Town of Canmore

Environmental Sustainability Action Plan

Originally Approved by Council June 22, 2010

Revisions Approved by Council June 4, 2013

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Executive Summary

This Environmental Sustainability Action Plan (ESAP) has been developed to update, integrate and expand the Town's strategies, programs and initiatives related to environmental stewardship and to ensure effective implementation of the community's vision related to environmental stewardship.

The (ESAP) was approved by Council June 2010; revised and approved June 2013. A common framework has been used to ensure consistency throughout the document including:

- the application of The Natural Step framework for strategic sustainable development;
- the development of targets for each program area;
- a formal performance measurement system with clear accountabilities and specific indicators;
- a process and schedule for regular reporting to the corporation and the community; and
- linkages to key Town documents and policy.

The ESAP is meant to be a living document, a work in progress that provides direction, guides future action, and allows for changes to be made and progress to be monitored. The document will be reviewed and updated biannually.

The following is a summary of the goals and targets developed for each of the five program areas:

Energy and Climate Protection

Targets for Town of Canmore (Corporate) Operations	Targets for the Community
By 2015 • Stabilize Town of Canmore corporate CO2 emissions - no further increases in absolute emissions even with population growth (tonnes CO2e/yr), • and/or reduce absolute corporate emissions to 2007 levels (tonnes CO2e/yr).	By 2015 • Stabilize community CO2 emissions - no further increases in absolute emissions even with population growth (tonnes CO2e/yr).
By 2020 • Reduce Town of Canmore corporate greenhouse gas emissions by 50 % from 2007 levels (tonnes CO2e/yr) (including the use of offsets (*i.e.* green power purchase program or other).	By 2020 • Reduce community CO2 emissions to 2007 levels (tonnes CO2e/yr).
By 2050 • Reduce Town of Canmore corporate greenhouse gas emissions by 80 % from 2007 levels (tonnes CO2e/yr) and/or Town operations are carbon neutral.	By 2050 • Reduce community CO2 emissions by 50 % from 2007 levels (tonnes CO2e/yr).
Fuel Goal: • Reduce corporate fuel consumption to 103,300 L and hold.	

Emission Goal: • Reduce GHG emissions from corporate fuel to 265,227kg by 2015 and hold.	

Resource Conservation and Waste Management

Targets for Town of Canmore (Corporate) and the Community
Total Solid Waste Land-Filled The amount of municipal solid waste land filled will be reduced to: • 0.60 tonnes/person/yr by 2015 • 0.45 tonnes/person/yr by 2020 • 0.30 tonnes/person/yr by 2035
Residential and ICI Wastes Sent to Calgary-Area Landfills The amount of municipal solid waste from the residential and ICI sectors sent to Calgary area landfills (or other landfills) for disposal will be reduced to: • 0.35 tonnes/person/yr by 2015 • 0.30 tonnes/person/yr by 2020 • 0.20 tonnes/person/yr by 2035
C&D Wastes Land Filled at Francis Cooke Landfill The amount C&D wastes from the residential and ICI sectors and the Town of Canmore land filled at the Francis Cooke landfill will be reduced to: • 0.25 tonnes/person/yr by 2015 • 0.15 tonnes/person/yr by 2020 • 0.10 tonnes/person/yr by 2035

Water Conservation

Targets for Town of Canmore (Corporate) Operations	Targets for the Community
By 2015 • Reduce water losses from the water distribution system to 10 % or less. • Reduce groundwater infiltration into the wastewater collection system by 20%. By 2020 • Maintain water losses from the water distribution system at 10 % or less. • Reduce groundwater infiltration into the wastewater collection system by 50 % or limit it to a maximum of xx. By 2035 • Maintain water losses from the water distribution system at 10 % or less.	**Total Water Consumption** By 2015 • Reduce annual per-capita water production (consumption) by 30 % from 2000 levels. By 2020 • Reduce annual per-capita water production (consumption) by 40 % from 2000 levels. By 2035 • Reduce annual per-capita water production (consumption) by 50 % from 2000 levels.

• Reduce groundwater infiltration into the wastewater collection system by 80 % or limit it to a maximum of xx.	
	Residential Water Consumption <u>By 2015</u> • Reduce per-capita residential water consumption by 30 % from 2000 levels (155 litres/person/day). <u>By 2020</u> • Reduce per-capita residential water consumption by 40 % from 2000 levels (133 litres/person/day). <u>By 2035</u> • Reduce per-capita residential water consumption by 50 % from 2000 levels (111litres/person/day).
	ICI Water Consumption <u>By 2015</u> • Reduce total annual ICI water consumption by 10 % from 2008 levels. <u>By 2020</u> • Reduce total annual ICI water consumption by 20 % from 2008 levels. <u>By 2035</u> • Reduce total annual ICI water consumption by 30 % from 2008 levels.

Toxin Reduction

Targets for Town of Canmore (Corporate) Operations	Targets for the Community
<u>By 2015</u> • Continue approach of zero use of chemical herbicides for cosmetic purposes. • Map and monitor extent of areas where chemical herbicides are used to control noxious and restricted weeds. • Develop a formal Integrated Pest Management (IPM) plan for Town of Canmore operations. <u>By 2020</u> • Continue approach of zero use of chemical herbicides for cosmetic purposes. • Further goals to be developed. <u>By 2035</u> • Continue approach of zero use of chemical herbicides for cosmetic purposes. • Further goals to be developed.	<u>By 2015</u> • 50 % of residences voluntarily report that they do not use chemical herbicides to maintain their properties. • Approach retailers and commercial applicators to confirm willingness to provide annual data on herbicide sales or applications. • Collect three years of baseline data on residential herbicide sales and commercial herbicide applications. • Establish herbicide reduction goal. <u>By 2020</u> • To be developed. <u>By 2035</u> • To be developed.
Street Sweeping Recovery: • Increase the recovery of the volume of winter sanding material used per year to 55% in 2015. • Increase the recovery of the volume of winter	

sanding material used per year to 60% in 2020. • Increase the recovery of the volume of winter sanding material used per year to 65% in 2035.	

Community engagement

Targets for Town of Canmore (Corporate) and the Community
• Develop formal community education and engagement programs and initiatives that support the attainment of the sustainability goals outlined in each of the other sections of the ESAP. • Achieve awareness and active participation of the majority of the residential population in activities or initiatives that move the community towards sustainability. • Achieve awareness and active participation of the majority of local businesses and organizations in activities or initiatives that move the community towards sustainability.

Energy and Climate Protection

Energy and Climate Protection

Desired Future State

We are striving for a future in which the citizens of Canmore, local businesses and visitors understand the connection between energy use, climate change and environmental quality and have made the changes necessary to create a more sustainable future.

We use energy responsibly and efficiently and have access to an abundant, diverse and affordable supply of energy resources to meet the needs of the community. We have reduced the energy we use for transportation by embracing the use of active and pedestrian-friendly modes of transportation. By deploying renewable and other forms of low carbon energy, we have significantly reduced the carbon intensity of the energy that we do use. Our individual and the community's collective activities no longer contribute to the progressive build up of greenhouse gases and other pollutants in the atmosphere.

As a result of our efforts and those of other communities, we are no longer worried about our supply of energy or the threat of climate change. We continue to enjoy clear skies, clean air and the spectacular natural beauty of the environment in which we live. Although we have made significant changes in how we use and generate energy, these changes have enhanced, rather than diminished the quality of our mountain lifestyle.

Current Reality

Summary

In late 2002 Council approved the following goal statement with respect to greenhouse gas emissions:

"The Town of Canmore will achieve an "overall" reduction in greenhouse gas emissions on a community-wide basis of 6% per unit of measure by the year 2012 using 2000 as the base year of comparison. The 6% "overall" reduction will include a 20% reduction in Town of Canmore operation emissions."

Since 2002, the Town of Canmore has implemented a significant number of programs and initiatives intended to reduce the Town's greenhouse gas emissions including the development and implementation of an Energy Management Action Plan (EMAP) in early 2005. Although many of the actions identified in the EMAP have been implemented, corporate and community energy use and associated greenhouse gas emissions have not been tracked, making it difficult to know what progress has been made towards achieving the reduction targets established for 2012.

To develop an understanding of what progress has been made towards the 2012 targets, Town of Canmore corporate and community energy use data was collected for 2007 and 2008 and compared to the energy baseline established for 2000 as part of the Town's participation in the Partners in Climate Protection program and used in the development of the EMAP. Greenhouse gas emissions were estimated from the energy data and also compared to the 2000 baseline emission estimates.

