200 m of new 400 mm water line
- 5 connections to the existing system

Project Trigger

- Development of the following number of units in OSL Area 13 and 14:
  - 265 ICI Units
  - 920 Hotel Units
  - 440 Low Density Residential Units
  - 2215 Medium / High Density Residential Units
- MDD of 60 L/s from Grassi Reservoir and 20 L/s from Smith Creek Reservoir
- Triggered by growth in OSL Zone 13, 14 and 15
- Recommended Project Year: 2037-2038

Project Cost

Engineering	$	300,000.00
Implementation	$	1,990,000.00
Contingency	$	690,000.00
Total	**$**	**2,980,000.00**

Project Cost Sharing

As the proposed water line would have the benefit of redundancy for the Town as a whole, a benefitting areas assessment was performed as an alternative to the cost allocation methodology. This compares the existing developed area to the gross developable area at the 25 year growth horizon for all offsite levy areas with projected growth. The following table shows the benefitting area and their relative percentages of the total area, which can be attributed to cost allocation.

OSL Zone	Area (ha)	% of Total
Existing	750.0	73.1%
1	21.7	2.1%
2	20.5	2.0%
6	8.4	0.8%
7	3.0	0.3%
9	10.5	1.0%
10	5.3	0.5%
13	56.9	5.5%
14	70.1	6.8%
15 (DMF)	75.0	7.3%
16	2.3	0.2%
17	2.7	0.3%
Total Growth	**276.2**	**26.9%**
Total Area	**1026.2**	

3.7.9 W6 – Grassi Storage Reservoir Capacity Upgrade

Formerly part of UMP2016 – Project W3

Project Description

Construct a new 2000 m^3 storage reservoir cell in the Grassi reservoir.

Project Rationale

The Western and Central supply zones will eventually run out of available storage capacity and will be unable to meet the design criteria for potable water storage.

The most reasonable place to upgrade the available storage is in the Grassi reservoir, as it has the capability to provide water to all areas of Canmore.

While the storage upgrade will serve all of Canmore, the trigger to upgrade will come from the Western Supply Zone, as it is entirely reliant on the Grassi reservoir and has “priority” on the remaining capacity.

Project Details

- 2000 m^3 storage reservoir cell

Project Trigger

- Development of the following number of units in the Western Supply Zone:
  - 265 ICI Units
  - 920 Hotel Units
  - 440 Low Density Residential Units
  - 2215 Medium / High Density Residential Units
- MDD of 6,700 m3 in the Western Supply Zone
- Triggered by OSL Zones 2, 6, 7, 9, 10, 13, 14, 15, 16 and 17
- Recommended Project Year: 2038-2039

Project Cost

Engineering	$	540,000.00
Implementation	$	3,580,000.00
Contingency	$	1,140,000.00
Total	**$**	**5,360,000.00**

Project Cost Sharing

This is new infrastructure, and is 100% attributable to growth. Of the 2000 m^3 upgrade, Dead Man's Flats requires 494 m^3.

- 25% of the project cost should be borne by OSL Area 15 ($ 1,340,000)
- 75% of the project cost should be borne by all other OSL areas ($ 4,020,000)

3.7.10 W7 – Grassi Booster Station Capacity Upgrade (Phase 2)

New

Project Description

Upgrade the Three Sisters / Grassi Booster Station to have a firm pumping capacity that meets the 25-year horizon demands, for a firm pumping capacity of approximately 135 L/s.

Project Rationale

Development in the Three Sisters Resort Area, Stewart Creek, Smith Creek, and Dead Man's Flats drives the needs for higher pumping capacity through the booster station to support Grassi reservoir and its service area.

Project Details

+ Upgrade to firm pumping capacity of 135 L/s

Project Trigger

+ Development of the following number of units in OSL Area 13 and 14:
  - 265 ICI Units
  - 920 Hotel Units
  - 440 Low Density Residential Units
  - 2215 Medium / High Density Residential Units
+ MDD of 60 L/s from Grassi Reservoir and 20 L/s from Smith Creek Reservoir
+ Triggered by growth in OSL Zone 13, 14 and 15
+ Recommended Project Year: 2037-2038

Project Cost

Engineering	$	80,000.00
Implementation	$	500,000.00
Contingency	$	170,000.00
Total	**$**	**750,000.00**

Project Cost Sharing

This is upgrading infrastructure that will be designed to be upgraded, and is 100% attributable to growth

Of the 55 L/s upgrade, 47 L/s is from OSL areas 13 and 14, and 8 L/s is from Dead Man's Flats.

+ 85% of the project cost should be borne by OSL Areas 13 and 14 ($ 640,000)
+ 15% of the project cost should be borne by OSL Area 15 ($ 110,000)

3.7.11 W8 – Smith Creek Booster Station Upgrade (Phase 2)

Formerly part of UMP2016 – Project W6

Project Description

Upgrade the Smith Creek Booster Station to have a firm pumping capacity that meets the 25-year horizon demands, for a firm pumping capacity of approximately 45 L/s.

Project Rationale

Development in the Smith Creek area drives the needs for higher pumping capacity through the booster station to support Smith Creek Reservoir and its service area.

Project Details

+ Upgrade to firm pumping capacity of 45 L/s

Project Trigger

+ Development of the following number of units in OSL Area and 14 (Smith Creek):
  - 440 Low Density Residential Units
  - 185 Medium / High Density Residential Units
+ MDD of 20 L/s from Smith Creek Reservoir
+ Triggered by growth in OSL Zone 14
+ Recommended Project Year: 2037-2038

Project Cost

Engineering	$	70,000.00
Implementation	$	480,000.00
Contingency	$	170,000.00
Total	**$**	**720,000.00**

Project Cost Sharing

This infrastructure upgrade is fully in a future development area and is 100% attributable to developers.

3.7.12 W9 – South Canmore Waterline Replacement

New

Project Description

Replace aging water infrastructure in the South Canmore area, between 3rd Street and 6th Street.

Project Rationale

Water lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75-year lifecycle by 2041, approximately 19 years after this study.

150 mm pipes should be upsized to 200 mm pipes.

For the best use of resources, the utility replacement program should be paired with a roadworks program.

Project Details

- 2,000 m of 200 mm water line replacement
- 12,000 m^2 of road replacement

Project Trigger

- Recommended Project Year: 2037-2038

Project Cost

Engineering	$	860,000.00
Implementation	$	3,430,000.00
Contingency	$	1,720,000.00
Total	**$**	**6,010,000.00**

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

3.7.13 W10 – Downtown Canmore Waterline Replacement

New

Project Description

Replace aging water infrastructure in the Downtown area, between 6th Street and 10th Street.

Project Rationale

Water lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

150 mm pipes should be upsized to 200 mm pipes.

For the best use of resources, the utility replacement program should be paired with a roadworks program.

Project Details

- 3,000 m of 200 mm water line replacement
- 18,000 m^2 of road replacement

Project Trigger

- Recommended Project Year: 2038-2039

Project Cost

Engineering	$	1,260,000.00
Implementation	$	5,050,000.00
Contingency	$	2,520,000.00
Total	**$**	**8,830,000.00**

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

3.7.14 W11 – 7th Avenue Waterline Replacement

New

Project Description

Replace aging water infrastructure in the 7th Avenue area, 10th Street and Industrial Place.

Project Rationale

Water lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

150 mm pipes should be upsized to 200 mm pipes.

For the best use of resources, the utility replacement program should be paired with a roadworks program.

Project Details

- 2,500 m of 200 mm water line replacement
- 15,000 m^2 of road replacement

Project Trigger

- Recommended Project Year: 2039-2040

Project Cost

Engineering	$	1,050,000.00
Implementation	$	4,190,000.00
Contingency	$	2,100,000.00
Total	**$**	**7,340,000.00**

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

3.7.15 W12 – Rundle Waterline Replacement

New

Project Description

Replace aging water infrastructure in the Rundle area, including Bridge Road, Rundle Plant Lane, Rundle Crescent, Rundle Drive, MacDonald Place and St. Barbara's Terrace. This project would include a river crossing at Bridge Road.

Project Rationale

Water lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

150 mm pipes should be upsized to 200 mm pipes.

For the best use of resources, the utility replacement program should be paired with a roadworks program.

Project Details

- 2,000 m of 200 mm water line replacement
- 12,000 m^2 of road replacement

Project Trigger

- Recommended Project Year: 2040-2041

Project Cost

Engineering	$	860,000.00
Implementation	$	3,430,000.00
Contingency	$	1,720,000.00
Total	**$**	**6,010,000.00**

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

3.7.16 W13 – TeePee Town / Railway Ave Waterline Replacement

New

Project Description

Replace aging water infrastructure in the TeePee Town and Railway Ave area, from Gateway Street to Benchlands Trail along Railway Ave. This project also involves crossing Policeman's Creek along 8th Street.

Project Rationale

Water lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

150 mm pipes should be upsized to 200 mm pipes.

For the best use of resources, the utility replacement program should be paired with a roadworks program.

Project Details

- 1,500 m of 200 mm water line replacement
- 9,000 m^2 of road replacement

Project Trigger

- Recommended Project Year: 2041-2042

Project Cost

Engineering	$	650,000.00
Implementation	$	2,610,000.00
Contingency	$	1,300,000.00
Total	**$**	**4,560,000.00**

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

3.7.17 W14 – Water Treatment and Supply Study

New

Project Description

Perform an engineering study to determine the optimal way to increase the available water supply and treatment for the Town of Canmore, in order to facilitate growth to the 25 year horizon and beyond.

Project Rationale

There is a projected deficit to the available water treatment rate in Pumphouse 1 and Pumphouse 2 prior to the 25 year horizon, which could potentially limit growth in the Town until it is addressed.

There are several potential options for increasing the water treatment rate, or further ensuring water security, which should be assessed in detail prior to the town committing funds to upgrade their infrastructure.

The three potential options are as follows:

- Increase the available water withdrawal rate from the rundle forebay and subsequent treatment rate from Pumphouse 2 (Approximate Cost - $3,000,000)
- Upgrade the withdrawal rates and treatment rates at Pumphouse 1 through a new deep well and a replacement of the treatment facility (Approximate Cost - $12,000,000)
- Construct a large (~7,000 m^3) storage reservoir which could accommodate the deficits during peak demand. (Approximate Cost - $14,000,000)

Project Trigger

- Triggered by development in all Offsite Levy Areas
- Assessment, recommendations and resultant capital projects should be completed prior to a system wide MDD of 260 L/s

Project Cost

Engineering	$	150,000.00
Contingency	$	50,000.00
Total	**$**	**200,000.00**

Project Cost Sharing

The costs for this study will be 100% borne by the Town.

4. Wastewater System

4.1 System Characterization

The Town of Canmore's wastewater system consists of approximately 80 km of gravity sewer, 30km of forcemain, thirteen Town operated lift stations and eight privately operated lift stations. Currently, all of the Town's wastewater is collected at the wastewater treatment plant, treated and discharged into the Bow River.

There are also a few private systems on septic tanks and fields.

4.1.1 Pipe Diameters and Material

Gravity Mains

The wastewater gravity mains in Canmore consist of approximately 70% PVC and 30% unknown material, which is likely a mix of Concrete and Vitreous Clay Tile (VCT) pipe. The average age of the wastewater lines in the system is approximately 30 years old. The following tables shows the break down of the age, diameter, and pipe material of Canmore's wastewater system.

The existing wastewater system can be seen in Figure S1 (Appendix D)

Table 4-1 Wastewater Gravity Pipes Age

Age	Length (km)	% of Total
>50 Years	9.9	12%
41-50 Years	7.6	9%
31-40 Years	18.5	22%
21-30 Years	29.0	34%
11-20 Years	16.1	19%
0-10 Years	3.2	4%
Unknown	0.8	1%
Total	**85.1**	**100%**

Table 4-2 Wastewater Gravity Pipes Diameters

Diameter (mm)	Length (km)	% of Total
100	0.4	0.5%
150	1.3	1%
200	57.0	67%
250	13.8	16%
300	4.9	6%
375	2.2	3%
450	3.3	4%
>450	1.7	2%
Unknown	0.6	1%
Total	**85.1**	**100%**

Table 4-3 Wastewater Gravity Pipes Materials

Material	Length (km)	% of Total
CON	0.3	0.3%
PVC	60.0	70%
VCT	0.5	1%
UNK	24.3	29%
Total	**85.1**	**100%**

Forcemains

The wastewater forcemains in Canmore consist of approximately 40% PVC, 20% HDPE, and the remaining a mix of Ductile Iron, Polyethylene, and Unknown materials. The average age of the wastewater forcemains in the system are approximately 25 years old. The following tables shows the break down of the age, diameter, and pipe material of Canmore's wastewater system

Table 4-4 Wastewater Forcemains Age

Age	Length (km)	% of Total
>50 Years	0.3	1%
41-50 Years	2.0	7%
31-40 Years	10.9	36%
21-30 Years	2.7	9%
11-20 Years	5.3	17%
0-10 Years	7.5	25%
Unknown	1.6	5%
Total	**30**	**100%**

Table 4-5 Wastewater Forcemains Diameter

Diameter (mm)	Length (km)	% of Total
<100	4.8	16%
100	2.1	7%
150	3.4	11%
200	6.7	22%
250	6.4	21%
300	3.0	10%
350	2.5	8%
>350	1.1	4%
Unknown	0.1	1%
Total	**30**	**100%**

Table 4-6 Wastewater Forcemains Material

Material	Length (km)	% of Total
DI	0.7	2%
PE	0.8	3%
HDPE	4.9	17%
PVC	10.8	36%
UNK	12.5	42%
Total	**30**	**100%**

4.1.2 Low Pressure Systems

The southeast area of downtown Canmore is serviced by a low-pressure sanitary sewer system, and is the largest in the Town. Each service has its own wetwell and pump system and discharges into a common forcemain in the roadway. Low pressure systems were not individually modelled, however their contributions to the collection system were included.

The main low-pressure system discharges into the gravity sewer on 2nd Street and on 5th Avenue and then flows by gravity to Lift Station 1.

There are also some homes on Spring Creek Drive, and homes on the north side of 7 Street and east of 6th Avenue that are serviced by a low-pressure system, along with other localized low pressure systems and services across the Town.

4.1.3 Wastewater Collection Areas

There are a total of thirteen lift stations, and fourteen collection areas in the Town of Canmore. Three of the lift stations have other lift stations upstream discharging into its collection area, those areas were included in the downstream lift station collection area. One area of Canmore is not supported by a lift station, and instead the gravity collection system discharges directly into the triple forcemain, with the higher elevation facilitating flow through it. These areas include Benchlands, and portions of Avens and Cougar Creek neighbourhoods.

Table 4-7 Wastewater Collection Areas

Lift Station	Collection Area (ha)	Upstream Lift Stations
LS1	148	LS 3, LS 5
LS 2	107	None
LS 2A	57	None
LS 3	7	None
LS 4	105	LS 9
LS 5	45	None
LS 6	50	None
LS 7	70	None
LS 8	175	LS10, LS 11, LS 12
LS 9	8	None
LS 10	92	LS 11, LS 12
LS 11	14	LS 12
LS 12	5	None
No Lift Station	115	None
Total	**998**	

4.1.4 Lift Stations

The following is a summary of the thirteen lift stations operated by the Town of Canmore. Private lift stations were not included.

Firm pumping capacity is defined as the capacity of the facility with its largest pump out of service. i.e. with one pump running at a two-pump facility, or two pumps running at a three-pump facility. The pumping capacities were determined through a mix of SCADA flow meter information, interpolation from pump curves, and draw down testing that was performed for the previous UMP.

Lift Station 2 was recently replaced, and the new lift station was commissioned in 2019. Lift Station 6 was also replaced since the previous UMP. Two new lift stations, LS 11 and LS 12, were also constructed since the previous UMP.

The lift stations and their respective catchment areas ca be seen in Figure S2 (Appendix D)

Table 4-8 Lift Station Summary

Lift Station	Pumps	Power / Voltage / Phases	Firm Pumping Capacity (L/s)	Discharge Location
Lift Station 1	1 x Vaughan S4K2 2 x Vaughan SE8N5	10HP / 460V / 3 100HP / 460V / 3	200+	WWTP
Lift Station 2	3 x KSB KRTK 150-317	40HP / 600V / 3	130	Triple FM to WWTP
Lift Station 2A	2 x Flygt NP3171.091-453	34HP / 600V / 3	51	WWTP
Lift Station 3	2 x Flygt CP3085.182MT	3.2HP / 460V / 3	Unknown	LS 1 Collection Area
Lift Station 4	2 x Flygt NP3153.181-435	15HP / 208V / 3	85	WWTP
Lift Station 5	1 x Flygt CP3102.180-432 1 x Zoeller 6221 HD Series	5HP / 208V / 3 7.5HP / 208V / 3	40	LS 1 Collection Area
Lift Station 6	2 x Flygt CP3201.180 HT	20HP / 460V / 3	30	Triple FM to WWTP
Lift Station 7	3 x Flygt CP3152.181-436	47HP / 600V / 3	120	Triple FM to WWTP
Lift Station 8	2 x Flygt CP3152.181-436	20HP / 600V / 3	72	WWTP
Lift Station 9	2 x Flygt MP3127.170-212	11HP / 208V / 3	7	LS 4 Collection Area
Lift Station 10	3 x Flygt CP3152.181-454	20HP / 600V / 3	80	LS 8 Collection Area
Lift Station 11	2 X Vaughan S3F-060	7.5 HP / 600V / 3	15	LS 10 Collection Area
Lift Station 12	2 x Lowara 1315M S35	4 HP / 600V / 3	5	LS 11 Collection Area

Most of the lift stations operate on a Start/Stop level control philosophy with the following exceptions; Lift Station 1 operates on a flow control philosophy and ramps the pump speed up and down as needed. Lift Station 4 appears to operate on a hybrid Start/Stop level control at lower flow rates with the pumps operating at lower speeds, and a wet well level control during the day at higher flow rates where the pump speeds are adjusted to maintain a consistent wet well level

The following table summarizes the basic Start and Stop elevations for the main duty pumps at each lift station.

Table 4-9 Lift Station Operating Points

Lift Station	Pump Name	Ground Elevation (m)	Pump Elevation (m)	Pump Start Elevation (m)	Pump Stop Elevation (m)
LS 1	P1	1308.20	1303.20	1304.80	1304.00
LS 2	P101	1309.50	1301.20	1302.50	1301.90
	P102	1309.50	1301.20	1302.50	1301.90
LS 2A	P1	1309.30	1302.05	1303.40	1302.60
LS 3	P1	1311.30	1306.80	1307.70	1307.10
LS 4	P1	1310.10	1304.21	1305.30	1305.00
LS 5	P1	1311.60	1306.37	1307.27	1306.77
LS 6	P1	1313.60	1308.20	1309.60	1309.10
LS 7	P1	1308.60	1305.00	1306.40	1305.60
	P2	1308.60	1305.00	1306.40	1305.60
LS 8	P1	1312.10	1304.50	1305.41	1304.60
LS 9	P1	1383.50	1378.00	1379.00	1378.60
LS 10	P1	1311.04	1304.40	1305.80	1305.35
	P2	1311.04	1304.40	1305.80	1305.35
LS 11	P1	1356.75	1350.2	1350.58	1350.08
LS 12	P1	1358.26	1350.62	1351.82	1351.32

4.1.5 Wastewater Treatment

Alongside the UMP, a full Wastewater Treatment Plant Capacity Evaluation report was performed and is attached in Appendix G.

4.2 Flow Monitoring Program

To determine wastewater flow generation rates, diurnal usage patterns, and assess groundwater infiltration and rainfall derived infiltration, a flow monitoring program was developed. Inline flow monitors were installed in key locations.

A total of 5 flow monitors were installed across the Town of Canmore, which in tandem with lift stations that have flow meters installed on their discharge, was used to chart the flows in the wastewater system during dry weather and wet weather periods. The flow monitors were in place from April 12, 2022 to July 20, 2022. Two rain gauges were also installed for the duration, which tracked rainfall volume and intensity. One was installed on top of Pumphouse 1 and one on top of Pumphouse 2.

Inline flow monitors determine pipe flow by measuring depth and velocity of the water flowing past them and calculate and record flow rate every 5 minutes for the duration of the monitoring period.

SFE Global was contracted to supply, install, maintain, and report on the flow monitors. Their Flow Monitoring Report can be found in Appendix F.

The following is a summary of the flow monitors and lift stations used for the flow analysis. Figure S3 (Appendix D) shows the flow monitor locations and their respective catchment areas.

Flow Monitor 1 (FM1)

Installed in SMH 1414 along 4th Street, the catchment area for this flow monitor is the southwestern portion of the South Canmore / Downtown area. The total catchment area is approximately 22 ha.

Originally one flow monitor was intended to be installed for the Lift Station 1 catchment area, however discussions with SFE Global indicated that the location for this, on the upstream end of the lift station inlet pipe, would not be ideal due to the turbulence created by flow coming from two other directions in the manhole. Flow monitors operate best in manholes with a straight line of flow. As such, it was decided to split the Lift Station 1 catchment area into two flow monitors.

Flow Monitor 2 (FM2)

Installed in SMH 0279 along 5th Street, the catchment area for this flow monitor is the northern portion of the Downtown area, and up to and including the Larch and Industrial Place areas. Lift Stations 3 and 5 both discharge into the catchment area for this flow meter. The total catchment area is approximately 103 ha.

Flow Monitor 3 (FM3)

Installed in SMH 0249 at the upstream end of the triple forcemain, the catchment area for this flow monitor includes the Cougar Creek, Benchlands, and Avens Neighbourhoods. Lift Station 6 also discharges into this catchment area. The total catchment area is approximately 160 ha.

Flow Monitor 4 (FM4)

Installed in SMH 1200 along Silvertip Trail, the catchment area for this flow monitor is the Silvertip area, upstream of Lift Station 7. The total catchment area is approximately 58 ha.

Flow Monitor 5 (FM5)

Installed in SMH 1251 upstream of Lift Station 8, the catchment area for this flow monitor includes Cairns Landing, Miskow Close, Stewart Creek and Dead Man's Flats. Lift stations 10, 11 and 12 discharge into this catchment area. The total catchment area is approximately 100 ha.

Lift Station 2 (LS2)

Lift Station 2 was also utilized to track flow patterns, as it has a flow meter on its discharge. While the lift station operates on a start/stop level control, the hourly averages of the flows recorded in the SCADA system give a good representation of the flows. It's catchment area includes Railway Avenue and Bow Valley Trail, and Harvey Heights discharges into the catchment. The total catchment area is approximately 107 ha.

Lift Station 2A (LS2A)

Originally a sixth flow monitor upstream of Lift Station 2A was planned, however access constraints made it not feasible to install in the field. SCADA data of the lift station water level was instead used to calculate flows and patterns of its catchment area. Using the wet well level recorded in the SCADA system, and the cross-sectional area of the wetwell, the change in volume during each pump and fill cycle can be calculated, which effectively provides the flow rate in and out of the lift station. The hourly averages of these flow rates give a good representation of the flows.

The catchment area for Lift Station 2A includes Kananaskis Way and the southeastern portion of Bow Valley Trail. The total catchment area is approximately 57 ha.

Lift Station 4 (LS4)

Lift Station 4 was also utilized to track flow patterns, as it has a flow meter on its discharge. While the lift station operates on a start/stop level control for lower flows, and a wet well level control for higher flows, the hourly averages of the flows recorded in the SCADA system give a good representation of the flow patterns. The catchment area includes the Rundle, McNeil, and Grassi Peaks areas. Lift Station 9 also discharges into the catchment area. The total catchment area is approximately 107 ha.

Lift Station 6 (LS6)

Lift Station 6 was also utilized to track flow patterns, as it has a flow meter on its discharge. While the lift station operates on a start/stop level control, the hourly averages of the flows recorded in the SCADA system give a good representation of the flows. The catchment area includes the Elk Run Industrial area, and portions of the Avens and Canyon ridge area. The lift station discharges into the FM3 catchment area. The total catchment area is approximately 50 ha.

4.3 Design Criteria

The following criteria are used to assess the existing and future systems.

4.3.1 Flow Generation Criteria

Existing wastewater generation rates were calibrated using SCADA data records and results from the flow monitoring program.

Future wastewater flow is based on the unit rates established in the Canmore Engineering Design and the 2017 Utility Master Plan. These unit rates are applied to the hydraulic model using the number of units for each land use type in each of the growth areas. The ICI land use area-based unit rates were updated, as the unit density was assessed against unit consumption, and was shown to be significantly higher than the EDCG.

Table 4-10 Future System Wastewater Flow Generation Parameters

Demand Type	Rate	Units
Wastewater Treatment Plant (Composite Rate)	360	L/c/d
Residential	250	L/c/d
ICI	30	m^3/ha/d
Hotels	700	L/unit/day
Residential Peaking Factor	1+14 / (4+P ½)	Harmon's Formula
Commercial / Industrial Peaking Factor	3.5	PF
Hotel Peaking Factor	4	PF

4.3.2 Collection System Criteria

The gravity collection system of Canmore was modeled using the Peak Wet Weather Flow scenario. The pipes were evaluated based on the following criteria

- Hydraulic capacity
  - The capacity of a gravity sewer is evaluated based on the peak expected flow and the flow capacity of the pipe which is calculated using pipe slope and diameter at 86% flow depth. Pipe capacity must be greater than the expected peak flow or surcharging of the collection system can occur. This value is represented as a percentage which is calculated by dividing the peak flow by the pipe's flow capacity. A percentage less than 100% means that peak flow is less than the capacity of the pipe.
- Hydraulic grade line should not exceed the top of the pipe
- Pipe velocity should not exceed 3.0 m/s

4.3.3 Lift Station Pumping Requirements

Under peak wet weather flow conditions, a lift station should be able to convey peak flows using the station's firm flow capacity (i.e. with the largest pump out of service).

4.4 Wastewater Flow Generation Analysis

Wastewater flow generation in the Town of Canmore was broken into two periods: dry weather period where there was no appreciable rainfall and the river level / groundwater is low, and wet weather period where there is significant rainfall.

4.4.1 Dry Weather Flow Generation

The following sections discuss how the dry weather flows were calculated in the existing system. The average dry weather flows represent the average day, with the diurnal patterns showing the low flows and peak flows throughout the day.

4.4.1.1 Average Day Dry Weather Flows

Dry weather flow generation for the existing system was developed by first establishing baseline flows, which represent the Average Dry Weather Flow (ADWF). This was done in a similar way to the water system.

Average Dry Weather Flows were developed by assessing the total volume of water distributed to the Town over the past four years, versus the total volume of wastewater collected and treated in the same time period. The annual water volumes were scaled to match the annual wastewater collection volumes, which on average was a factor of 1.15 times more wastewater than water each year.

These were assigned to the hydraulic model through geolocated customer water meter data, which has been scaled such that the total volume of consumption is equivalent to the total volume of wastewater collection.

Table 4-11 Wastewater Collection vs Water Distribution

Year	Annual Water (m^3)	Annual Wastewater (m^3)	Wastewater to Water Ratio	Wastewater to Water Meter Ratio
2018	2,724,788	2,943,504	1.08	1.62
2019	2,589,814	3,167,849	1.22	1.77
2020	2,512,425	3,095,458	1.23	1.69
2021	2,749,175	2,971,909	1.08	1.55
Average	2,644,051	3,044,680	1.15	1.67

The flow monitors and lift stations discussed in Section 4.2 were then reviewed to develop diurnal patterns for each of the catchment areas. Diurnal patterns represent the changes in flow through the system throughout the day, with the lowest point typically being during the night and early morning hours, and two peaks during the morning and evening. A separate diurnal pattern for Saturdays, Sundays, and Weekdays were developed, as they all have distinct characteristics.

The dry weather period was determined to be between April 12, 2022 (the day of the flow monitor installation) and May 10, 2022. No significant rainfall events occurred during this period, and there was no visible increase in flows due to groundwater or rising river levels.

The flows for each catchment were developed as an hourly average, and the average of these were taken to create separate diurnal flows for Saturdays, Sundays, and Weekdays. These hourly flows, divided by the average flow for each catchment, were used to develop the diurnal patterns, which act as a multiplier for the baseline demands.

The following table shows the average dry weather flows calculated for each catchment from the customer water meter data, versus the measured average dry weather flows from the flow monitors and lift station SCADA data.

Table 4-12 Average Dry Weather Flows – Calculated vs Measured

Catchment Area	Calculated Average Flow (L/s)	Measured Average Flow (L/s)
FM 1	2.7	1.6
FM 2	8.4	5.1
FM 3	17.0	21.5
FM 4	1.7	1.8
FM 5	7.2	4.2
LS 2	17.0	17.1
LS 2A	7.5	7.6
LS 4	6.6	13.4
LS 6	5.7	4.3
LS 7	4.8	11.2
LS 8	7.6	10.9
LS10	6.3	8.2
WWTP Influent	74.0	74.0

Overall, the calculated average flows and the measured average flows correlate well, but with some notable outliers.

Both FM1 and FM2 catchments had higher calculated flows than measured flows. There are some possible explanations for this, such as increased water usage that does not translate into wastewater generation. To be conservative, the higher calculated average flows will still be used as the baseline flows.

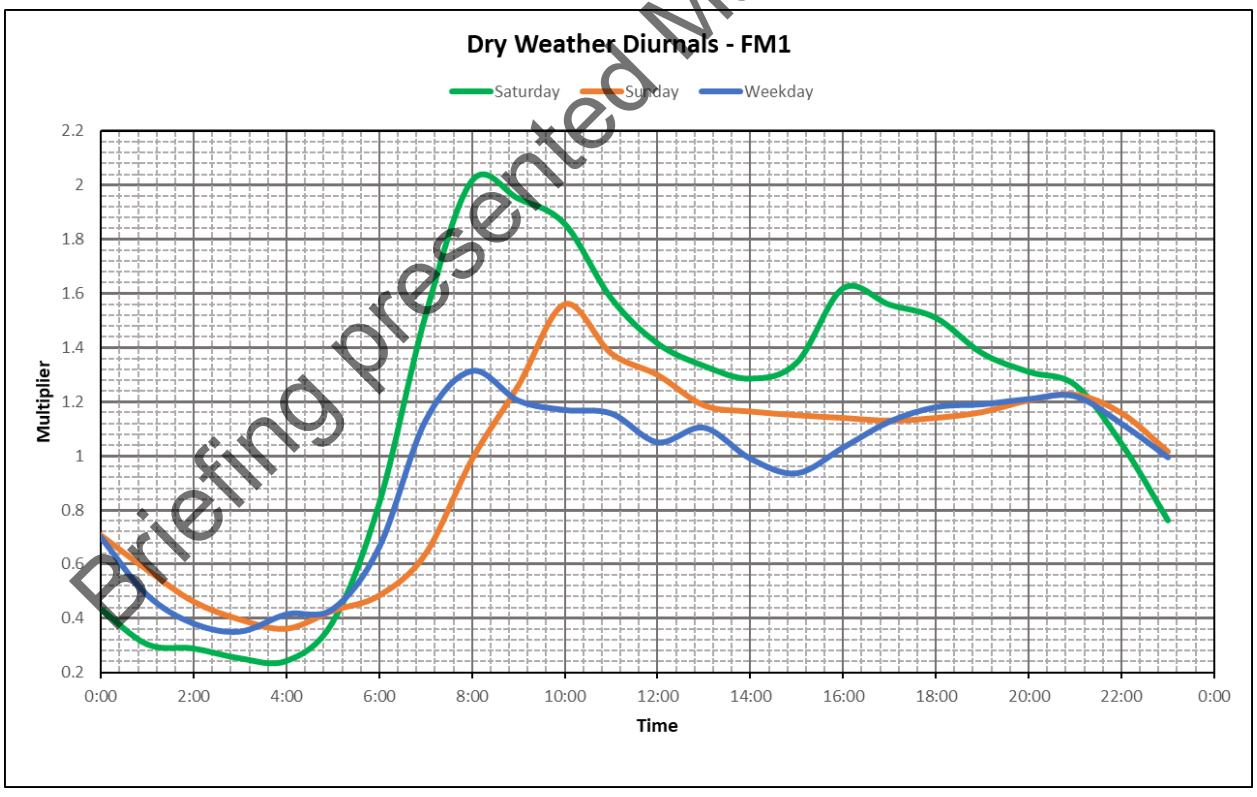
FM5 had notably lower measured flows than calculated flows, and the measured flow was half of that of Lift Stations 8 and 10, which have largely the same catchment areas. The likely explanation for this discrepancy is due to the five-minute recording increment of the flow monitor. The upstream flows all come from Lift Station 10, and the recording increment could be missing the spikes in flows that come from frequent pump cycles. Due to this large discrepancy, information from Lift Station 8 will be used to determine the diurnal patterns of the catchment area. If future flow monitoring programs are executed, efforts should be made to record that catchment at a higher frequency to account for frequent lift station pump cycles.

Lift Station 4 had significantly higher measured flows than calculated flows. This is due to the Pumphouse 2 filter backwash schedule which discharges directly into the Lift Station 4 catchment area. Filter backwash generally happens between 9 am and 3 pm daily, and is observable in the lift station diurnal flow patterns. To account for this, the difference in calculated and measured flows (~7 L/s) will be added to the catchment area near Pumphouse 2 as a separate demand, with its own pattern of entering the system between 9 am and 3 pm. The diurnal pattern of the catchment area is still influenced by this, and as the backwash flows are inconsistent and not tracked, there was no practical way to adjust the pattern to account for this. As such, the Lift Station 4 diurnal patterns do not reflect typical usage patterns but do represent the flows in the catchment area as a whole.

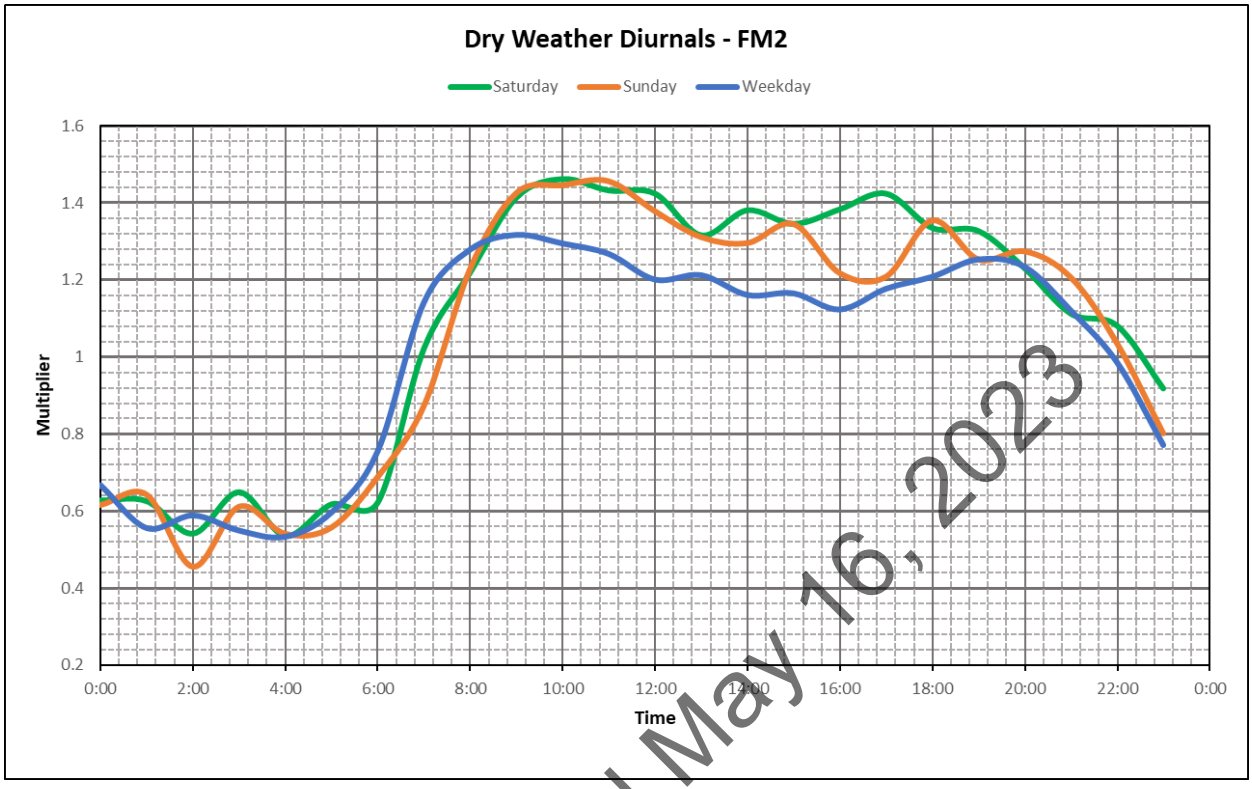
Lift Station 7 had significantly higher measured flows than calculated flows. Upon reviewing the lift station flow patterns, there is no apparent consistency to the flows, and they do not create a discernable diurnal pattern. As such it is assumed that the wet well levels reported to the SCADA system are unreliable. FM4 patterns, which are in the same catchment area, will be applied to any demands downstream of it that enter Lift Station 7.

The following are the diurnal patterns that were developed using the above information, and which will be applied to their respective catchment areas to develop the time based average dry weather flows.