The data for 2007 and 2008 indicates that although the Town has already met its 20 % intensity reduction target (several years ahead of schedule), overall corporate emissions continue to grow. In 2008 net corporate greenhouse gas emissions were slightly more than 6700 tonnes of CO2e, or approximately 11 % higher than in 2000.

Although accurate energy consumption data for the community has been more difficult to come by, the data that is available suggests that the community's greenhouse gas emissions for 2008 were at least 154,000 tonnes of CO2e and likely in excess of 170,000 tonnes CO2e. This is 45 - 60 % higher than in 2000. The observed increase in greenhouse gas emissions exceeds the observed growth in the total population (permanent + part-time) for the community, suggesting that no progress has been made towards the community's target of a 6 % reduction in per-capita greenhouse gas emissions by 2012. The significant growth in the community's greenhouse gas emissions is attributed to significant population growth, high levels of development activity and an increase in the per-capita use of energy.

Although a comparison of recent community energy use data to the 2000 EMAP baseline data is useful for identifying the direction and magnitude of the changes that have occurred, some caution must be exercised with respect to the use of the 2000 EMAP baseline data. Prior to 2006, obtaining accurate energy use data on a community level was difficult due to the deregulated nature of the Alberta energy market and the multiple energy providers servicing most communities. As a result, development of the EMAP baseline data required the use of a number of assumptions. As the original power consumption data used to develop the 2000 baseline was not available for review, the accuracy of the 2000 baseline data for the community could not be verified and therefore should be interpreted with the necessary caution.

Since the community's greenhouse gas emission reduction targets were established in 2002, public concern about climate change has increased due in part to increasingly dire predictions from climate change scientists about the potential for dangerous climate change should we not take steps to significantly reduce society's greenhouse gas emissions. In its 2007 Synthesis Report, the Intergovernmental Panel on Climate Change (IPCC) suggests that absolute reductions in greenhouse gas emissions in the order of 50 – 85 % from 2000 levels are required by 2050 if the risks of dangerous climate change are to be minimized (IPCC, 2007).

In response to these concerns, new more aggressive greenhouse gas emission reduction targets are being discussed and established at the international, national, provincial and municipal levels. Under the Government of Canada's *Turning the Corner Plan*, absolute green house gas emission reductions of 20 % by 2020 and 60 – 70 % by 2050 (from 2006 levels) are proposed (Government of Canada, 2008). Meeting intensity-based emission targets while allowing overall greenhouse gas emissions to continue to grow, is no longer considered an adequate approach for addressing the risks of climate change.

Clearly achieving our desired future will not be easy. New targets and new approaches to our use of energy will be required. While the Town of Canmore has had some success in limiting the rate of growth of its corporate greenhouse gas emissions, many of the energy and emission reduction initiatives that have been implemented have been relatively easy and/or inexpensive to implement. At the same time, the criteria used by the Town to evaluate and approve energy and emission reduction initiatives have not been clearly articulated or consistently applied. In the future, increased commitment, focus and creativity will be required to achieve the necessary absolute reductions in corporate greenhouse gas emissions while maintaining our desired lifestyle and accommodating growth and development within the community.

For the broader community, the challenge is even greater. The Town of Canmore's corporate emissions account for less than 6 % of the community's total greenhouse gas emissions. This means that 94 % of the community's greenhouse gas emissions are generated by residents, visitors and the commercial and industrial sectors. Measuring the community's use of energy and associated greenhouse gas emissions is difficult and without the active support, participation and leadership of the broader community, it will be impossible to achieve significant absolute reductions in the community's greenhouse gas emissions.

EMAP Goals and Initiatives

The Town of Canmore joined the Federation of Canadian Municipalities' Partners for Climate Protection (PCP) Program in 1999.

The Town of Canmore completed Milestone 1 (Emissions Inventory and Forecast) in March 2002 and Milestone 2 (Setting an Emissions Reduction Target) in December 2002. On December 3, 2002 Council approved EARC's recommended goal statement of:

"The Town of Canmore will achieve an "overall" reduction in greenhouse gas emissions on a community-wide basis of 6% per unit of measure by the year 2012 using 2000 as the base year of comparison. The 6% "overall" reduction will include a 20% reduction in Town of Canmore operation emissions."

In July 2004, the Town commenced development of an Energy Management Action Plan (EMAP) to fulfill the requirements of the PCP program (Milestone 3 – Develop Action Plan) and help move the community closer to its sustainability goals. The EMAP was completed in March 2005 and included an

emissions inventory and forecast, goals and objectives, indicators and targets and a list of existing and proposed actions.

Existing actions identified in EMAP included:

- construction of the first LEED silver certified building in Alberta (the new Civic Centre)
- implementation of a green power purchase program
- energy retrofit program for existing Town buildings and facilities
- purchase and use of a hybrid vehicle for Town business
- implementation of an anti-idling policy for Town vehicles; and
- a streetlight retrofit program.

Proposed actions identified in EMAP included:

- use of alternative transportation fuels (such as biodiesel) for the Town's vehicle fleet
- fleet right sizing and use of more efficient vehicles
- expansion of energy retrofit program
- expansion of street lighting retrofit program
- development of a green building policy for new Town buildings
- expansion of green power purchasing program
- development of green procurement policy
- enhanced reuse and recycling programs
- energy awareness, education and award programs
- community energy outreach and education programs
- green development incentive program (for private sector buildings)
- development of smart growth land-use & zoning bylaws
- green building and site guidelines
- community anti-idling program or bylaw
- active and green transportation programs; and
- renewable energy and conservation programs.

Good progress has been made on the following proposed EMAP actions:

Proposed Action	**Progress**
Alternative Transportation Fuels	• In 2008 the Town used approximately 23,000 litres of biodiesel in place of conventional diesel • A B5 blend is used in winter and B20 blend in summer
Street Light Retrofit Program	• The Town has continued to replace older inefficient lighting with more efficient lighting
Green Building Policy	• In 2005 Council adopted both the Green Building Policy for community development and the Sustainable Building Policy for Town facilities
Green Power Purchasing	• Since 2004 the Town has participated in a green power purchasing program through its contracted supplier, Nexen

	• The initial target was to purchase sufficient green power to supply 20% of the power required by the Town of Canmore to provide municipal services • Plans were to increase the amount of green power purchased to 60 % in 2009

Some progress has been made on the following proposed EMAP actions:

Proposed Action	**Progress**
Fleet Right Sizing and Efficiency	• The Town currently operates a single hybrid vehicle in its fleet inventory • The Town has made some progress at right sizing vehicles to better fit their function (in some cases larger pickup trucks and vans have been replaced by small economy sized cars or smaller pickups) • More recently a number of large pick-ups have been purchased
Energy Efficiency Retrofits	• The Town has completed some retrofits in a number of corporately occupied facilities (Civic Centre, Recreation Centre, Public Works, Fire Hall, Library, Seniors Centre, public washrooms)
Green Procurement Policy	• Council adopted the Green Procurement Policy in 2007
Reuse & Recycle	• The Town has a number of initiatives currently underway including mini garbage cans, office equipment swap, enhanced recycling at the Recreation Centre, Toxic Round-up, Large Item Clean-up and the Sustainable Meeting Kit.
Development of Smart Growth Land-use & Zoning Bylaws	• The Town is currently in the process of consolidating the public input received from the CSP "Mining the Future II" consultation process into a reference document for Council's consideration as an attachment to the Municipal Development Plan, which speaks to this type of growth management
Community Anti-idling Program	• Community-wide education and awareness is being spearheaded through the Biosphere Institute
Active and Green Transportation Programs	• The Town has recently implemented o a trail directional and way-finding system o extensive commuter pathway development program o grant money for the Community Cruiser Program

	○ development of the Transportation Master Plan; and ○ participation in the formation of a Regional Transportation Authority ○ Cougar Commuter paving ○ Pedestrian signal on Benchlands Trail • The Town has expanded its capital project program to enhance trail and sidewalk systems
Renewable Energy Projects	• The Town has installed renewable energy (solar) projects at the Senior's Centre, Recreation Centre, Civic Centre, Fire Hall, Public Works Building and at the Palliser Project.
Green Engineering Design Guidelines	• The Town is planning to have this completed as an Engineering priority for 2010

No or very limited progress has been made on the following proposed EMAP actions:

Proposed Action	**Progress**
Energy Education and Award Programs (for Staff)	• There are currently no formal programs in place although indirect awareness does occur through eco-teams / e-news / TNS e-learning & the Town's orientation video
Community Energy Outreach and Education Programs	• The One Tonne Challenge was implemented by the Biosphere Institute of the Bow Valley however this program was discontinued by the federal government. Canmore did have the highest participation per capita of any other community in Canada.
Green Development Incentives Program	• The Town is currently working on guidelines that would apply to private developments • The Town's Sustainability Screening Report process was adopted in July 2007 but focus has been primarily social rather than environmental

Although a significant number of programs and initiatives have been implemented to reduce energy consumption and associated GHG emissions, there has been no systematic tracking or reporting of corporate or community energy or emissions related performance indicators since EMAP was developed in 2005. Furthermore, the 2000 energy baseline developed for the Partners in Climate protection program and used in the development of the EMAP was based on a number of assumptions, some of which are difficult to verify at the community level. Consequently it has been difficult to know to whether progress was being made towards the EMAP goals.

Population Growth[1]

Key to understanding Canmore's energy use and greenhouse gas emissions is the growth in population of the community. Canmore's population for the years 2000 (EMAP baseline year and the two most recent years for which energy data is available is summarized in the following table.

Population	2000 EMAP Baseline	2007	2008	Increase from 2000 to 2008
Permanent	10,517	11,802	12,005	14 %
Non-Permanent	1,955	5,193	5,567	185 %
Total	**12,472**	**16,995**	**17,572**	**41 %**

Key observations:

- While there has been modest growth in the community's permanent population, the non-permanent population has grown significantly since 2000 and now represents approximately one third of Canmore's population
- The high percentage of non-permanent residents suggests that per-capita goals and indicators that are based on the permanent population only may not be meaningful.
- In addition to the permanent and non-permanent populations, the Town experiences a significant number of day and overnight visitors, complicating the interpretation and usefulness of per-capita based indicators. The per capita emission intensities calculated for the EMAP baseline were based on permanent + part-time + day visitors + overnight visitors.
- As accurate information on day and overnight visitors can be difficult to obtain, the per-capita energy and GHG intensities calculated in subsequent sections have been calculated using the permanent and/or total population (permanent and part-time population) only.

Town of Canmore (Corporate) Operations – Transportation Fuel[2]

The volume of transportation fuels used by the Town of Canmore in 2007 and 2008 to provide services to the community is summarized in the following table.

Transportation Fuel Use	2000 EMAP Baseline	2007	2008
Gasoline (litres)	NA	45,473	46,164
Diesel (litres)	NA	45,954	53,879
Biodiesel (litres)	NA	18,031	22,994
Propane (litres)	NA	NA	NA
Total Fuel (litres)	**NA**	**109,458**	**123,037**

A comparison of the Town of Canmore's use of transportation fuels in 2007 and 2008 to the EMAP baseline year (2000) is provided in the following table. To facilitate comparison with the 2000 EMAP baseline data the fuel consumption data for 2007 and 2008 has been converted in the equivalent energy content in gigajoules (GJ).

Transportation Fuel Use	2000 EMAP Baseline	2007	2008
Gasoline (GJ)	1,063	1,576	1,600

Diesel (GJ)	1,037	1,778	2,084
Biodiesel (GJ)	0	697	889
Propane (GJ)	2	NA	NA
Total Fuel (GJ)	**2,102**	**4,051**	**4,573**
Change Relative to 2000		**+ 93 %**	**+ 118 %**

Key Observations:

- Total Town of Canmore corporate transportation fuel use more than doubled between 2000 and 2008
- The increase in transportation fuel use appears to be the result of significant population growth as well as changes in the nature and level of services being delivered by the Town (i.e. increased level of emergency services including increased ambulance transfers to Calgary)
- The use of biodiesel has grown from near zero in 2000 to almost 23,000 litres/yr in 2008
- The 2007 and 2008 transportation fuel use numbers do not include the transportation fuel use associated with some contract operations such as highway maintenance (Volker Stevin), water and waste water services (EPCOR) and some solid waste services. As such they are an underestimate of the total amount of transportation fuels used.

Town of Canmore (Corporate) Operations – Electrical Power Consumption[3]

The following table summarizes the electrical power consumed by the Town of Canmore in 2007 and 2008 to provide services to the community.

Electrical Power Consumption in kWh[3]	2007	2008
Recreation Centre - Main (kWh)	990,659	1,077,304
Recreation Centre – Rink 2 (kWh)	610,810	894,127
Civic Centre (kWh)	342,331	350,757
Environmental Services (kWh)	89,859	88,171
EMS (kWh)	75,845	73,432
Other Buildings/Facilities (kWh)	238,772	253,928
Subtotal Buildings & Facilities (kWh)	**2,348,276**	**2,737,719**
Subtotal Traffic Lights (kWh)	**43,041**	**42,367**
Subtotal Water & Wastewater Services (kWh)	**4,713,489**	**4,870,049**
Total Power Consumption (kWh)	**7,104,806**	**7,650,135**

The following table compares the Town of Canmore's corporate electrical power consumption in 2007 and 2008 to the Town's power consumption in the 2000 EMAP baseline year. The 2007 and 2008 kWh data has been converted into GJ to allow comparison to the 2000 EMAP data.

Electrical Power Consumption in GJ	2000 EMAP Baseline	2007	2008	% of 2008 Power Consumption
Buildings & Facilities (GJ)	7,286	8,454	9,856	35.8 %
Traffic Lights (GJ)	1,743	155	153	0.5 %
Water & Wastewater Services (GJ)	8,547	16,968	17,532	63.7 %
Total power consumption (GJ)	**17,576**	**25,577**	**27,541**	**100 %**
Change Relative to 2000		**+ 46 %**	**+ 57 %**	

Key Observations:

- Total power consumption for Town of Canmore operations in 2008 was approximately 57 % higher than in 2000 (EMAP baseline year)
- As the total combined permanent and non-permanent population only grew by about 41 % during this period it appears that the growth in power consumption is due to both population growth and an increase in the amount of electrical power used per capita served
- Water and waste water services accounted for approximately 64 % of total corporate power consumption in 2008, up from 49 % of power consumption in 2000. This is attributed to the addition of UV and/or other treatment facilities and additional pumping capacity required to service the Three Sisters area
- The Recreation Centre accounted for 72 % of the electrical power consumed by buildings and facilities and 26 % of total corporate power consumption
- Between 2000 and 2008 there was an approximately 90 % reduction in energy use associated with traffic lights. The Town of Canmore implemented a traffic light retrofit program and all traffic lights now use energy efficient light emitting diode (LED) lights.

Town of Canmore (Corporate) Operations – Natural Gas Consumption[4]

The table below summarizes the amount of natural gas consumed by the Town of Canmore to provide services to the community.

Natural Gas Consumption	2000 EMAP Baseline	2007	2008	% of 2008 Consumption
Buildings & Facilities (GJ)	15,748	20,582	21,117	72.3 %
Water & Wastewater Services (GJ)	8,558	8,331	8,108	27.7 %
Total Natural Gas Consumption (GJ)	**24,306**	**28,903**	**29,225**	**100 %**
Change Relative to 2000		**+ 19 %**	**+ 20 %**	

Key Observations:

- Natural gas consumption was approximately 20 % higher in 2008 than it was in 2000
- The increase in natural gas consumption was lower than the increase in total population growth suggesting an improvement in the energy efficiency of services delivered
- In 2008, buildings and facilities accounted for approximately 72 % of natural gas consumption, up from approximately 65 % in 2000. This is attributed to the larger stock of buildings including construction of the new Civic Centre and the addition to the Recreation Centre.

Town of Canmore – Solar Initiatives

The Town has installed a number of alternative energy projects at Town owned or operated buildings and facilities. The projects completed to date are summarized in the table below.

Solar Projects	Type/Size	Installation date	Estimated Annual Solar Output (kWh)	Estimated Annual CO2 Reduction (tonnes CO2e)

Senior's Centre	1 kW solar photovoltaic (PV)	December 2007	1200	1
Recreation Centre	20 kW solar thermal	September 2008	25,298	7
Palliser Project	80 kW solar thermal	January 2009	84,512	18
Public Works	solar thermal	May 2009	2,780	1
Civic Centre	solar thermal	July 2009	2,780	1
Firehall	solar thermal	September 2009	4,170	1.5

Key Observations:

- The size of the projects has increased as the Town has gained experience with deploying alternative energy projects
- Collectively these projects are expected to avoid the emission of approximately 29.5 tonnes of CO2e annually. This represents 0.4 % of the Town of Canmore's total corporate GHG emissions for 2008.