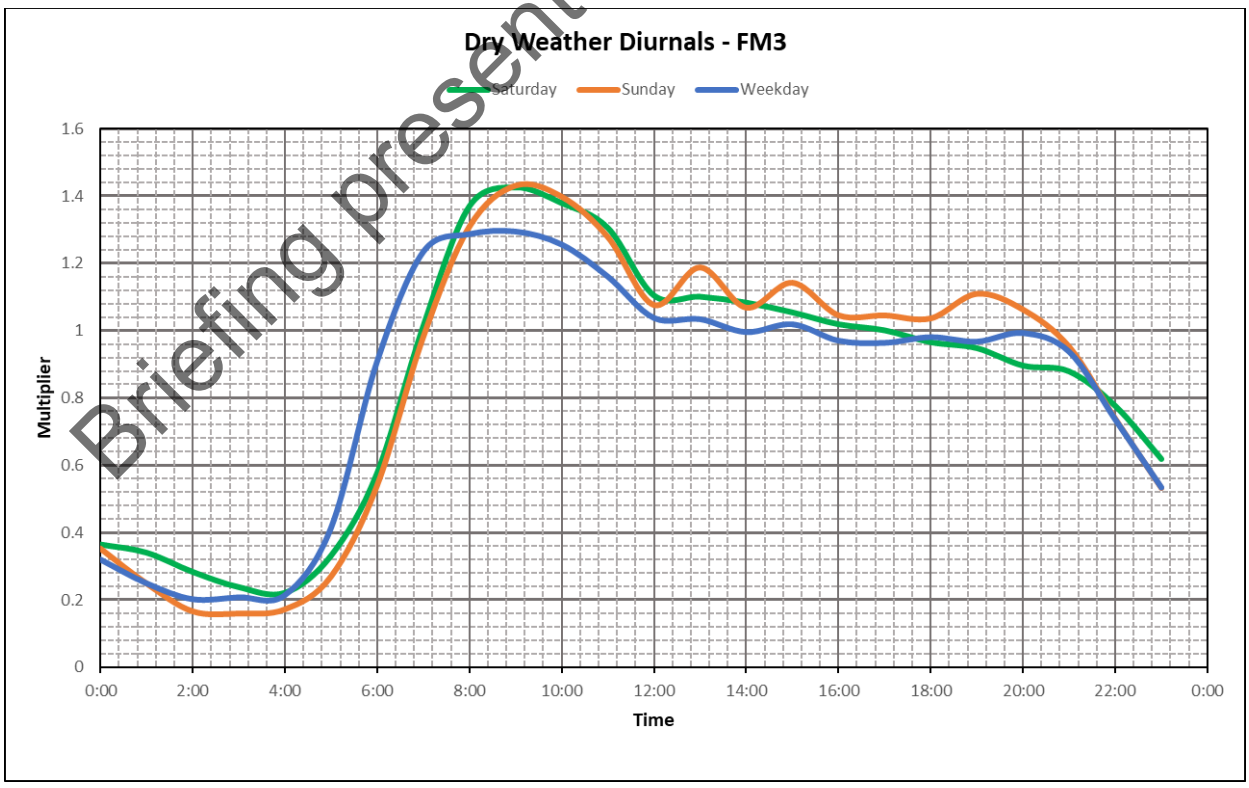
Flow Monitor 1



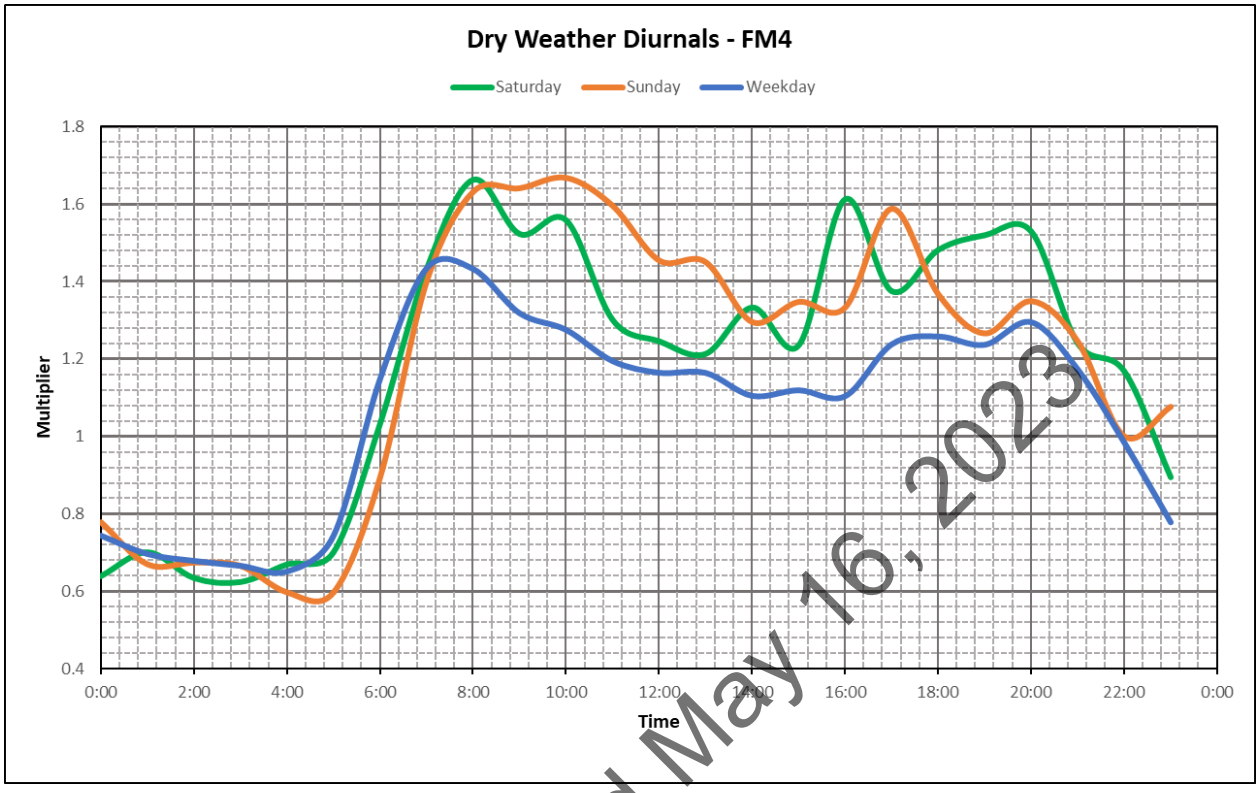
Flow Monitor 2



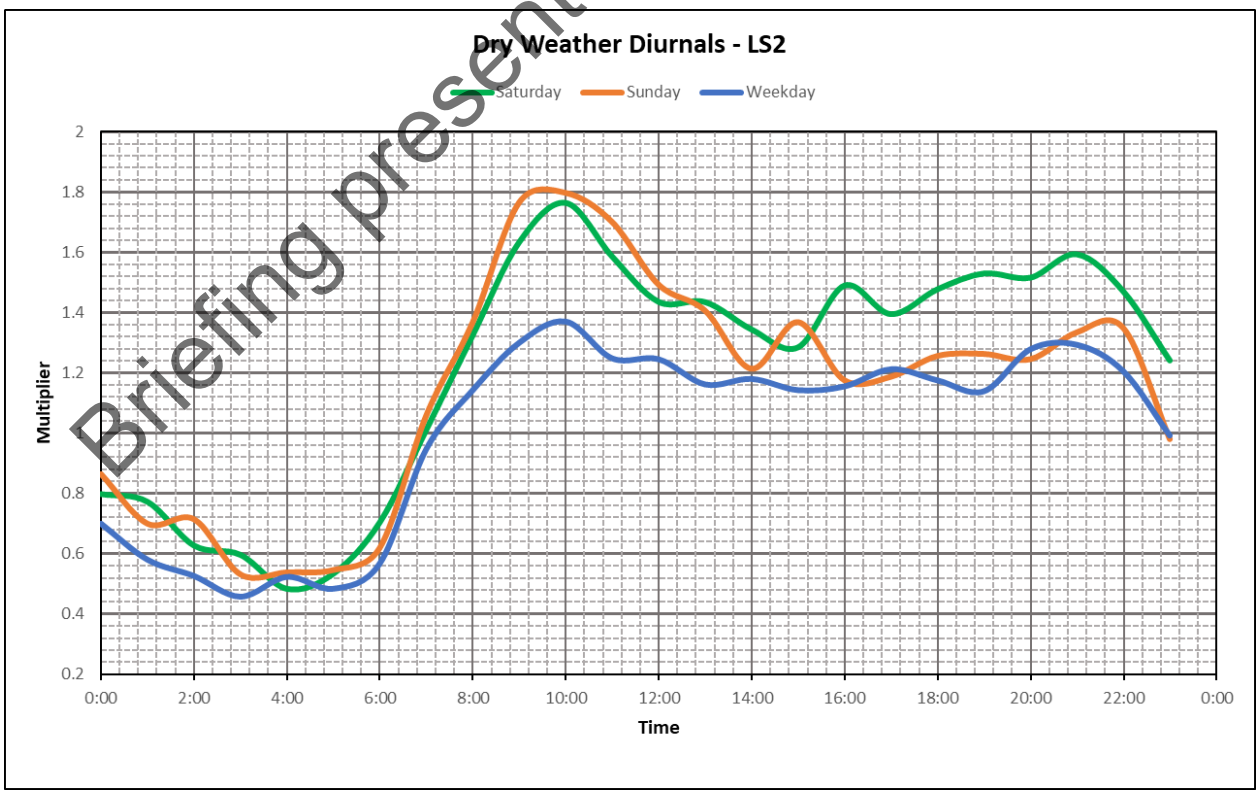
Flow Monitor 3



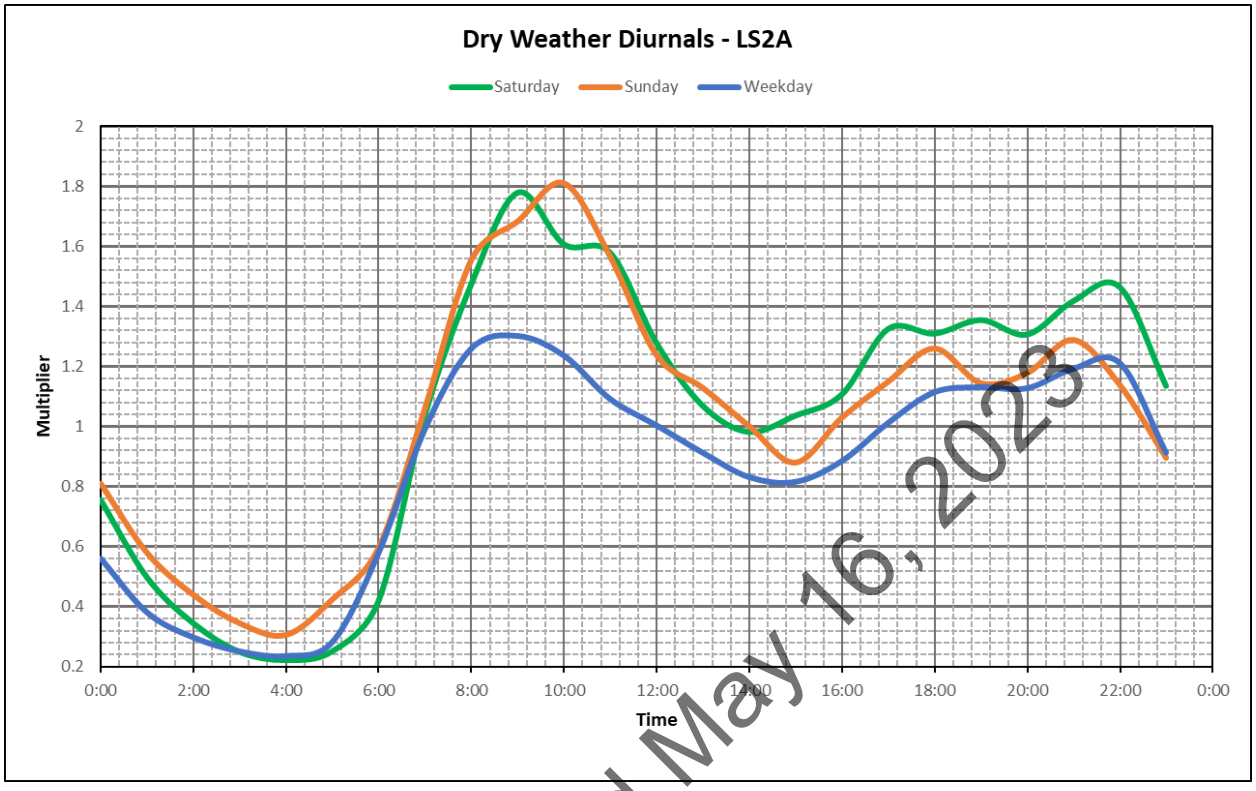
Flow Monitor 4



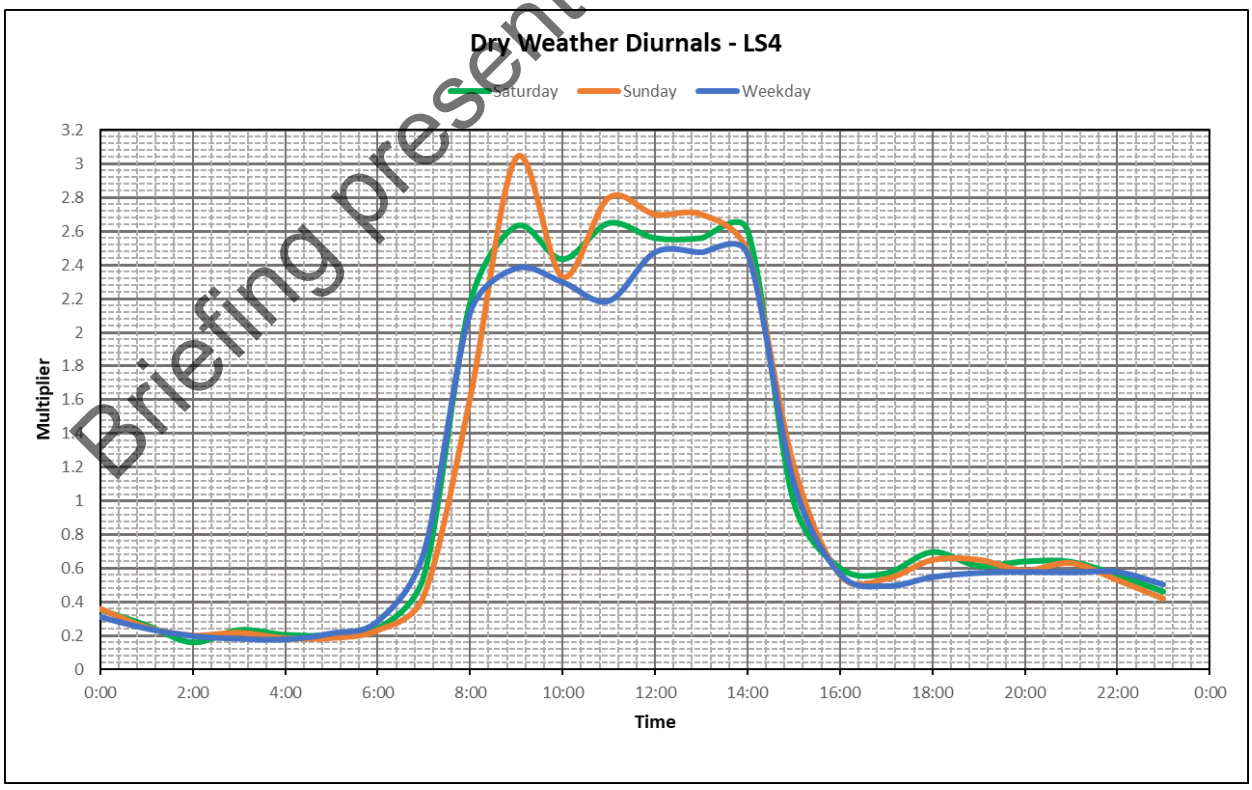
Lift Station 2



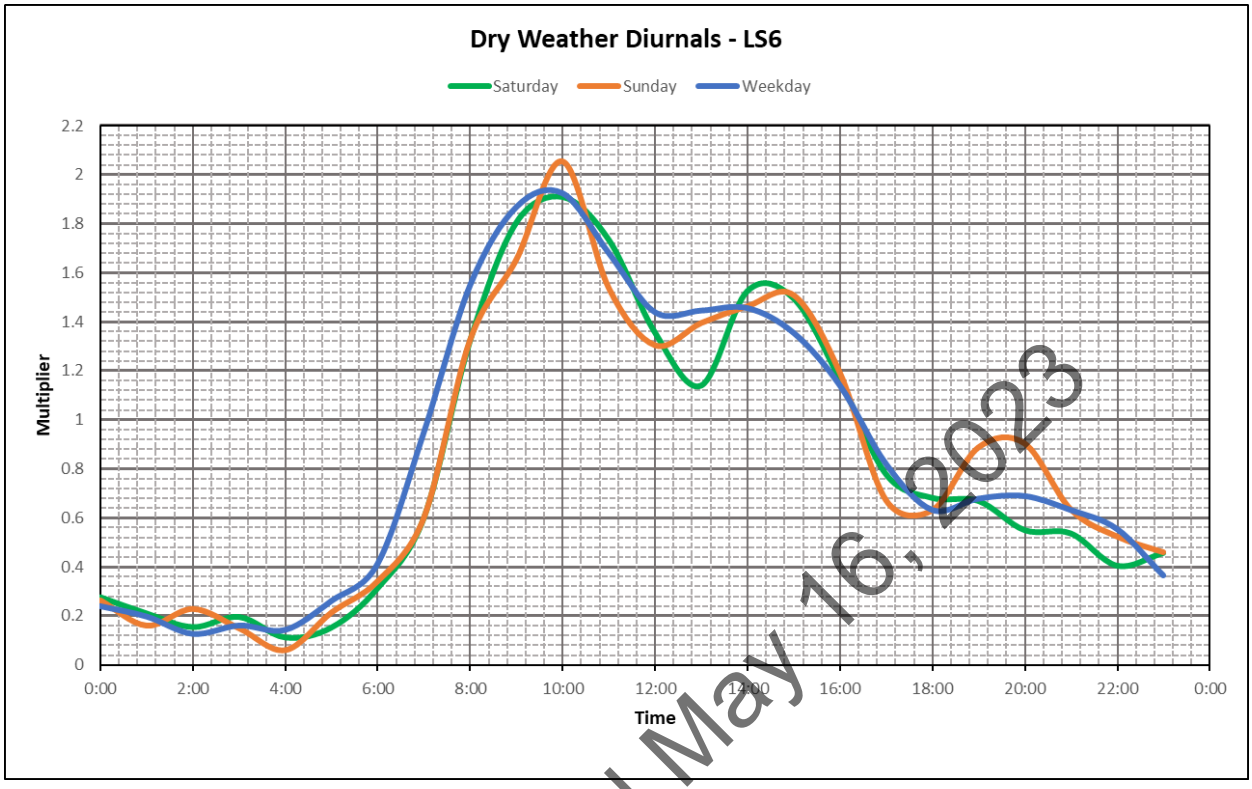
Lift Station 2A



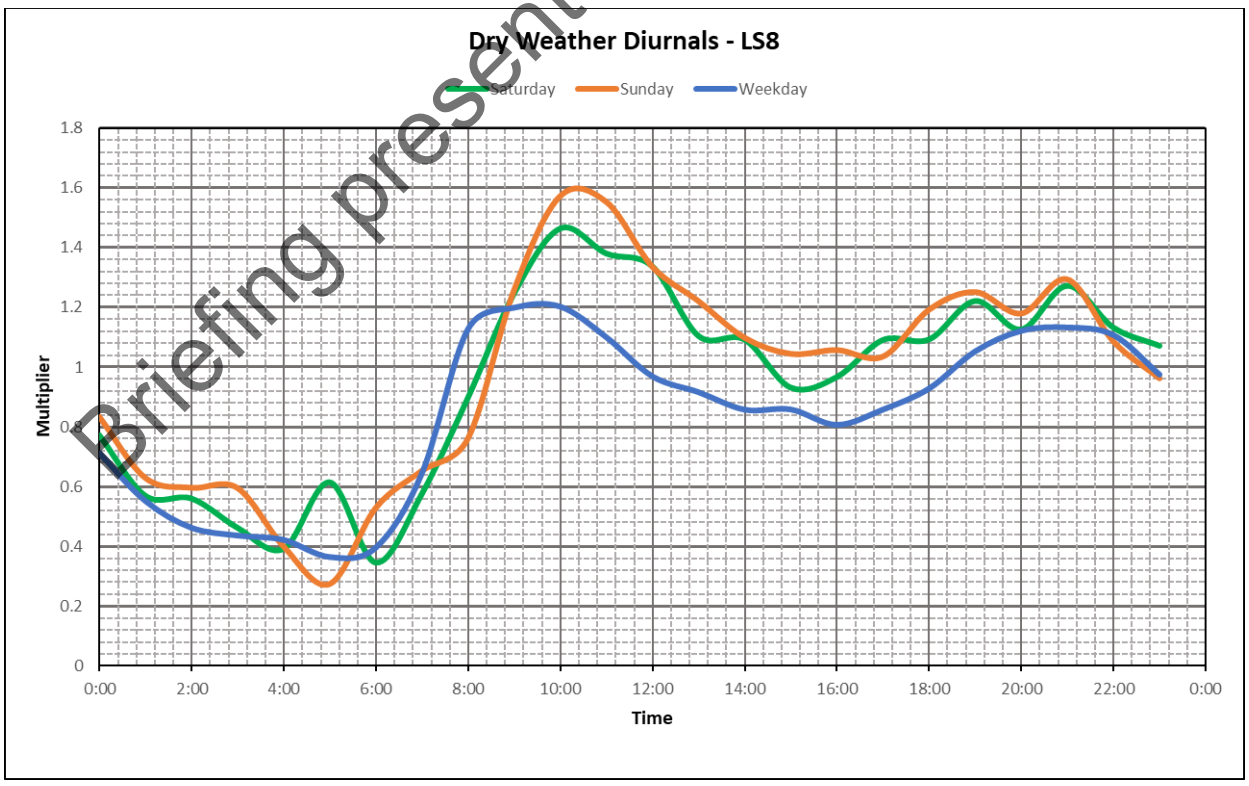
Lift Station 4



Lift Station 6



Lift Station 8



4.4.1.2 Maximum Day Dry Weather Flows

The maximum day flows are an estimate of the same flow patterns as the average days for the highest usage days of the year.

The maximum day flows take the baseline flows, and multiply them by the water Maximum Day Demand peaking factor of 1.7 times. The maximum daily flows entering the wastewater system are not representative of the dry weather flows, as they are heavily influenced by inflow and infiltration that occurs during wet weather periods and high river levels.

The following table shows the maximum day dry weather flows for each catchment area that a diurnal pattern was developed for.

Table 4-13 Maximum Day Dry Weather Flows Summary

Catchment Area	Average Day Dry Weather Flows (L/s)	Maximum Day Dry Weather Flows (L/s)
FM 1	2.7	4.5
FM 2	8.4	14.2
FM 3	17.0	28.9
FM 4	1.7	2.9
LS 2	17.0	28.9
LS 2A	7.5	12.7
LS 4	6.6	11.2
LS 6	5.7	9.6
LS 8	7.6	12.9

4.4.2 Wet Weather Flow Generation

Generally, the Town is split into two areas with different wet weather influences. The valley bottom, generally bounded by the Bow River to the southwest, and Highway 1 to the northeast, is influenced through inflow and infiltration into the system by ground water. During the snowmelt period which can include large rainstorms, a groundwater surge occurs and a dramatic increase in flows can be observed.

The valley slopes, generally bounded by being southwest of the Bow River, and northeast of Highway 1, have minimal groundwater influence. Inflow and infiltration would be caused by rain events, with runoff water entering the system through manholes and some pipe infiltration from local soil saturation.

Valley Bottom

The valley bottom consists of the FM1, FM2, LS2 and LS2A catchment areas, which generally includes downtown Canmore, Bow Valley Trail, and Kananaskis Way.

In reviewing the flow monitors and lift station flow data in the valley bottom, the peak wet weather period was determined to be between June 13, 2022 and June 24, 2022. The figure below shows the trend for increased flows as the river levels rise, peaking between the noted period. This period also contained the most significant rainfall event observed during the monitoring period, which occurred between June 13-June14

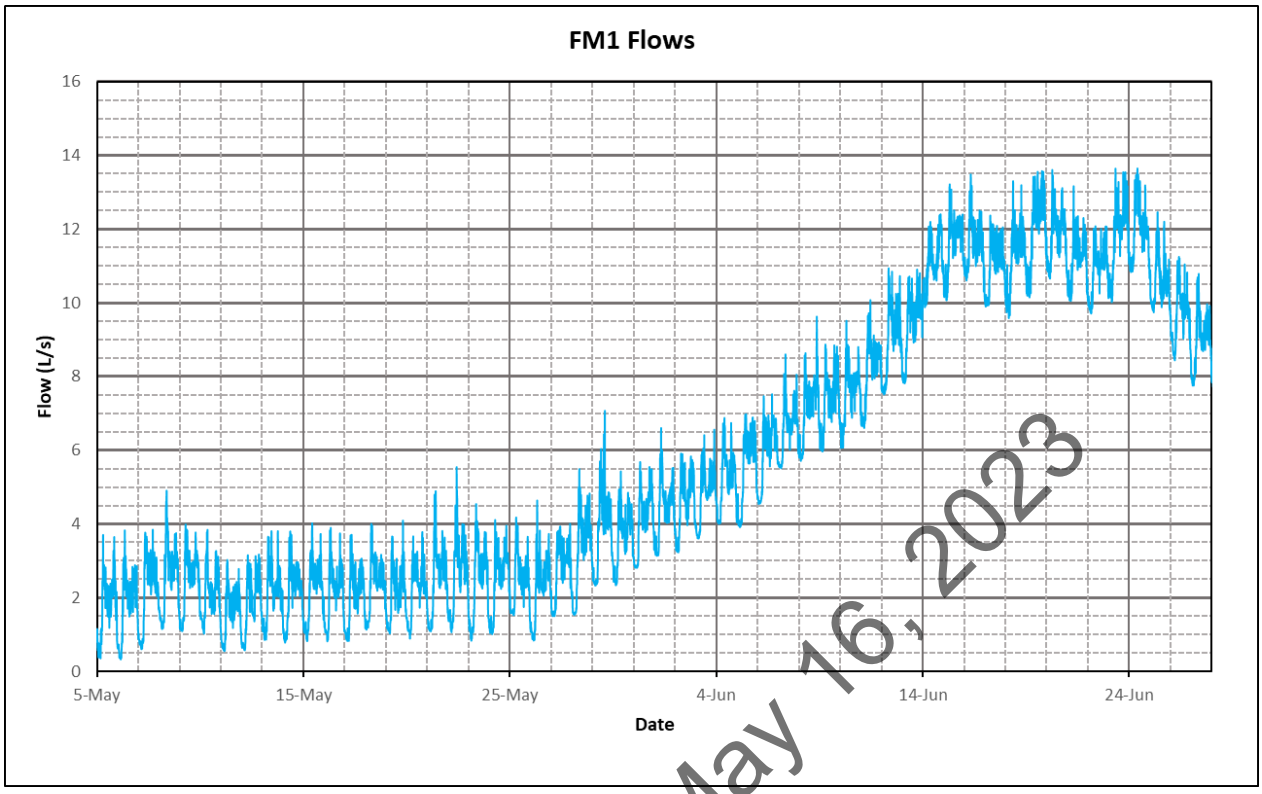


Figure 4-1 FM 1 Flows – Wet Weather Period

The additional wet weather flow for each catchment was determined by reviewing the minimum night flow during the dry weather period and comparing it against the maximum night flow during the wet weather period. Using the night flows ensures that flow generated by connections to the system are at a minimum, allowing for the best comparison.

The following table shows the dry weather and wet weather night flows for each catchment area, and the calculated additional flows due to the wet weather. Also shown are the approximate area based inflow and infiltration rates for each catchment.

Table 4-14 Valley Bottom I&I Rates

Catchment Area	Area (ha)	Night Flow Dry (L/s)	Night Flow Wet (L/s)	I&I (L/s)	I&I Rate (L/s/ha)
FM 1	21.6	0.3	11.0	10.7	0.50
FM 2	105.0	2.3	18.9	16.6	0.16
LS 2	107.3	8.4	63.8	55.4	0.52
LS 2A	48.3	1.6	2.8	1.2	0.02

All catchments in the valley bottom had I&I rates lower than the 0.66 L/s originally determined in the 2014 Flow Monitoring Program, however the FM 1 and LS 2 catchments were still notably high.

The LS 2A catchment had a significantly lower I&I rate, at 0.02 L/s/ha. This is possibly due to the overall newer construction of the area, and a change in underlying soil type. Due to the low I&I rate observed in the catchment, the LS 2A catchment area will have wet weather flow generation applied to it in the same way as the Valley Slopes, which is at a rate of 0.1 L/s/ha.

Valley Slopes

The original intent to assess wet weather flows on the valley slopes was to utilize the flow monitoring program to identify rainfall events and the additional flow introduced into the system during these rain events. Using this data, the model could be calibrated to the observed storm event, to project the effects of the system during a 1:50 year storm event.

However, across all the flow monitor and lift station locations that were used to assess flow on the valley slopes, there was minimal rainfall response observed in the collection system. Because of this, the rainfall response was not significant enough to derive calibration parameters for storm events.

The primary rainfall event was between June 13, 2022 and June 14, 2022. The following figure shows the flow recorded at FM 3 and the rainfall intensity. Overall, approximately 43 mm of rain fell in that time period. This would typically induce a noticeable response to flows in the system. Flow Monitor 3 also has the largest catchment area in the system

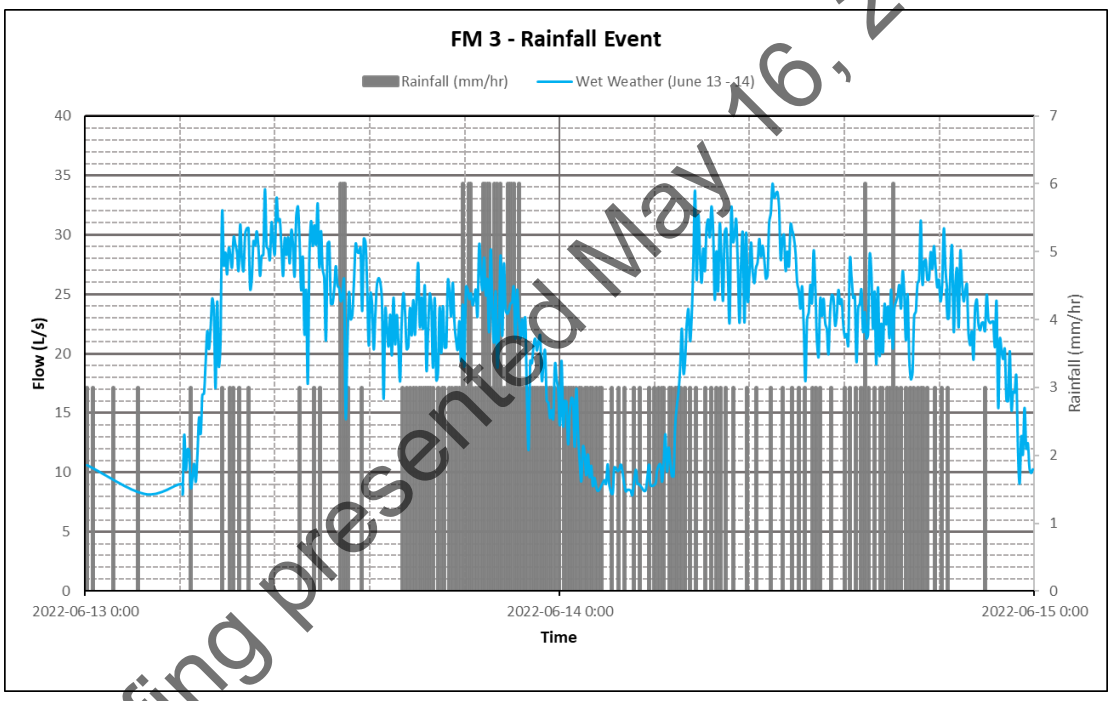


Figure 4-2 Flow Monitor 3 Rainfall Event

These two days were on a Monday and a Tuesday. As a comparison, the flows on this day were compared against the next Monday and Tuesday, June 20 – June 21, which had no notable rainfall. The period of time with the highest rainfall intensity shows almost no difference in flows from the dry weather comparison.

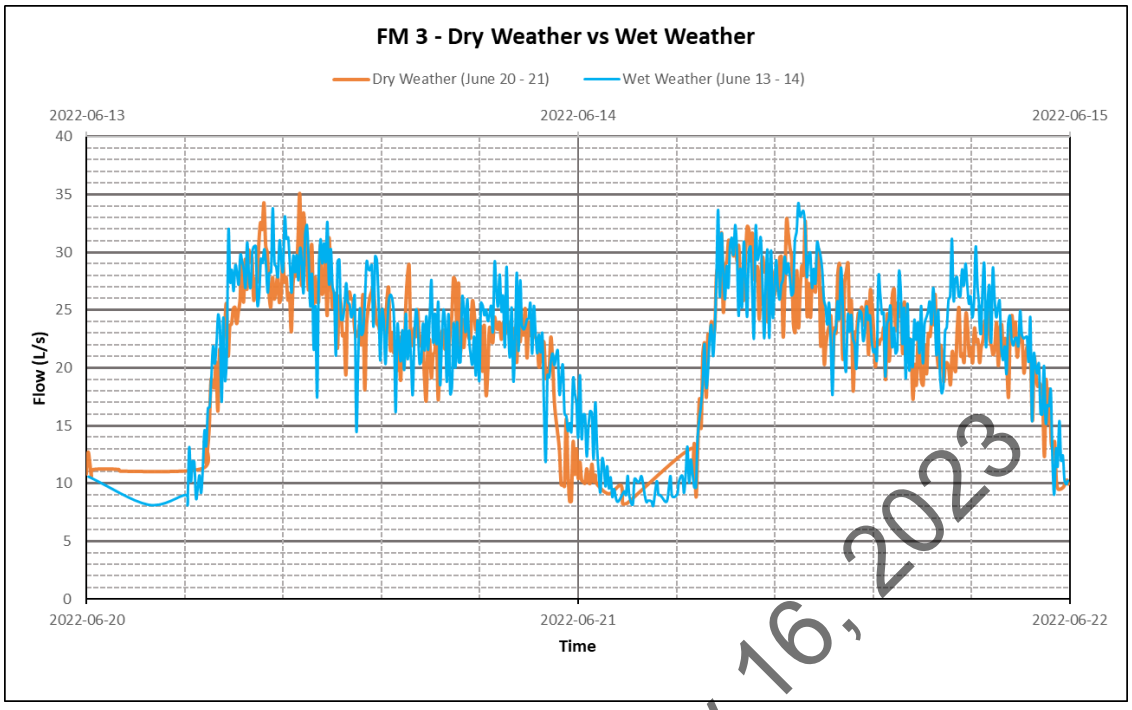


Figure 4-3 Flow Monitor 3 Dry Weather vs Wet Weather

This leads to the conclusion that the valley slopes have minimal responses to rainfall events, for the intensity of storms that were observed during the monitoring period.

To account for some level of rainfall derived inflow and infiltration, an assumed I&I rate of 0.1 L/s/ha was applied to the valley slopes to simulate an extreme wet weather event.

The following table shows the I&I for the valley slopes catchment areas with the assumed 0.1 L/s/ha rate applied.

Table 4-15 Valley Slopes I&I Rates

Catchment Area	Area (ha)	I&I Rate (L/s)
LS 2A	48	5
FM 3	160	16
FM 4	58	6
LS 4	107	11
LS 6	50	5
LS 8	175	18

4.4.3 Future Flow Generation

The future wastewater demands are determined in the same way as the water network, by applying the unit rates to the projected growth, in units, for each land use. The units were distributed as shown in the Growth Projections and Design Basis Memo. There are three growth horizons, 5 years, 15 years, and 25 years, and two separate growth scenarios.

Dead Man's Flats was projected as linear growth, where the 25 Year Horizon maxes out the current Memorandum of Agreement for wastewater flow, which is 7.5 L/s ADWF and 37.2 L/s PWWF. Using these flow maximums, a peaking factor of 5x was assumed, and accounts for I&I. Current PWWF is approximately 5 L/s.

As per the design criteria, each land use has its own peaking factor for Peak Dry Weather Flow. I&I rates were assigned to the system using the estimated gross developable area of each growth area, determined by the unit densities discussed in Section 1.2.

Growth Scenario 1

The following are the system wide wastewater flows for each growth horizon in Growth Scenario 1, which represents the full projected growth across 25 years. They do not include the existing demands.

The gross developable areas are shown in the following table.

Table 4-16 Wastewater Gross Developable Areas

Land Use	5 Year	15 Year	25 Year
	Area (ha)	Area (ha)	Area (ha)
Commercial	8.5	15.4	25.1
Hotels	10.1	21.3	32.5
Residential - Low Density	13.1	33.7	54.2
Residential - Medium / High Density	24.5	57.7	90.9
Total	**53.4**	**128.1**	**202.7**

The following table shows the system wide demands for the 5 Year Horizon.

Table 4-17 5 Year Horizon Wastewater Flows

Land Use	ADWF	PF	PDWF	I&I	PWWF
	L/s		L/s	L/s	L/s
Commercial	2.0	3.5	6.9	2.4	9.3
Hotels	9.1	4.0	36.3	2.8	39.1
Residential - Low Density	1.3	3.1	4.2	3.7	7.9
Residential - Medium / High Density	7.7	3.1	23.9	6.9	30.7
Dead Mans Flats	1.3	5.0	6.7	-	6.7
Total	**20.1**	**-**	**71.3**	**15.7**	**87.0**

The following table shows the system wide demands for the 15 Year Horizon.