Town of Canmore (Corporate) Operations – Total Energy Consumption

The following table summarizes the Town of Canmore's total corporate energy use in 2007 and 2008 and compares it to the 2000 EMAP baseline year.

Corporate Energy Consumption	2000 EMAP Baseline	2007	2008	% of Total Energy for 2008
Vehicle Fleet (GJ)	2,102	4,051	4,573	7.5 %
Buildings & Facilities (GJ)	23,034	29,036	30,973	50.5 %
Traffic Lights (GJ)	1,743	155	153	0.2 %
Water & Wastewater Services (GJ)	17,105	25,300	25,640	41.8 %
Total Energy Consumption (GJ)	**43,984**	**58,542**	**61,339**	**100 %**
Change Relative to 2000		**+ 33 %**	**+ 39 %**	
Total Energy Consumed per capita served - total population (GJ/person)	3.53	3.44	3.49	
Total Energy Consumed per capita served - permanent population (GJ/person)	4.18	4.96	5.10	

Key Observations:

- Total energy consumption by Town of Canmore operations has increased approximately 40 % since 2000

- In 2008, town owned buildings and facilities account for approximately 50 % of total corporate energy use while water and waste water services accounted for approximately 42 % of corporate energy use
- Vehicle emissions associated with the Town's fleet of mobile equipment accounted for approximately 7.5 % of energy use
- Energy consumption per capita served has remained relatively constant since 2000 if the total population of the community is taken into account

Town of Canmore (Corporate) Operations – Total GHG Emissions[5]

The estimated GHG emissions associated with the Town of Canmore's corporate operations are summarized in the table below.

Total Corporate GHG Emissions[4]	2000 EMAP Baseline	2007	2008	% of Total Emissions for 2008
Vehicle Fleet (tonnes CO2e)	153	275	311	4.0 %
Buildings & Facilities (tonnes CO2e)	2,726	2,957	3,244	41.1 %
Traffic Lights (tonnes CO2e)	464	35	34	0.4 %
Water & Wastewater Services (tonnes CO2e)	2,702	4,286	4,297	54.5 %
Total GHG Emissions (tonnes CO2e)	**6,045**	**7,553**	**7,886**	**100 %**
Change Relative to 2000		**+ 24 %**	**+ 30 %**	
Total GHG Emissions per capita served - total population (tonnes CO2e/person)	0.49	0.44	0.45	
Total GHG Emissions per capita served - permanent population (tonnes CO2e/person)	0.57	0.64	0.66	

Key Observations

- Total corporate GHG emissions in 2008 were approximately 30 % higher than in 2000
- Between 2000 and 2008 there was a modest (approximately 8 %) decrease in the amount of GHG emissions generated by Town operations per capita served suggesting an improvement in the energy efficiency of services delivered
- Water and wastewater services accounted for approximately 55 % of total corporate GHG emissions in 2008 while town owned buildings and facilities accounted for 41 % of total corporate GHG emissions
- Buildings and facilities account for a larger percentage of corporate energy use than water and wastewater services. However, water and wastewater services account for a larger share of corporate GHG emissions. Water and wastewater services use a larger amount of electrical power than buildings and facilities. The generation of this power has higher carbon intensity than the natural gas used to heat buildings and facilities.

- The GHG emissions associated with solid waste services were not calculated as a separate category as some of the data required to do this was not readily available (contract operations). However the GHG emissions resulting from the operation of Town owned buildings, facilities and the mobile fleet used to collect and manage solid wastes are accounted for in the above estimate.

Town of Canmore (Corporate) Operations – Net GHG Emissions

Since 2004, the Town of Canmore has participated in a Green Power Purchase Program offered through the Alberta Urban Municipalities Association (AUMA) and Nexen. Through this program the Town purchases green power to reduce or offset a portion of the GHG emissions associated with the electrical power the Town of Canmore consumes.

The table below provides a summary of the amount of green power purchased and the resulting emission reductions or offsets that have occurred since the program began.

Year	Offsets Purchased (kWh)	Emissions Offset (tonnes CO2e)
2004	1,638,031	1147
2005	1,972,992	1381
2006	1,980,253	1386
2007	1,730,727	1212
2008	1,677,592	1174
Total To Date		**6,300**

In 2007 and 2008 the amount of green power purchased by the Town was equivalent to approximately 24 % and 22 % respectively of the Town's total electrical power consumption (including water and waste water services).

The following table shows the impact of the Green Power Purchase Program on The Town of Canmore's net corporate GHG emissions.

Net Corporate GHG Emissions	2000 EMAP Baseline	2007	2008
Total Corporate GHG Emissions (tonnes CO2e)	**6,045**	**7,553**	**7,886**
Emissions Offset through Green Power Purchase Program (tonnes CO2e)	**NA**	**1,212**	**1,174**
% of Total Corporate GHG Emissions Offset	**NA**	**16 %**	**15 %**
Net Corporate GHG Emissions after Offsets (tonnes CO2e)	**6,045**	**6,341**	**6,712**
Change Relative to 2000		**+ 5 %**	**+ 11 %**
Net Corporate GHG Emissions per capita served after offsets - total population (tonnes CO2e/person)	**0.49**	**0.37**	**0.38**
Change Relative to 2000		**-24 %**	**-22%**

Net Corporate GHG Emissions per capita served after offsets – permanent population (tonnes CO2e/person)	**0.57**	**0.54**	**0.56**
Change Relative to 2000		**-5 %**	**-2 %**

Key observations:

- After taking into account the GHG offsets obtained through the Green Power Purchase Program, the Town of Canmore's total corporate GHG emissions were approximately 11 % higher in 2008 than they were in 2000
- The offsets obtained through the Green Power Purchase Program were sufficient to offset 16 % and 15 % of the Town of Canmore's total corporate emissions (electricity, gas, fuel) in 2007 and 2008 respectively and have had the most significant effect on reducing the Town's net GHG emissions
- The Town of Canmore has already achieved the 20 % per capita reduction in GHG emissions that was to be achieved by 2012 under EMAP (based on the total population)
- The above estimate of net GHG emissions should be considered as an underestimate of the total Town of Canmore corporate GHG emissions as it does not include the GHG emissions associated with some contract operations provided on behalf of the Town of Canmore (these include snow removal, EPCOR, and commercial waste hauling).

Community Energy Use & GHG Emissions

Tracking energy use and GHG emissions within the broader community is quite challenging and currently no mechanisms are in place to allow this to be done on a regular basis. The Town of Canmore is currently working with AUMA who in turn is working with the various energy providers in an effort to develop a system that will allow municipalities to track community energy use on a regular basis.

Although the development and of a an accurate inventory of the community's current energy use and GHG emissions was beyond the scope of this study, sufficient information was obtained to allow for progress towards the EMAP goal of a 6 % reduction in per-capita GHG emissions to be evaluated.

Community – Transportation Fuels[6]

For the 2000 baseline year, EMAP estimated the community's use of transportation fuels to be equivalent to 188,175 GJ however this estimate was based on a number of assumptions which are difficult to verify at the community level. The community's actual use of transportation fuels for 2000 and subsequent years is unknown as there are no mechanisms in place for collecting and aggregating this type of information at the community level.

However, if it is assumed that there have been no significant changes in the models of vehicles being driven or in individual driving habits (i.e. number of kilometres driven annually) since 2000, then the per-capita use of transportation fuels would not change significantly. The use of transportation fuels in the community would be expected to increase at a rate similar to the observed rate of population growth in the community. This suggests that the use of transportation fuels may have increased by 40 % since 2000 based on the observed growth rate for the combined permanent and non-permanent population.

Community – Electrical Power Consumption

Electrical power consumption data for the community was obtained from Fortis for 2007 and 2008. This data is summarized and compared to the 2000 EMAP baseline data in the following table.