Table 4-18 15 Year Horizon Wastewater Flows

Land Use	ADWF	PF	PDWF	I&I	PWWF
	L/s		L/s	L/s	L/s
Commercial	5.4	3.5	18.9	4.3	23.2
Hotels	19.1	4.0	76.4	6.0	82.4
Residential – Low Density	3.5	2.8	9.5	9.4	18.9
Residential – Medium / High Density	18.1	2.8	49.7	16.2	65.9
Dead Mans Flats	4.0	5.0	20.1	-	20.1
Total	**50.0**	**-**	**174.6**	**35.9**	**210.5**

The following table shows the system wide demands for the 25 Year Horizon.

Table 4-19 25 Year Horizon Wastewater Flows

Land Use	ADWF	PF	PDWF	I&I	PWWF
	L/s	L/s	L/s	L/s	L/s
Commercial	8.8	3.5	30.8	7.0	37.8
Hotels	29.1	4.0	116.5	9.1	125.6
Residential - Low Density	5.6	2.6	14.2	15.2	29.4
Residential - Medium / High Density	28.5	2.6	72.8	25.5	98.3
Dead Mans Flats	6.7	5.0	33.5	-	33.5
Total	**72.0**	**-**	**234.4**	**56.8**	**291.2**

4.5 Hydraulic Model Development

4.5.1 Existing System Implementation

A wastewater hydraulic model of the Town's wastewater system was developed for the 2016 UMP, however due to it being six years old, and the intent to move to a time-based model, the decision was made to remake the model utilizing Bentley SewerGEMS.

Schematic linework, manhole locations, and asset attributes such as pipe diameter, material, and invert elevations were established from the Town's most recent GIS data. All assets were associated to the GIS IDs from the Town's asset management system, which will result in easily updating and removing assets as the GIS information is updated. All new assets as of March 2022 were included in the model.

The inputs, particularly the invert elevations at pipes and manholes, were reviewed for completeness and to ensure all pipes in the network had their inverts oriented in the proper direction.

Lift station pump curves and operating points were retained from the previous UMP inputs, and were reviewed for accuracy and updated where necessary as per information provided from EPCOR. Lift Station 2 was notably updated since the previous UMP, and had its new wet well location, orientation and inputs updated, in addition to updated lift station pump curves.

Any missing ground level or manhole rim inputs were updated as per the most recent LiDAR information provided by the Town.

Wastewater flows were implemented into the model utilizing the customer water meter data, as discussed in Section 4.4.1. Each catchment area was divided into smaller sub catchments for each manhole in the system using Thiessen geometry. All water meters that fell into a particular manhole's sub catchment had their demands assigned to that manhole. The sum of demands in each of these sub catchments equals the Average Dry Weather Flow for each catchment area.

4.5.2 Extended Period Simulation

The model was developed as a time-based model, also known as an extended period simulation. This form of model simulates the daily demands and operational information such as pump cycles in real time, and is a more accurate way of representing the flow patterns and characteristics in the system. The flows and hydraulic grade lines of the system can be charted over time to see when and how long particular events affect the system.

As discussed in Section 4.4, diurnal patterns were developed for each of the flow monitor and lift station catchment areas. These diurnal patterns act as peaking factors or multipliers for the demands, creating the peak and low flows throughout the day.

4.6 Existing System Evaluation

4.6.1 Collection System Analysis

Flow Capacity

The existing collection system was reviewed under the Peak Wet Weather flow scenario, with particular focus on the peak flows during the day. The simulation results during the peak flows, showing pipe flows and any surcharging pipes can be found in Figure S4 (Appendix D).

Overall, there were only two pipe sections that did not meet the design criteria for pipe capacity, hydraulic gradeline, or velocity.

+ SNG1263 – Located on Bow Valley Trail in front of the Canmore Rocky Mountain Inn, this pipe segment has a flow that is 109% of the pipe's capacity. As it is a short pipe segment with a lower slope than downstream, no surcharging is observed during or after the peak flows. No action will need to be taken for the existing system, however this pipe should be monitored during future scenarios, as it will act as a bottleneck if additional flows are introduced.
+ SNG0800 – Located on Hospital place and is the connection for TeePee town into Bow Valley Trail. This pipe segment has a flow that is 100% of the pipe's capacity. No surcharging is observed during or after the peak flows. No action will need to be taken for the existing system, however this pipe should be monitored during future scenarios, as it will act as a bottleneck if additional flows are introduced.

Pipe Lifecycle

The Town of Canmore's wastewater collection system contains aging infrastructure, particularly in the Downtown area. The service life of wastewater mains as per Canmore's asset management standards is 75 years.

Currently there are pipes dating back to 1965, making the oldest pipes in the system approximately 58 years old. Figure S5 (Appendix D) shows the pipes according to age.

Currently no pipes in the system are approaching the end of their lifecycle, however replacement programs should be considered in the future when pipe lifecycle is approaching its end.

4.6.2 Lift Station Analysis

The existing lift stations were reviewed under the Peak Wet Weather flow scenario. All lift stations had a firm pumping capacity greater than the peak flows, and meet the design criteria.

Table 4-20 Existing Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 1	57.3	200+
LS 2	88.6	130
LS 2A	21.3	51
LS 3	1.2	Unknown
LS 4	32.2	85
LS 5	9.3	40
LS 6	26.4	30
LS 7	10.9	120
LS 8	28.9	72
LS 9	2.1	7
LS 10	26.4	80
LS 11	4.0	15
LS 12	0.5	4

From a lifecycle and operational standpoint, Lift Station 3 is in severely deteriorated condition and does not operate reliably. The lift station should be replaced when practical for the Town.

4.7 Future System Evaluation

4.7.1 Collection System Analysis

The existing collection system was reviewed under the Peak Wet Weather flow scenario, with particular focus on the peak flows during the day. The results during the peak flows, showing pipe flows and any surcharging pipes can be found in Figures S6 – S11.

5 Year Horizon

The 5-year horizon saw significantly increased flows along the Bow Valley Trail area, as the growth projections accelerated all projected development in Bow Valley Trail and TeePee town to the 5-year horizon. These increased flows result in surcharging along Bow Valley Trail. The following figure shows the hydraulic grade line between Hospital Place and 17th Street. Figure S6 shows the hydraulic model results fo this scenario.

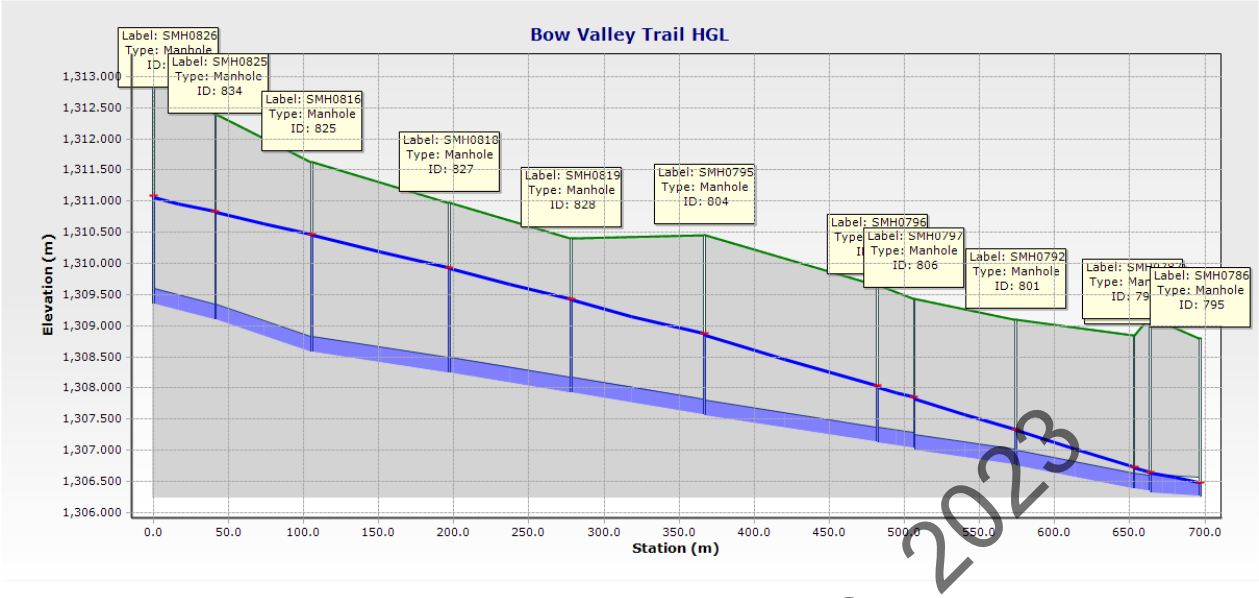


Figure 4-4 BVT Hydraulic Grade Line

The flow through these pipes is significantly higher than the pipe capacity and act as a bottleneck for upstream flows, resulting in surcharging. The surcharging under these conditions carries on to the upstream end of the Bow Valley Trail collection system.

The pipes between Hospital Place and 17th Street will need to be upgraded to at least 300 mm diameter to increase pipe capacity and eliminate surcharging. Figure S7 shows the model results after upgrading Bow Valley Trail.

The following figure shows the hydraulic grade line of the same pipes, when upgraded to 300 mm.

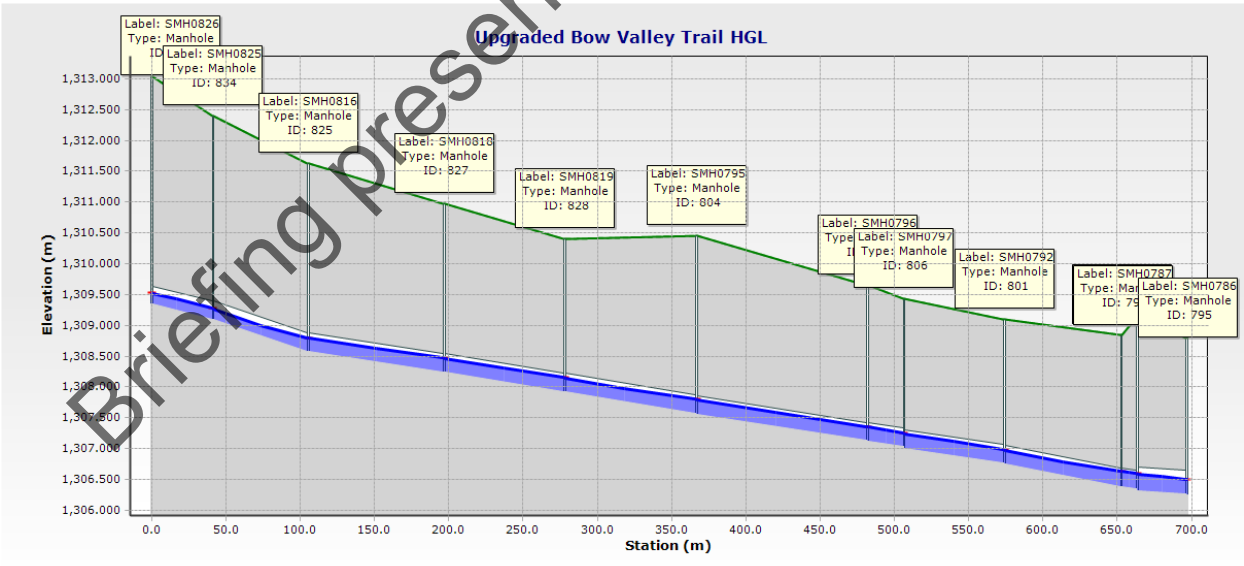


Figure 4-5 Upgraded BVT Hydraulic Grade Line

Outside of the noted surcharging, there are five other pipe segments which do not meet the design criteria for flow capacity. All of these pipe segments are part of the Bow Valley Trail collection system, and do not result in any surcharging. These sections should be monitored if development beyond what has been projected for the Bow Valley Trail area occurs.

+ SNG0810
+ SNG0273
+ SNG0657
+ SNG1649
+ SNG1263

15 Year Horizon

Figure S8 shows the hydraulic model results for the 15 Year Horizon. Surcharging is seen upstream of Lift Station 11, as it over capacity in this horizon, as per Section 4.7.2. Figure S9 shows the hydraulic model results after the proposed lift station upgrade, which resolves the noted surcharging.

25 Year Horizon

Figure S 10 shows the hydraulic model results for the 15 Year Horizon .In the 25-year horizon, there are two additional pipe segments that are above their design capacity. Both are on the trunk line down stream from Stewart Creek and Lift Station 10, just before it ties into Three Sisters Parkway. No surcharging occurs in either pipe, and no action needs to be taken.

+ SNG1327
+ SNG11325

Surcharging is seen upstream of Lift Stations 8, 10 and 11. Figure S11 shows the hydraulic model results after the proposed lift station upgrades, which resolves the noted surcharging

Pipe Lifecycle

A replacement program should be developed for pipes installed between 1965 and 1972, to be executed starting from the end of the 15-year horizon and replacing sections of pipe each year. This would ensure that there are no assets older than the 75-year lifecycle by the end of the 25 year horizon, and are represented by pipes that are currently older than 50 years.

There are approximately 10 km of wastewater lines older than 50 years. They are primarily located in the Downtown area, Railway Ave, Bow Valley Trail / TeePee town, and Rundle Drive.

The replacement program will be broken out into five separate areas, for the purposes of project time lines and cost estimates. These are the same areas as the water distribution system, and the replacement programs should be done in tandem. They are as follows:

+ South Canmore (6th Street to 3rd Street) – 2 km
+ Downtown (6th Street to 10th Street) – 3.5 km
+ 7th Avenue (10th St to Industrial Place) – 1.5 km
+ Rundle (Bridge Road to Three Sisters Drive) – 0.75 km
+ Teepee Town / Railway Ave – 2.5 km

Cured in Place Pipe (CIPP) lining is a possible alternative to outright replacement for aging sewer infrastructure, it can effectively extend the lifespan of gravity collection systems, even if they are severely deteriorated.

Typically, CIPP lining is significantly more cost effective than open cut replacement, however these cost savings would be less significant than replacing just the sewer, as the intention of the replacement program is to perform it in tandem with water replacement where possible. With that in mind, CIPP lining should still be investigated, as it may still be more cost effective and result in less consumer and environmental impact than direct replacement.

To be conservative, costs for replacement will be used to estimate the project costs, however an allowance for CCTV which can determine the viability of CIPP lining will be included.

4.7.2 Lift Station Analysis

In order to consider the impacts of Dead Man's Flats to available lift station capacity, timing of upgrades, and extent of upgrades, along with consideration for existing infrastructure agreements, Lift Station 8 and Lift Station 10 were additionally reviewed with no contribution from Dead Man's Flats.

5 Year Horizon

The lift stations were assessed under the 5-year scenario during peak flow conditions. All lift stations are within their firm pumping capacity, with the exception of Lift Station 11, which has peak flows slightly above its firm pumping capacity. No surcharging occurs during the peak flows, however the lift station should be upgraded to accommodate the 15 year flows prior to additional development.

The peak flow into Lift Station 11 at the end of the 15-year horizon is approximately 40 L/s.

Table 4-21 5 Year Horizon Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 1	65.0	200+
LS 2	112.6	130
LS 2A	24.5	51.0
LS 3	1.2	Unknown
LS 4	32.5	85.0
LS 5	9.3	40.0
LS 6	26.6	30.0
LS 7	27.4	120.0
LS 8	59.5	72.0
LS 9	2.1	7.0
LS 10	50.7	80.0
LS 11	15.5	15.0
LS 12	0.5	4.0

The existing Lift Station 11 was designed as an interim lift station, with future phases planned for higher flows. The future phases include a new building, process piping, and other appurtenances. This upgrade should trigger the first phases of the ultimate lift station design.

5 Year Horizon – No DMF

Under the 5 year horizon with no future DMF flow, Lift Station 8 and Lift Station 10 are within their firm pumping capacity.

Table 4-22 5 Year Horizon – No DMF Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 8 – No DMF	47.1	72
LS 10 – No DMF	43.2	80

15 Year Horizon

The lift stations were assessed under the 15-year scenario during peak flow conditions. Lift station 11 was upgraded to 40 L/s pumping capacity as recommended in the 5-year horizon in this assessment.

Lift Stations 8 and 10 both have peak flows higher than their firm pumping capacities with Dead Man's Flats online. Surcharging can occur upstream of these lift stations at their peak flow rates.

Table 4-23 15 Year Horizon Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 1	64.7	200+
LS 2	118.2	130
LS 2A	31.2	51.0
LS 3	1.2	Unknown
LS 4	33.0	85.0
LS 5	9.3	40.0
LS 6	27.7	30.0
LS 7	62.3	120.0
LS 8	93.1	72.0
LS 9	2.1	7.0
LS 10	91.1	80.0
LS 11	38.9	40
LS 12	0.5	4.0

Lift Station 8 currently operates two pumps and was designed to be easily upgraded to three pumps. Adding the third pump will increase the firm pumping capacity to approximately 150 L/s, which will be sufficient to satisfy the 15 year and 25-year horizons.

Lift Station 10 currently operates three pumps and will require pump replacements in order to upgrade its pumping capacity. Due to the relatively small increase in pumping capacity required to satisfy the design criteria for the 15-year horizon, it is recommended that the lift station be upgraded for the 25 year horizon, for a total pumping capacity of approximately 125 L/s.

15 Year Horizon – No DMF

Under the 15 year horizon with no future DMF flows, Lift Station 8 would still be over it's firm pumping capacity, and require the recommended upgrade to three pumps. Lift Station 10 would still be below it's firm pumping capacity, and an upgrade would not be triggered under this horizon.

Lift Station 8 had an existing incoming PWWF of 28.6 L/s. As such, the TSMV developments could contribute 43.4 L/s to the lift station prior to an upgrade being required.

Table 4-24 15 Year Horizon – No DMF Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 8 – No DMF	76.2	72
LS 10 – No DMF	69.2	80

25 Year Horizon

The lift stations were assessed under the 25-year scenario during peak flow conditions. Lift station 8 was upgraded to 150 L/s pumping capacity and Lift Station 10 was upgraded to 125 L/s pumping capacity, as recommended in the 15-year horizon in this assessment.

All lift stations are within their firm pumping capacity, with the exception of Lift Station 11, which has peak flows of approximately 65 L/s, compared to the previously upgraded capacity of 40 L/s. A final upgrade up to 65 L/s will satisfy the design criteria for the 25-year horizon.

Table 4-25 25 Year Horizon Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 1	67.1	200+
LS 2	118.7	130
LS 2A	36.7	51.0
LS 3	1.2	Unknown
LS 4	33.0	85.0
LS 5	9.3	40.0
LS 6	26.6	30.0
LS 7	98.0	120.0
LS 8	127	150.0
LS 9	2.1	7.0
LS 10	125.0	125.0
LS 11	62.8	40.0
LS 12	0.5	4.0

25 Year Horizon – No DMF

Under the 25 year horizon with no future DMF flows, Lift Station 10 would be over its firm pumping capacity and would require an upgrade. Lift Station 8 would be withing its firm pumping capacity, when upgraded to 150 L/s.

Lift Station 10 had an existing incoming PWWF of 26.4 L/s. As such, the TSMV developments could contribute 53.6 L/s to the lift station prior to an upgrade being required.

Table 4-26 25 Year Horizon – No DMF Lift Station Analysis

Lift Station	PWWF (L/s)	Firm Pumping Capacity (L/s)
LS 8 – No DMF	93.6	150
LS 10 – No DMF	92.2	80

Lift Station 8 and Lift Station 10 Contributing Flows Summary

In total, TSMV contributes 65 L/s to Lift Station 8. The lift station had 43.4 L/s of remaining capacity, resulting in 21.6 L/s contributing to the upgrade if the existing capacity were assigned to TSMV. DMF contributes 33.5 L/s to the lift station upgrade.

In total, TSMV contributes 65 L/s to Lift Station 10. The lift station had 53.6 L/s of remaining capacity, resulting in 12.2 L/s contributing to the upgrade if the existing capacity were assigned to TSMV. DMF contributes 33.5 L/s to the lift station upgrade.

4.8 Wastewater Projects

4.8.1 EX S1 – Lift Station 3 Replacement

New

Project Description

Replace the existing Lift Station 3 with a new wet well, pumps, electrical and building structure.

Project Rationale

Lift Station 3 is in poor condition and is eligible for a life cycle replacement. Regrading the collection system to connect to downstream lift stations by gravity is not feasible. New developments in the immediate area may increase risks associated with the lift station's failure.

Project Details

- New wet well
- New pumps and electrical
- New building

Project Trigger

- This project should be completed in the next 5 years
- 100% attributed to lifecycle

Project Cost

Engineering	$	110,000.00
Implementation	$	750,000.00
Contingency	$	240,000.00
Allowance for care of water	$	400,000.00
Total	**$**	**1,500,000.00**

4.8.2 S1 – Bow Valley Trail Sewer Upgrade

Formerly UMP2016 – Project S6

Project Description

Upgrade approximately 430 m of existing wastewater line from 250 mm to 300 mm along Bow Valley Trail between approximately 13th St and 17th St.

This project was assumed to be coordinated with a roadworks program, and only captured deep utility installation costs.

Project Rationale

Significant growth is projected in the northwestern portion of Bow Valley Trail, and was captured in the 5 Year development horizon. Due to this growth, Peak Wet Weather Flows will exceed current pipe capacity and could cause pipe surcharging.

Project Details

- 430 m of 250 mm to 300 mm wastewater pipe upgrade

Project Trigger

- This project should be completed prior to further development along Bow Valley Trail, and before any roadworks programs
- Triggered by growth, OSL Zone 6

Project Cost

Engineering	$	60,000.00
Implementation	$	400,000.00
Contingency	$	140,000.00
Total	**$**	**600,000.00**

Project Cost Sharing

This project is necessary for growth-related conditions.

Deep utility assets have a prescribed life cycle of 75 years. The recorded installation date for the sewer lines is 1990, resulting in a remaining lifecycle of 43 years.

As per the cost allocation methodology, the formula is as follows:

$$UpgradeCost - \left(1 - \frac{ServiceLifeRemaining}{LifeSpan}\right) * Basecost = DeveloperCost$$

Where:

- Base Cost = $580,000
- Upgrade Cost = $600,000
- Service Life Remaining = 43 Years
- Life Span = 75 Years
- $\$600{,}000 - (1 - \frac{43}{75}) * \$580{,}000 = \$350{,}000$ developer cost

Using the cost sharing methodology, 58% of the total cost should be borne by development, and 42% of the cost should be borne by the Town of Canmore.

4.8.3 S2 – Lift Station 11 Upgrade Phase 1

New

Project Description

Upgrade Lift Station 11 to a pumping capacity of 40 L/s. The existing lift station is an interim phase, this upgrade would include the first phases of the ultimate design for the lift station.

Project Rationale

Growth in Stewart Creek and Smith Creek both discharge flow into Lift Station 11. The lift station needs to be upgraded to support the initial flows. This upgrade will trigger the planned future phases of the lift station.

Project Details

+ New process piping
+ 40 L/s pumping capacity
+ Electrical and mechanical equipment
+ New standby generator
+ Lift Station Building

Project Trigger

+ Development of the following number of units in OSL 14:
  - 30 ICI Units
  - 150 Low Density Residential Units
  - 130 Medium / High Density Residential Units
+ Peak Wet Weather Flow of 15 L/s into lift station
+ Triggered by growth, OSL Zone 14

Project Cost

Engineering	$	230,000.00
Implementation	$	1,530,000.00
Contingency	$	530,000.00
Total	**$**	**2,290,000.00**

Project Cost Sharing

This is a planned future phase to support development. Cost is 100% attributable to development

4.8.4 S3 – Lift Station 8 Upgrade

Project Description

Add a third pump in Lift Station 8, upgrading the pumping capacity to approximately 150 L/s

Project Rationale

Growth in the Stewart Creek, Smith Creek and Deadman's flats all contribute flows to Lift Station 8. Once the Peak Wet Weather Flow is greater than the firm pumping capacity an upgrade is required. Lift Station 8 was designed to install a third pump, effectively doubling the firm pumping capacity.

The upgrade will satisfy pumping requirements past the 25 year horizon.

Project Details

- Install third pump
- Install new VFD and update electrical system and programming

Project Trigger

- Development of the following number of units in OSL 14:
  - 60 ICI Units
  - 310 Low Density Residential Units
  - 280Medium / High Density Residential Units
- In approximately 10 years of development
- PWWF of 72 L/s into Lift Station 8
- Triggered by growth, OSL Zone 14 and 15
- Recommended Project Year: 2032-2033

Project Cost

Engineering	$	60,000.00
Implementation	$	400,000.00
Contingency	$	140,000.00
Total	**$**	**600,000.00**

Project Cost Sharing

This is new infrastructure installed in existing infrastructure designed for the upgrade, and the costs are 100% attributable to development. If available capacity were assigned to TSMV, then TSMV would contribute 21.6 L/s to the upgrade, and DMF would contribute 33.5 L/s to the upgrade, resulting in the following cost allocation:

- 39% of the project cost should be borne by TSMV ($ 235,000)
- 61% of the project cost should be borne by DMF ($ 365,000)

4.8.5 S4 – Lift Station 10 Upgrade

Project Description

Replace the existing pumps in Lift Station 10 for a peak wet weather flow of approximately 125 L/s, along with possibly existing electrical equipment and backup generator

Project Rationale

Growth in the Stewart Creek, Smith Creek and Deadman's flats all contribute flows to Lift Station 10. Once the Peak Wet Weather Flow is greater than the firm pumping capacity an upgrade is required. Lift Station 10 will have to be upgraded to reach the required flows, including the pumps, some electrical equipment, and potentially the backup generator. VFDs would also be beneficial to install.

The upgrade will satisfy pumping requirements past the 25 year horizon.

Project Details

+ Replace 3 pumps for a firm pumping capacity of 125 L/s
+ Upgrade electrical equipment
+ Replace backup generator if required
+ Add VFDs

Project Trigger

+ Development of the following number of units in OSL 14:
  - 75 ICI Units
  - 400 Low Density Residential Units
  - 360 Medium / High Density Residential Units
+ 18 L/s from Dead Man's Flats
+ In approximately 13 years of development
+ PWWF of 80 L/s into Lift Station 10
+ Triggered by growth, OSL Zone 14 and 15
+ Recommended Project Year: 2035-2036

Project Cost

Engineering	$	230,000.00
Implementation	$	1,530,000.00
Contingency	$	530,000.00
Total	**$**	**2,290,000.00**

Project Cost Sharing

This project is necessary for both growth-related conditions.

Facilities have an estimated life cycle of 50 years. The recorded installation date for Lift Station 10 is 2001, resulting in a remaining lifecycle of 30 years. As per the cost allocation methodology, the formula is as follows:

$$UpgradeCost - \left(1 - \frac{ServiceLifeRemaining}{LifeSpan}\right) * Basecost = DeveloperCost$$

Where:

- Base Cost = $1,950,000
- Upgrade Cost = $2,290,000
- Service Life Remaining = 30 Years
- Life Span = 50 Years
- $\$2{,}290{,}000 - (1 - \frac{30}{50}) * \$1{,}950{,}000 = \$1{,}510{,}000$ developer cost

Using the cost sharing methodology, 66% of the total cost should be borne by development, and 34% of the cost should be borne by the Town of Canmore.

If available capacity were assigned to TSMV, then TSMV would contribute 21.6 L/s to the upgrade, and DMF would contribute 33.5 L/s to the upgrade, resulting in the following cost allocation:

- 39% of developer cost (26% of project cost) should be borne by TSMV ($ 590,000)
- 61% of developer cost (40% of project cost) should be borne by DMF ($ 920,000)

4.8.6 S5 – Lift Station 11 Upgrade Phase 2

Project Description

Upgrade Lift Station 11 to a pumping capacity of 60 L/s.

Project Rationale

Growth in Stewart Creek and Smith Creek both largely end up discharging flows into Lift Station 11. The lift station needs to be upgraded to support the initial flows. This upgrade will trigger the planned future phases of the lift station.

Project Details

+ 60 L/s pumping capacity

Project Trigger

+ Development of the following number of units in OSL 14:
  - 80 ICI Units
  - 440 Low Density Residential Units
  - 400Medium / High Density Residential Units
+ Peak Wet Weather Flow of 40 L/s into lift station
+ Triggered by growth, OSL Zone 14

Project Cost

Engineering	$	60,000.00
Implementation	$	380,000.00
Contingency	$	130,000.00
Total	**$**	**570,000.00**

Project Cost Sharing

This is a planned future phase to support development. Cost is 100% attributable to development

4.8.7 S6 – South Canmore Sewer Line Replacement

Project Description

Replace aging wastewater infrastructure in the South Canmore area, between 3rd Street and 6th Street.

Project Rationale

Wastewater lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

CIPP lining can be investigated instead of replacement, with CCTV performed to determine viability

For the best use of resources, the utility replacement program should be paired with a roadworks program and the water replacement program.

Project Details

+ 2,000 m of 200 mm wastewater line replacement

Project Trigger

+ Recommended Project Year: 2037-2038

Project Cost

Engineering	$	390,000.00
Implementation	$	1,560,000.00
Contingency	$	780,000.00
Total	**$**	**2,730,000.00**

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

4.8.8 S7 – Downtown Canmore Sewer Line Replacement

Project Description

Replace aging wastewater infrastructure in the Downtown area, between 6th Street and 10th Street.

Project Rationale

Wastewater lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

CIPP lining can be investigated instead of replacement, with CCTV performed to determine viability

For the best use of resources, the utility replacement program should be paired with a roadworks program and the water replacement program.

Project Details

- 3,500 m of 200 mm wastewater line replacement
- 3,000 m^2 road replacement

Project Trigger

- Recommended Project Year: 2038-2039

Project Cost

Engineering	$	760,000.00
Implementation	$	3,030,000.00
Contingency	$	1,520,000.00
Total	**$**	**5,310,000.00**

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

4.8.9 S8 – 7th Avenue Sewer Line Replacement

Project Description

Replace aging wastewater infrastructure in the 7th Avenue area, 10th Street and Industrial Place.

Project Rationale

Wastewater lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

CIPP lining can be investigated instead of replacement, with CCTV performed to determine viability

For the best use of resources, the utility replacement program should be paired with a roadworks program and the water replacement program.

Project Details

- 3,000 m of 200 mm wastewater line replacement
- 3,000 m^2 road replacement

Project Trigger

- Recommended Project Year: 2039-2040

Project Cost

Engineering	$	670,000.00
Implementation	$	2,690,000.00
Contingency	$	1,340,000.00
Total	**$**	**4,700,000.00**

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

4.8.10 S9 – Rundle Sewer Line Replacement

Project Description

Replace aging wastewater infrastructure in the Rundle area, Rundle Drive, MacDonald Place and St. Barbara's Terrace.

Project Rationale

Wastewater lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

CIPP lining can be investigated instead of replacement, with CCTV performed to determine viability

For the best use of resources, the utility replacement program should be paired with a roadworks program and the water replacement program.

Project Details

+ 750 m of 200 mm wastewater line replacement

Project Trigger

+ Recommended Project Year: 2039-2040

Project Cost

Engineering	$	180,000.00
Implementation	$	710,000.00
Contingency	$	360,000.00
Total	**$**	**1,250,000.00**

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

4.8.11 S10 - Railway Ave / Bow Valley Trail Sewer Line Replacement

Project Description

Replace aging wastewater infrastructure in the TeePee Town and Railway Ave area, from Gateway Street to Benchlands Trail along Railway Ave. This project also involves crossing Policeman's Creek along 8th Street.

Project Rationale

Wastewater lines in the older areas of Canmore are nearing their lifecycle, and the Town should begin a program to replace the infrastructure that is nearing its lifecycle. The oldest pipes in Canmore were installed in 1966, and will reach their 75 year lifecycle by 2041, approximately 19 years after this study.

CIPP lining can be investigated instead of replacement, with CCTV performed to determine viability

For the best use of resources, the utility replacement program should be paired with a roadworks program and the water replacement program.

Project Details

- 3,000 m of 200 mm wastewater line replacement
- 9,000 m^2 road replacement

Project Trigger

- Recommended Project Year: 2041-2042

Project Cost

Engineering	$	540,000.00
Implementation	$	3,590,000.00
Contingency	$	1,240,000.00
Total	**$**	**6,290,000.00**

Project Cost Sharing

This is existing infrastructure replacement that is 100% attributable to the Town of Canmore.

5. Summary of Projects

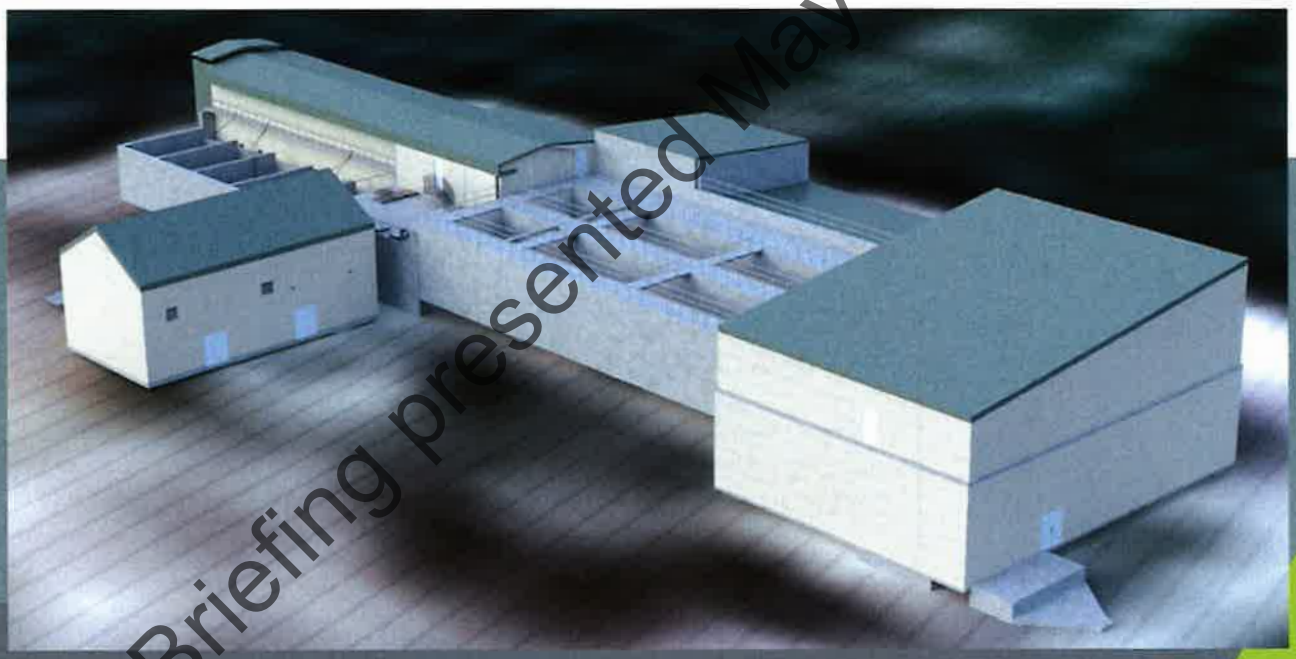
Project	Name	Timeline	Trigger	Infrastructure	Cost	ToC Share	Dev Share	DMF Share
EX W1	Grassi Booster Station Capacity Upgrade (Phase 1)	2025	**Existing /Growth**	Facilities	$2,310,000.00	42%	46%	12%
EX W2	Pumphouse 2 Backwash Water Reuse	2035	**Existing**	Facilities	$1,500,000.00	100%	0%	-
EX W3	Pumphouse 1 Gas Chlorine to Liquid	TBD	**Existing**	Facilities	$1,000,000.00	100%	0%	-
W1	TeePee Town Waterline Replacement	2024	**Growth**	Linear	$900,000.00	81%	19%	-
W2	Smith Creek Reservoir and Booster Station	2027	**Growth**	Facilities	$12,780,000.00	0%	100%	-
W3	Canyon Ridge Booster Station Decommissioning	2027	**Existing**	Facilities	$1,200,000.00	100%	0%	-
W4	Silvertip Trail Looping	2028	**Growth**	Linear	$1,290,000.00	0%	100%	-
W5	Grassi Booster Station Waterline Twinning	2038	**Growth**	Linear	$2,980,000.00	73.1%	19.6%	7.3%
W6	Grassi Storage Reservoir Capacity Upgrade	2039	**Growth**	Facilities	$7,590,000.00	0%	75%	25%
W7	Grassi Booster Station Capacity Upgrade (Phase 2)	2038	**Growth**	Facilities	$750,000.00	0%	85%	15%
W8	Smith Creek Booster Station Upgrade (Phase 2)	2037	**Growth**	Facilities	$720,000.00	0%	100%	-
W9	South Canmore Waterline Replacement	2037	**Lifecycle**	Linear	$6,010,000.00	100%	0%	-
W10	Downtown Canmore Waterline Replacement	2038	**Lifecycle**	Linear	$8,830,000.00	100%	0%	-
W11	7th Avenue Waterline Replacement	2039	**Lifecycle**	Linear	$7,340,000.00	100%	0%	-
W12	Rundle Waterline Replacement	2040	**Lifecycle**	Linear	$6,010,000.00	100%	0%	-
W13	TeePee Town / Railway Ave Waterline Replacement	2041	**Lifecycle**	Linear	$4,560,000.00	100%	0%	-
W14	Water Treatment and Supply Study	2025	**Growth**	Facilities	$200,000.00	100%	0%	-
					$65,970,000.00	**$40,530,000.00**	**$22,940,000.00**	**$2,500,000.00**

Project	Name	Timeline	Trigger	Infrastructure	Cost	ToC Share	Dev Share	DMF Share
EX S1	Lift Station 3 Replacement	2027	**Lifecycle**	Facilities	$1,500,000.00	100%	0%	-
S1	Bow Valley Trail Sewer Upgrade	2024	**Growth**	Linear	$600,000.00	43%	57%	-
S2	Lift Station 11 Upgrade Phase 1	2027	**Growth**	Facilities	$2,290,000.00	0%	100%	-
S3	Lift Station 8 Upgrade	2032	**Growth**	Facilities	$600,000.00	0%	39%	61%
S4	Lift Station 10 Upgrade	2035	**Growth**	Facilities	$2,290,000.00	34%	26%	40%
S5	Lift Station 11 Upgrade Phase 2	2037	**Growth**	Facilities	$570,000.00	0%	100%	-
S6	South Canmore Sewer Line Replacement	2037	**Lifecycle**	Linear	$2,730,000.00	100%	0%	-
S7	Downtown Canmore Sewer Line Replacement	2038	**Lifecycle**	Linear	$5,310,000.00	100%	0%	-
S8	7th Avenue Sewer Line Replacement	2039	**Lifecycle**	Linear	$4,700,000.00	100%	0%	-
S9	Rundle Sewer Line Replacement	2040	**Lifecycle**	Linear	$1,250,000.00	100%	0%	-
S10	Railway Ave / Bow Valley Trail Sewer Line Replacement	2041	**Lifecycle**	Linear	$6,290,000.00	100%	0%	-
					$28,130,000.00	**$22,820,000.00**	**$4,030,000.00**	**$1,280,000.00**

Town of Canmore

Wastewater Treatment Plant

Capacity Evaluation and Capital Upgrades



CIMA+ file number: C017 | C04-00496.12
April 5, 2023

CIMA+

Confidentiality and ownership

Sign Off

PROFESSIONAL ENGINEER ALBERTA
PAVEL MANCHINSKIY
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PERMIT TO PRACTICE
CIMA CANADA INC.
Signature
Date April 11 2023
PERMIT NUMBER: P 8204
The Association of Professional Engineers and Geoscientists of Alberta

Executive Summary

The Canmore WWTP is a two stage BAF plant for BOD removal and Nitrification. A detailed capacity assessment was conducted on all the major process units to determine bottleneck process units and aid capital planning for the 5, 15 and 25 year horizon.

The historical flow rates through the plant, loadings and effluent concentrations from 2017 through 2021 were analyzed. The historical performance was generally good with the ability to treat the wastewater within compliance limits across the challenging wet weather flows due to the spring freshet as well as the winter and max month loading scenarios. The projected flows and loads were estimated from population projections at the 5, 15 and 25 year horizon.

The Canmore WWTP is nearing its capacity for major process units and is expected to experience challenges within the next 5 years. Between the 5 and 10 year horizon, the BAF system is expected to experience difficulties to reliably achieve the effluent ammonia limits. A BioWin model was initially calibrated and aligned well with the capacity assessment demonstrating the facility will be challenged to achieve the final effluent limits by the 10 year-horizon. Process optimizations and potential stress testing are recommended to identify the empirical limitation of the nitrification process prior to reaching the capacity limit.

The water quality based effluent limits study has identified draft limits that will come into effect c. 2031. The new limits are more stringent with the inclusion of a total nitrogen limit. The existing facility will not able to be achieve these limits without a significant upgrade and potentially a change in secondary treatment technology. A separate report is being produced to identify the preferred alternative for achieving the new limits.

The capital planning identified in this report focus on the next 10 years to support the existing facility in operating prior to the large capital upgrade. The capital planning prioritized upgrades that can be re-used beyond 2031 and reduce wasted capital investment. The following table outlines the list of identified projects.

Project	Description	Project Justification	Priority	Year Required	Probable Cost
Headworks					
Inlet Lift Station Upgrade (Mechanical)	Replacement of existing lower flow pumps and discharge piping	Life Cycle Population Growth	Medium	2027	$1.17M

Inlet Lift Station Upgrade (Wetwell)	Increase the size of the Inlet LS Wetwell, Provide Actuated valving to EQ tank	Undersized Population Growth	Medium	2027	$2.9M
Odor Control Unit for EQ Tank, Headworks Bldg	Add odor control building near the Headworks to treat odors from EQ tank, Headworks	Potential Complaints, Future Regulatory Requirements	Medium	2027	$2.9M
Septage Receiving Station	Add septage receiving station with flow monitoring and payment system [Odor Control project required before]. Include EQ tank upgrades	Population Growth	Low	2032	$1.17M
Influent Piping between Inlet LS and Headworks	Piping Replacement, Actuated isolation valves at high point	Life Cycle	High	2027	$1.17M
Inlet Screen Replacement	Replacement of older inlet screen with smaller mesh, and sludge press unit	Life Cycle	High	2024	$900k
Grit Separator Replacement	Replace Existing Grit Separator	Life Cycle	Medium	2027	$720k
Grit Separator Exhaust Fan	Redesign, replace. Existing fan full of grease	Process Improvements	High	2025	$290k
Headworks Channel Valves	Add sluice gate valve at the Clarifier Distribution Channel Actuation on Clarifier sluice gates and screen inlet gates	Process Improvements	Medium	2027	$530k

Water Heating System, MUA Replacement	Replace existing boiler, piping, MUAs	Life Cycle Process Improvements	Medium	2025	$2.17M
Scum Removal Piping	Rearrange Scum Removal Piping to pump to digester instead of Headworks	Process Improvements	High	2025	$720k
Third Clarifier Addition	Add third Clarifier [high flow fluctuations]. North of ex. clarifier	Process Improvements Population Growth	Medium	2027	$10.2M
BAF, DAF					
Intermediate Transfer Pumps Upgrade	Upgrade existing pumps	Life Cycle	Medium	2026	$1M
UV					
UV 1, 2 upgrade	Replace existing UV 1, 2	Life Cycle	High	2023	700k
UV 3 addition	Add UV3	Population Growth	Medium	2028	500k

Update after the report completion (April 5. 2023)

The Town has completed the Water Quality Based Effluent Limits study and the Environment and Protected Areas (EPA) assigned the new effluent limits that includes the requirements for Total Nitrogen and deeper Phosphorus treatment.

CIMA+ has issued a separate report "Wastewater Treatment Plant Technology Evaluation" (April 5, 2023). This report provides the upgrade recommendations for Canmore WWTP to achieve the effluent limits required by EPA. The complete capital costs required for Canmore WWTP upgrade are combined in the "Wastewater Treatment Plant Technology Evaluation" (April 5, 2023) report, and include the costs noted in the "Capacity Evaluation" report.

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1 Introduction

The Canmore Wastewater Treatment Plant (WWTP) is in the Town of Canmore in Alberta, Canada and has been in service since 1997. The plant provides secondary treatment with biological aerated filtration (BAF) and ultraviolet (UV) disinfection prior to discharging effluent to the Bow River. The wastewater treatment system consists of the following processes:

- Septage receiving
- Influent pumping
- Mechanically cleaned influent bar screening
- Flash mix chemical addition
- Enhanced primary clarification
- Primary effluent screening
- Two stage biological aerated filtration
- Ultraviolet Disinfection
- Backwash storage tank
- Dissolved air flotation (DAF)
- Two open-air holding tanks "digesters"
- Centrifuging

The following figure is the process flow diagram (PFD) of the Canmore WWTP.

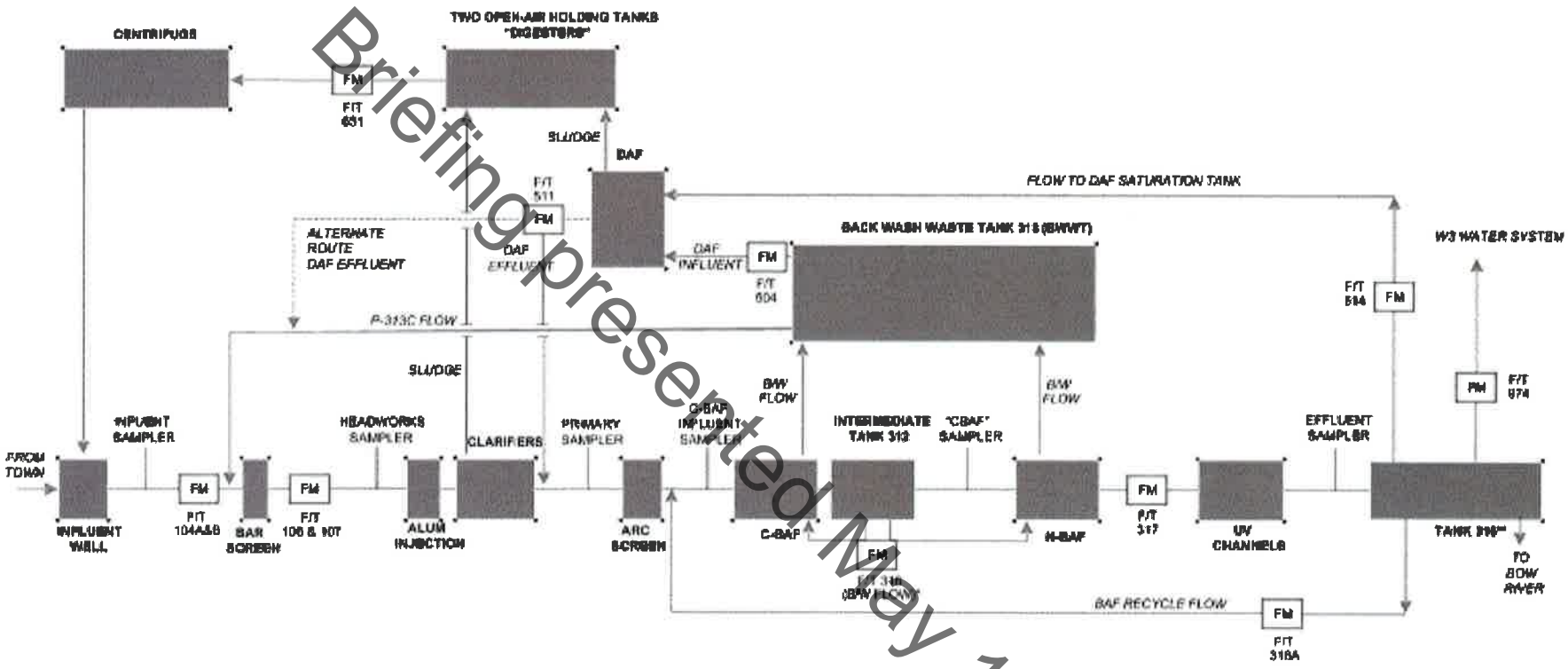


Figure 1-1 Process flow diagram (PFD) of the Canmore WWTP

The Town of Canmore is planning to increase its permanent population while maintaining significant seasonal population fluctuations due to tourism in both the summer and winter months. This growth will increase the hydraulic and constituent loading to the treatment plant. To understand the impacts of this growth, a capacity assessment of the existing wastewater plant is required to properly plan for short and long-term upgrades that may be required to maintain compliance within existing effluent limits.

1.1 Work Scope

The tasks that were completed for this report were as follows:

- Analyze historical data to formulate trends and max flow factors
- Assess the existing capacity of each process unit at the Canmore WWTP
- Assess the capacity of the Canmore WWTP at 5, 15, and 25 year horizons
- Use BioWin modelling to simulate the current and future scenarios

1.2 Objectives

The objective of this capacity assessment report is to identify bottlenecks in the existing processes at the Canmore WWTP. The findings will help steer planning for short and long-term planning of upgrades.

2 Historical Data

The capacity assessment of the process units within the Canmore WWTP relies on plant data to determine existing flows and loads entering the facility. The historical data was synthesized from 2017 to 2021 to establish various flow rates and loading scenarios to assess the plant and individual process units to determine the capacity at existing conditions. The established historical data is also used as the baseline flows and loadings for future projections at the 5, 15 and 25 year horizons.

2.1 Population

The reported population for the Town of Canmore was 19,865 in 2021 inclusive of permanent and non-permanent residents. The population for the Town of Canmore has been projected for the time intervals of 5, 15, and 25 years; the following table illustrates the projections for the population.

Table 2-1: Population Projections

Population	Current	2027	2037	2047
Permanent	15,990	20,982	25,308	27,758
Non-Permanent	3,875	5,820	10,462	16,982
Total	19,865	29,802	35,770	44,740

With these population projections, future flows and loadings entering the WWTP will be determined in the proceeding sections, and then the plant can be deemed to have sufficient capacity or require upgrades to handle the future flows and loadings.

2.2 Influent Flowrate

The influent flowrates were analyzed for the study period from 2017 to 2021 (Table 2-2). The annual average daily flow (ADF) for the study period corresponded to a per capita wastewater generation rate of 435 L/p/d. As the population of Canmore is set to increase (Table 2-1), the flows entering the WWTP will increase. The future flow projections were based on a historic per capita wastewater generation of 435 L/p/d, which is close to the general typical value of 450 L/p/d for planning purposes.

The more granular flows were analyzed for max month flow (MMF), peak daily flow (PDF) and peak hourly flow (PHF). From Figure 2-1 the peak flow occurs during June of each year. This is likely due to the large snow melt that occurs around the Canmore area that contributes to elevated extraneous flows entering the sanitary system. Extraneous flows are common for most communities and are typically challenging to identify and quantify. At Canmore, the peaks are relatively consistent over the five-year period and isn't during a noticeably high traffic time of year. This indicates the primary source of the peak flows is likely driven by the spring freshet.

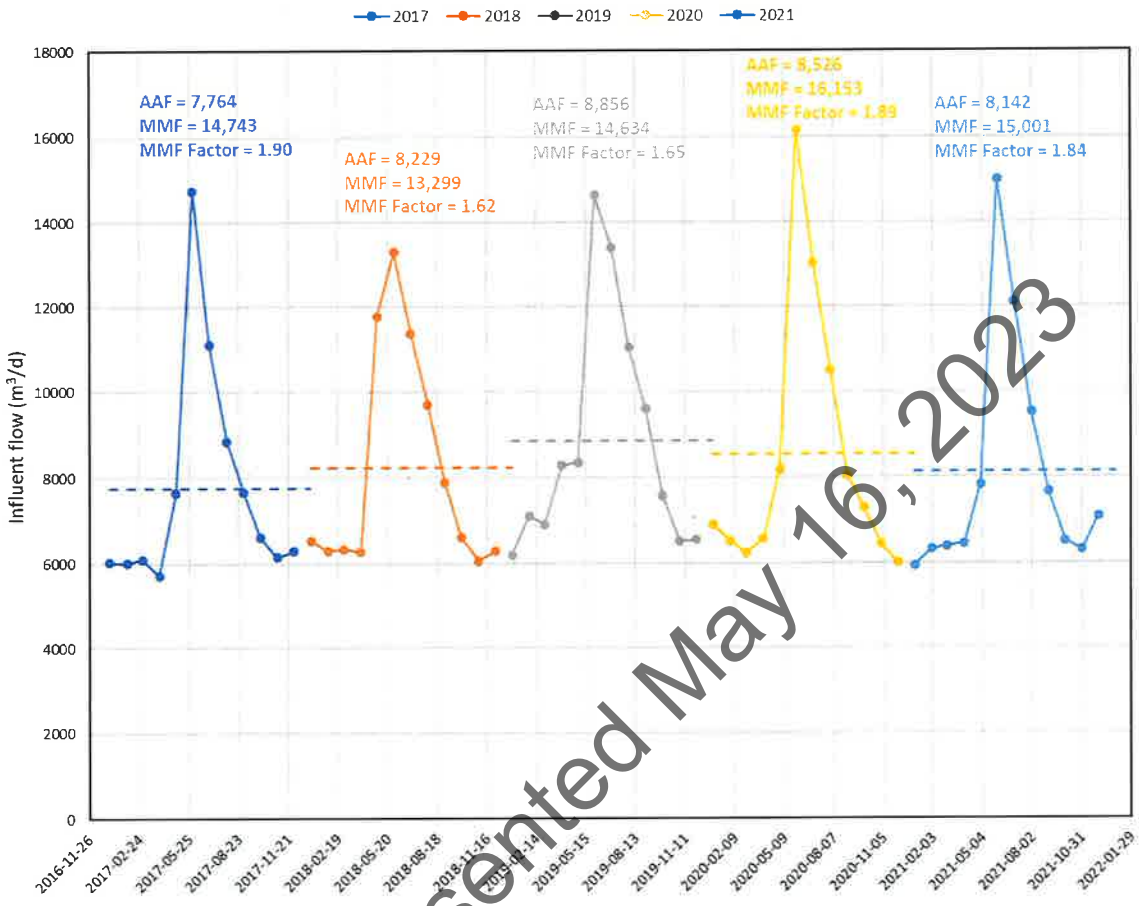


Figure 2-1: Historic Influent Flows for 2017 – 2021

The future MMF, PDF, and PHF were calculated using the historic ratios of each parameter to the ADF. The calculated peaking factors (PF) for the MMF is higher than typically observed, however, the PDF and PHF are within typical expectations for a network this sized facility. These factors were carried forward to the future projected flows as the design basis.

Table 2-2: Canmore WWTP Design Influent Flows

	2017 - 2021	2027	2037	2047
Average Annual Flow – ADF (ML/d)	8.3	11.3	15.2	19.1
Maximum Monthly Flow – MMF (ML/d)	16.2 (PF 1.95)	22.0	29.6	37.2
Peak Daily Flow – PDF (ML/d)	20.9 (PF 2.52)	28.5	38.3	48.1
Peak Hourly Flow – PHF (ML/d)	30.2 (PF 3.64)	41.1	55.4	69.5

2.3 Influent Characteristics

At the Canmore WWTP, the characteristics regularly measured in the influent water are biological oxygen demand (BOD), chemical oxygen demand (COD), total suspended solids (TSS), total ammonia nitrogen (TAN), and total phosphorus (TP). The following graphs present the historic loading of these constituents for the past 5 years (2017-2021). The constituent loadings are used to size biological process units; hence it is important to understand the monthly loadings to assess the capacity during the "worst-case scenario". For all parameters, the maximum influent loadings typically occur in the summer months (July-August) of each year, correlating with the increased tourist population during these months.

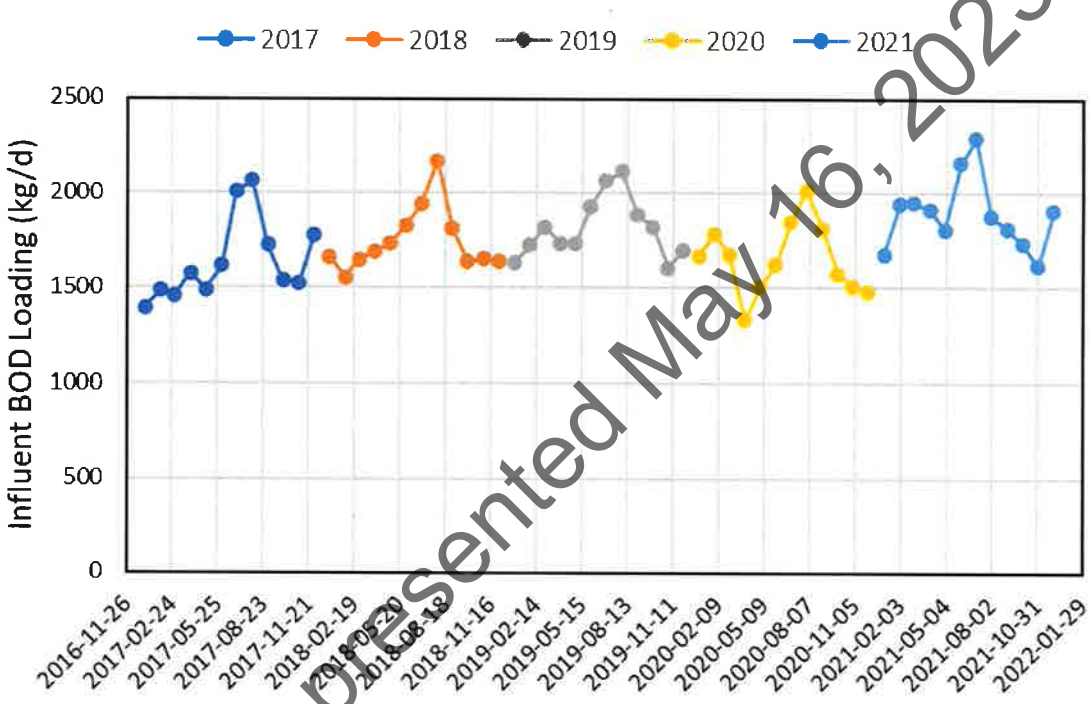


Figure 2-2: Influent BOD Loading from 2017-2021

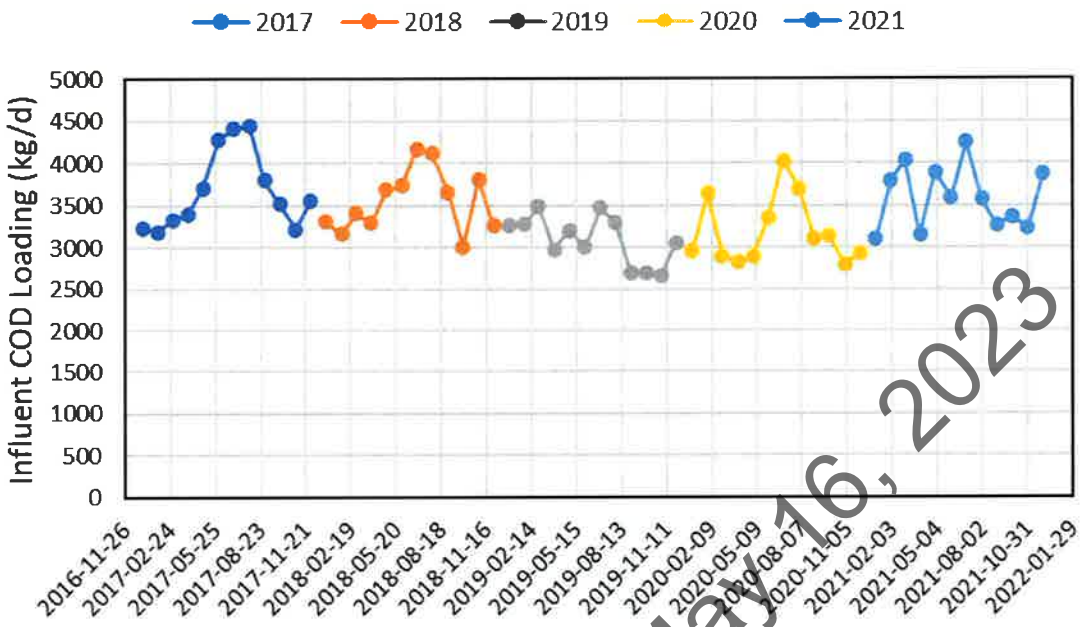


Figure 2-3: Influent COD Loading from 2017-2021

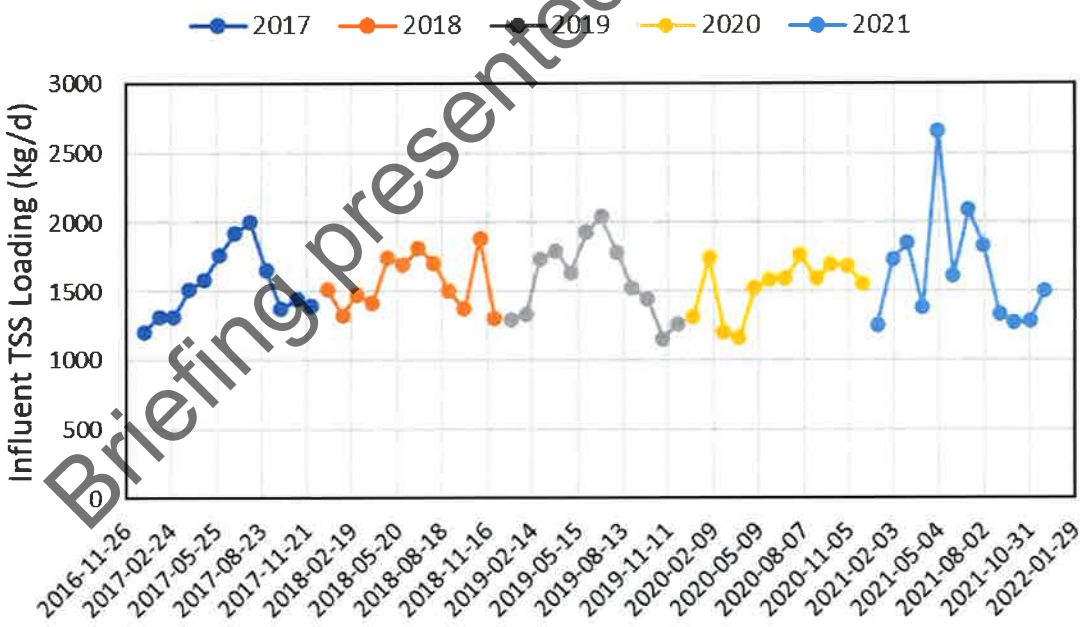


Figure 2-4: Influent TSS Loading from 2017-2021

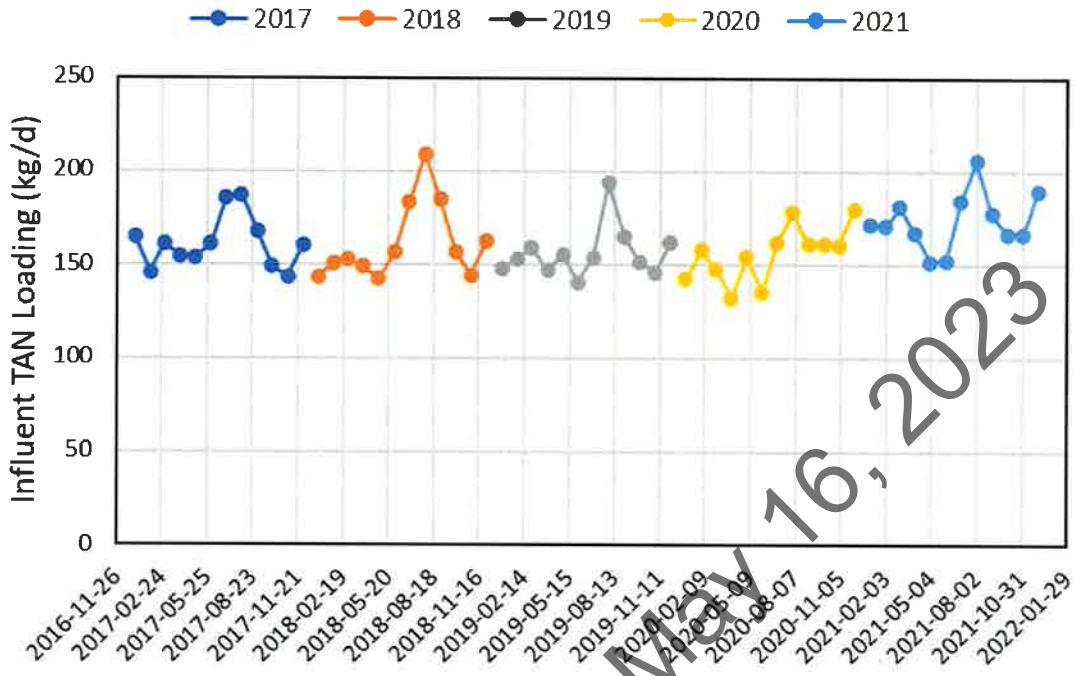


Figure 2-5: Influent TAN Loading from 2017-2021

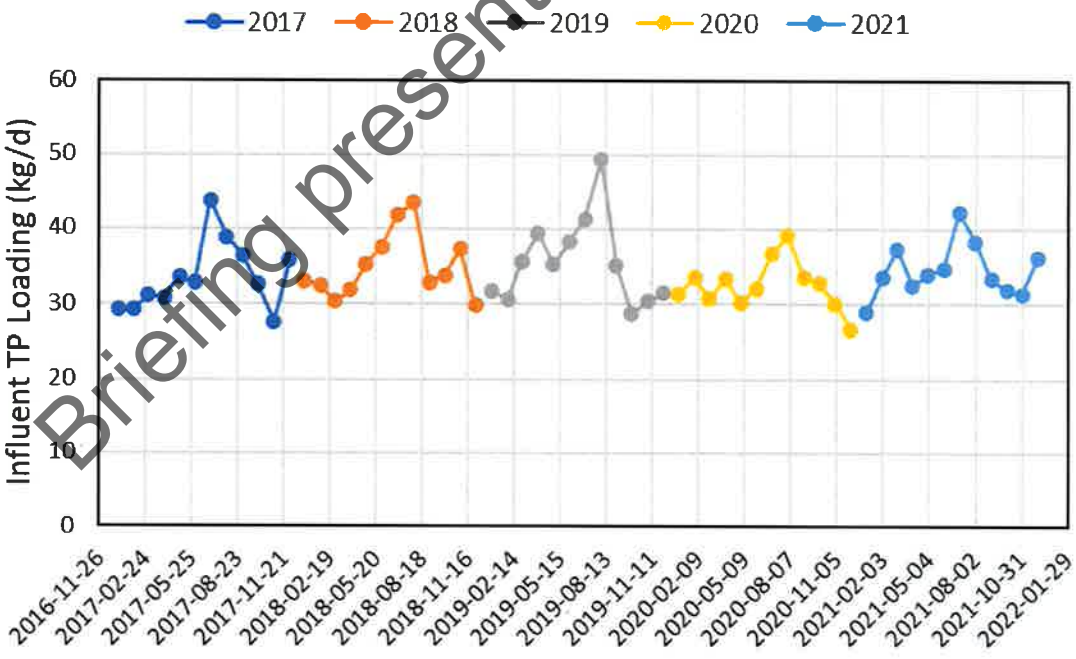


Figure 2-6: Influent TP Loading from 2017-2021

2.4 Existing Plant Performance Limits

Currently EPCOR and the Alberta Environment and Parks are in discussion about the future effluent regulations to which the Canmore WWTP must adhere. The current effluent regulations are shown below.

Table 2-3: Current Canmore WWTP Effluent Limits

Parameter	Effluent Limit
$cBOD_5$	≤ 20 mg/L (1)
TSS	≤ 20 mg/L (1)
TAN	≤ 5 mg/L (1) (Jul – Sep) ≤ 10 mg/L (1) (Oct – Jun)
TP	≤ 1.0 mg/L (1)
Faecal Coliform	≤ 200 per 100 mL (2)

Notes:

(1) Monthly arithmetic mean of daily composite samples

(2) Monthly geometric mean of daily grab samples

2.5 Effluent Characteristics

The following graphs compare the Canmore WWTP effluent limits (Table 2-1) to the historic average daily effluent data for $cBOD_5$, TSS, TAN, TP, and fecal coliforms per month for the past 5 years (2017-2021).

The plant is consistently below the 20 mg/L effluent limits for BOD and TSS. Higher effluent TSS concentrations are typically recorded in spring (March-June) of each year, indicating that the plant's process units may be hydraulically strained by high flows during these months.

In 2017, the TAN effluent concentration exceeded the 10 mg TAN/L limit between January and March and exceeded the 5 mg TAN/L limit between July and September. It is important to note that in 2017 several BAFs had to be taken offline for operational maintenance and repair, artificially reducing capacity, and resulting in higher effluent TAN concentrations. Between 2018 to 2021 the plant exceeded the TAN limit of 5 mg TAN/L in summer on two occasions, July and August of 2021, with effluent concentrations of 5.04 and 6.54 mg TAN/L respectively.

The plant has historically achieved adequate TP levels in the effluent. While Figure 2-10 shows a trend of increasing TP levels in the effluent stream from the plant, the concentration of TP has not exceeded the allowable 1 mg/L over the last 5 years.

From Figure 2-16, it can be observed that the Canmore WWTP has approached or past the effluent regulation limit for fecal coliform of 200/100 mL on several occasions throughout the last 5 years. An upgrade to UV disinfection is planned to meet the allowable limit of fecal coliforms in the effluent.