Electrical Power Consumption	**2000 EMAP Baseline**	**2007**	**2008**
Residential (GJ)	86,849	NA	NA
Commercial (GJ)	46,319	NA	NA
Industrial (GJ)	8,685	NA	NA
Town of Canmore (GJ)	17,576	25,577	27,540
Total Community (GJ)	**159,429**	**366,570**	**394,615**
Change Relative to 2000		**+130 %**	**+148 %**
Per capita electrical power consumption – total population (GJ/person)	13	22	23
Per capita electrical power consumption – permanent population (GJ/person)	15	31	33

Key Observations:

- Total electrical power consumption for the community was 148 % higher in 2008 than in 2000, which is equivalent to an average annual growth rate of approximately 11 %.
- The observed increase in electrical power consumption greatly exceeds the rate of population growth in the community as evidenced by the large increase in per capita power consumption
- Although construction activity may account for the much higher power consumption levels observed in 2008, a direct comparison of the 2000 baseline and more recent data sets was not possible as the source data used to develop the 2000 EMAP baseline was not available for review. It is therefore likely that the 2000 baseline and 2007 and 2008 data sets are not directly comparable.
- In 2000, the residential and commercial sectors accounted for 55 % and 29 % of the community's electrical power consumption respectively. The Town of Canmore's operations accounted for 11% of the community's power consumption
- A breakdown of power consumption by sector was not available for 2007 and 2008.

Community - Natural Gas Consumption

Natural gas consumption data for the community was obtained for 2007 and 2008. The data is summarized and compared to the 2000 EMAP baseline data in the following table.

Natural Gas Consumption	**2000 EMAP Baseline**	**2007**	**2008**
Residential (GJ)	603,876	NA	NA
Commercial (GJ)	314,814	NA	NA
Industrial (GJ)	58,578	NA	NA
Town of Canmore (GJ)	24,306	28,903	29,225
Total (GJ)	**1,001,574**	**1,264,498**	**1,335,099**
Change Relative to 2000		**+ 26%**	**+ 33 %**

Per capita natural gas consumption - total population (GJ/person)	80	74	76
Per capita natural gas consumption – permanent population (GJ/person)	95	107	111

Key Observations:

- In 2008, natural gas consumption for the community was approximately 33 % higher than in 2000
- The increase in natural gas consumption between 2000 and 2008 was slightly less than the observed growth in the total population of the community as evidenced by the somewhat lower per capita gas consumption numbers (based on total population)
- In 2000, the residential and commercial sectors accounted for approximately 60 % and 31 % of natural gas consumption respectively while the Town of Canmore's operations accounted for just 2.4 % of natural gas consumption.
- A breakdown of natural gas consumption by sector was not available for 2007 and 2008

Community – Total Energy Consumption

The community's energy consumption in 2000 is summarized in the table below.

Community Energy Consumption	**2000 EMAP Baseline**	**% of 2000 Baseline**
Residential (GJ)	690,725	51.1 %
Commercial (GJ)	361,133	26.7 %
Industrial (GJ)	67,263	5.0 %
Transportation (GJ)	188,175	13.9 %
Town of Canmore (GJ)	43,984	3.3 %
Total (GJ)	**1,351,280**	**100 %**
Per Capita Energy Use - Total Population (GJ/person)	108	
Per Capita Energy Use – Permanent Population (GJ/person)	128	

Key Observations:

- In 2000, residential and commercial buildings accounted for 51 % and 27 % of total community energy use respectively
- Town of Canmore operations accounted for only 3.3 % of total community energy use.

Community Energy Consumption	**2000 EMAP Baseline**	**2007**	**2008**
Electrical Power (GJ)	159,429	366,570	394,615
Natural Gas (GJ)	1,001,574	1,264,498	1,335,099
Total	**1,161,003**	**1,631,068**	**1,729,714**
Change Relative to 2000		+ 40 %	+ 49 %
Per capita energy use - total population (GJ/person)	93.1	96.0	98.4

Per capita energy use - permanent population (GJ/person)	110.4	138.2	144.1

Key Observations:

- The community's consumption of energy provided by electrical power and natural gas consumption (excluding transportation fuels) was 49 % higher in 2008 than it was in 2000
- On a per capita basis, energy consumption (excluding transportation fuels) also increased , driven largely by the significant increase in power consumption between 2000 and 2008

Community – GHG Emissions[7]

The table below summarizes the community's GHG emissions in 2000, the EMAP baseline year.

Community GHG Emissions	**2000 EMAP Baseline**	**% of 2000 Baseline**
Residential (tonnes CO2e)	53,281	50.1 %
Commercial (tonnes CO2e)	28,054	26.4 %
Industrial (tonnes CO2e)	5,238	4.9 %
Transportation (tonnes CO2e)	13,694	12.9 %
Town of Canmore Tonnes (CO2e)	6,045	5.7 %
Total Community GHG Emissions (tonnes CO2e)	**106,310**	**100 %**
Per-capita GHG emissions – total population (tonnes CO2e/person)	8.5	
Per-capita GHG emissions – permanent population (tonnes CO2e/person)	10.1	

The table below summarizes the community's GHG emissions associated with the consumption of electrical power and natural gas for 2007 and 2008.

Community GHG Emissions Excluding Transportation	**2007 GHG Emissions**	**2008 GHG Emissions**
Electrical Power (tonnes CO2e)	83,578	87,604
Natural Gas (tonnes CO2e)	63,225	66,754
Total GHG Emissions (tonnes CO2e)	**146,803**	**154,358**
Per-capita GHG emissions – total population (tonnes CO2e/person)	8.6	8.8
Per-capita GHG emissions – permanent population (tonnes CO2e/person)	12.4	12.9

Key Observations:

- In 2008, the community's GHG emissions associated with the consumption of electrical power and natural gas were approximately 154,358 tonnes CO2e, compared to total GHG emissions (including the community's use of transportation) of 106,310 tonnes of CO2e in 2000
- The per-capita GHG emissions associated with the consumption of electrical power and natural gas in 2008 were higher than the per-capita GHG emissions associated with the community's use of electrical power, natural gas and transportation in 2000.

- If the GHG emissions associated with the community's use of transportation were added to the GHG emissions calculated above for 2007 and 2008, the per-capita GHG emissions for those years would be considerably higher than the 2000 baseline year.
- Consequently while it is difficult to accurately determine the community's energy use and GHG emissions associated with transportation, we can conclude that there has been no progress towards the EMAP goal of a 6 % reduction in per-capita GHG emissions based on the 2000 year.

Goals & Targets

Context

In its 2007 Synthesis Report, the Intergovernmental Panel on Climate Change (IPCC) suggests that stabilizing atmospheric CO2 levels in the range of 350-400 ppm (the 2005 level was 379 ppm) would likely limit global warming to 2.4 ° C or less, thereby minimizing the potential for dangerous climate change. The IPCC predicts that stabilizing global atmospheric CO2 at this level would require that global CO2 emissions peak by 2000 – 2015 and then be reduced by 50 – 85 % from 2000 levels by 2050 (IPCC, 2007). Similarly, to stabilize atmospheric CO2 levels at 400 – 440 ppm would require global CO2 emissions to peak by 2000 – 2020 and be reduced by 30 – 60 % from 2000 levels by 2050. This would likely limit global warming to 2.4 – 2.8 °C with an increased risk of experiencing dangerous climate change.

The IPCC recommendations are the driving force behind many national and municipal greenhouse gas reduction goals. In 2008, the Government of Canada announced a federal climate change strategy in the Turning the Corner Plan. The plan included a proposed 20 % reduction in CO2 emissions by 2020 and a 60-70 % reduction by 2050, using 2006 as the baseline year. More recently, in January 2010 Canada committed to a 17 % reduction in CO2 emissions from 2005 levels by 2020 as part of its commitment under the Copenhagen Accord.

Planning Horizon

Short term goals are those that are to be achieved within 5 years (by 2015)

Medium term goals are those that are to be achieved within 10 years (by 2020)

Long term goals are those that are to be achieved within 40 years (by 2050)

Targets for Town of Canmore (Corporate) Operations

<u>By 2015</u>

- Stabilize Town of Canmore corporate CO2 emissions - no further increases in absolute emissions even with population growth (tonnes CO2e/yr)
- and/or reduce absolute corporate emissions to 2007 levels (tonnes CO2e/yr)

<u>By 2020</u>

- Reduce Town of Canmore corporate greenhouse gas emissions by 50 % from 2007 levels (tonnes CO2e/yr)
- includes the use of offsets (i.e. green power purchase program or other)

<u>By 2050</u>

- Reduce Town of Canmore corporate greenhouse gas emissions by 80 % from 2007 levels (tonnes CO2e/yr)
- and/or Town operations are carbon neutral

Corporate Fuel Management Program

The purpose of this program is to pursue reduced emissions, lower the Towns fuel consumption and raise awareness of the environmental impacts.

Fuel Goal

- Reduce corporate fuel consumption to 103,300 L and hold.

Emission Goal

- Reduce GHG emissions from corporate fuel consumption to 265,227 kg by 2015 and hold.

Targets for the Community

By 2015

- Stabilize community CO2 emissions - no further increases in absolute emissions even with population growth (tonnes CO2e/yr)

By 2020

- Reduce community CO2 emissions to 2007 levels (tonnes CO2e/yr)

By 2050

- Reduce community CO2 emissions by 50 % from 2007 levels (tonnes CO2e/yr)

The use of absolute reduction targets (tonnes CO2e/yr) is recommended over the use of intensity based or per capita targets which can be achieved while still allowing overall emissions to grow. The tracking of per capita energy use or GHG emissions may still be useful as it allows improvements in energy efficiency to be tracked. Improvements in per capita energy use or emissions can also be linked to the corresponding absolute reduction targets once they have been established.

Other possible goals that could be considered include:
- Average carbon emission intensity of energy supply
- % of electrical power supplied by renewable sources
- % of energy supplied by renewable sources
- % of new buildings that are green built or LEED certified

Strategies

General Strategies

There are three general strategies for reducing greenhouse house gas emissions resulting from the use of energy

1. Use less energy (conservation)

2. Use energy more efficiently

3. De-carbonize the energy supply/mix

Strategies for Town of Canmore (Corporate) Operations

- Reduce the energy used to operate Town owned facilities, buildings and infrastructure

- Reduce the carbon intensity of energy used to operate Town owned facilities, buildings and infrastructure

- Reduce the energy used to operate the Town's fleet of mobile equipment (i.e. driving less km or using more fuel efficient vehicles)

- Reduce the carbon intensity of energy used to operate the Town's fleet of mobile equipment

- Reduce the lifecycle greenhouse gas emissions associated with waste management activities

- Increase staff awareness of the importance of energy and climate related issues and initiatives

- Utilize a comprehensive approach to the monitoring and management of energy use and greenhouse gas emissions

- Identify and secure sources of external (non municipal tax) funding to support energy conservation, efficiency and alternative energy projects and initiatives

Priorities for the Town of Canmore

The following actions should be considered as priorities for Town of Canmore corporate operations:

1. Develop and implement a formal system to measure and report corporate energy use and associated greenhouse gas emissions on a regular basis.

2. Develop and implement a formal energy management plan for Town operations that has clear priorities and a separate budget. The energy management action plan should include an energy audit program for Town owned or operated facilities in order to identify and evaluate potential

energy efficiency opportunities at high energy consumption facilities. Initial facilities that should be considered for audits include:

a. Water and Wastewater Services (accounted for 64 % of corporate power consumption and 54 % of corporate greenhouse gas emissions in 2008)
b. Recreation Centre (accounted for 72 % of the electrical power consumed by Town owned/operated buildings and facilities and 26 % of total corporate power consumption)

3. Strengthen Green Power Purchase Program

4. Update goals, actions and progress under FCM's PCP program

5. Develop a corporate energy and climate change education and engagement strategy

The above actions should all be considered priorities and do not necessarily need to be implemented in the order in which they appear.

Strategies for the Community

- Increase community awareness of the importance of energy and climate change related issues
- Increase community commitment to and engagement in initiatives to reduce energy use and greenhouse gas emissions
- Reduce energy use and GHG emissions associated with the residential sector (buildings)
- Reduce energy use and GHG emissions associated with the commercial sector (buildings/infrastructure)
- Reduce energy use and GHG emissions associated with the community's use of transportation (reducing the number of km driven, encouraging use of active transportation alternatives)
- Reduce energy use and GHG emissions associated with the industrial sector

Priorities for the Community

The following actions should be considered as priorities for the community:

1. Develop and implement a formal system to measure and report community energy use and associated greenhouse gas emissions on a regular basis

2. Develop a community energy and climate change education and engagement strategy

3. Reduce community energy use and greenhouse gas emissions.

The second initiative will be developed as part of the Community Education and Engagement component of this Environmental Stewardship Action Plan.

Existing Actions – Town of Canmore

Action or Program	**ECP-E1 Sustainable Building Policy for Town Facilities**
Action Type	**Existing**
Applies To	**Town owned and/or operated facilities**
Strategy	Reduce the energy used to operate Town owned facilities, buildings and infrastructure
Description & Progress	Reduces the energy required to operate newly constructed buildings & facilities through incorporation of green design principles Council adopted the Green Building Policy in 2005 The Town constructed the Civic Centre to a LEED Silver Certification and Elevation Place to a LEED Gold Certification
Accountabilities	Manager of Engineering Manager of Public Works Manager of Facilities General Manager of Community Infrastructure
Performance Measures	Annual Power Consumption in kWh Annual gas consumption in GJ
Future Priorities & Actions	The Town must ensure its accountability to the future implementation of this initiative. The Civic Centre should be re-commissioned to ensure the long term energy efficiency of this LEED silver building is maintained. Increase percentage of buildings and facilities constructed and maintained to LEED Gold standard.
Supporting Documents & Linkages	Town of Canmore Sustainable Building Policy

Action or Program	**ECP-E2 Building Retrofit Program**
Action Type	**Existing**
Applies To	**Town owned and/or operated facilities**
Strategy	Reduce the energy used to operate Town owned facilities, buildings and infrastructure
Description & Progress	Reduces the energy consumption of existing buildings & facilities through energy efficiency upgrades and other related initiatives. The Town has completed retrofits in a number of Town owned and occupied facilities including the Civic Centre, Recreation Centre, Public Works Building & Fire Hall. This has been an ongoing project for several years, and will require continuation as technologies change
Accountabilities	Manager of Public Works Manager of Facilities General Manager of Community Infrastructure
Performance Measures	Annual Power Consumption in kWh Annual gas consumption in GJ
Future Priorities & Actions	The criteria (business case) used to evaluate and approve energy efficiency and emission reduction initiatives should be clarified and consistently applied. The criteria should include consideration of both financial (length of time to payback) and sustainability (contribution to emission reduction goals) objectives.
Supporting Documents & Linkages	

Action or Program	**ECP-E3 Traffic Light Retrofit Program**
Action Type	**Existing/Complete**
Applies To	**Traffic lights owned by the Town and Fortis and operated by Fortis**
Strategy	Reduce the energy used to operate Town owned facilities, buildings and infrastructure
Description & Progress	Program replaces existing lights bulb with more efficient LED light bulbs. 100% of traffic lights have been retrofitted to date although replacement of LED lights will be an ongoing maintenance activity.
Accountabilities	Manager of Public Works Manager of Engineering
Performance Measures	% traffic lights using LED or high efficiency bulbs
Future Priorities & Actions	Only traffic lights have been retrofitted to date. Retrofitting street lights to LED or high efficiency bulbs may result in significant energy savings.
Supporting Documents & Linkages	

Action or Program	**ECP-E4 Green Power Purchase Program**
Action Type	**Existing**
Applies To	**Town owned and/or operated facilities**
Strategy	Reduce the carbon intensity of energy used to operate Town owned facilities, buildings and infrastructure
Description & Progress	The Town purchases green power through a program offered by the Alberta Urban Municipalities Association (AUMA) and Nexen. By purchasing green power and receiving Renewable Energy Certificates the Town is able to reduce or offset some of the greenhouse gas emissions resulting from the Town's consumption of electrical power. The Town has purchased approximately 20 % green power since 2004. In 2004, RECs received were sufficient to cover 1,638,031 kWh In 2005, RECs received were sufficient to cover 1,972,992 kWh In 2006, RECs received were sufficient to cover 1,980,253 kWh In 2007, RECs received were sufficient to cover 1,730,727 kWh In 2008, RECs received were sufficient to cover 1,677,592 kWh In 2007 and 2008, the amount of green power purchased represented approximately 24 % and 22 % of total corporate power consumption. Plans are to increase the amount of green power purchased to 60 % in 2009.
Accountabilities	CAO Deputy CAO Manager of Facilities Sustainability Coordinator
Performance Measures	% of total power purchased that is green power Tonnes of carbon emissions avoided annually
Future Priorities & Actions	Increase the level of oversight and management of this program to more closely monitor the level, quality and cost of green power being purchased. Increase the amount of green power purchased to 100 %
Supporting Documents & Linkages	