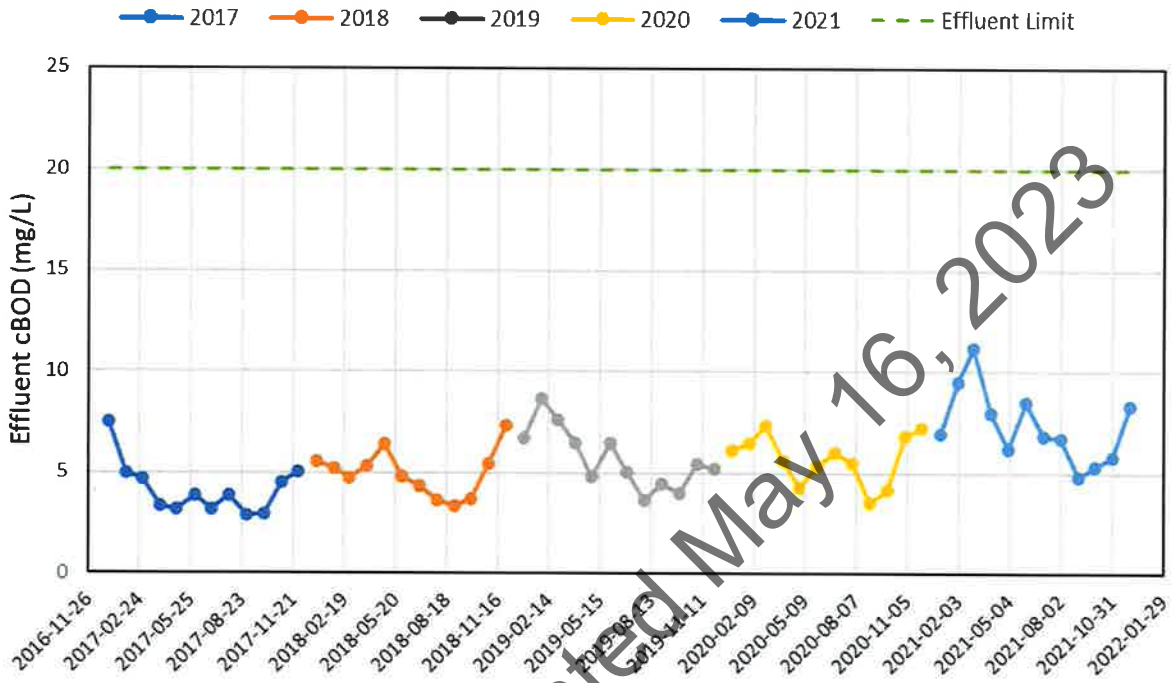


Figure 2-7: Effluent BOD level from 2017 – 2021

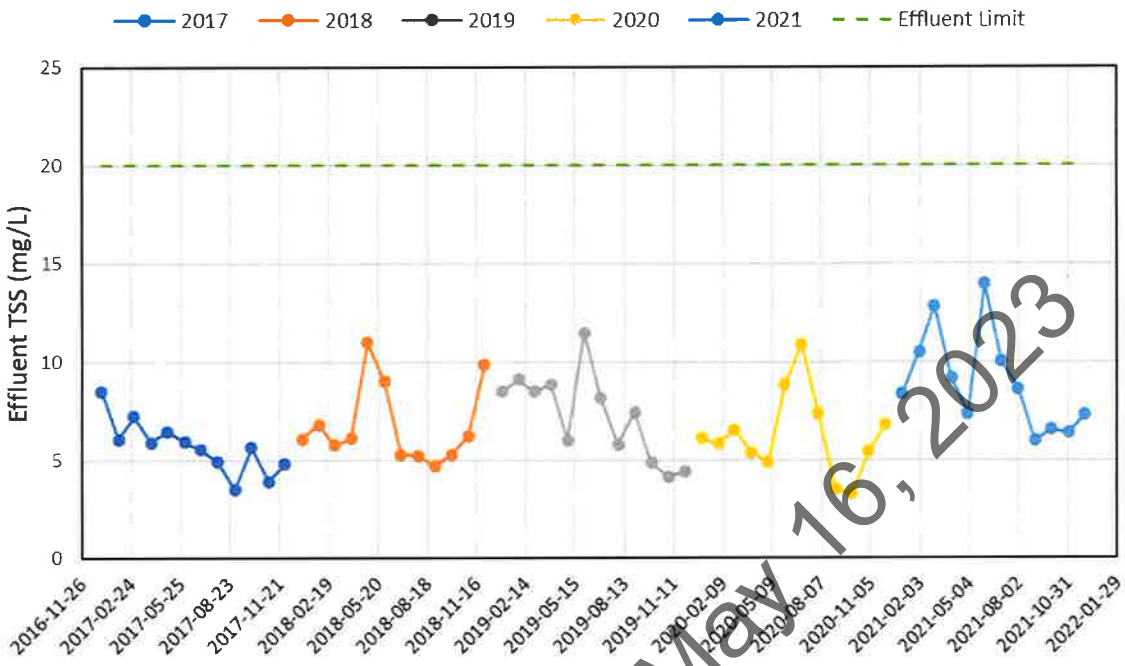


Figure 2-8: Effluent TSS level from 2017 – 2021

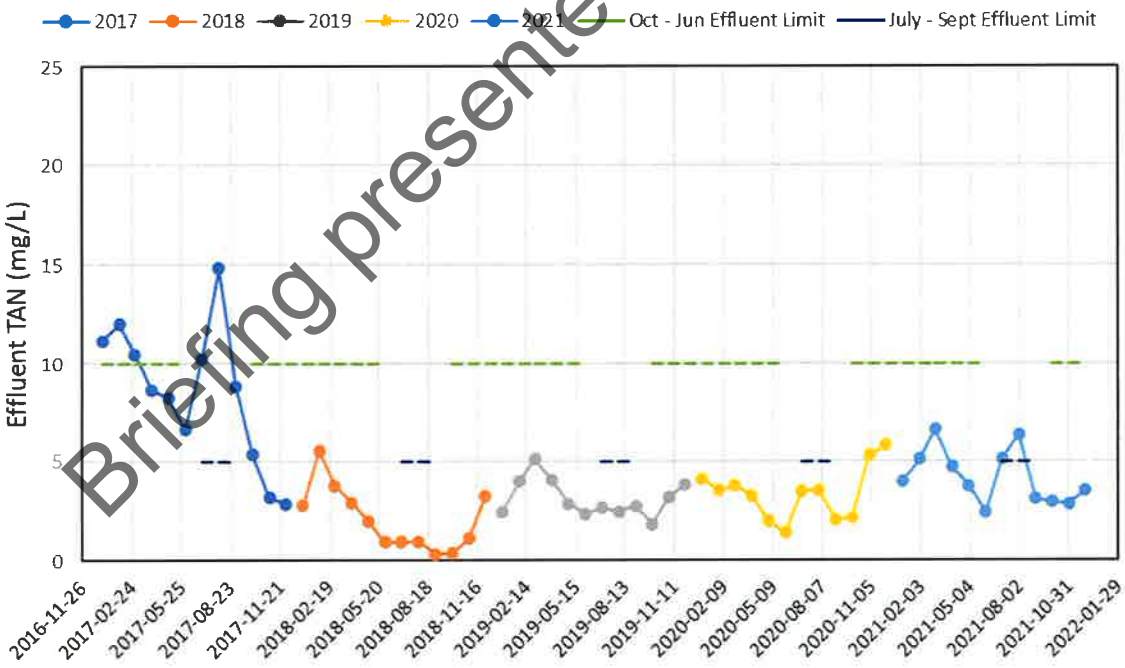


Figure 2-9: Effluent TAN level from 2017 – 2021

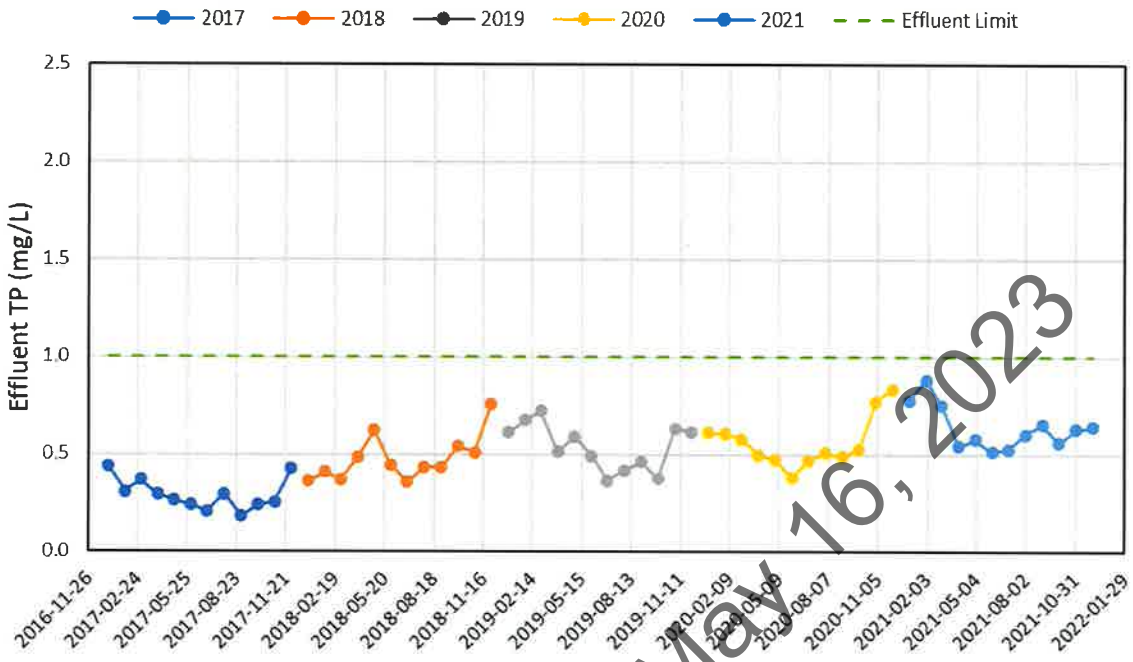


Figure 2-10: Effluent TP level from 2017 – 2021

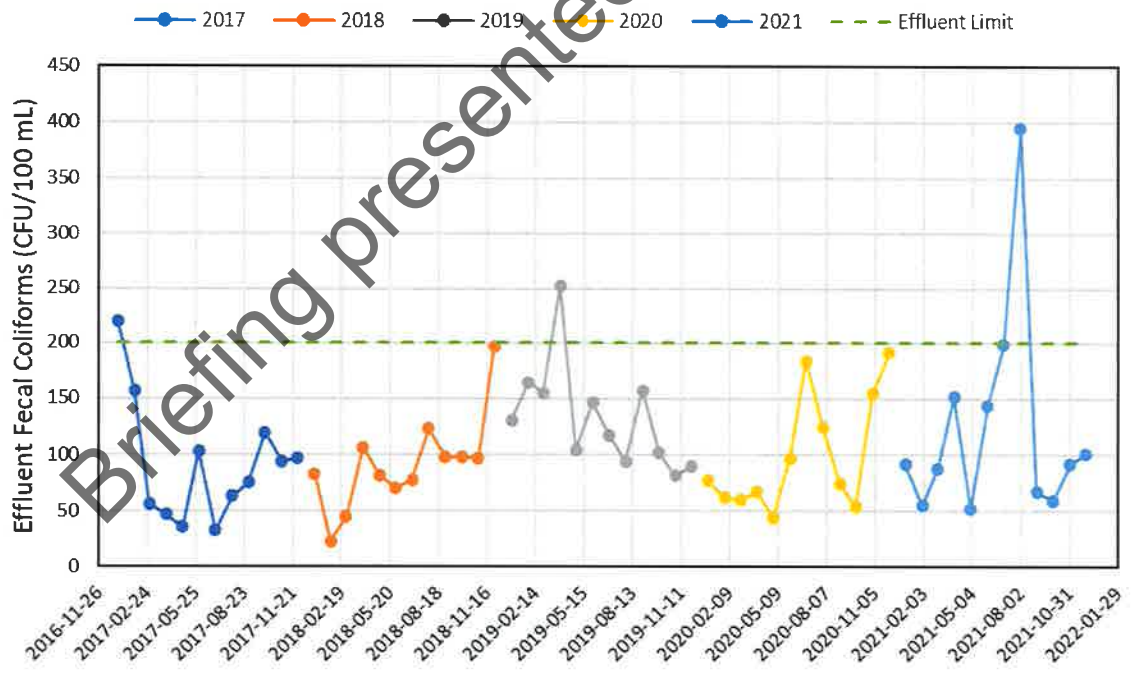


Figure 2-11: Effluent Fecal Coliform level from 2017 – 2021

3 Existing Plant Summary

Table 3-1 outlines the current equipment at the Canmore WWTP along with the rated capacities for each instrument and unit process.

Table 3-1: Canmore WWTP Design Data

Component	Current Available Capacity
Design Population	
Permanent Population	15,990
Non-Permanent Population	3,875
Total	19,865
Influent Characteristics	
Flows	
ADF, ML/d	8.3
MMF, ML/d	16.2
PDF, ML/d	20.9
PHF, ML/d	30.2
Loads	
BOD	
Average, kg/d	1,754
Maximum Month Factor	1.22
TSS	
Average, kg/d	1,574
Maximum Month Factor	1.31
TAN	
Average, kg/d	162

Component	Current Available Capacity
Maximum Month Factor	1.20
TP	
Average, kg/d	34.4
Maximum Month Factor	1.27
Equalization Tank	
Tank Cells	2
Tank Volume (total), m^3	440
Number of Overflow Pumps	2
Capacity per Pump, L/s	17.1
Power per Pump, KW	2.2
Influent Pumping	
Pump 100 C/D	
Number of Pumps	2
Capacity per Pump, L/s	105
Power per Pump, KW	18.7
Pump 100 A/B	
Number of Pumps	2
Capacity per Pump, L/s	190
Power per Pump, KW	37.3
Total Capacity, ML/d	50.9
Total Firm Capacity, ML/d	34.6

Component	Current Available Capacity
Mechanically Cleaned Bar Screens	
Number of Screens	2
Bar Opening, mm	6 (primary) 15 (bypass channel)
Width, mm	1,000
Water Depth, mm	1,050
Capacity per unit, ML/d	34.0
Grit/Scum Removal (Spiral Roll)	
Number of Chambers	1
Number of Sumps per Chamber	4
Volume, m^3	128
Capacity, ML/d	35.0
Alum Addition System	
Number of Pumps	2
Capacity per Pumps, L/min	4.0
Alum Storage, m^3	27.3
Polymer Addition System	
Number of Pumps	2
Capacity per Pumps, L/min	7.8
Primary Clarifiers	
Number	2
Dimensions	

Component	Current Available Capacity
Length, m	33.0
Width, m	6.6
Depth, m	5.0
Surface area per Clarifier, m^2	218
Volume per Clarifier, m^3	1,089
Automatic Curved Arc Screens	
Number of Screens	2
Screen Opening, mm	2.4
Width, mm	1,000
Water depth, mm	1,000
Capacity per Unit, ML/d	46.0
Biological Aerated Filters	
C-side Filters	
Number	5
Cell Dimensions	
Media Depth, m	2.5
Surface Area, m^2	40
Media Volume, m^3	100
N-side Filters	
Number	5
Cell Dimensions	
Media Depth, m	2.5

Component	Current Available Capacity
Surface area, m^2	40
Media Volume, m^3	100
Intermediate Pumps (P-312 A/B)	
Number	2
Capacity per Pump, L/s	128
Size per Pump, kW	9.5
Firm Capacity, ML/d	22.1
Aeration Blower	
Number	10
Capacity per Blower, m^3/h	440
Size per Blower, kW	18.7
Backwash Pumps (P-310 A/B & P-311)	
Number	3
Capacity per Pump, L/s	111
Size per Pump, kW	12.8
Backwash Waste Pumps (P-313 A/B/C)	
Number	3
Capacity per Pump, L/s	36.1
Size per Pump, kW	7.5
Backwash Blower	
Number	3
Capacity per Blower, m^3/h	1,400

Component	Current Available Capacity
Size per Blower, kW	45.0
Backwash Waste Tank	
Volume, m^3	460
Intermediate Transfer tank	
Volume, m^3	305
Recirculation Pumping (P-316 A/B)	
Number of Pumps	2
Capacity per Pump, L/s	56
Power per Pump, kW	7.5
Total Capacity, ML/d	9.7
UV Disinfection	
UV Transmissivity, %	65
UV Dosage, mWs/cm^2	22.4
Number of Channels	2
Number of Banks per Channels	1
Number of Lamps per Channels	42
Primary Sludge Pumping (P-134 A/B)	
Number of Pumps	2
Capacity per Pump, L/s	11.4
Grease Pumping (P-127, P-136)	
Number of Pumps	2
Capacity per Pump, L/s	11.4

Component	Current Available Capacity
Aerobic Digesters	
Sludge TS Concentration, %	2.2
Number of Reactors	2
Dimensions	
Diameter, m	14.0
SWD, m	7.5
Volume per Reactor, m^3	1,155
Aerobic Digester Blowers	
Number	2
Capacity per Blower, m^3/h	2,108
Size per Blower, kW	75
Digested Sludge Pumps (P-610 A/B)	
Number of Pumps	2
Capacity per Pump, L/s	4.1
Size per Pump, kW	3.7
Dissolved Air Flotation (DAF)	
Number	2
Dimensions	
Length, m	3.6
Width, m	2.1
Total Surface Area, m^2	7.7
Thickened sludge, %	2 - 4

Component	Current Available Capacity
Loading Rate Range, $m^3/m^2/h$	24 – 48
DAF Pumps (P-511 A/B)	
Number of Pumps	2
Capacity per Pump, L/s	50
Size per Pump, kW	11
Centrifuge	
Number	2
Operation hours per day, hr	8
Operation days per week, d	5
Minimum Solids Capture Efficiency, %	95%
Feed Sludge TS Concentration, %	1.8
Designed Firm Capacity, m^3/d	100
Flow Capacity per Centrifuge, m^3/h	29.5
Solid Loading Rate, kg/h	530
Centrifuge Sump Pumps (P-660 A/B)	
Number of Pumps	2
Capacity per Pump, L/s	13.6
Size per Pump, kW	3.7

4 Existing WWTP Capacity Assessment

4.1 Methodology

A capacity assessment aims to evaluate the capacity and performance of each unit process in isolation and in conjunction with the entire treatment train operating as a system. An assessment was conducted in the present report, to determine the capacity of each liquid and solid unit process. The assessment assists in identifying process constraints for further evaluation with operations and planning for upgrades. This capacity assessment in general was based on the current and the future design criteria, historical operational plant data during the study period of 2017 to 2021, equipment data and specifications, and typical design guidelines (MECP Design Guidelines for Sewage Works, 2008; WEF MOP 8, 2009; Metcalfe and Eddy, 2014). The Ontario Ministry of the Environment, Conservation and Parks (MECP) Design Guidelines were used as they recently underwent a comprehensive update for typical treatment performance values and a basis for benchmarking several WWTP unit processes.

4.2 Septage Receiving

The Canmore WWTP receives both wastewater from the sewer system and septage that is trucked to the plant. Historically, the plant receives approximately one truck of septage per day, however this fluctuates throughout the year. The septage that arrives at the plant is deposited upstream of the influent lift station or at the equalization tank. Septage flows and concentrations are quantified by the plant's influent sampler, thus are included in the plants' influent flows and loading values.

If the septage is received upstream of the influent lift station, the wastewater and septage enter the plant in the usual manner and go through all the plant's process units for treatment. If the septage is received at the equalization tank, it must pass through a screen to remove any large objects and flows to the influent well so that it can be pumped through the plant for treatment.

4.3 Equalization Storage

An equalization tank was installed at the Canmore WWTP to offer equalization and surge protection in the event of a power failure. The tank has a volume of 440 m^3 and is capable of storing diverted flows from the influent wet well for up to 30 minutes during high flow periods. The equalization tank contains two cells, one larger cell for overflow and surge protection, while the second cell is smaller, and acts as a septage receiving cell.

The overflow cell of the tank has two submersible pumps each with a capacity of 17.1 L/s, that return the overflow wastewater to the influent lift station so that it can be pumped through the plant for treatment.

Due to the anticipated increase in flows over the next 25 years, additional equalization capacity may be required to maintain 30 minutes of storage during high flow periods and mitigate plant bypass events. It's important to note, significant plant upgrades may negate the need for an EQ tank for buffering peak flows.

4.4 Influent Pumping

The influent lift station transfers wastewater from the collection system to the head of the WWTP. There are currently four submersible influent pumps in the influent lift station. Two of the pumps have a capacity

of 105 L/s, while the other two pumps have a capacity of 190 L/s. The firm capacity (one of the larger pumps out of service) of the influent pumps is 34.6 ML/d.

The most recent upgrade to the influent pumps occurred in 2015 when two 105 L/s pumps were replaced with the current 190 L/s pumps. This upgrade ensured that the plant has sufficient influent pumping for the historical peak hourly flows of the plant, which are 30.2 ML/d (see Table 3-1). However, with the expected population increase in the Canmore area, future upgrades may be required to meet the projected peak hourly flows.

4.5 Screening

Screening is an important process of WWTPs as the screens remove large debris that could harm or clog downstream processes. At the Canmore WWTP, currently there are two screens that are used. The primary screen is a 6 mm mechanically cleaned bar screen, while the second screen, located in the bypass channel, has is manual with an opening of 15 mm. The mechanical bar screen has a rated capacity of 34 ML/d which is currently sufficient to meet plant's historical peak hourly flows.

As only the primary screen is typically in service, the Canmore WWTP will likely have insufficient screening capacity for the future flows. In future, replacement of the 15 mm bypass screen with a 6 mm mechanically cleaned bar screen may be required to provide sufficient capacity and redundancy.

4.6 Aerated Grit Chamber

From screening, the wastewater then passes into the aerated grit chamber with a rated capacity of 35 ML/d. The historical operating conditions for the grit chamber were reviewed and summarized in Table 4-1. At historical peak hourly flows of 30.2 ML/d, the hydraulic retention time (HRT) in the grit chambers is estimated to reach 6.1 minutes, which is greater than the 2 to 5 minutes recommended range by the Ministry of the Environment, Conservation and Parks (MECP) Design Guidelines (2008). The original design capacity of 35 ML/d results in an HRT of 5.26 min. The longer retention time will not degrade performance, hence the grit chambers are adequate for the existing capacity.

Table 4-1 Historical Operating Conditions of Aerated Grit Chamber (2017-2021)

Parameter	Historical Value	Typical Design Value[1]
Total Grit Chamber Volume	128 m^3	N/A
Rated Capacity	35 ML/d	N/A
Historical PHF	30.19 ML/d	N/A
Historical HRT at PHF	6.11 min	2 – 5 min
Original Design HRT	5.26 min	2 – 5 min

Note: (1) Based on MECP Design Guidelines for Sewage Works (2008).

The grit chamber is also responsible for fat, oil, and grease (FOG) removal at the Canmore WWTP. The grit chamber achieves FOG removal through fine bubble diffusion, a process that attaches air to the FOG and then floats it to the surface so that grease pumps can transfer the FOG to sludge processing.

4.7 Chemical Injection Systems

Alum is currently added to the wastewater prior to the primary clarifiers. The injection of alum to the wastewater provides phosphorus removal, while enhancing the suspended solids removal within the primary clarifiers. Typically, the concentration of alum added to the system is between 20 – 180 mg/L, dependent on influent flow.

The current effluent regulation for phosphorus is 1 mg/L, and while the Canmore WWTP is currently meeting this regulation, if the regulation decreased to 0.5 mg/L, additional alum or a tertiary treatment process may be required to enhance removal rates.

4.8 Primary Clarifiers

The primary clarifiers each have a surface area of 218 m^2 and treat both the primary wastewater and excess filter backwash that cannot be treated by the dissolved air flotation (DAF) system. The role of these clarifiers is to remove a significant portion of both BOD and TSS from the wastewater through settling. Prior to the addition of side stream treatment for the BAF backwash, it the backwash was contributing more than 50% of the solids loading to the primary clarifiers. With the addition of the dissolved air flotation (DAF) for BAF backwash treatment, the solids loading to the primary clarifiers from the filter backwash has decreased, allowing the clarifiers to run at higher overflow rates. The effluent from the DAF can also be re-introduced to the system downstream of the clarifiers, further lessening the load on the clarifiers.

The historical operating conditions of the primary clarifiers between 2017 – 2021 are summarized in Table 4-2. The historical ADF and PDF surface overflow rate (SOR) are nearing the low end of typical MECP design guidelines for primary clarifiers not receiving waste activated sludge (WAS).

Table 4-2 Historical Operating Conditions of Primary Clarifiers (2017-2021)

Parameter	Historical Value	Typical Design Value[1]
Number of Clarifiers	2	N/A
Total Clarifier Surface Area	436 m^2	N/A
Historical Primary Influent ADF[2]	11.7 ML/D	N/A
Historical Primary Influent PDF[2]	26.1 ML/D	N/A
Historical SOR at ADF	26.9 $m^3/m^2/d$	30-40 $m^3/m^2/d$
Historical SOR at PDF	59.8 $m^3/m^2/d$	60-80 $m^3/m^2/d$

Parameter	Historical Value	Typical Design Value[1]

Note:

(1) Based on MECP Design Guidelines for primary clarifiers not receiving WAS
(2) Includes BAF Backwash Waste Recycle Flow

The historical primary clarifier performance was reviewed and is summarized in Table 4-4. The primary clarifiers have produced a primary effluent of relatively good quality, with a BOD_5 and TSS removal rate of approximately 45% and 64%, respectively. In general, the performance of the primary clarifiers is between a conventional primary clarifier with no chemical addition and chemically enhanced primary treatment (CEPT).

Table 4-3 Historical Primary Clarifiers Performance (2017-2021)

Parameter	Average Concentration[1]		Removal Efficiency[1]	Typical Design Value[2]
	Influent	Effluent		
BOD_5	227 mg/L	125 mg/L	45%	Clarifiers with chemical addition: 45% to 85% BOD_5 removal 60% to 90% TSS removal Clarifiers without chemical addition: 35% to 65% BOD5 removal 40% to 70% TSS removal
TSS	201 mg/L	73 mg/L	64%	

Note:

(1) Based on average historical concentration values of 2017 to 2021.
(2) Based on MECP Design Guidelines for Sewage Works (2008).

The existing primary clarifiers are limited by both ADF and PDF SOR, since the estimated values are higher than the historical average and peak flows of the plant (presented previously in Table 4-2). The historic operation of the primary clarifiers suggest that they are operating near the low end of the typical design value for both the SOR at ADF and PDF without co-thickening. This may be due to the influence of the recycle line from the DAF or the composition of the raw sewage that is not allowing the clarifiers to operate as efficiently as they could. To help alleviate some of this stress, another primary clarifier could be added to the WWTP.

The capacity of the primary clarifiers was evaluated based on an ADF SOR of 40 $m^3/m^2/d$ and a PDF SOR of 80 $m^3/m^2/d$ (MECP, 2008). The capacity assessment results are summarized in Table 4-3.

Table 4-4 Capacity Assessment for Primary Clarifiers

Parameter	Evaluation criteria[1]	Estimated Capacity
SOR at ADF	40 $m^3/m^2/d$	17.4 ML/d
SOR at PDF	80 $m^3/m^2/d$	34.9 ML/d

Note:

(1) Based on MECP Design Guidelines for primary clarifiers not receiving WAS

The clarifier inlet channel requires an isolation sluice gate valve to provide maintenance. This sluice gate can be installed as part of maintenance works or grouped into a capital upgrade.

4.9 Primary Effluent Screening

Prior to entering the BAFs, primary effluent passes through automatic arc screens, with 2 mm openings. The purpose of these screens is to remove any large objects that have made it through the clarifying process that could harm or negatively affect the biological aerated filters. The capacity of these screens is 46.0 ML/d, while providing 100% redundancy.

4.10 Biologically Activated Filters

Following the primary effluent screens, the wastewater enters the biologically activated filters. The Canmore WWTP has a two stage BAF system comprised of five (5) C – side filters, along with five (5) N – side filters. The C – side filters remove suspended solids and BOD from the water, while the N – side filters remove ammonia – nitrogen from the wastewater. The two-stage system provides reliable treatment for BOD and TSS, while any carryover of carbon inhibits the N stage process for nitrification.

All ten (10) filters are the same within the BAF system; each with a surface area of 40 m^2 and a media depth of 2.5 metres. The wastewater first enters the C – side filters through the influent channels, where it flows up through the media and then overflows to the effluent channels and is then transferred to the intermediate transfer tank. The wastewater is then pumped to the N – side filters where the process is repeated, and the effluent from the N – side filters flows to the UV reactors for disinfection.

The BAF system is not equipped with an anoxic zone and any requirement to denitrify will require downstream biological processes with carbon addition or the addition of a pre-denitrification reactor.

The primary clarifiers are precipitating phosphorus upstream of the BAF. There must be a residual P content for the biological system in the BAF to function properly. This limits the effluent TP concentration that can be reliably achieved without causing system upsets. In general, the BAF can achieve 0.5 to 0.7

mg P/L for periods, however, sustained operation below 0.5 mg P/L is not practical. It is anticipated increased flows will require the effluent phosphorus concentration to be decreased to maintain a similar loading to the river. Downstream tertiary filtration is likely required to achieve the lower effluent limits irrespective of the BAFs biological capacity.

4.10.1 General Characteristics and Main Equipment

As wastewater is filtered and treated through the BAF system, suspended solids and organic material builds up in the filters. To counteract this, the C – side BAF cells are backwashed every 14 – 24 hours, while the N – side BAF cells are backwashed every 24 – 48 hours. Performing backwashes helps remove built up organic material and helps to maintain optimal filter performance.

Losing filter media during backwashing can be a problem some WWTPs encounter. The Canmore WWTP has a media screen in each BAF cell, reducing the volume of media lost, as losing media decreases BAF performance, thus decreasing effluent quality. The media loss per year is less than 3% due to the media screens.

The equipment that is required for the operation of the BAF include the intermediate well, blowers, a backwash well, backwash blowers, and backwash waste pumps. The following subsections will discuss each of these components.

4.10.2 Design Loading and Overall Performance

The historical operating conditions for the BAF system are summarized in Table 4-10.

Table 4-5 Historical Operating Conditions of the BAF System (2017-2021)

Parameter	Historical Value	Typical Design Value
C-side BAF Filters		
Number of Filters	5	
Surface Area per Filter	40 m^2	
Media Volume Per Filter	100 m^3	
Historical Hydraulic Loading Rate at MinF	2.0 $m^3/m^2/h$	2 – 10 $m^3/m^2/h$ (1)
Historical Hydraulic Loading Rate at ADF	4.4 $m^3/m^2/h$	(Average = 6 $m^3/m^2/h$)
Historical BOD_5 Loading Rate at ADF	5.1 kg/m^3	3 – 7 kg/m^3 (2)
Historical BOD_5 Loading Rate at MMF	10.7 kg/m^3	(Average = 5 kg/m^3)
Historical TSS Loading Rate at ADF	2.9 kg/m^3	3 – 7 kg/m^3 (2)

Parameter	Historical Value	Typical Design Value
Historical TSS Loading Rate at MMF	7.6 kg/m^3	(Average = 5 kg/m^3)
N-side BAF Filters		
Number of Filters	5	
Surface Area per Filter	40 m^2	
Media Volume Per Filter	100 m^3	N/A
Historical Hydraulic Loading Rate at MinF	2.0 m^3/m^2/h	2 – 10 m^3/m^2/h (1)
Historical Hydraulic Loading Rate at ADF	4.4 m^3/m^2/h	(Average = 6 m^3/m^2/h)
Historical TKN Loading Rate at ADF	0.8 kg/m^3	0.5 – 2 kg/m^3 (2)
Historical TKN Loading Rate at MMF	1.3 kg/m^3	(Average = 1.25 kg/m^3)

Note:

(1) Based on BAF Operation and Maintenance Manual (Degremont Technologies, 2008)
(2) Based on Degremont Technologies recommendations (Stantec, 2012)

The capacity of the BAF system was evaluated based on both the hydraulic loading rate (HLR) and the organic loading rate (OLR). These capacities were evaluated at the average HLR and OLR values recommended by the vender of the technology, Degremont Technologies, for C- and N-side BAF filters. The results are summarized in Table 4-11.

Table 4-6 Capacity Assessment of BAF Systems

Parameter	Evaluation Criteria (1,2)	Estimated Capacity
C-side BAF Filters		
Average HLR	6 m^3/m^2/h	28.8 ML/d
Average OLR	5 kg/m^3	20.1 ML/d
N-side BAF Filters		
Average HLR	6 m^3/m^2/h	28.8 ML/d

Parameter	Evaluation Criteria [1,2]	Estimated Capacity
Average OLR	1.25 kg/m^3	32.7 ML/d

Note:

(1) Based on BAF Operation and Maintenance Manual (Degremont Technologies, 2008)
(2) Based on Degremont Technologies recommendations (Stantec, 2012)

The average estimated HLR capacity of the plant is higher than BAF historical combined influent ADF, 20.9 ML/d (as presented in Table 4-6). As for the OLR capacity, the estimated C-side BAF filters capacity is lower than historical ADF capacity of the BAF, while higher loading capacity for N-side BAF filters is observed. The BAF filters are therefore limited by the C-BAF average organic loading rate, which would gradually affect the overall treatment performance of the BAFs. In fact, with the population rise and the expected increase of organic loadings to the BAF, the C-side BAF would have less available capacity and thus, the untreated organic matter would pass into the N-side BAF. This could result in lower nitrification efficiency of the N-BAF and therefore, producing a higher final effluent TAN concentration.

The operations staff at the Canmore WWTP has also been experiencing issues with the BAFs during the backwash stage of the filters. Periodically during backwashing, media from the BAFs can be propelled into the air and land outside of the BAF units. This is coupled with the aeration of the BAFs being uneven in some of the tanks, leading to possible short circuiting within the BAFs. With media being propelled into the air during backwash, and uneven aeration, it is possible the BAFs are experiencing consolidation and clogging of the media. The BAF O&M manual suggests that a probable cause due to uneven process air distribution with violent local bubbling could be due to a leak in the aeration system. The course of action recommended in the manual is to empty the media from the cell and change any defective parts as required. Several of the C-Side filters were emptied and replaced within the last 5 years and the problem is persisting.

4.10.3 BAF Influent and Effluent

The BAFs is the heart of the process of the Canmore WWTP as they remove large portions of the BOD, TSS, and ammonia – nitrogen that remain in the wastewater after primary clarification. As the BAFs play a critical role in the removal of these wastewater parameters, they are important for the effluent water characteristics and ensuring that the effluent wastewater regulations are met. This section will discuss both the BAF influent and BAF effluent wastewater characteristics.

The wastewater that enters the BAF consists of primary clarified water, water from the backwash waste tank, a portion of the effluent wastewater from the DAF, and a BAF recycle line. The historical BAF combined influent flows and loadings are summarized in Table 4-6.

Table 4-7 Historical BAF Combined Influent Flows and Loadings (2017-2021)

Parameter	Historical Value
Flows (ML/d)	
ADF	20.9
MMF	28.7
PDF	42.5
PHF	46.1
MinF	9.4
Loads (kg/d)	
BOD_5 Loads	
Average Annual	2,545
Max Month	5,360
TSS Loads	
Average Annual	1,496
Max Month	3,816
TAN Loads	
Average Annual	398
Max Month	663
TKN Loads	
Average Annual	594
Max Month	989

The loadings are calculated based on the flows and the BAF influent concentration measured before C-side BAF filters. Influent TSS and COD concentrations to the BAFs are measured daily, BOD and TP are measured several days a week, while TAN influent concentrations are measured weekly. These influent concentrations, as well as final effluent concentrations and effluent limits are summarized in Table 4-7.

Table 4-8 Historical BAF System Performance (2017-2021)

Parameter	Average Concentration[1]		Removal Efficiency[1]	Effluent Limits[2]
	Influent	Effluent		
BOD_5	125 mg/L	8.2 mg/L	94%	20 mg/L
TSS	73 mg/L	6.9 mg/L	90%	20 mg/L
TP	2.7 mg/L	0.5 mg/L	81%	1 mg/L
TAN	14 mg/L	4.3 mg/L	69%	< 5/< 10 mg/L (Jul – Sept / Oct - Jun)

Note:

(1) Based on average historical concentration values of 2017 to 2021.
(2) Canmore WWTP Regulatory Effluent Limits

Based on this historical performance evaluation, BAF systems have produced a good quality effluent over the last five years. As shown previously in Section 2.5 of this report, BOD_5, TSS, and TAN average concentration effluent levels have increased slightly during the study period.

Total ammonia nitrogen removal is an important characteristic to consider especially at max month loading scenarios, both in the summer and winter. The loading rates between these two seasons illustrate the range in flow and wastewater characteristics that the Canmore WWTP receives. During the summer flows are high, peaking in June, and most parameters have their highest influent loading rate to the plant in August. During the winter (the months of January, February, March, and December) the water is cooler, the flow to the plant is less on average, while the influent concentration typically does not vary too significantly.

To evaluate the BAFs and their effectiveness, the removal rates of TAN through the BAFs at these max month loading scenarios should be investigated. The following tables highlight the average mass of TAN removed from the BAFs, the average water temperature, average effluent TAN that was discharged from the plant during these max month scenarios, along with the actual and reference removal rates.

Table 4-9: Max Month TAN / TKN Removal

	TAN Removal[1] (kg)	TKN Removal[1] (kg)	Actual Removal Rate[1] (TAN) (kg/m³/d)	Actual Removal Rate[1] (TKN) (kg/m³/d)	Temperature[1] (°C)	Reference Removal Rate[1] (TAN) (kg/m³/d)	Reference Removal Rate[1] (TKN) (kg/m³/d)	Effluent TAN[1] (mg/L)	Effluent TKN[1] (mg/L)
2017	49.97	74.59	0.10	0.15	15.89	0.14	0.20	14.83	22.13
2018	162.55	242.62	0.33	0.49	15.26	0.46	0.69	0.95	1.42
2019	174.34	260.21	0.35	0.52	14.64	0.52	0.77	2.45	3.65
2020	112.78	168.33	0.23	0.34	9.93	0.47	0.70	5.82	8.69
2021	131.22	195.84	0.26	0.39	15.39	0.37	0.55	6.34	9.46
Average	126.17	188.32	0.25	0.38	14.23	0.39	0.58	6.08	9.07

Note:

(1) **Based on Canmore WWTP data from 2017 to 2021**
(2) **TAN/TKN assumed to be 0.67**

Table 4-10: Winter Max Month TAN / TKN Removal

	TAN Removal[1] (kg)	TKN Removal[1] (kg)	Actual Removal Rate[1] (TAN) (kg/m³/d)	Actual Removal Rate[1] (TKN) (kg/m³/d)	Temperature[1] (°C)	Reference Removal Rate[1] (TAN) (kg/m³/d)	Reference Removal Rate[1] (TKN) (kg/m³/d)	Effluent TAN[1] (mg/L)	Effluent TKN[1] (mg/L)
2017	N/A[2]	N/A[2]	N/A[2]	N/A[2]	9.24	N/A[2]	N/A[2]	11.17	16.67
2018	95.68	142.80	0.19	0.29	10.33	0.39	0.58	3.24	4.84
2019	118.05	176.19	0.24	0.35	10.13	0.49	0.73	3.82	5.71
2020	112.78	168.33	0.23	0.34	9.93	0.47	0.70	5.82	8.69
2021	118.06	176.20	0.24	0.35	9.92	0.49	0.74	3.51	5.24
Average	111.14	165.88	0.22	0.33	9.91	0.46	0.69	5.51	8.23

Notes:

(3) Based on Canmore WWTP data from 2017 to 2021

(4) **Values were not recorded in historical data for Winter Max Month Loading**

From the tables above, the Actual Removal rate was calculated from the mass of TAN removed, divided by the volume of media within the biological aerated filters. The reference removal rates were normalized to 20°C to compare the influence of max month loading and winter loading, the two worst case scenarios for the biological treatment.

The max month loading included the adverse event in 2017, which skewed the removal rates lower. Removing this event and using the more typical operational conditions, the temperature corrected removals were equivalent at 0.46 kg TAN/m^3/d or 0.69 kg TKN/m^3/d. In both scenarios, the effluent ammonia concentrations were above 3 mg/L indicating the BAF units were operating near their maximum kinetics. Additional data for dissolved oxygen concentration would confirm this, however, for the purpose of operations the observed ammonia removal rate is 0.46 kg TAN/m^3/d at 15°C during the worst-case scenario operations.

4.10.4 Intermediate Well

The intermediate well is 305 m^3 with three submersible intermediate transfer pumps, two of them sized for 128 L/s and one rated at 111 L/s. The function of these pumps is to transfer C – side BAF effluent to the N – side BAF filter influent via the intermediate tank. These intermediate pumps share a standby unit with the backwash pumps (the one with 111 L/s rated capacity) and are all equipped with VFDs.

The intermediate pumps have a combined firm capacity of 22.1 ML/d. This firm capacity is currently adequate to cope with the average day flow and peak day flows expected at the Canmore WWTP. Depending on the anticipated future flows to the plant, the pumps may need to be replaced such that they have a larger firm capacity to deal with the rise in flow to the plant.

4.10.5 Aeration Blowers

There are ten (10) blowers provide oxygen to the BAF cells. The blowers utilised at the Canmore WWTP are 18.7 kW positive displacement blowers each with a rated capacity of 440 m^3/h, providing a total capacity of 4,400 m^3/d for the BAF system.

The capacity of the aeration system was assessed based on the total capacity of the blowers and an oxygen transfer efficiency (OTE) of 20%, given by the vender in the Operation and Maintenance Manual (Degremont, 2008). Average BAF influent BOD_5 and TKN concentrations were used to calculate the oxygen demand. Then a historical peak diurnal and month loading factor of 1.1 and 2.1, respectively, were applied to the calculated oxygen demand to obtain the maximum (actual) oxygen transfer required (AOTR). The aeration system capacity assessment is summarized in Table 4-5.

Table 4-11 Capacity Assessment of BAF Systems

Parameter	Estimated Capacity	Description
Oxygen Demand	220 kgO_2/h	Systems with nitrification: 1 kg O_2/kg BOD_5+4.6 kg O_2/kg TKN[1]
AOTR	503 kgO_2/h	Oxygen demand x Peak Factors

Parameter	Estimated Capacity	Description
SOTR	1,599 kgO_2/h	Standard Oxygen Transfer Required
OTE	20%[2]	
Air flow required	2,206 m^3 air/h	SOTR x OTE

Note:

(1) Based on MECP Design Guidelines for Sewage Works (2008).
(2) Based on BAF Operation and Maintenance Manual (Degremont Technologies, 2008).

The required air flow estimated is 2,206 m^3air/h, while the blower system has a total rated capacity of 4,400 m^3/h. The existing blower system therefore has adequate capacity to meet the required oxygen demand.

4.10.6 Backwash Well

The Canmore WWTP backwashes one filter at a time, such that the plant can still operate effectively when backwashing is taking place. Within the intermediate transfer tank, there are three backwash pumps, each rated at 111 L/s. One of the backwash pumps is a standby pump that can aid either the backwash pumps or the intermediate transfer pumps as needed. Along with the pumps, the backwash blowers also aid in removing built up organic material from the BAFs.

4.10.7 Backwash Blowers

The backwash blowers aid the backwash pumps in removing organic material from the BAF cells when needed. There are three blowers, each is 45 kW, and they provide air scour during the BAF backwash cycle.