Action or Program	**ECP-E5 Renewable and Alternative Energy Program**
Action Type	**Existing**
Applies To	**Town owned and/or operated buildings and facilities**
Strategy	Reduce the carbon intensity of energy used to operate Town owned facilities, buildings and infrastructure
Description & Progress	The Town has recently commissioned a number of solar projects at Town of Canmore facilities including: • a solar photovoltaic demonstration project at the Senior's Centre • solar hot water heating systems at the Recreation Centre, Palliser project, Civic Centre, Fire Hall and Public Works • Solar powered pedestrian crossing signal on Benchlands Trail. By using renewable energy sources, the Town is able to reduce the carbon emission intensity of the energy used to satisfy lighting, heating and other energy requirements in Town owned or operated facilities.
Accountabilities	Manager of Engineering Manager of Public Works Manager of Facilities General Manager of Community Infrastructure
Performance Measures	No. of renewable or alternative energy projects completed/installed % of energy supplied by renewable or alternative sources Tonnes of GHGs avoided by use of alternative energy projects
Future Priorities & Actions	The Town should investigate additional opportunities for expanding the use renewable and alternative energy systems at Town operated facilities. Expanded use of renewable and alternative energy systems will diversify the Town's energy supply and further reduce the carbon intensity of the Town's energy supply. The criteria (business case) used to evaluate and approve alternate energy projects should be clarified and consistently applied. The criteria should include consideration of both financial (length of time to payback) and sustainability (contribution to emission reduction goals) objectives.
Supporting Documents & Linkages	

Action or Program	**ECP-E6 Fleet Rationalization & Management**
Action Type	**Existing**
Applies To	**Town owned and/or operated vehicle fleet**
Strategy	Reduce the energy used to operate the Town's fleet of mobile equipment
Description & Progress	By rightsizing vehicles and through the use of low emission vehicles the Town is able to improve the fuel efficiency of the Town's vehicle fleet and reduce energy consumption and emissions. The Town has completed some right-sizing initiatives and has down-sized a number of vehicles to better fit their function. For example, larger pickup trucks and vans have been replaced by small economy sized cars and smaller pickups. The Town currently operates a single hybrid vehicle in its fleet inventory.
Accountabilities	Chief Administrative Officer Manager of Public Works Fire Chief
Performance Measures	No. of hybrid vehicles Composition of fleet Total kilometres traveled per year
Future Priorities & Actions	Continue to identify opportunities for right-sizing as vehicles need to be replaced. Continue to monitor development of hybrid, alternative fuel and electric vehicles and consider utilizing these types of vehicles for future fleet needs as these vehicles become commercially available. Consider increasing the number of hybrid vehicles in the fleet inventory
Supporting Documents & Linkages	Sustainable Purchasing Guidelines

Action or Program	**ECP-E7 Alternative Fuels Program**
Action Type	**Existing**
Applies To	**Town owned and/or operated fleet of vehicles and mobile equipment**
Strategy	Reduce the carbon intensity of energy used to operate the Town's fleet of mobile equipment
Description & Progress	Use of alternative fuels such as biodiesel , methanol and natural gas reducing the carbon intensity of the liquid fuels resulting in lower greenhouse gas emissions. The Town currently uses biodiesel in its mobile equipment fleet A 20 % biodiesel blend (B20) is used in the summer and a 5 % biodiesel blend (B5) during the winter.
Accountabilities	Manager of Public Works
Performance Measures	% of biodiesel or alternate fuels used in mobile fleet/equipment
Future Priorities & Actions	Evaluate the feasibility of increasing the amount of biodiesel blended into conventional diesel. Investigate the use of other alternative fuels such as natural gas or ethanol blended fuels.
Supporting Documents & Linkages	

Action or Program	**ECP-E8 Anti-Idling Procedure**
Action Type	**Existing**
Applies To	**Town owned and/or operated vehicles**
Strategy	Reduce the energy used to operate the Town's fleet of mobile equipment
Description & Progress	The Town currently has an internal anti-idling policy in place for the Town's fleet vehicles. The program was implemented in 2002. Reducing unnecessary idling reduces fuel consumption, resulting in lower greenhouse gas and other emissions. The procedure outlines when idling is acceptable/necessary and the duration of acceptable idling in these situations. The policy applies to all ToC staff who drive a fleet vehicle. It's every employee's responsibility. Some monitoring also occurs by vigilant members of the community.
Accountabilities	Deputy CAO Manager of Public Works Fire Chief
Performance Measures	None - not easily quantified
Future Priorities & Actions	
Supporting Documents & Linkages	Environmental Services Idling Procedure

Action or Program	**ECP-E9 Sustainable Purchasing Guidelines**
Action Type	**Existing**
Applies To	**Town of Canmore**
Strategy	Reduce the energy used to operate Town owned facilities, buildings and infrastructure Reduce the energy used to operate the Town's fleet of mobile equipment
Description & Progress	A green procurement policy was developed and implemented in 2007. Use of a green procurement policy ensures that sustainability considerations such as the energy efficiency or emissions generated by products and services are taken into account prior to making the purchase.
Accountabilities	All Managers and Town purchasers
Performance Measures	
Future Priorities & Actions	This document is full of excellent data to inform purchasing decisions, however is cumbersome to use and is quickly outdated. Regular updating of the document is required and where possible, efforts should be made to simplify the document. The Town does a good job bulk purchasing items critical to each of the Service Areas (Finance – Office Supplies with Bow Valley Basics), however enhancements in communication could achieve greater compliance and improved economic and environmental returns. The Town could consider other options to ensure more effective purchasing controls (i.e. purchasing officer)
Supporting Documents & Linkages	Sustainable Purchasing Guidelines

Action or Program	**ECP-E10 Green Energy Funding Program**
Action Type	**Existing**
Applies To	**Town of Canmore**
Strategy	Identify and secure sources of external (non municipal tax) funding to support energy conservation, efficiency and alternative energy projects and initiatives
Description and Progress	The Town has a grants coordinator who pursues sources of external (non-tax) funding that can be used to accelerate energy conservation, efficiency and alternative energy projects and initiatives As some alternative energy projects have poor economics, external funding is required to make them feasible.
Accountabilities	General Manager of Community Infrastructure Manager of Finance
Performance Measures	$ value of grants/external funding received % of projects receiving external funding
Future Priorities and Actions	This program could be expanded to support energy efficiency and emission reduction initiatives in the community by making the community aware of grants that may be available.
Supporting Documents & Linkages	

Existing Actions - Community

Action or Program	**ECP-E11 Active and Green Transportation Program**
Action Type	**Existing**
Applies To	**Community**
Strategy	Reduce energy use and GHG emissions associated with the community's use of transportation
Description & Progress	Reliance on fossil fuelled vehicles is a major contributor to pollution and green house gases in our environment. Reducing this reliance and encouraging alternative forms of transportation is both good for the environment and good for the health of the Town's residents. These alternatives include bikes, pedestrians, and transit. The Town has recently implemented: • a trail directional and way-finding system • extensive commuter pathway development • grant money for the Community Cruiser Program • development of the Transportation Master Plan • Cougar Commuter paved trail • Pedestrian crosswalk on Benchlands trail • An Active Transportation group made up of Town employees • Pedestrian underpass The Town has also expanded its Capital Project Program to enhance the trail and sidewalk system (development and maintenance)
Accountabilities	Manager of Engineering Manager of Planning and Development General Manager of Community Infrastructure Manager of Public Works
Performance Measures	None at this time
Future Priorities & Actions	Develop a Terms of Reference for the Open Spaces and Trails Plan Ensure path connectivity with future transit Implement, when viable, local transit within the Town of Canmore
Supporting Documents & Linkages	Town of Canmore 2009 Business Plan

Action or Program	**ECP-E12 Anti-Idling Program**
Action Type	**Existing**
Applies To	**Community**
Strategy	Reduce energy use and GHG emissions associated with the community's use of transportation
Description & Progress	A voluntary anti-idling program was initiated in 2004. Anti-idling signs have been posted at railway crossings and a limited number of other key locations. Community-wide education is being spearheaded through the Biosphere Institute. The Biosphere Institute recently teamed up with Lawrence Grassi students to complete a survey and video project to increase community awareness of this initiative. Reducing unnecessary idling reduces fuel consumption, resulting in lower greenhouse gas and other emissions.
Accountabilities	Sustainability Coordinator Biosphere Institute
Performance Measures	TBD
Future Priorities and Actions	Increase level of advertising and promotion Introduction of anti-idling bylaw
Supporting Documents & Linkages	