4.10.8 Backwash Waste Pumps

The water that is used during backwashing goes to the backwash waste tank (460 m3) for holding prior to either side stream treatment, DAF, or re-introduction to the system at the head of the plant. The water is pumped to either the DAF or to headworks via three 36 L/s submersible backwash waste pumps. Two of these pumps are used to pump backwash waste to the DAF unit which have a total rated capacity of 6.2 ML/d. The rated capacity of the P-313 backwash return pump is 3.1 ML/d

4.10.9 BAF Recirculation Pumps

To maintain adequate flow to the BAFs, two 200 m3/hr vertical turbine pumps are installed in a wet well downstream of the UV disinfection channels, which provide a hydraulic loading rate of 4 m/hr via a recycle line to the filters. These pumps are designed to operate at variable speeds, and can provide flows between 75 m3/hr to 400 m3/hr.

4.10.10 Treated Effluent Measurement

A 600 mm wide fiberglass Parshall flume is utilised to measure BAF effluent flows. The capacity of the flume is 35.0 ML/d. To increase the future capacity of BAF effluent flow monitoring, an additional Parshall flume or alternative sensor (laser) that reduces hydraulic bottlenecks can be considered.

4.11 DAF System

The DAF system utilizes air to remove suspended matter from the surface of treated water. Dissolving air under pressure (whitewater) is introduced to the influent of the DAF tank along with BAF backwash water. The small air bubbles in the whitewater attach to suspended matter and float to the surface of the tank, where skimmers remove the solids. To encourage clustering of solids and promote removal, coagulant is typically added to the influent water. The treated water is then removed as the effluent, while the sludge that is skimmed from the surface is treated further.

Currently at Canmore WWTP, one DAF tank (AquaDAF) with a total surface area of 7.7 m2 is in operation. According to the vendor, AquaDAF can treat a high loading rate range of 24 to 48 m3/m2/h (AquaDAF* Brochure, Suez). Based on general experiences with these systems, a lower operational loading rate is anticipated, and with the addition of polymer to the DAF, the historic HLR of 9.4 m3/m2/h (Table 4-12) is within the anticipated range. The historical operating conditions for the DAF tank are summarized in Table 4-12. The operational schedule of DAF was assumed to be 24 hours per day and 7 days per week.

Table 4-12 Historical Operating Conditions of DAF (2017-2021)

Parameter	Historical Value	Typical Design Value[1]
Number of DAF tanks	1	N/A
Total Surface Area	7.7 m^2	N/A
Solid Capture	90%[2]	N/A
Historical Annual Average Waste Secondary Sludge (WSS) Feed	1,826 kg/d	N/A
Historical Max Month Waste Secondary Sludge (WSS) Feed	2,221 kg/d	N/A
Historical Average DAF Feed Flow	1.72 ML/D	N/A
Historical Average Solid Loading Rate (SLR)	9.9 $kg/m^2/h$[3]	10 $kg/m^2/h$
Historical Average Hydraulic Loading Rate (HLR)	9.4 $m^3/m^2/h$[4]	6.3 $m^3/m^2/h$

Parameter	Historical Value	Typical Design Value[1]

Note:

(1) Based on MECP Design Guidelines for Sewage works (2008).
(2) **Based on AquaDAF* Brochure (Suez).**
(3) Based on historical average waste sludge generated in the BAF backwash waste tank (1,826 kg/d).
(4) Based on historical influent flows to the DAF (1.72 ML/d), recorded by the flow meters F/T 504 and F/T 514.

The DAF tank has operated at SLR value less than the typical design values recommended by the MECP (2008). Though its historical HLR seems to be higher than MECP recommended typical design value (6.3 m3/m2/h), the original design HLR of AquaDAF* is anticipated to be at least 10 m3/m2/h. Hence, the DAF tank could possibly cope with historical hydraulic loading rates with polymer addition.

The capacity of the DAF tank was evaluated based on the MECP recommended SLR and HLR values and is summarized in Table 4-13.

Table 4-13 Capacity Assessment of DAF Tank

Parameter	Evaluation Criteria [1]	Estimated Capacity
DAF Solid Loading Capacity at Average SLR	10 kg/m^3	1,845 kg/d [2]
DAF Hydraulic Loading Capacity at Average HLR	6.3 m^3/m^2/h	1.15 ML/d

Note:

(1) Based on MECP Design Guidelines for Sewage works (2008).
(2) Solid Loading Capacity of the DAF.

Based on the assessment results, it could be concluded that the solid loading capacity of the DAF tank is almost equal to the historical generated WSS fed to the DAF (1,826 kg/d). As for the hydraulic loading capacity, this unit has reached its capacity when evaluated with the considered MECP values. Stress-testing is recommended to validate the capacity assessment.

4.12 UV Disinfection

The existing ultraviolet (UV) disinfection system is housed in a separate room. There are three hydraulic channels in this room. Two channels are equipped with the banks of Trojan 3000Plus (42 lamps each) installed around the year 2000. The third channel is a bypass channel suitable for the installation of the third UV. Each of the two UV channels has a treatment capacity of 17.5 ML/d at UV transmittance of 65%. The total peak flow capacity of the installed UV system is 35 ML/d which is greater than current plant's rated peak hourly flowrate (30.2 ML/d).

Each of the two UV channels is equipped with a recirculation pump. The recirculation pumps ensure that the channels have enough water for UV lamps submergence.

The existing two ultraviolet reactors have a potential point of failure (i.e. the existing controller is operational but it does not have replacement parts due to its age). The gate valves within the existing UV channels do not allow the level control and require to run the recirculation system during low flow periods.

Additionally, the WWTP will eventually require the third UV reactor to accommodate the future flows.

The existing controller is obsolete. In the event of failure only a custom-built controller can be used for replacement. The new controllers that Trojan currently manufactures are not compatible with the existing UV system. The custom-built controller for replacement of the existing will cost around 100k (which is comparable with the cost of entire new UV bank) and would be a "throw away" cost during future addition of the third UV.

The proposed path forward is to install the new UV with automatic level control gates instead of the two existing UV banks. The new controller will be suitable to run up to three UVs and when the third UV is added in the future, it can be connected to the new controller.

4.13 Outfall

The Bow River is the receiving body of water for the effluent from the Canmore WWTP. The effluent is discharged to the river through a 660 mm outfall. A field inspection is recommended in Spring 2023 during favorable conditions.

4.14 Solids Processing

The main solids produced at the Canmore WWTP are from the clarifiers and the BAF backwash. The clarifiers produce co-thickened primary solids, while the BAF backwash has solids that are from the media that filters the wastewater. The main solids come from the primary clarifiers, however there is some FOG contribution from the aerated grit chambers.

The plant currently has capacity to treat the generated solids, however with an increase in loading to the plant expected with a rise in population, the solid processing of the plant must be evaluated to ensure adequate future capacity.

4.14.1 Primary Sludge Pumping

Primary sludge pumping occurs in two locations at the Canmore WWTP. There are sludge and scum pumps in the primary clarifiers, along with the grease pumps in the grit chamber. All these pumps are rated at 11 L/s, having a firm capacity of 985 m^3/d when one pump is out of service. The primary sludge flows were not being recorded historically. The ADF and PDF of the primary sludge leaving the primary clarifier is therefore estimated by conducting a mass balance around the clarifier. The estimated historical and projected sludge flows are summarized in Table 4-14.

Table 4-14 Historical and Projected Primary Sludge Flows and Concentrations

Parameter	Historical values[1]
Primary Sludge Flows	
ADF	55 m^3/d
PDF	124 m^3/d
Primary Sludge Loads	
Average	1,382 kg/d
Maximum Day	3,093 kg/d
Average Concentration	25000 mgTSS/L(2)

Note:

(1) Mass Balance estimated values based on historical ADF and PDF of the primary clarifier.

(2) **Based on 2.5% primary sludge concentration assumption.**

The primary sludge pumps have a greater firm capacity than the maximum daily primary sludge produced. These pumps have therefore adequate capacity for the historical condition of the WWTP.

4.14.2 Sludge Holding Tanks

The aerobic digesters at the Canmore WWTP act more as open-air holding tanks rather than digesters. The primary sludge and DAF Sludge are sent to two digesters for stabilization. Each of the digesters have a volume of 1,155 m^3. The historical operating conditions of the digesters are summarized in Table 4-15.

Table 4-15 Historical Operating Conditions of Digesters (2017-2021)

Parameter	Historical Value (1)
Number of Digesters	2
Total Volume Available	2,310 m^3

Parameter	Historical Value [1]
Annual Average Sludge Flows to the Digesters	84.9 m^3/d [1]
Max Month Sludge Flows to the Digesters	86.5 m^3/d [1]
Annual Average Sludge Mass to the Digesters	3,026 kg/d [2]
Max Month Sludge Mass to the Digesters	3,680 kg/d [2]

Note:

(1) Historical combined DAF and primary clarifiers sludge flows.
(2) Historical DAF sludge loadings + primary sludge loadings (values presented respectively in ***Table 4-12*** and ***Table 4-14***)

The historical maximum monthly total sludge flow to the digester tanks is approximately 86.5 m^3/d which provides 26.7 d of retention. The tanks are aerated to reduce odors and partially digest the solids. The solids are centrifuged and hauled to compost; hence full stabilization is not necessary.

4.14.3 Digested Sludge Pumps

To pump the digested sludge from the open-air holding tanks there are two pumps each with a capacity of 4.1 L/s. These pumps transfer sludge from the open-air holding tanks to the centrifuge such that the centrifuge has sufficient influent flow when it is operated.

4.14.4 Dewatering

The Canmore WWTP currently dewaters using a centrifuge; the capacity of the centrifuge is 27.2 L/s. The centrifuge can receive sludge with up to 4% solids and produce sludge that is between 25% – 35% solids. The centrifuge works by separating the solids from the water through centrifugal forces. Through the introduction of polymer to the influent wastewater, the centrifuge thickens the solids to allow for more efficient and effective solids separation. Centrifuging lowers the overall odor of dewatering as it is an enclosed process, while also maintaining a small footprint. The existing centrifuges operate 8 hours per day for 5 days per week. The historical operating conditions of the centrifuges are summarized in Table 4-16.

Table 4-16 Historical Operating Conditions of Centrifuges (2017-2021)

Parameter	Historical Value
Number of Centrifuges	2
Operation hours per day	8 hrs/5 days

Parameter	Historical Value
Feed Sludge TS Concentration	1.80% (1)
Flow Capacity per Centrifuge	29 m^3/h (1)
Operational Flow Capacity per centrifuge	7.02 m^3/h
Max Month Sludge Mass to the Centrifuges	3,680 kg/d (2)
Max Month Sludge Flows to the Centrifuges	204 m^3/d (2)

Note:

(1) **Centrifuges Operation and Maintenance Manual**

(2) Historical DAF sludge loadings + primary sludge loadings (values presented respectively in ***Table 4-12*** and ***Table 4-14***)

The solid loading rate of the centrifuges is 530 kg/h or 12,720 m^3/d (see Table 3-1). These dewatering units thus have sufficient capacity to receive the historical peak sludge loadings (3,680 kg/d) pumped from the digesters.

The cake that is produced from the centrifuge is loaded onto a truck and then shipped to a plant for further composting. Since the centrifuge can significantly enhance the solids content of the sludge, the number of trucks required for transportation is minimal, thus lowering transportation costs and limiting the truck traffic on the roads of the Town of Canmore.

4.14.5 Dewatering pumps

The centrifuge centrate is recycled to the influent well, using two pumps each with a rated capacity of 13.6 L/s.

4.15 Existing Capacity Assessment Summary

The assessed historical capacity of the major plant unit processes is shown Figure 4-1. The chart is colour coded based on the capacity limiting condition for each unit process as follows:

- Unit Processes limited by peak hourly flows are shown in orange.
- Process limited by primary clarifier average daily flows is shown in purple.
- Process limited by primary clarifier peak daily flows is shown in green.
- Processes limited by average day BAF Influent flows/loadings are shown in blue.

Based on the capacity analysis, the plant is already at or near capacity, with the bottleneck currently being the BAF process unit. The BAFs are currently near their capacity to handle the organic loading rate entering the facility.

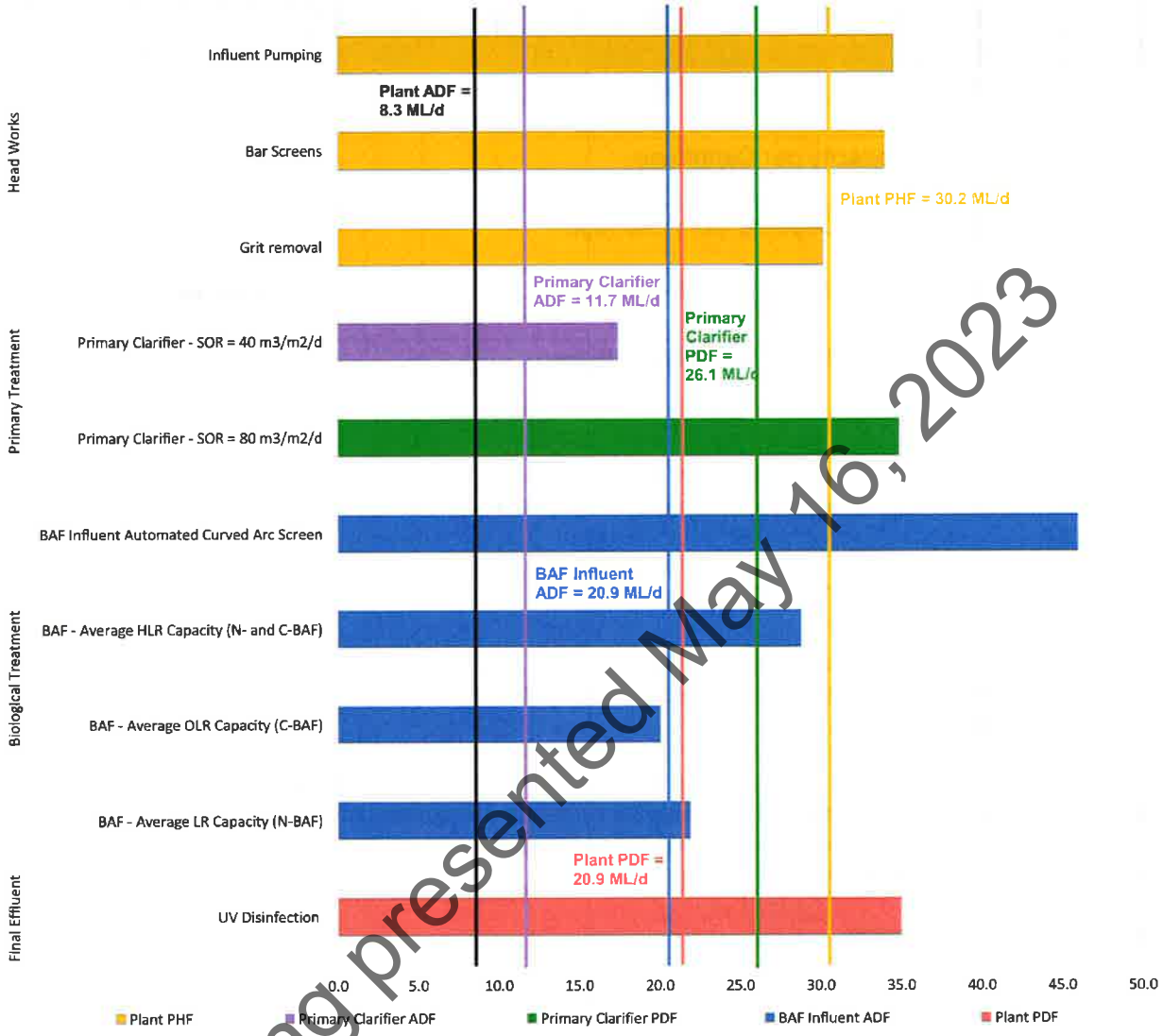


Figure 4-1: Canmore WWTP Process Capacity Assessment Summary

5 Design Basis and Future Projections

5.1 Future Loading Rates

Historic loading rates were used to project the future loading to the WWTP. Where historic rates were above or below the typical range, the future per capita loading rate was adjusted to within the range. Historic loading rates for each of the major wastewater parameters are listed in the following table, along with the assumed per capita loading rate that was considered throughout the future projection calculations.

Table 5-1: Per Capita Loading rates

Constituent Parameter	Average Per Capita Load (g/p/d)	Assumed Future Per Capita Loading (g/p/d)
BOD	88.3	90
TSS	79.2	85
TAN	8.16	8.50
TP	1.73	1.80

5.2 Future Design Basis

The design basis to evaluate the WWTP at 5, 15, and 25 year intervals is shown in Table 5-2. The max month loadings were projected using the historical max month loading factors and applied to the increased loads.

Table 5-2: Future Design Basis

Component	5 Year	15 Year	25 Year
Design Population			
Permanent Population	20,982	25,308	27,758
Non-Permanent Population	5,820	10,462	16,982
Total	26,802	35,770	44,740
Influent Characteristics			
Flows			
ADF, ML/d	11.32	15.22	19.12
MMF, ML/d	22.02	29.61	37.20
PDF, ML/d	28.46	38.26	48.07
PHF, ML/d	41.16	55.35	69.53
Loads			
BOD			

	Average, kg/d	2,378	3,185	3,993
	Maximum Month, kg/d	2,892	3,873	4,855
TSS				
	Average, kg/d	2,163	2,925	3,688
	Maximum Month, kg/d	2,846	3,849	4,852
TAN				
	Average, kg/d	221.1	297.3	373.6
	Maximum Month, kg/d	266.1	357.9	449.7
TP				
	Average, kg/d	46.8	63.0	79.1
	Maximum Month, kg/d	59.4	79.9	100.4

5.3 Future Projections

From Sections 5.1 and 5.2, a capacity assessment of the Canmore WWTP can be accomplished for the future 5, 15, and 25 year marks.

As shown in Figure 5-1, within 5 years many WWTP unit processes will have insufficient capacity, including influent pumping, screening, primary clarifiers (at PDF), BAF, and UV disinfection.

At the 15-year mark (Figure 5-2), most of the plant will exceed capacity and struggle to provide adequate effluent to the Bow River. The only unit processes that will have capacity at the projected flows will be the grit removal and the arc screens before the BAFs.

The 25-year capacity assessment (Figure 5-3) shows that the only unit process that would have capacity is the grit removal system.

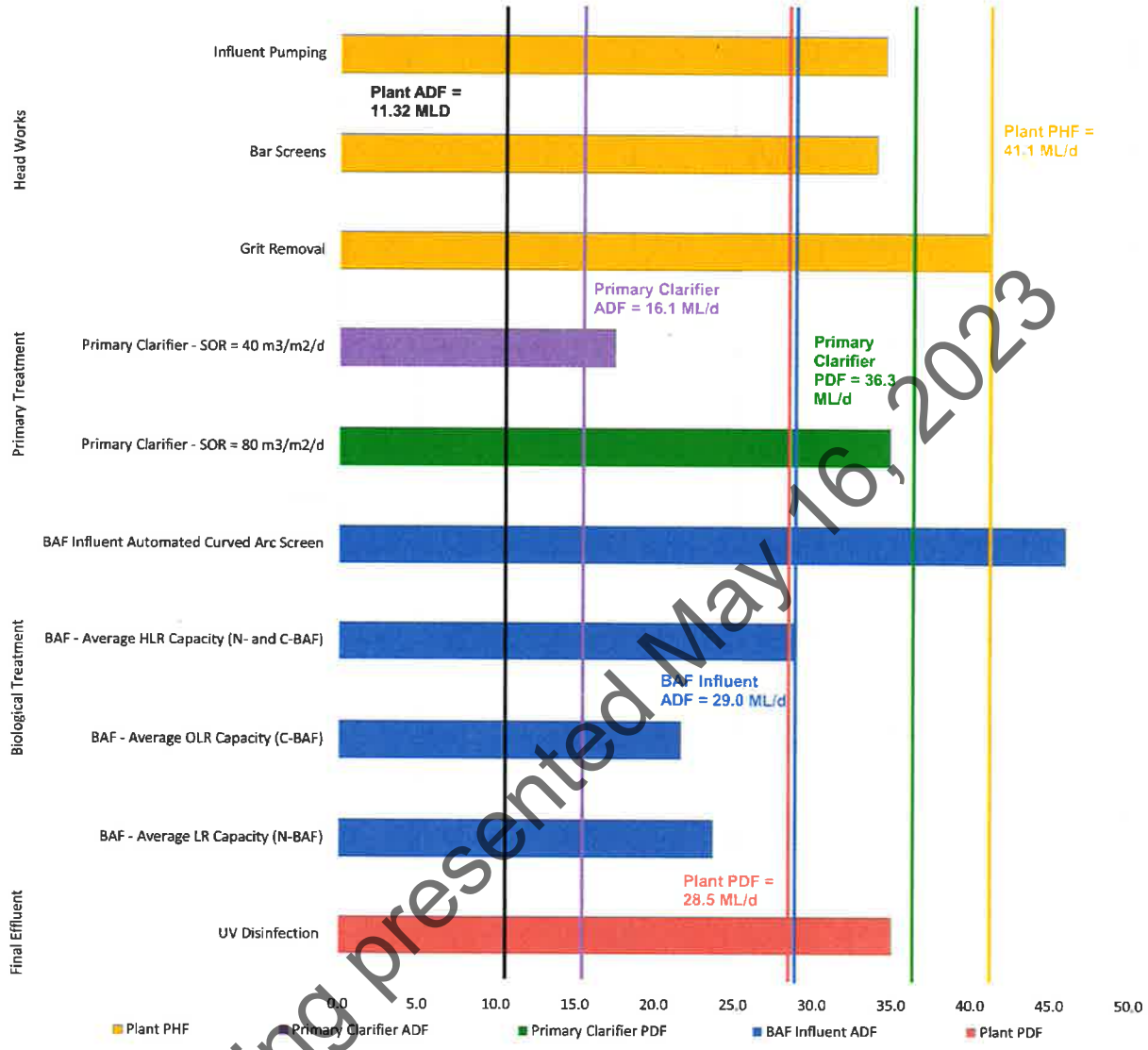


Figure 5-1: 5 Year Canmore WWTP Process Capacity Assessment

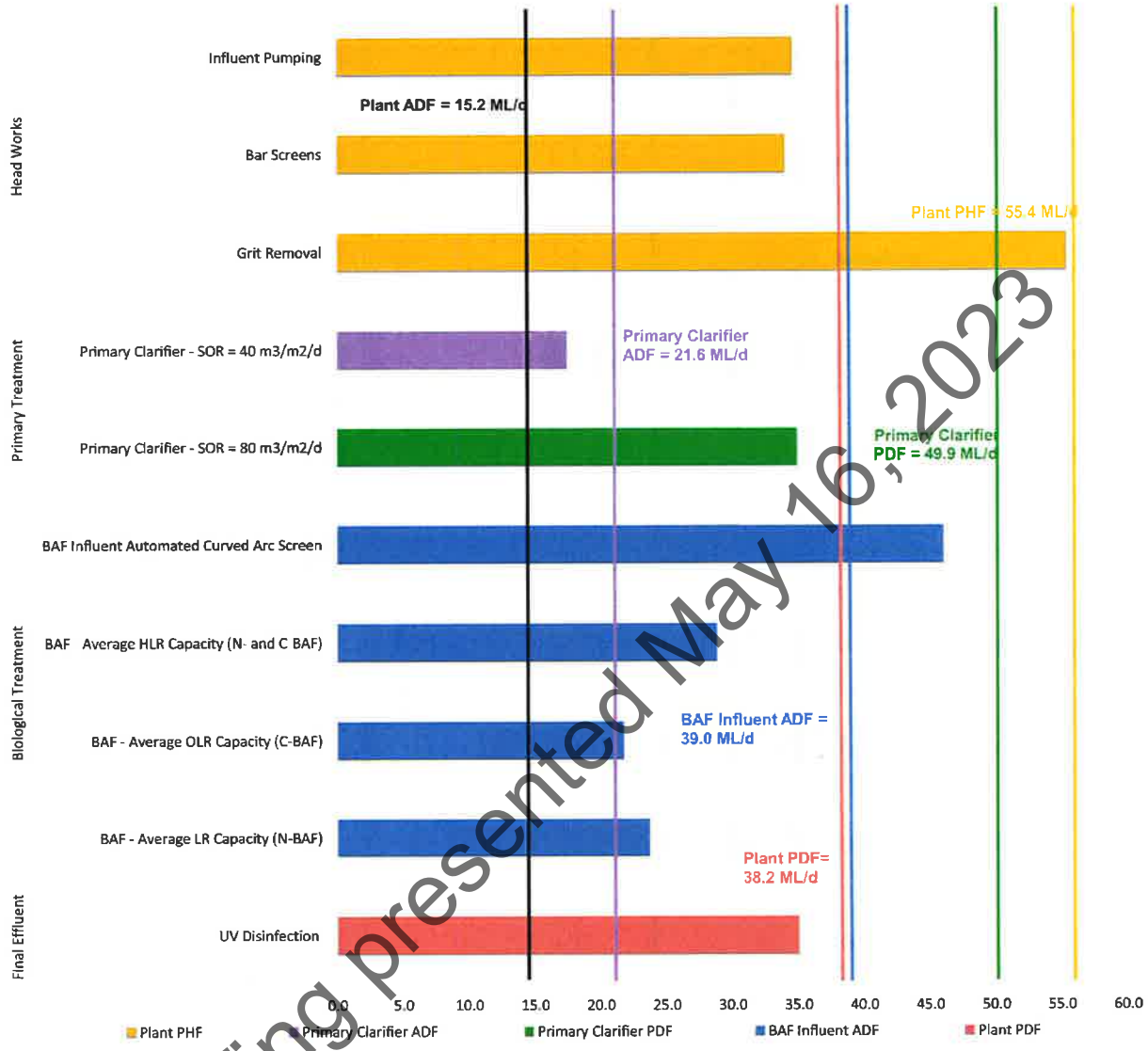


Figure 5-2: 15 Year Canmore WWTP Process Capacity Assessment

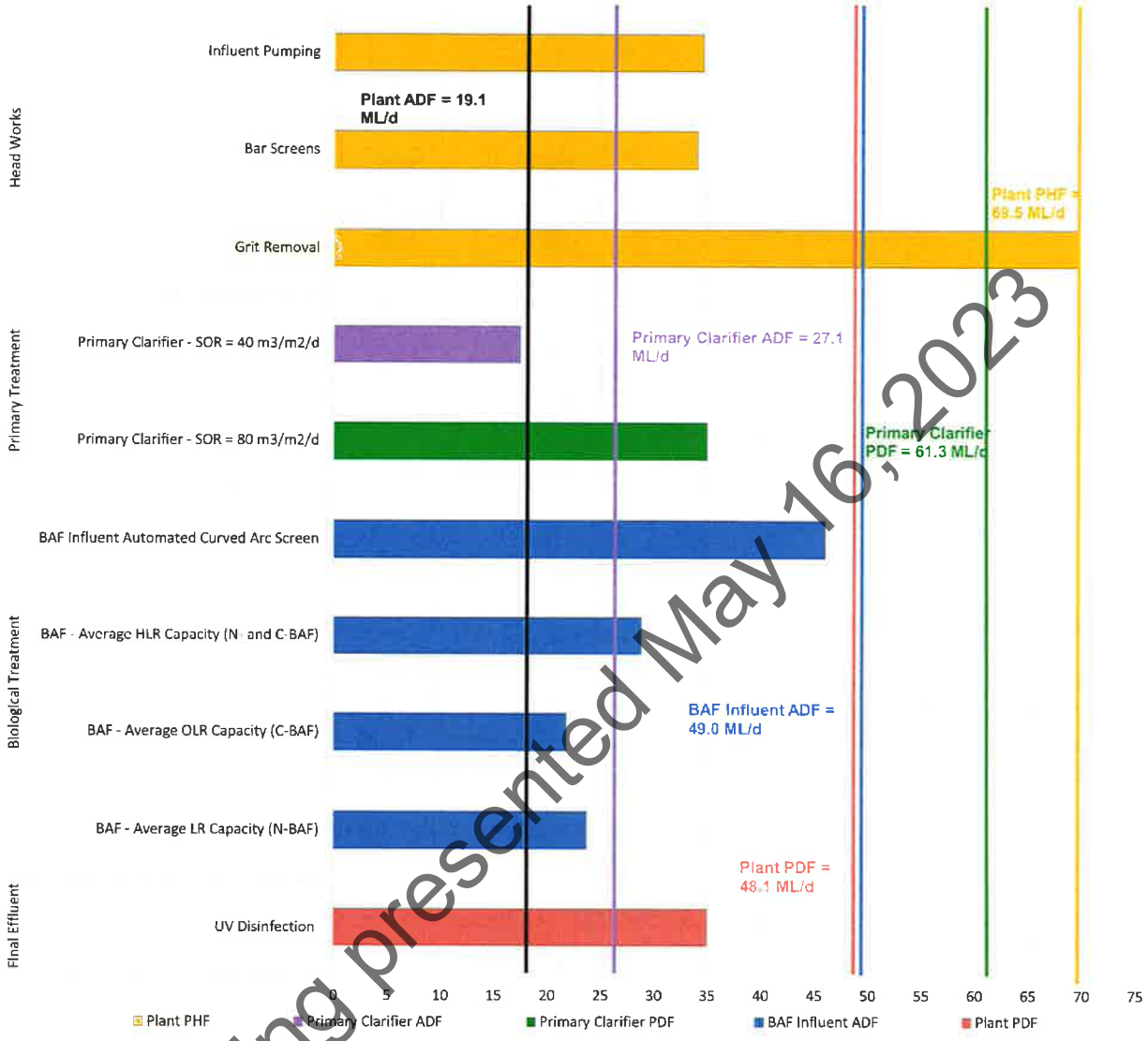


Figure 5-3: 25 Year Canmore WWTP Process Capacity Assessment

6 BioWin Modelling

A Biowin model was developed based on the existing plant process flow, sizing, historical flows (influent and recycle) and loadings. The BioWin model is most appropriate to evaluate the biological processes, which in this case in the BAF system for BOD and TAN removal. The model was partially calibrated using kinetic values from full scale two stage BAF cells on the historical performance during critical periods during the year. To fully calibrate a BioWin model for the plant, extensive sampling over extended periods would be required. This sampling program would require atypical parameters for the plant to identify influent fractionations. EPCOR provided a TKN sample to confirm the TAN/TKN fractionation was within typical ranges for municipal wastewater. The additional excess sampling was not available or required for the purpose of the modelling as a check for the capacity assessment evaluation.

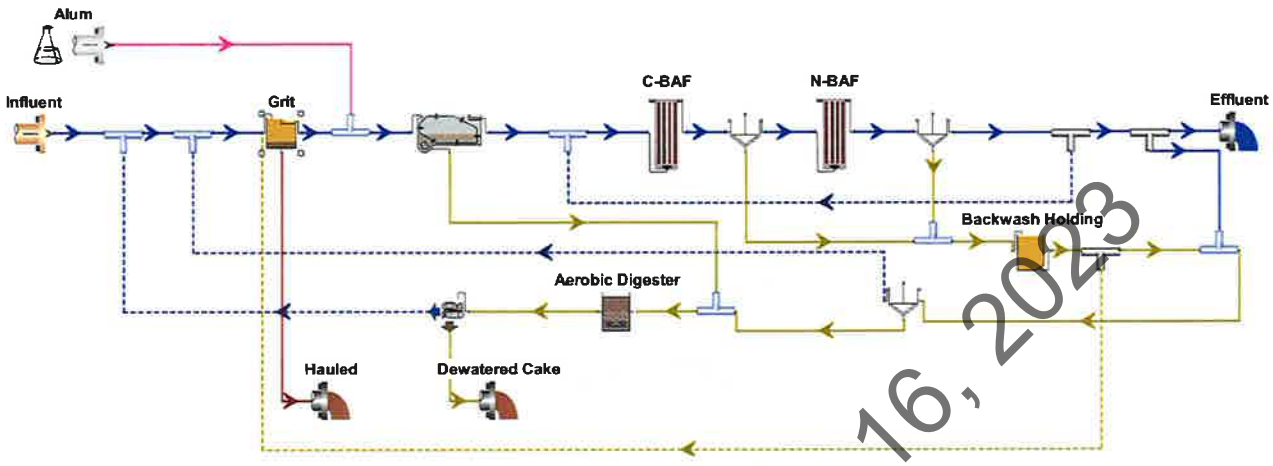


Figure 6-1: Canmore WWTP BioWin Model Process Schematic

6.1 Model Scenario Analysis

The model was calibrated on evaluated on three scenarios, winter, max month loading and max month hydraulic. The scenarios were selected as they represent the most challenging conditions given the influences at the Canmore WWTP from snow melt, tourist seasons and temperature impacts. They also represent the regulatory framework for compliance on a monthly average.

The max month hydraulic loading historically had the same mass loading as the winter scenario and occurs during the same effluent limit period. Hence, the winter case was carried forward for the future projections analysis. In this report, the effluent data presented is the ammonia concentrations. The soluble BOD removal will not be limiting in the BAF systems with the two stages and the particulate material removal is dependent on solids retention capacity/hydraulic capacity of the filters. The effluent ammonia concentrations are the limiting biological component and what is most reliable within the modeling software. Predicted effluent concentrations for all parameters is in Appendix A.

6.1.1 Winter Scenario

The winter months are present challenges for the biological process due to lower temperatures and comparable loadings to the annual average. The flowrates and loadings were pro-rated from the annual average to reflect the actual conditions present during the low temperature period. The model inputs are presented in (Table 6-1).

Table 6-1 Winter Condition

Design Parameter	Historical	5-Year	15-Year	25-Year
ADF, ML/d	6.64	9.06	12.18	15.29

Temperature, °C	8.0	8.0	8.0	8.0
BOD Loading, kg/d	1,754	2,378	3,185	3,993
TSS Loading, kg/d	1,574	2,163	2.925	3,687
TAN Loading, kg/d	162	221	297	374
TP Loading, kg/d	34.4	46.8	63.0	79

The partially calibrated effluent TAN well predicted the winter condition using the historical data. The future projections were applied to the winter condition and outputs plotted in Figure 6-2. It can be observed the effluent is projected to be at the existing limit in the 5-year horizon and exceed in the 15-year horizon. The partially calibrated model does not consider operation optimizations that may be performed (i.e. recirculation adjustment, alkalinity addition, etc.). Adjusting the kinetic rates to the theoretical maximum provides additional capacity in the five (5) year horizon (Figure 6-2). Hence, optimization efforts may gain some additional capacity, however, the trend aligns with the capacity assessment and overall plant being overloaded between the 5 and 10 year horizon.

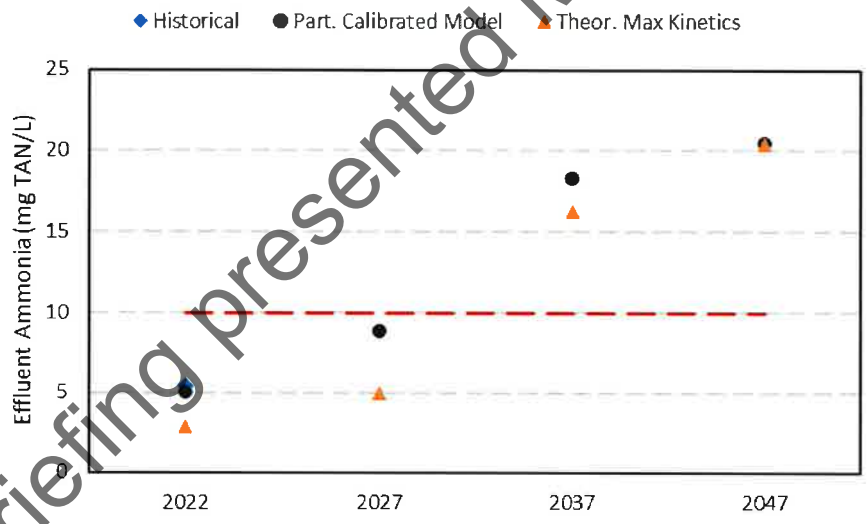


Figure 6-2: Canmore WWTP BioWin Model Winter Performance

6.1.2 Max Month Loading Scenario

The max month loading condition represents the highest mass loading the Canmore WWTP is required to remove. Historically, the max month load occurs in August for most constituents and most notably the TAN Loading. The minimum monthly average temperature observed during the study period in August was f 13.2 °C. All flows and loads were pro-rated based on historical information and the model inputs are presented in (Figure 6-2).

Table 6-2 Max Month Loading Condition

Design Parameter	Historical	5-Year	15-Year	25-Year
ADF, ML/d	8.30	11.32	15.22	19.12
Temperature, °C	13.2	13.2	13.2	13.2
BOD Loading, kg/d	2,105	2,892	3,873	4,855
TSS Loading, kg/d	1,888	2,846	3,849	4,852
TAN Loading, kg/d	195	266	358	450
TP Loading, kg/d	42.9	59.4	79.9	100

The partially calibrated effluent TAN well predicted the historical data. The BAF system generally reduces kinetics at lower effluent concentrations, hence it having a slightly lower baseline in the model compared to the historical data is not unexpected. Similar to the winter monthly loading, the existing BAF system is expected to have challenges at the five (5) year horizon with the process predicted to be beyond its capable limits between the five (5) and ten (10) year horizon.

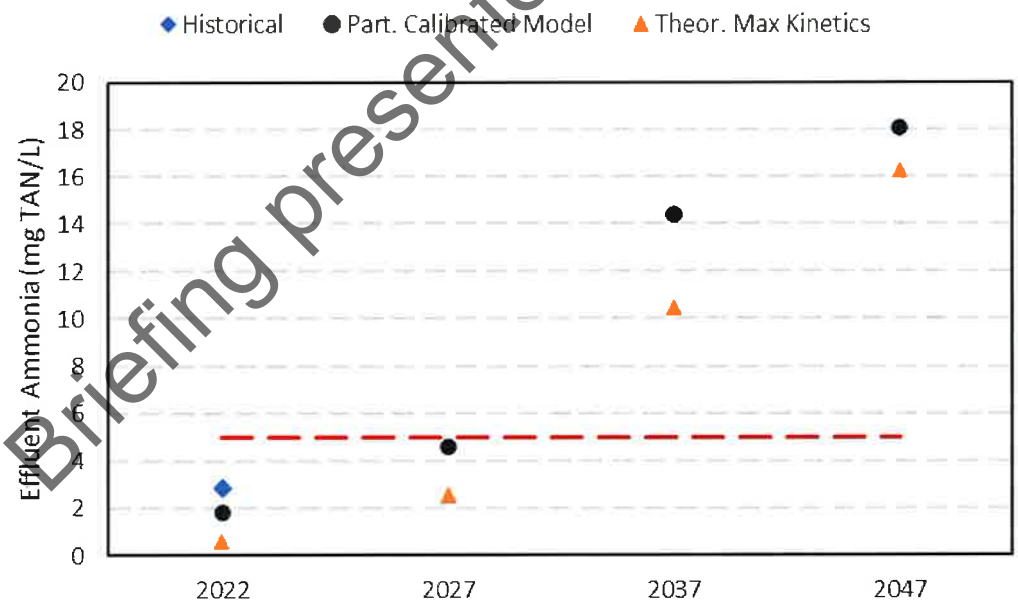


Figure 6-3: Canmore WWTP BioWin Max Month Load Performance

6.1.3 BioWin Model Summary

The BioWin modeling was well aligned with the capacity assessment outlined in Section 4 and 5. The BioWin model provides additional context to predicted effluent concentrations in the future scenarios. The predictions are to be used as a tool for planning as there are several variables that can influence the actual results in the future (i.e. population growth, load variation, plant operations, etc.). In general, the model demonstrates the operations staff are operating the facility well near the capacity limit. It is expected in the five (5) year horizon for the plant to be challenged during the worst case scenarios during the max month load and low temperature conditions.

The Canmore WWTP BAF units are projected to be pushed beyond it's limits even if the facility can operate within the maximum theoretical kinetic rates. This emphasizes the importance of planning and preparing for the large capital upgrade within the ten (10) year horizon, which also coincides with the new license and effluent limits.

7 Summary of Limits and Capacity

7.1 Existing Capacity Summary

The capacity assessment of the Canmore WWTP identified several capacity constraints for the main process units for future flows and loads. The following table illustrates the bottlenecks and challenges as the flows and loads increase with increased development.

Table 7-1 Summary of Key Process Units

Process Unit	Challenges and Recommendations
Raw Sewage Pumping	Increase pump capacity required
Bar Screens	Monitor screenings. Will operate adequately during majority of flow conditions. Bypass events will need to monitor impacts on downstream processes
Grit Removal	Monitor grit carryover. Will operated adequately during majority of flow conditions
C and N-BAF	Nearing Capacity of the filters. Capacity is expected to be challenged at the five (5) year horizon and exceeded between the five (5) and ten (10) year horizon. Optimization and stress testing of system recommended to confirm capacity assessment
UV System	Lifecycle replacement ongoing, will improve reliability from existing capacity assessment

The effluent limits achievable by the plant are limited by the installed process units. A summary of the achievable effluent limits is provided in Table 7-2.

Table 7-2 Effluent Quality Limits of Existing Process Technologies

Constituent	Limit of Installed Technologies
BOD_5	15 mg/L
TSS	15 mg/L
TAN	5 mg N/L
TN	Assimilation only (no denitrification)
TP	1.0 mg P/L

The plant is lacking the capacity to treat the influent wastewater that it will be subjected to within the next 25 years at existing limits. At the 5-year mark, 2027, the BAFs will be near their limit, along with various other process units within the plant. At the 15 and 25-year mark, 2037 and 2047 respectively, the plant does not have the capacity required to adequately treat the wastewater produced by the Town of Canmore. To cope with the future projected flows and loadings a plant upgrade will likely need to be complete by 2030 to achieve the existing limits.

7.2 Water Quality Based Effluent Limits

Alberta Environment and Parks are finalizing the limits that will be in effect on the new approval that will come into effect in 2031. The draft limits are as follows.

Table 7-3: Future Proposed Canmore WWTP Effluent Limits

Parameter	Effluent Limit
$cBOD_5$	≤ 10 mg/L (1)
TSS	≤ 10 mg/L (1)
TAN	≤ 5 mg/L (1) (Jul – Sep) ≤ 10 mg/L (1) (Oct – Jun)
TN	15 mg/L (1)
TP	≤ 0.5 mg/L (1)
Faecal Coliform	≤ 200 per 100 mL(2)

Parameter	Effluent Limit
Notes:	
(1) Monthly arithmetic mean of daily composite samples	
(2) Monthly geometric mean of daily grab samples	

The existing treatment plant is not designed to provide total nitrogen removal and will not be able to reach total phosphorus, BOD and TSS on a consistent basis. Significant upgrades will be required to meet the proposed limits.

Refer to "Wastewater Treatment Plant Technology Evaluation" (April 5, 2023) for the upgrade details.

8 Capital Projects

The projects noted in this section are required as a life cycle replacement or maintenance of the existing WWTP equipment to ensure reliable operation of the plant until the Water Quality Based Effluent Limits required upgrades come online in 2031. These upgrades and probable costs are outlined in Table 8-1.

However, the consolidated summary of upgrades and associated costs required to achieve new EPA effluent limits as well as to maintain the existing WWTP are described in a separate report "Wastewater Treatment Plant Technology Evaluation" (April 5, 2023).

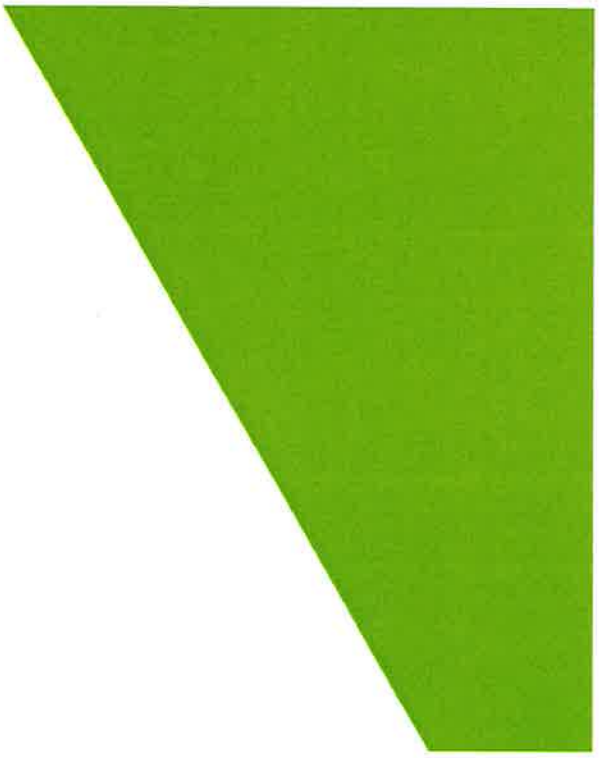
Table 8-1: Capital Projects

Project	Description	Project Justification	Priority	Year Required	Engineering	Construction	Contingency	Probable Cost
Headworks								
Inlet Lift Station Upgrade (Mechanical)	Replacement of existing lower flow pumps and discharge piping	Life Cycle Population Growth	Medium	2027	$120k	$800k	$250k	$1.17M
Inlet Lift Station Upgrade (Wetwell)	Increase the size of the Inlet LS Wetwell, Provide Actuated valving to EQ tank	Undersized Population Growth	Medium	2027	$300k	$2M	$600k	$2.9M
Odor Control Unit for EQ Tank, Headworks Bldg	Add odor control building near the Headworks to treat odors from EQ tank, Headworks	Potential Complaints, Regulatory Requirements	Medium	2027	$300k	$2M	$600k	$2.9M
Septage Receiving Station	Add septage receiving station with flow monitoring and payment system [Odor Control project required before]. Include EQ tank upgrades	Population Growth	Low	2032	$120k	$800k	$250k	$1.17M

Influent Piping between Inlet LS and Headworks	Piping Replacement, Actuated isolation valves at high point	Life Cycle	High	2027	$120k	$800k	$250k	$1.17M
Inlet Screen Replacement	Replacement of older inlet screen with smaller mesh, and sludge press unit	Life Cycle	High	2024	$100k	$600k	$200k	$900k
Grit Separator Replacement	Replace Existing Grit Separator	Life Cycle	Medium	2027	$70k	$500k	$150k	$720k
Grit Separator Exhaust Fan	Redesign, replace. Existing fan full of grease	Process Improvements	High	2025	$30k	$200k	$60k	$290k
Headworks Channel Valves	Add sluice gate valve at the Clarifier Distribution Channel Actuation on Clarifier sluice gates and screen inlet gates	Process Improvements	Medium	2027	$70k	$350k	$110k	$530k
Water Heating System, MUA Replacement	Replace existing boiler, piping, MUAs	Life Cycle Process Improvements	Medium	2025	$220k	$1.5M	$450k	$2.17M

Scum Removal Piping	Rearrange Scum Removal Piping to pump to digester instead of Headworks	Process Improvements	High	2025	$70k	$500k	$150k	$720k
Third Clarifier Addition	Add third Clarifier [high flow fluctuations]. North of ex. clarifier	Process Improvements Population Growth	Medium	2027	$900k	$7M	$2.3M	$10.2M
BAF, DAF								
Intermediate Transfer Pumps Upgrade	Upgrade existing pumps	Life Cycle	Medium	2026	$150k	$650k	$200K	$1M
UV								
UV 1, 2 upgrade	Replace existing UV 1, 2	Life Cycle	High	2023	$70k	$500k	$130k	700k
UV 3 addition	Add UV3	Population Growth	Medium	2028	$50k	$350k	$100k	500k

The total estimated probable cost is $27M over the next 10 years. There are several projects that may be consolidated to generate cost efficiencies. It is important to note, with the exception of the BAF transfer pumps project, the specified projects will be utilized past 2031 and will become part of the new facility.



Briefing

DATE OF MEETING:	**October 3, 2023**	**Agenda #:** I-1
TO:	Council	
SUBJECT:	Integrated Parking Management Plan Update	
SUBMITTED BY:	Caitlin Miller, Manager of Protective Services Andy Esarte, Manager of Engineering Palki Biswas, Manager of Finance	
PURPOSE:	To provide Council with a comprehensive review of the first year of the paid parking program in the Town Centre and provide clarity on how program changes will be considered and made.	

EXECUTIVE SUMMARY

The Integrated Parking Management Plan makes several recommendations for strategies to ease parking congestion and demand during peak times in the Town Centre. A Paid Parking program is one of the tools recommended by the Integrated Parking Management Plan and has now been in place in the Town Centre for over one year and at Quarry Lake for two years. This report provides a comprehensive review of the first year of operation in the Town Centre and provides clarity on how program changes are considered and made.

BACKGROUND/HISTORY

The 2018 Integrated Parking Management Plan (IPMP) was approved by Council for planning purposes at the June 19, 2018 regular meeting of Council. The IPMP outlined strategies for meeting Council's goals of managing traffic congestion and parking in the Town Centre and broader community. These strategies informed a Council priority to evaluate paid parking as a tool to manage traffic congestion and fund fare-free transit.

At the May 2, 2023 Council meeting, the Downtown Canmore BIA delegation made recommendations for changes to the paid parking program for Council to consider. At the June 6, 2023 meeting, Council referred these requests to administration to consider and bring forward any recommendations from these requests in the comprehensive review of one year of operation of paid parking in Town Centre. Administration has analyzed these requests alongside data and feedback collected over the first full year of the paid parking program. As paid parking is one tool outlined in the Integrated Parking Management Plan, it is helpful to keep the goals of the plan top of mind when considering feedback, data, and recommendations for improvement.

DISCUSSION

The IPMP outlines how regulating and pricing parking can improve the management of parking stock, improve customer experience, and reduce congestion in the Town Centre:

- ensures prime parking is used for the highest value uses;
- ensures parking is available most times on each block face and in each parking lot;
- allows visitors and residents to experience the Town Centre;
- reduces up to 30% of vehicle congestion by significantly reducing time spent hunting for spots;
- funds transportation initiatives like fare-free transit;
- funds Town Centre enhancements;
- can be implemented with better information signage for drivers; and
- can be implemented with technologies to improve the efficiency of enforcement, ticket payment, and data collection.

The goals and measures for the implementation of paid parking and regulation include:

- increased parking availability and reduced congestion - achieve utilization of 85% or less of parking spaces in all areas of the Town Centre during typical peak times;
- system ease of use – easy payment with a range of options, online payment of fines, license plate-based enforcement; and
- effective communications and engagement – communications plan with appropriate stakeholder communications.

Occupancy of parking spaces was measured in 2016 and again in 2019. This data was used to inform where and when pricing and time regulations would help to meet the goals of the IPMP. Occupancies were generally under 85% in the Town Centre as a whole, however, varied significantly from area to area and exceeded 85% during peak times. This suggested pricing and time regulation in Canmore's highest-demand areas would be a very effective tool to move demand to lower occupancy areas, encourage turnover, and reduce demand in core parking areas during peak times.

Paid Parking – One Year Review

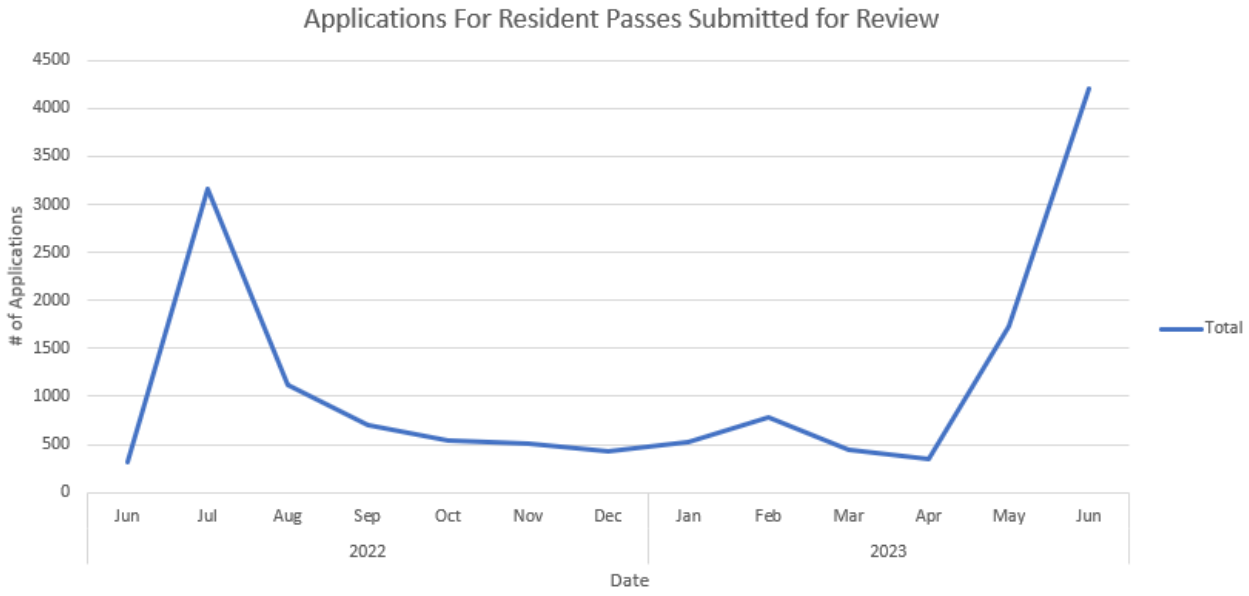
Resident Parking Permits

Starting in June 2022, residents and businesses were able to apply for a resident parking permit that would allow them to park for three free hours in any paid parking zone (Town Centre or Quarry Lake) and in residential parking zones. It was decided that resident parking zones would be open to anyone in Canmore with a resident parking permit so that residents living in those zones could have businesses and visitors attend and park in front of their homes with convenience. Homeowners are able to register out of town visitors and businesses with visitor passes in RPP zones. While there was concern that there would be a lot of spillover from residents parking in the resident zones around the Town Centre or Quarry Lake to avoid paying for parking, these concerns have not come to fruition other than a few occurrences. These occurrences were limited to notable vehicles being parked in resident parking zones in lieu of the designated no-payment areas or, in the case of Peaks of Grassi, are limited to hot days where parking at Quarry Lake is over capacity.

There are 8,105 residents who have approved parking permits on their vehicles and 13,775 vehicles registered. 57% of permit holders have one vehicle associated with their account, 28% have two vehicles, 8% have three vehicles, 5% have four vehicles, and 3% have five vehicles. There are 267 businesses that have approved parking permits and 1,059 vehicles registered. 78% of business users have one to four vehicles associated with their account, 13% have between five and nine vehicles, 5% have between 10-14 vehicles, and 4% have over 15 vehicles associated with their accounts.

Resident Permits						
Number of Users	Number of License Plates	1 Vehicle	2 Vehicles	3 Vehicles	4 Vehicles	5 Vehicles
8,105	13,775	4,616	2,246	673	367	203
Business Permits						
Number of Users	Number of License Plates	1-4 Vehicles	5-9 Vehicles	10-14 Vehicles	15+ Vehicles	
267	1,059	207	36	13	11	

Most initial permits were approved in June and July of 2022 but permit applications intake remained steady until increasing again in May and June of 2023, when emails to remind users to renew their permits were sent out.



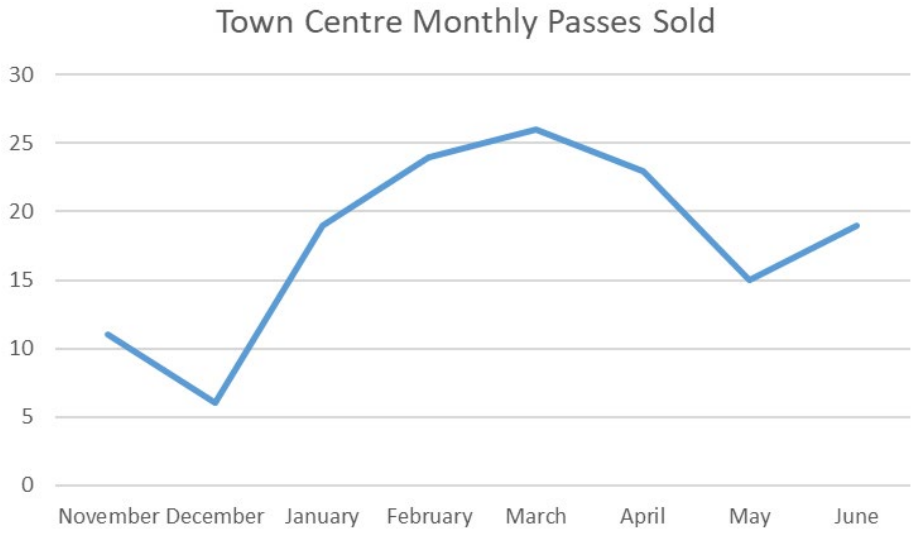
Monthly Permits

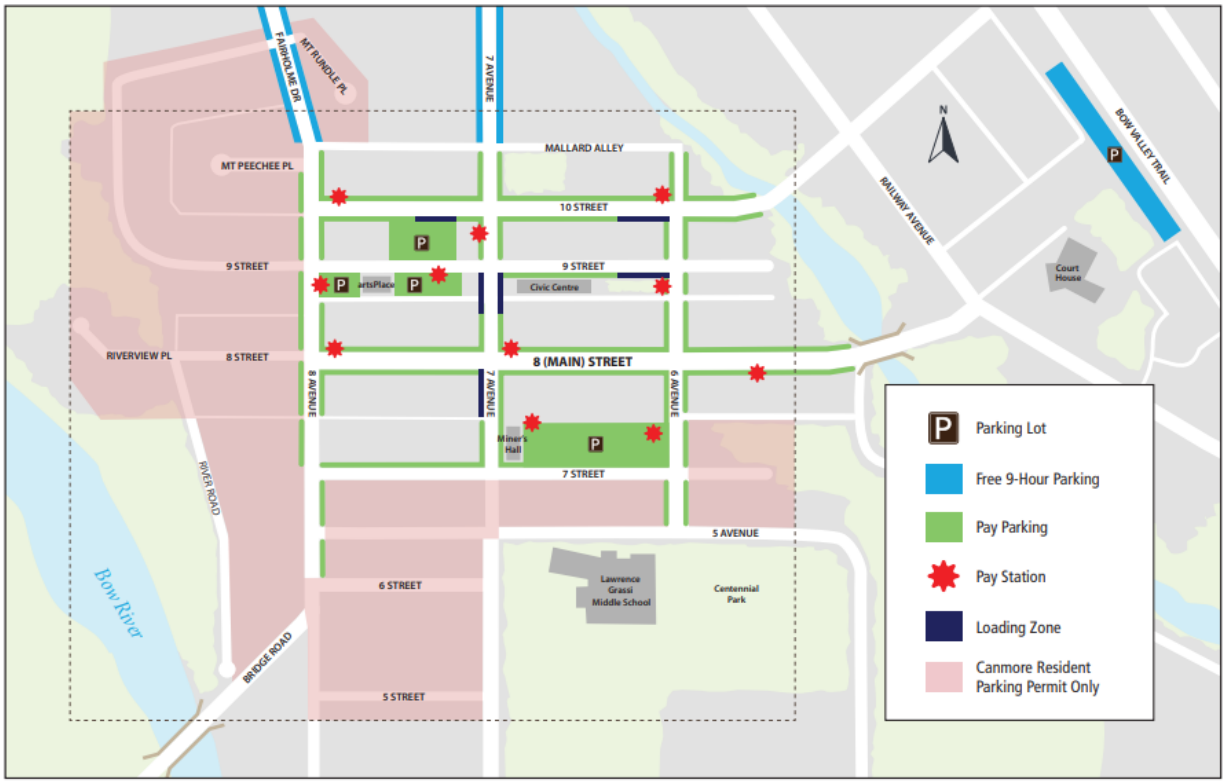
Monthly permits for Canmore residents launched on November 1, 2022 and there have been 181 permits purchased. These permits are valid as an add-on option to those who already have a Canmore Resident Parking Permit. The monthly parking pass allows for all-day parking in the four municipal parking lots in Town Centre without activating a parking session. Monthly pass holders parking outside of the lots or at Quarry Lake would still need to activate a parking session to use their three free hours. These permits are available year-round and are priced at $83/month during the peak season (May 1 to October 31) and $41.50 during the off-peak season (November 1 to April 30).

On November 1, 2022, Council approved the implementation of a Town Centre Non-resident Employee Monthly Parking Permit. This permit is only available to employees working in the Town Centre during the

off-peak season. This permit will be available starting November 1, 2023 for $96/month and is available until April 30.

The graph below shows the trend of Monthly Resident Passes sold throughout the first year of operation (November 2022 – June 2023).

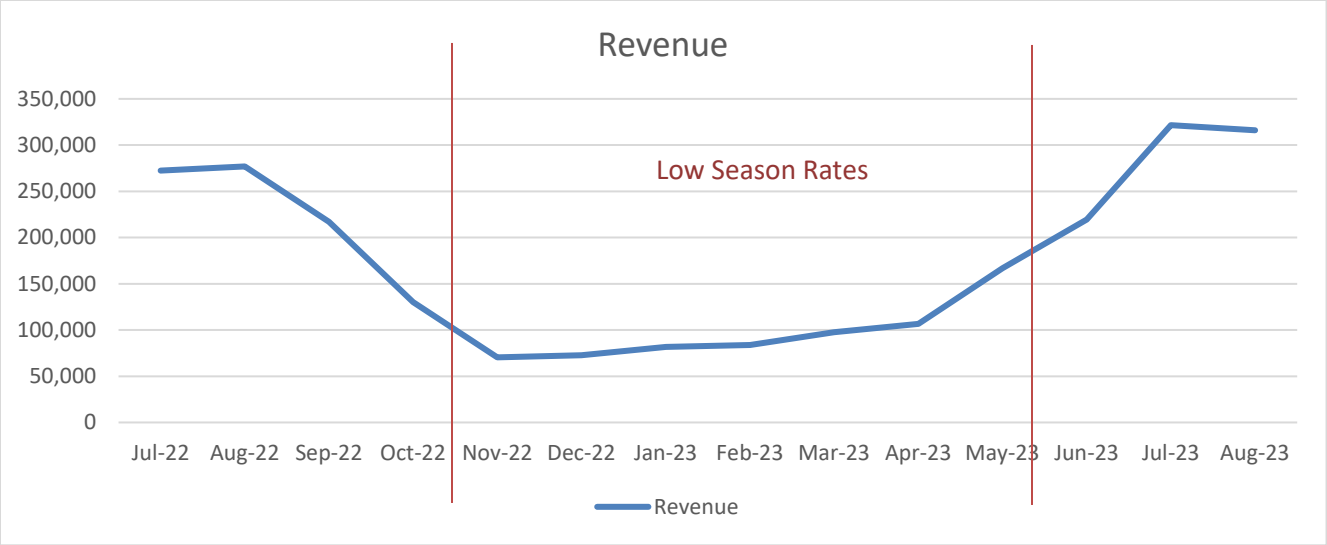




Parking Revenue

In Town Centre, paid parking fees were set at $3 during the peak season (May 15 – October 14) and $2 during the low season (October 15 – May 14). At Quarry Lake, the fees are set at $10 for two hours (May 15 – October 14) and $2.50/hr during the low season (October 15 – May 14). Paid parking revenues exceeded forecasted expectations in 2022 and totaled $1.14 million. In 2023, the paid parking revenue was forecasted for $1.14 million and by August had already reached $1.39 million.

The revenue chart below shows the trend throughout the first year of operation (July 2022 – August 2023).



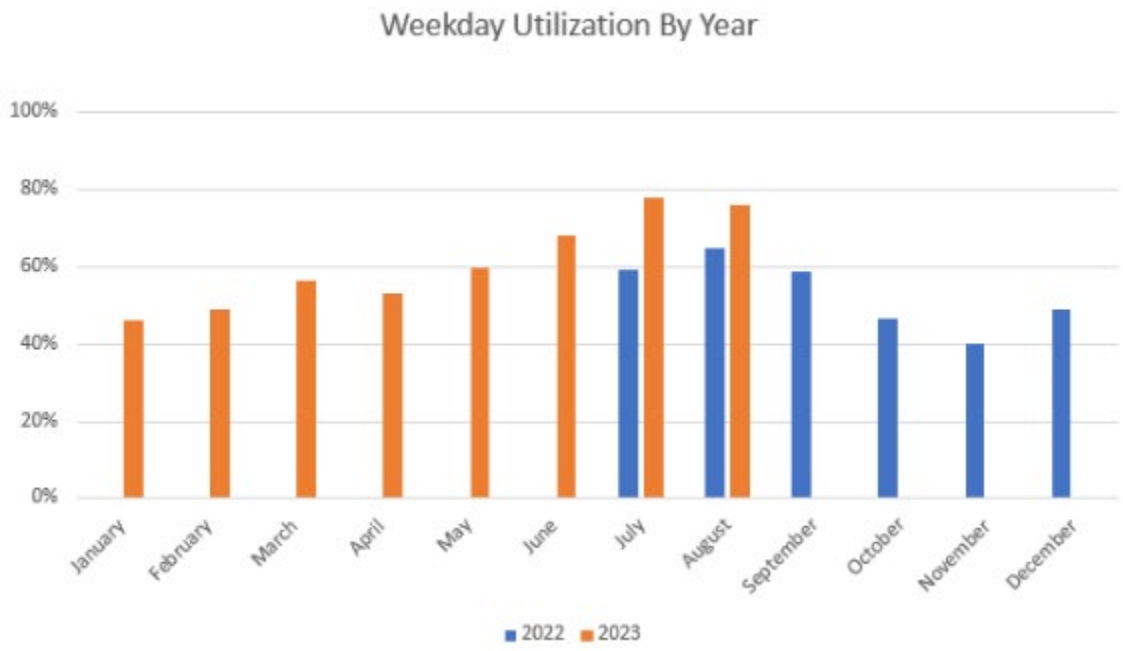
Of note, while there is a big dip in revenue during the off-season, this is not attributed only to a lower trend in parking utilization but also the decrease in parking fees during those months.

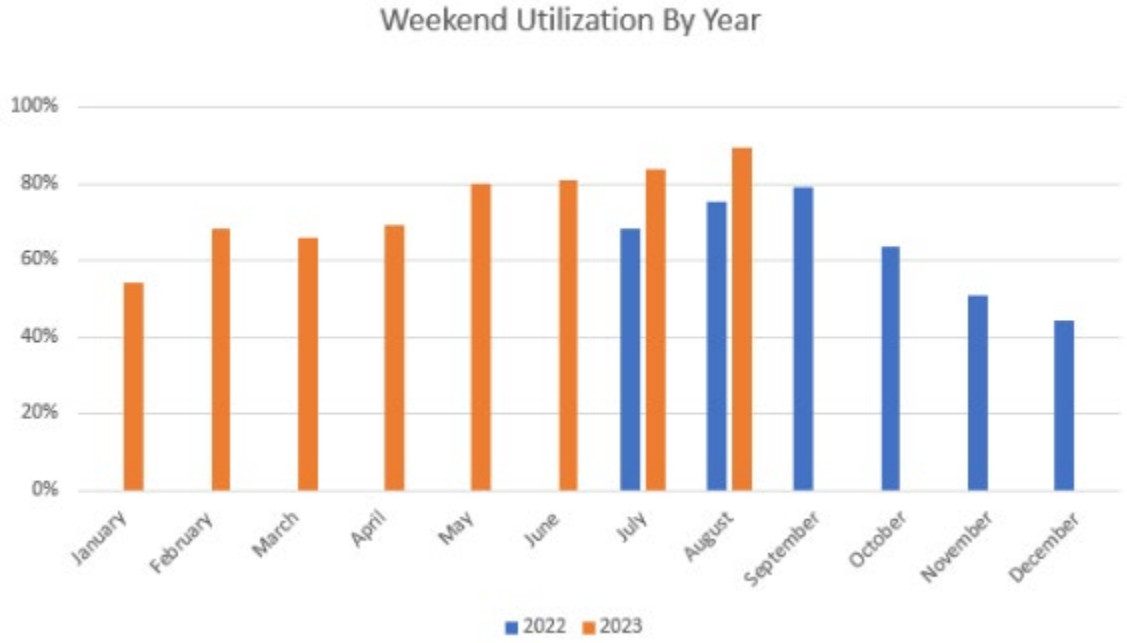
Parking Utilization

One of the goals of pricing parking is to increase the availability of parking and reduce congestion in the Town Centre by achieving a maximum utilization of 80-85% of parking spaces in primary parking areas of the Town Centre during typical peak times. At this level of utilization, some areas will be full, and it can be challenging to find parking, resulting in congestion due to hunting.

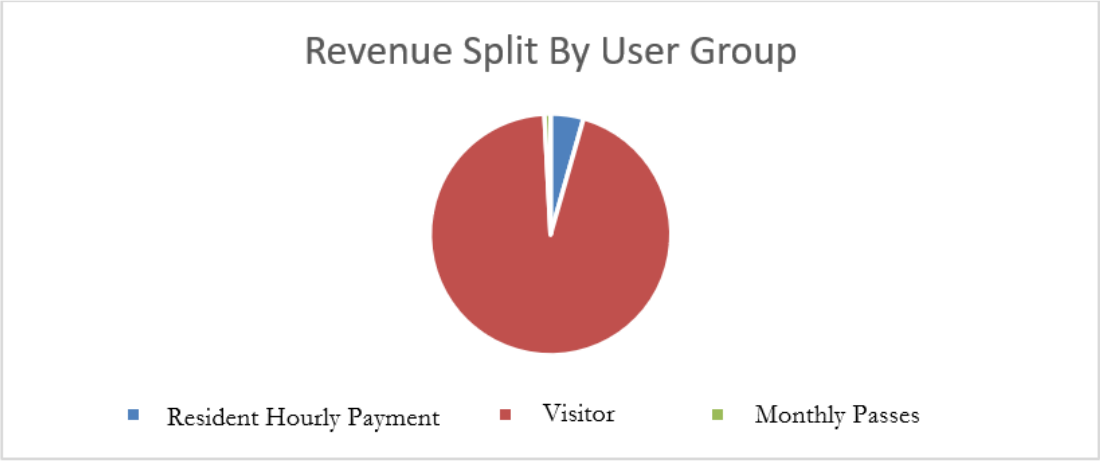
Our parking management system provides transaction outputs that can be used to calculate occupancy. These outputs have been calibrated against physical counts of all parking areas that were taken over three days in August. The results of the analysis are illustrated in the graphs below, and represent the average occupancies for each month during peak periods.

Based on this analysis, weekday utilization ranges from 40% in November, 2023, to nearly 80% summer, 2024. Weekday utilization increases consistently throughout the 2023 calendar year of operation after the November lull, with periods of peak weekday utilization in March and May, that could coincide with spring breaks and the beginning of peak season. Weekend utilization is consistently higher, particularly in peak season when it is above 80%. The dips in December and January could be attributed to the extreme cold weather and lack of snow that Canmore experienced during the peak winter holiday weeks last winter. Starting in May, weekend utilization is consistently at target utilization, with strong year-over-year growth in parking demand noted where two years of data are available during summer months.

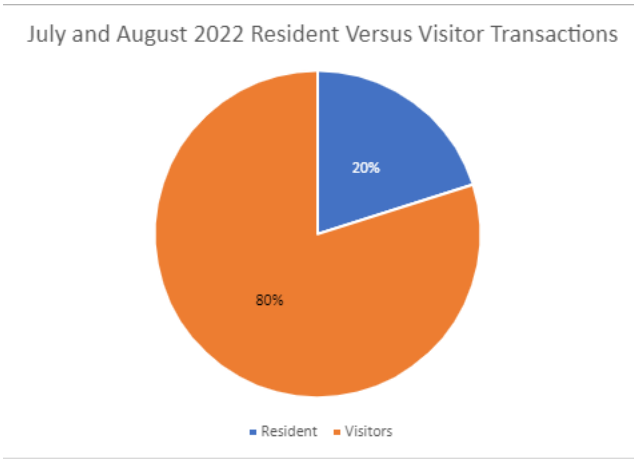


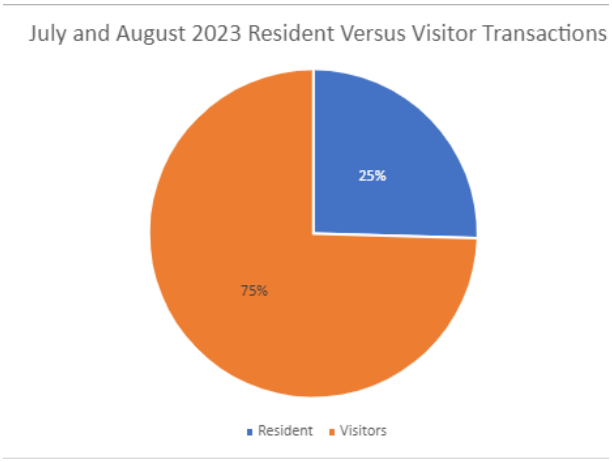


In July and August of 2022, 100,579 transactions were recorded, with 20% of transactions by residents, and 80% of transactions by visitors. Visitors contribute upwards of 95% of revenue, with residents primarily using the three free hours provided for their visits to the Town Centre.



In 2023, the total number of transactions in July and August increased by 23%, to 123,563. Notably, half of the increase in transactions is attributable to residents. Resident transactions for the same period increased by 55% in 2023 to 31,444, while visitor transactions increased 15% to 92,084. As a result, resident transactions in 2023 increased to 25% of total transactions. This growth in share of resident visitation may be attributed to several factors including increased familiarity and comfort with the Blinkay system, increases in passholder numbers, and increased parking availability. While it is positive that residents are taking advantage of the system and represent a growing share of visitation to the Town Centre, this trend will be important to follow. Increased resident use of free parking contributes to congestion and parking pressures.

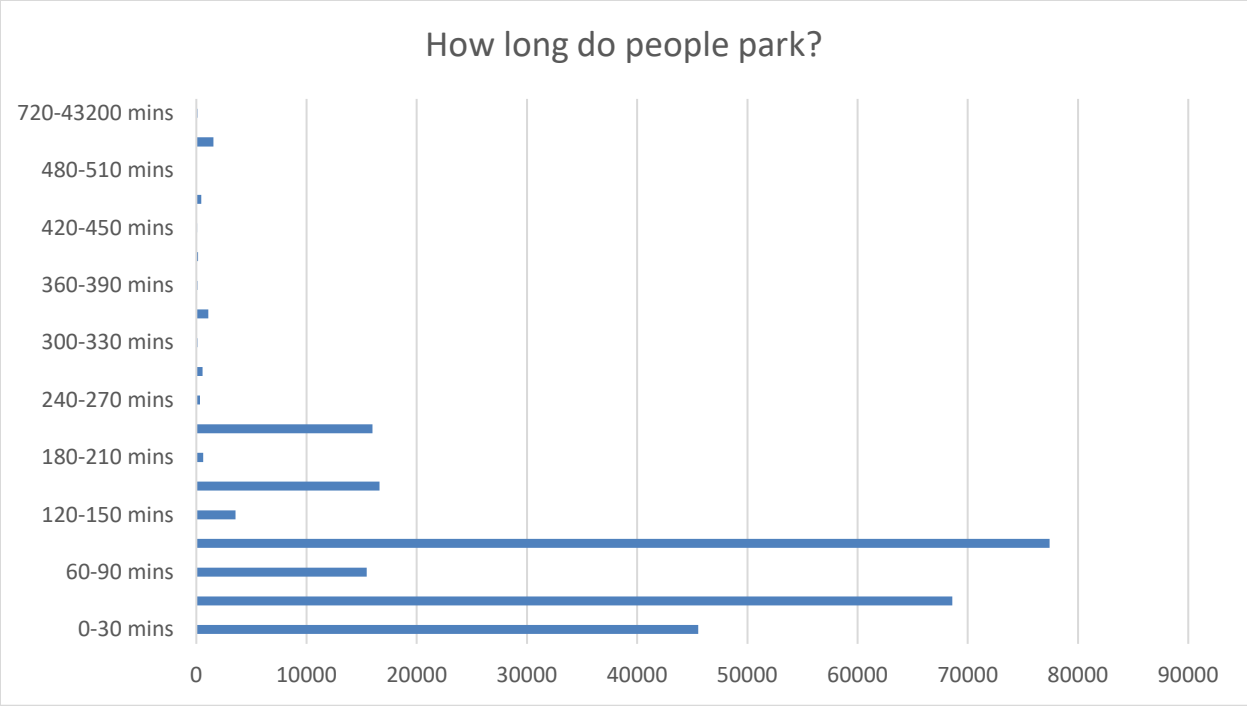




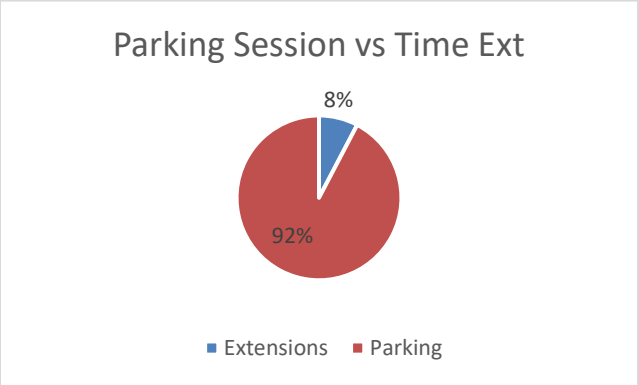
That said, residents tended to utilize parking more during weekdays than on weekends. During weekdays, resident transactions could represent over half of all transactions, while during busier days the number of resident transactions fell and could represent as little as 15% of all transactions.

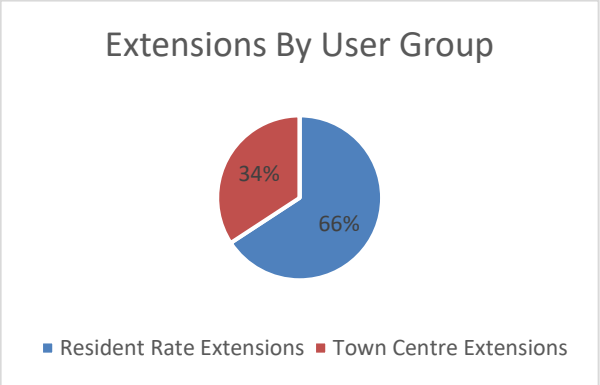
Parking Duration

Residents tended to utilize shorter parking sessions, often taking multiple shorter trips to the Town Centre, and averaging 88 minutes per session. Visitors tended to stay longer, with average session lengths of 114 minutes.



The Blinkay app functionality that allows for a session to be easily extended has been well utilized with 8% of all transactions being time extensions. Residents are twice as likely to use this functionality, a result of residents being far more likely to use the app.





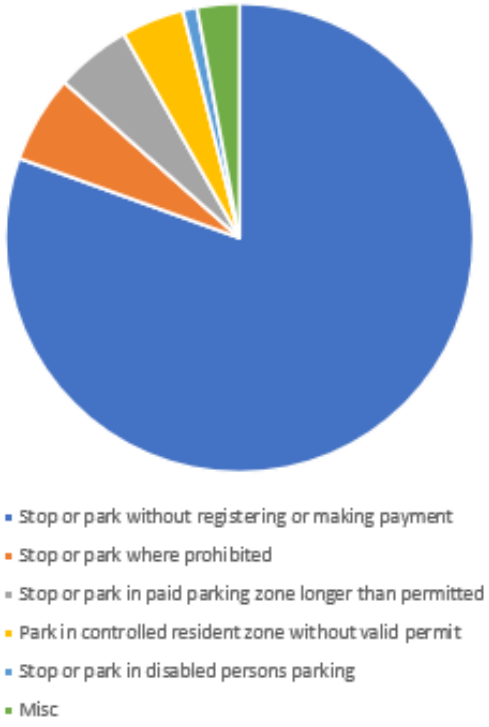
Parking Enforcement

The sections of the Traffic and Road Use Bylaw referring to Paid Parking are mainly enforced by the Municipal Enforcement Officers (or Parking Ambassadors) with occasional help from the Community Peace Officers. Beginning in June 2022, parking enforcement centered around program education in the Town Centre and residential parking permit zones. At the launch of paid parking in the Town Centre, the Municipal Enforcement Officers concentrated on providing customer service and informing residents, businesses, and visitors downtown on how to use the various payment options and how to register their vehicles. They addressed confusion that some residents had that after applying for a permit and having it approved, they still

needed to register their vehicle to use their three free hours. This commitment to customer service continues today as the Municipal Enforcement Officers not only conduct parking enforcement in and around Town Centre, but also act as ambassadors for the Town and the community. They often provide directions to local restaurants and retail stores, answer questions about activities around town, and continue to help individuals register their vehicles and pay for their parking. To further their customer service skills, the Municipal Enforcement Officers were enrolled in Tourism Canmore-Kananaskis' Peaks Academy to help them easily and confidently give advice to visitors for making the most out of their visit to Canmore.

To achieve compliance, the Municipal Enforcement Officers issued warnings to help educate people about the new program, especially residents who may have been confused regarding the process for registering their vehicle with their resident parking permit. More fulsome enforcement started in September of 2022, though warnings were still given frequently. Between July 1, 2022 and June 30, 2023, a total of 697 warnings were issued. Once enforcement started, there was also a period where appeals were granted to residents who were unaware that they were required to register their vehicles to access their three free hours. The warnings and granting of appeals served as another way to educate residents about the program and gain further compliance.

The Municipal Enforcement department issued a total of 12,516 tickets during the first year of paid parking operation. 79% of these were issued in the Town Centre, 5% at Quarry Lake, and approximately 15% were issued in either resident parking zones or for parking infractions unrelated to paid parking outside of paid zones. Parking or stopping without registering or making payment made up 81% of all tickets issued, and parking for longer than permitted made up 5% of all tickets issued. Other reasons that tickets were issued included parking where prohibited (6%), parking in a controlled resident zone without a valid permit (4%), parking in an accessible stall without a valid permit (1%), and other parking offenses such as parking against parallel or parking in front of a fire hydrant (3%). Of all the tickets issued, 3,749 were voided either as a courtesy (for example, the owner of the vehicle arrived right after the enforcement officer placed the ticket and they decided to void the ticket), because there was no offense (an appeal was awarded), or the ticket was not paid after 30 days and went through the "tag to ticket" process and was voided out of the Blinkay system and a violation ticket was written in its place and sent to the registered vehicle owner through the mail. Of all the voided tickets, 35% were voided out of courtesy, 25% for no offense, and 39% were put through the "tag to ticket" process. The benefit of putting a ticket through the "tag to ticket" process is that if vehicle owners do not pay their parking ticket, they can either plead their case in court or pay the fine amount before they renew their vehicle registration. This has resulted in greater compliance with the program.



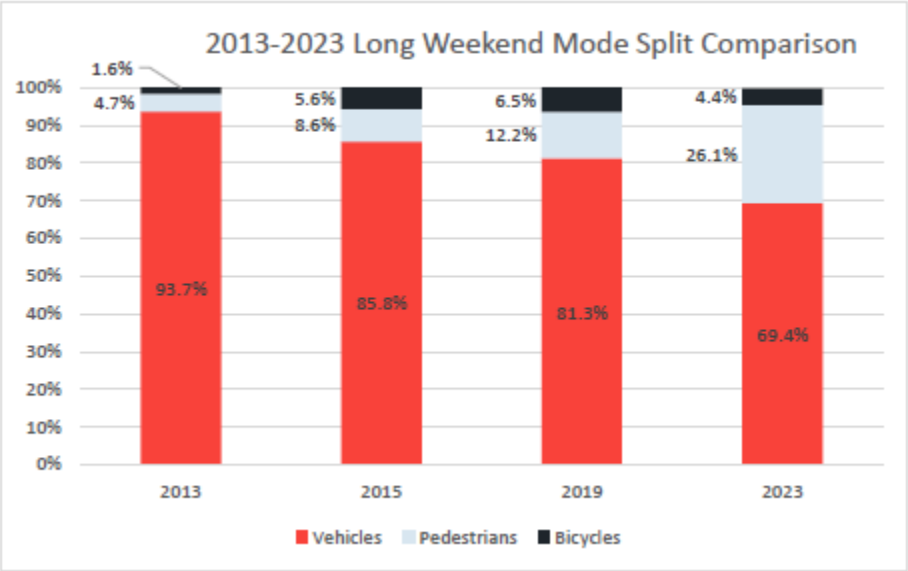
Of all the tickets issued, residents were issued 25%, and non-residents were issued 75%. Though more tickets were issued on Saturdays and Sundays (21% and 23%, respectively), the distribution of enforcement is even throughout the week.

Multi-Modal Transportation Shift

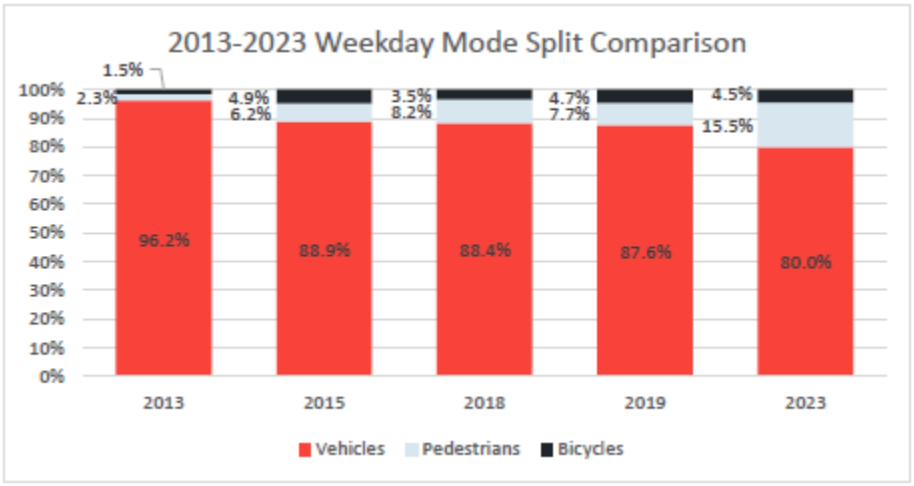
It is not possible to determine the specific role that parking regulation and pricing has played in supporting mode-shift as these strategies are part of a larger suite of efforts which include increased transit service, infrastructure improvements, and societal trends. That said, trends in walk, cycle, and transit uses are positive over the past several years, with strong increases correlating with the start of the pay parking program in the Town Centre.

Local transit ridership in July and August has increased by 254% in 2023 from the year prior to the launch of pay parking in the Town Centre, 2021. During the same period, regional transit has increase by 126%.

The share of trips taken by foot and bicycle has also seen a significant shift in recent years, as measured by Stantec at key intersections in and around the Town Centre. The most dramatic shift has occurred in the period encompassing the introduction of pay parking, with a nearly 12% reduction in vehicle trip share on long weekends between 2019 and 2023, down to 69%.



Weekday splits have similarly improved, with a large increase in walk trips noted over 2019 and a reduction of vehicle trip share to 80%.



Overall mode shift is tracking towards our 2030 Integrated Transportation Plan goals. Though this shift is supported by a suite of strategies, improved regulation and pay parking implementation playing an important role in removing driving subsidies, supporting transit growth, and encouraging people to walk and cycle.

Paid Parking – Feedback and Opportunities

With the implementation of paid parking in Town Centre, administration has received feedback on the program from staff, residents, visitors, businesses, and the Downtown BIA. The feedback is appreciated and has been thoughtfully considered and analyzed throughout the first year of operation. While not all feedback was constructive or possible to implement, there was generally positive feedback for the ease of operation of the Blinkay App and web payment options, appreciation for the three free hours for residents, and the increased ability to find parking spots in the Town Centre.

Pay Machines

The pay machines were carefully placed throughout the Town Centre on municipal land that would allow for the solar panels to receive enough power to run the machines. Feedback was received that there were not enough pay machines or that they were not well-signed. Additional signage was added near the pay machines, and administration purchased five new machines. The new machines will be installed this fall: three of the machines will be installed in the Town Centre and the other two have been secured for either future expansion or as replacements should there be any maintenance or repairs required. If required, the machines within the pedestrian zone can be relocated in future seasons to high-use areas during the time the area is pedestrianized. One machine was moved to address confusion because a property owner chose to add their own paid parking program to a private lot adjacent to a pay machine location.

Some of the feedback has been that the machines are down often or have not accepted payment easily. There have been some challenges with a few of the machines, but given the machines are working outside in all elements and are solar-powered, they have fared very well. Additional signage has been placed on the machines to remind users that there are two other ways to pay for parking, through the app or the web portal.

Permit Approval and Renewal Process

The process for permit approvals and renewals was created to ensure permits were issued only to eligible Town of Canmore residents and businesses but Administration is looking to change the renewal process to a two-year process or to distribute the permit renewal times throughout the year. This would reduce resource requirements and increase convenience for residents, especially for those requiring in-person help.

Administration has heard from residents that it would be beneficial to have longer permit periods for seniors so that they would not have to go through the permit renewal process as often. Part of the challenge would be identifying account holders who are seniors and would require additional personal information collected by the Town to determine this. Instead, administration will be offering in-person permit renewal sessions for residents of all ages during either peak renewal times or throughout the year at special public engagement events. This was successfully done with the Canmore Seniors Association and administration received positive feedback about this approach.

Recommendations from the Downtown Canmore BIA

In May, Council heard from a delegation from the Downtown Canmore BIA who provided several recommendations for the paid parking program.

The first was to offer free (non-registered) parking Monday-Thursday during the off-season. The reason provided was that this encourages more traffic on slow days and maximizes the use of public parking areas. There already is free parking available to residents Monday-Thursday with their resident permit, and free non-registered parking downtown would indeed increase the number of vehicles parked downtown, but these would likely belong to employees working in the downtown area. Instead, administration has had discussions with the Downtown Canmore BIA Executive Director about running a marketing campaign geared towards residents, encouraging them to use their three free hours or alternative modes of transportation, like fare-free transit, to access downtown businesses.

The next recommendation was to reduce the paid parking hours from 8 AM to 8 PM to 10 AM to 6 PM. The reasoning was this would provide locals who do not want to register their vehicles for parking time to park

downtown for errands. This would also allow employees working downtown to park for longer downtown for free, which would discourage turnover on parking stalls. This also does not benefit businesses that are not open until 10 AM and possibly close at 6 PM, so the errands that are being run downtown by locals may fall outside of that time and they would still need to register for their three free hours should they wish to visit those businesses. Utilization data was used to support the direction related to these requests.

The issuance of employee passes for a nominal fee was also recommended. This would involve dedicating one of the Town of Canmore parking lots that appear to be under-utilized during some months or times of day and using them for all-day parking for employees commuting from outside of Canmore boundaries. This is being addressed through the non-resident employee monthly pass that is launching November 1st. Though the fees are not nominal, they are representative of the cost of providing parking to out-of-town employees and have been previously approved by Council. Free parking options remain a short walking distance to the Town Centre.

The next recommendation Is to include the MD of Bighorn and area in the 3-hour program. This decision would need to be made by Council. Administration recommends that should this decision be made, there be some form of payment to access the three free hours. While the hours are referred to as "free", they are still subsidized by Canmore resident's tax dollars for provision and maintenance of parking areas.

Allowing for a grace period before a ticket is issued was another recommendation. This is already done in the form of the appeal process that those who were issued a ticket may go through if there has been an error or they have not had enough time to pay for their parking before they received a ticket. Administration notes that although this does happen, it is not a frequent occurrence, and the ticket is usually voided on the spot by the enforcement officer or when the appeal is received by the administrator.

The final recommendation was to allow residents to register their license plates with the Town rather than beginning a session to reduce the perceived barrier to coming downtown by some locals. While this would be more convenient for residents, there would be no way for enforcement officers to know when the vehicles started parking downtown and the three free hours was activated. This would be akin to offering free parking all day for residents. It appears this is less of an issue over time, with a 55% increase in resident transactions in summer of 2023 over 2022, well over the pace of increase in visitor transactions of 15%.

Feedback from Residents

Administration received feedback throughout the implementation and the last year of operation that can be grouped into some key points.

While there were concerns from residents regarding spillover in resident zones, this was largely resolved, with a couple of exceptions.

In Peaks of Grassi, spillover is experienced in resident parking zones on hot days when Quarry Lake is already at capacity. To address the parking in the Peaks of Grassi, enforcement officers continue to monitor these areas, particularly during hot days. Illegal parking is addressed, but it is difficult to determine whether the other vehicles parked there are residents who live in the area, are visiting or working on construction projects in the area or are parking there and walking to Quarry Lake. This area will continue to be monitored and potential solutions analyzed once construction in the area is completed.

Spillover also exists along 7th Avenue, to the north of the Town Centre. 7th Avenue is a residential street classification; however, it is unregulated, is not part of the resident parking permit program, and has been identified as a free-parking zone. While this has been an effective way to shift all-day parking out of the Town Centre, additional parking and traffic in the area have generated resident complaints and concerns about safety. To increase visibility and sightlines, the no parking zone on either side of Spur Line Trail was extended from 5m to 10m, and the crosswalk was painted with the Trans Pride flag colours to increase attention in the area, while also demonstrating the Town's commitment to creating an equitable, diverse, and inclusive community. As the program matures, this area could be treated in the same way as other residential areas around the Town Centre, with resident permits required north of the pond.

Residents have also provided feedback around the ability to have smaller increments of time as an option or to put in the ability to end a parking session. This could allow for more parking sessions for residents to use their three free hours, allow for charging in loading zones, and provide an additional level of customer service for users. These recommendations are being explored with the vendor on feasibility and request for change quotation.

Opportunities for Expansion

To address congestion in other areas around Town Centre, there is an opportunity to expand the paid parking zones to Riverside Park and the Boat Launch during peak-season months. Riverside Park is undergoing some roadwork to improve parking and traffic flow in the area. It has also been advertised as a place for visitors to park when visiting the Canmore Engine Bridge.

Administration is considering other areas that may require study for new regulation and pricing, these include public parking in remaining commercial, and mixed-use development areas.

Fee Increases

Based on parking utilization targets and trends, it is recommended to increase fees during periods at or above utilization targets. These include weekends, and peak season weekdays. An increase of fees will continue to help avoid congestion by encouraging turnover, minimizing hunting for spaces, and encouraging mode-shift in the Town Centre. Re-evaluating the peak season timeframe is another consideration that will be put forward during upcoming budget amendments. During off-peak busy times, such as the winter break, February and spring breaks, special events, and weekends throughout the year, utilization of parking in the Town Centre is reaching capacity and there is an opportunity to apply peak-season pricing to that timeframe as well. It is recommended that weekends, holidays, and school breaks in the off-peak season (October 15-May 14) be considered as peak times and have peak pricing applied. An increase of $1 or $2 per hour during peak times will be brought forward as a recommendation during the budget amendment process.

During the initial launch of pay-parking at Quarry Lake, a rate of $20 was utilized which allowed for up to 4 hours of parking. The same effective hourly rate of $5 was utilized in 2023 with a 2-hr minimum. While this approach encourages turnover, utilization is exceeding capacity on hot days. As part of the 2023 budget process, it will be recommended that rates be increased to $10/hour in 2023 as a part of the budget amendment process. This rate adjustment would take place for peak season. This rate increase coincides with the planned launch of a new transit route which will provide alternative transportation to Quarry Lake.

Decision-Making Framework

On October 5, 2021, Council approved resolution 231-2021 for the implementation of a paid parking program. In the report, it was recommended that Council provide administration with the ability and flexibility to make operational changes as required as the paid parking program was implemented, and that Council simply approve the implementation of a Paid Parking Program. The approved recommendation is as follows:

That Council:

1) Rescind motion 260-2019 "Moved by Mayor Borrowman that Council approve the implementation of a paid parking program and associated parking strategies in 2020 as presented"; and
2) Approve the implementation of a Paid Parking program.

There are many considerations when implementing the paid parking program, and for parking management decisions in general. Some decisions are operational in nature and can be made within existing operating or capital budgets. The following decision-making framework is in alignment with motion 231-2021 and details how decisions regarding parking regulation, permitting, and pricing changes are deliberated by administration.

Administration has categorized feedback and opportunities for change into two categories: operational adjustments and material program changes.

Operational adjustments may include, but are not limited to, the following:

- modifications to existing pay parking zones, and associated resident zones, as required to address operational issues. These modifications would generally affect a small portion of the zone and would not materially change revenues;
- process changes for permit or monthly pass renewals;
- programming changes that change payment processes on the apps.

Material program changes are changes that would significantly impact revenue, require a capital budget request, or have significant changes to operating expenses. These can include, but are not limited to:

- proposed new paid parking zones;
- pricing changes;
- regulation changes;
- expanded/adjusted RPP zones;
- seasonal changes;
- change of use of parking space (e.g. to patios, parklets, bicycle paths, sidewalks, bus stops, redevelopment of parking lots).

To address parking management related issues, or recommendations for changes to the way parking is managed, administration has established a 'Parking Management Team'. Parking management may involve multiple departments, and representatives from Protective Services/Municipal Enforcement, Engineering, Finance, and Economic Development may be involved in decision making as part of this team. Decisions may require significant data collection and analysis, or be safety related and urgent. Decisions may be operational in nature or require senior administration and Council approval. Stakeholder interests may be in

conflict, and there can be a wide range of opinions between them. To address these challenges, and provide clarity with respect to how parking management decisions are made, the Parking Management Team uses the following process:

1) A program change, or issue that may require a program change, is identified through operations or strategic planning. For example, issues may be raised by staff, the public, key stakeholders and partners, and Council or changes may be desired based on strategic plans or policies. The nature of the issue is documented, data is collected as required, and potential solutions are identified. If the request is safety or transportation related, it is generally better suited for the Traffic and Road Improvement Group and is referred there. If the solution is a change to the parking management program, it continues through the process as a Program Change Request (PCR).

2) The PCR is filtered for alignment with the Integrated Parking Management Plan, Integrated Transportation Plan, Area Planning, or Council's Strategic Plan. The PCR may be rejected at this point due to misalignment with strategic planning, or alternative solutions to address the root problem may be considered.

3) If in alignment with strategic planning, the PCR is evaluated for priority using a tool which considers the following:
    a. Degree of alignment
    b. Costs of implementation, versus available resources
    c. Impacts
    d. Ease of implementation

4) If a PCR is deemed a priority, consideration is then given to whether this is something that would be typically handled operationally or requires Council approval. Operational changes will typically have minimal impact on operating costs and revenues, and costs of implementation that can be managed within operating budgets. PCRs that require Council approvals are those that require project planning, a larger communications plan, are more resource intensive, have higher costs of implementation, and have costs and revenues that materially affect municipal budgets.

5) Approval is sought as required:
    a. If change is deemed a priority by the Parking Management Team and resources for the change have been approved by Council, the Parking Management Team managers (Finance, Protective Services, Engineering) can decide on priorities and direct the work. Changes that will be felt in the community will be communicated directly as required and through administration updates to the Committee of the Whole.
    b. If changes are sensitive in nature (moderate impact to medium or large number of stakeholders, or large impact to any number of stakeholders), the Parking Management Team managers may seek buy-in from senior administration. A briefing note will be circulated for signatures, and the change will be communicated directly as a required or through an update to the Committee of the Whole.
    c. If a change is deemed a priority by the Parking Management Team, and resources for the change have not yet been approved by Council, the Parking Management Team managers will bring forward budget amendments as part of the regular budget cycle. For urgent

changes (e.g. pandemic, significant safety concern), mid-cycle budget amendments may be considered, though are generally not desired. The Corporate Strategic Team will decide on direction and direct the managers on the appropriate Council approval process.

6) While working through prior steps, the Parking Management Team will maintain communication with those stakeholders who may have requested the change. Confirmation will be provided as to whether action, along with rationale, and, if so, when changes can be expected. At the time of implementation, the team will communicate with impacted stakeholders as required.

7) After implementation, the Parking Management Team will monitor as required to ensure desired outcomes are achieved. This may require additional data collection and may result in subsequent changes to achieve goals.

FINANCIAL IMPACTS

Parking management expenditures are consistent with plans and pay parking revenues are projected to be higher than budgeted for. The net impact on municipal finances is positive and are detailed in the Paid Parking Revenue Allocation Model report.

Any recommended changes to the paid parking program that have a financial impact will be brought forward to Council for approval as a part of the 2024 budget amendment package.

STAKEHOLDER ENGAGEMENT

The Downtown Canmore BIA has been in conversation with administration throughout the implementation of the paid parking program. The BIA's recommendations to Council were reviewed with administration prior to their spring 2023 delegation to Council and have been considered and analyzed as a part of the program review and recommendations.

Administration continues to hear from residents and businesses regarding their feedback for changes and opportunities with the paid parking program. Feedback is considered by administration against the decision-making framework and have used resident and business owner's feedback to make recommendations for material changes to the program that will be brought forward for future budget considerations and Council approvals.

ATTACHMENTS

None

AUTHORIZATION

Submitted by:	Caitlin Miller Manager of Protective Services	Date:	September 13, 2023
Submitted by:	Palki Biswas Manager of Finance	Date:	September 15, 2023
Submitted by:	Andy Esarte Manager of Engineering	Date	September 12, 2023
Approved by:	Scott McKay General Manager of Municipal Services	Date:	September 14, 2023
Approved by:	Sally Caudill Chief Administrative Officer	Date:	September 25, 2023

Request for Decision

DATE OF MEETING:	**October 3, 2023**	**Agenda #:** H-6
TO:	Council	
SUBJECT:	Paid Parking Revenue Allocation Model (PPRAM) Proposal	
SUBMITTED BY:	Palki Biswas, Manager of Finance Andy Esarte, Manager of Engineering Caitlin Miller, Manager of Protective Services	
RECOMMENDATION:	That Council approve the Paid Parking Revenue Allocation Model (PPRAM) as presented. That Council direct administration to bring back a revised Reserves Policy (FIN-007) to eliminate the Paid Parking Reserve and to transfer the balance from the Paid Parking Reserve to Asset Replacement/ Rehabilitation Reserve by 2023 year-end.	

EXECUTIVE SUMMARY

In response to the direction from Council, administration has developed a framework for paid parking revenue allocation to include both a mechanism to continue funding municipal paid parking priorities and to create a sustainable funding source to support advancing the Integrated Parking Management Plan (IPMP).

RELEVANT COUNCIL DIRECTION, POLICY, OR BYLAWS

31-2022FIN: Finance Committee directed administration to develop a Paid Parking Revenue Allocation Model (PPRAM) for approval prior to 2024 budget amendment in fall of 2023.

259-2022: Council directed administration to create a Town Centre Grant Program after consultation with Downtown Business Improvement Area to begin in 2023, funded by the Paid Parking Reserve with the annual amount determined as part of the budget process.

DISCUSSION

Public parking has been priced in the Town Centre for over one full year, with year-over-year data for July and August (since July 2022) and priced at Quarry Lake for two full years, with year-over-year data for three summers (since July 2021).

Revenues generated from paid parking offset operational costs, with net income allocated to municipal priorities related to Integrated Parking Management. In 2022 and 2023, a portion of the Local Transit Service was funded with the remainder contributed to a reserve. Having a full year worth of revenue data, as well as some indication of trends through partial year-over-year data, administration has a better sense of net revenue potential. The proposed Paid Parking Revenue Allocation Model (PPRAM) is outlined in the table shown in

the Financial Impacts section of this report. It will provide clarity for how net revenues will be directed and will inform upcoming budget processes.

The purpose of this allocation model is to provide a framework for decisions related to paid parking revenues. It sets out guidelines, rationale and identifies the information needed to support the distribution of net paid parking revenues in a manner that helps to alleviate some current and future pressure on operating and capital budgets, and reserves. This will lead to consistent and transparent decision-making during budget deliberations.

The following principles make up the Paid Parking Revenue Allocation Model (PPRAM):

Principle 1 – Cost Recovery Principle: The full cost of parking management should be covered with the revenues of the paid parking program. Each budget cycle, the program costs are approved by Council, based on projected resource requirements, and estimated revenues.

Administration will bring forward some differential pricing strategies that will include analysis of existing market price and utilization, peak-load pricing, pricing based on location scenarios etc. to be considered for 2024 during the budget deliberations. Regular fee reviews will be conducted with every two-year budget cycle.

Principle 2 - Benefits and Subsidies Principle: The costs of parking should be borne by those that benefit from parking, with a user-pay approach being preferable to general taxation. This approach directs a greater share of costs to those directly benefiting and reduces subsidies for driving. The community at large benefits from the provision of transit as it reduces traffic congestion and parking demand. The benefit is maximized when transit usage is maximized. Making local transit fare-free offset by parking revenues was identified as a primary strategy for parking management in the Integrated Parking Management Plan and approved by Council. Offsetting a portion of the costs of local transit with parking revenues continues to be a complimentary strategy in support of parking goals and is consistent with Council's strategic plan.

Principle 3 - Management of Public Assets Principle: The Town has a responsibility to appropriately manage and maintain its assets to ensure the ongoing function and benefit to the community. Roads and parking assets represent a significant portion of the Town's asset base. This principle recognizes that the cost of lifecycle maintenance of roadway and parking assets should be considered when determining the allocation of the paid parking revenues.

Following the above principles, administration is recommending that paid parking revenues be allocated in the following manner:

Operating Expenses

Based on the cost recovery principle, the paid parking revenues will first and foremost offset direct costs associated with the paid parking operations. The net income will then be transferred as per the allocation in the following sections.

Local Transit Services

It is recommended that paid parking revenues continue to cover a portion of local transit costs that would have otherwise been covered by user fees or tax funded. Parking revenues collected in the Town Centre and at Quarry Lake are directed back into a service that directly benefit residents, visitors, and businesses in those

areas and will continue the social benefit of managing parking demand and congestion, and providing a safe, accessible and affordable transportation option.

To ensure sustainability of this vital service, administration is recommending that Council approve a fixed amount for each fiscal year of transit operations within the two-year budget process as the first priority for directing paid parking revenue. This amount will be informed by the Bow Valley Regional Transit Services Commission budget requisition.

Contribution to Reserve

Council had approved a program specific "Paid Parking Reserve" to fund improvements in areas where paid parking has been implemented, and/or to fund fare free transit services and/or to fund offsite parking related infrastructure such as intercept parking or shuttle services. This reserve is funded from paid parking revenues, net of program expenses.

Administration is proposing to eliminate this program specific reserve and instead rely on the principles outlined above to direct parking revenues to the Asset Replacement/Rehabilitation Reserve. The paid parking program has changed since conception and strategies from the Integrated Parking Management Plan are now being applied more broadly to the whole community. Maintenance of roadway and parking assets represents a significant cost in our capital plan. Parking revenues can offset a portion of the costs associated with providing roads and parking and maintaining parking management assets like pay machines.

Therefore, it is recommended that a share of net parking income be allocated to the Asset Replacement/Rehabilitation Reserve to fund future maintenance and replacement of road and parking capital assets.

Town Centre Grant Program

In November 2022, Council directed administration to develop a Town Centre Grant Program in consultation with the Downtown Business Improvement Area (BIA). The objective of the grant was to create a mechanism through which some paid parking revenue could be used to enhance the Town Centre in alignment with the Paid Parking Reserve and other key Town guiding documents. The Town Centre Grant Program was established as a means through which the BIA can apply for funding to support the delivery of projects, programs, or initiatives that enhance the Canmore Town Centre in ways that are aligned with Council's Strategic Plan and other Guiding Documents, such as the Integrated Transportation Plan and the Integrated Parking Management Plan, as well as benefit the Town Centre business community.

Over the last few months, administration has worked with the BIA to develop the grant program which aims to reinvest a portion of the paid parking revenue to fund incremental enhancements to the Town Centre to benefit residents, visitors, and the business community. The grant program creates a mechanism through which the BIA can request funding to deliver on projects, programs, or initiatives to support the enhancement of the BIA area in alignment with Town Strategic documents while keeping the focus on areas of the BIA boards' strategic priorities. Eligible grant-funded projects will be reviewed and ranked by a small group of Town staff based on their ability to demonstrate fit with the purpose of the grant and its eligibility criteria. Applications will be evaluated against the following criteria:

- *Strategic Plan and Guiding Document Alignment* – how the project supports the objectives and key results in Council's Strategic Plan and other guiding documents.
- *Multi-Modal Transportation and Parking* – how the project aligns with the guidance provided in the ITP and IPMP.
- *Economic Benefit* – how the project benefits the Town Centre business community and how the project utilizes other grants or funding sources.

The grant funding will be determined by Council as part of the two-year budget approval process based on the PPRAM. The process of allocation is intended to be collaborative between the Town and BIA. Unspent grant funds are set aside in the Asset Replacement/Rehabilitation Reserve for future Town Centre Grant Program needs.

This grant program has the potential to advance recommendations from the Downtown ARP. Based on historical community grants and other Town Centre enhancement funding opportunities (e.g., in-street patios, vibrancy initiatives) an amount of $50,000 annually was approved by Council. There are significant infrastructure capital needs outside of this grant program and therefore this grant stream will be used for capital or operating programs/services with no recurring operating impact to municipal taxes.

Rocky Mountain Heritage Foundation

As co-owners of the Quarry Lake, 50% of the net paid parking revenue attributable to Quarry Lake operations would be paid to the Rocky Mountain Heritage Foundation subject to the final executed agreement, which will come to Council when finalized. Exact amounts will vary each year based on actual Quarry Lake operations' revenues and expenses. In the 2023 budget, this amounts to approximately $50,000. Currently Town administration is working with the Foundation for an agreement to be developed between both parties.

ANALYSIS OF ALTERNATIVES

Council could propose a different allocation and usage of net paid parking income or priority of the allocation other than stated above.

FINANCIAL IMPACTS

The financial implications related to the PPRAM proposal for 2024, based on 2023 projected revenues and expenses are outlined below. This is an illustrative example to determine where the net paid parking income gets allocated. As expenses and revenues associated with paid parking will continue to change over time, the table below will be updated as part of the Town's regular budget process. Additionally, the revenue allocation model itself will be reviewed in the next budget cycle (2025-2028) to validate the approach as more paid parking data becomes available.

	2023 Approved Budget	**2023** Projections (as of July 31, 2023)	**2024** Approved Budget	**2024** Revised Budget
Paid Parking Revenue	$1,150,000	$1,869,150	$1,159,280	$1,800,000
Paid Parking Expense	373,950	470,750	378,280	$450,000
Net Paid Parking Income	**$776,050**	**$1,398,400**	**$781,000**	**$1,350,000**
Allocation:				
Local Transit Services	$685,000	685,000	$731,000	731,000
Contribution to Reserve	41,050	613,400*	-	519,000*
Town Centre Grant Program	50,000	50,000	50,000	50,000
Fee Payable to RMHF	-	50,000*	-	50,000*
Total	**$776,050**	**$1,398,400**	**$781,000**	**$1,350,000**

**These numbers will vary each year based on actuals*

In an unlikely event that the paid parking revenues are not sufficient to cover all the operating expenses, then a draw from the Tax Stabilization Reserve would take place. Transfers to reserves, the Town Centre Grant Program, and the Rocky Mountain Heritage Foundation would not occur. In such a circumstance, the paid parking operating expenses need to be reduced while looking for strategies to increase the paid parking revenues.

STAKEHOLDER ENGAGEMENT

Internal: Finance worked with Corporate Strategic Team (CST) to come up with this plan for allocating the paid parking revenues.
External: Town administration is continuing to work with the Rocky Mountain Heritage Foundation and the Downtown BIA. Administration worked closely with the Downtown BIA to create the parameters and processes that will be used to administer the proposed Town Centre Grant Program.

ATTACHMENTS

Downtown BIA Letter of Support – Town Centre Grant Program

AUTHORIZATION

Submitted by:	Palki Biswas, Manager of Finance Andy Esarte, Manager of Engineering Caitlin Miller, Manager of Protective Services	Date:	September 13, 2023
Approved by:	Therese Rogers General Manager, Corporate Services	Date	September 14, 2023
Approved by:	Scott McKay General Manager, Municipal Services	Date:	September 14, 2023
Approved by:	Whitney Smithers General Manager, Municipal Infrastructure	Date:	
Approved by:	Sally Caudill Chief Administrative Officer	Date:	September 25, 2023

Downtown CANMORE

September 22, 2023

Scott McKay
General Manager of Municipal Services
Town of Canmore
scott.mckay@canmore.ca

Dear Scott:

Re: Town Centre Grant Policy Program

The Downtown Canmore BIA Board of Directors have reviewed the policy and have motioned to give support to the Town Centre Grant Policy Program. We look forward to working with the Town of Canmore in using the monies afforded in the grant to “create an inviting and activated environment for people once they get here”.

Regards,

Tory Kendal
Chair
Downtown Canmore BIA

Cc: Jeff Mah Councilor

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