Action or Program	**ECP-E13 Bow Valley Regional Transit System**
Action Type	**Existing**
Applies To	**Community**
Strategy	Reduce energy use and GHG emissions associated with the community's use of transportation
Description & Progress	The Municipalities of Canmore and Banff and Improvement District #9 are working with private sector representatives, provincial government representatives, the three ski areas, transportation providers, Parks Canada, environmentalists, and the regional accommodation sector to create a Bow Valley Regional Transit Services Commission (BVRTSC). The purpose of the Commission would be to enhance existing transit services and introduce new transit services to improve mobility and the experience of residents and tourists in living in and enjoying these municipalities and Banff National Park. The Steering Committee is currently preparing an application for the consideration of the Ministry of Municipal Affairs in summer 2010. If approved, there could be a possible start-up of the BVRTSC in 2011.
Accountabilities	Manager of Engineering
Performance Measures	None at this time
Future Priorities & Actions	1. Establish a partnership and Regional Transit Authority. 2. Implement Regional Transit connection to Banff. 3. Implement, when viable, local transit within the Town of Canmore.
Supporting Documents & Linkages	Town of Canmore 2010 Business Plan

Action or Program	**ECP-E14 Green Building Regulation for Private Developments**
Action Type	**Existing**
Applies To	**Residential and ICI Sectors**
Strategy	Reduce energy use and GHG emissions associated with the residential sector (buildings) Reduce energy use and GHG emissions associated with the commercial sector (buildings/infrastructure) Reduce energy use and GHG emissions associated with the industrial sector
Description and Progress	The Town developed and implemented a Green Building Policy for private developments in 2007. The Policy was adopted into the Land Use Bylaw 22-2010. The Green Building Regulation requires applicants seeking a Development and/or Building Permit to meet one of the following criteria: Third Party Certification • Built Green™ Certification (minimum bronze standard) (residential development); • LEED certification (Commercial or Residential); • R2000 certification; • Other third party certification to the satisfaction of the Town of Canmore; or • Town of Canmore Procedure ○ Town of Canmore Green Building checklist – minimum requirements consistent with Built Green™ bronze.
Accountabilities	Manager of Planning
Performance Measures	
Future Priorities and Actions	Review progress and compliance levels with respect to this policy, and review the need to update the required achievements
Supporting Documents & Linkages	Green Building Regulation – Land Use Bylaw 22-2010

Action or Program	**ECP-E15 Planning for a Sustainable Canmore**
Action Type	**Existing**
Applies To	**Town of Canmore, Residential and ICI Sectors**
Strategy	Reduce energy use and GHG emissions associated with the community's use of transportation
Description and Progress	The use of smart growth land use planning principles such as mixed use residential and commercial development and increased density will reduce the need to use motorized transportation. The Town is currently in the process of consolidating the public input received from the CSP "Mining the Future II" consultation process into a reference document for Council's consideration as an attachment to the Municipal Development Plan, which speaks to this type of growth management.
Accountabilities	Manager of Planning and Development
Performance Measures	
Future Priorities and Actions	Revision to the current Municipal Development Plan
Supporting Documents & Linkages	Municipal Development Plan

Recommended Actions – Town of Canmore

Action or Program	**ECP-R1 Energy Management Program**
Action Type	**Recommended**
Applies To	**Town Operations**
Strategy	Utilize a comprehensive approach to the monitoring and management of energy use and greenhouse gas emissions
Recommended Action	The Town should develop and implement a comprehensive energy management program to track and manage the energy used by Town owned and operated facilities. The program should encompass the following: • Clear objectives related to energy management (cost control, green power, emissions) • Development and implementation of a system to monitor and accurately report energy use at all Town facilities/operations • The use of energy audits to identify and prioritize opportunities for energy savings • Process to be used for energy procurement/contracting
Rationale	The purchase of energy is a significant expense for the Town. The purchase and use of energy needs to be managed in a comprehensive fashion to the Town's objectives related to cost, reliability and environmental sustainability are achieved. As energy purchase contracts come up for renewal, appropriate due diligence is required to ensure the best value is obtained considering the Town's objectives.
Expected Impact	
Resource Requirements	Requires additional staff time to develop, implement and maintain the plan.
Potential Barriers to Implementation	Staff time
Accountabilities	Chief Administrative Officer Deputy Chief Administrative Officer Manager of Facilities Manager of Public Works
Performance Measures	

Action or Program	**ECP-R2 Corporate Energy & Emissions Monitoring and Reporting System**
Action Type	**Recommended**
Applies To	**Town Operations**
Strategy	Utilize a comprehensive approach to the monitoring and management of energy use and greenhouse gas emissions
Recommended Action	The Town should develop and implement a formal system to monitor and report on energy use and greenhouse gas emissions for corporate operations. The system should allow for the preparation of an annual report that summarizes key corporate energy and emissions data for the previous year. The system should clearly indicate what data will be tracked and what sources will be used for the data. To the extent possible, energy suppliers should be required to provide energy use information in an easy to use format as a condition of the contract. There is also a need to consider to what extend the energy use and emissions resulting from contract service providers such as EPCOR and Volker-Stevin will be tracked. In deciding what energy and emissions sources to include, it may be useful to adopt the Scope 1, Scope 2, Scope 3 approach to emissions sources as outlined in the International Local Government GHG Emissions Analysis Protocol or similar document.
Rationale	This program is required to ensure consistent measurement and reporting of key energy data and to allow progress towards energy management and emission targets to be assessed. There is currently no accurate greenhouse emission inventory available for the Town or community. An accurate understanding of the types and amounts of energy used for Town operations is required to assess the short, medium and long term impact of the Town's business and policy decisions and to assess progress towards meeting the energy and emissions related objectives and targets outlined in this Environmental Stewardship Action Plan.
Expected Impact	
Resource Requirements	May require additional staff time to collect, monitor, and report on data

Potential Barriers to Implementation	Staff time
Accountabilities	Chief Administrative Officer Deputy Chief Administrative Officer Manager of Facilities Manager of Public Works
Performance Measures	See section on Performance Measures

Action or Program	**ECP-R3 Building & Facility Energy Audits**
Action Type	**Recommended**
Applies To	**All Town owned and/or operated buildings and facilities**
Strategy	Reduce the energy used to operate Town owned facilities, buildings and infrastructure
Recommended Action	Develop & implement a formal program of energy audits that covers all significant facilities, buildings and infrastructure owned by the Town. The first facilities to have an energy audit completed should be the Wastewater Treatment Plant and the Recreation Centre. For water and wastewater facilities, work previously completed by EPCOR (such as the power audit completed in 2006) should be reviewed as part of the planning for the energy audits. Consideration should be given to establishing a regular budget line item for energy audits and energy efficiency projects. There are numerous small opportunities that could be pursued at the discretion of the responsible manager if budget was available.
Rationale	Energy audits of individual facilities and buildings would provide a better understanding of current energy use within the building or facility and would allow for the identification of future energy efficiency opportunities. The wastewater treatment plant is the largest energy consuming facility owned or operated by the Town of Canmore.
Expected Impact	
Resource Requirements	Staff time and budget for consultant to conduct energy audits. A phased/prioritized approach based on energy consumption should be utilized to spread out the costs of this program.
Potential Barriers to Implementation	Cost of audits Cost of recommended actions The criteria (business case) that must be satisfied for approval of energy efficiency projects has not been clearly articulated or consistently applied.
Accountabilities	Manager of Engineering

	Manager of Public Works Manager of Facilities
Performance Measures	Power consumption in Town facilities Natural gas consumption in Town facilities

Action or Program	**ECP-R4 Energy Audit of Waste Management Activities**
Action Type	**Recommended**
Applies To	**All waste management operations provided by the Town of Canmore and private contractors**
Strategy	Reduce the lifecycle greenhouse gas emissions associated with waste management activities Utilize a comprehensive approach to the monitoring and management of energy use and greenhouse gas emissions
Recommended Action	Complete a lifecycle evaluation of the energy and green house gas emissions associated with current waste management practices.
Rationale	The air quality and greenhouse gas implications of hauling wastes to distant landfills or treatment facilities is not adequately understood.
Expected Impact	
Resource Requirements	Staff time and budget for contractor to complete audit
Potential Barriers to Implementation	Cost of audits Cost of recommended actions
Accountabilities	Manager of Public Works Deputy Chief Administrative Officer
Performance Measures	

Action or Program	**ECP-R5 Street Light Retrofit Program**
Action Type	**Recommended**
Applies To	**Street lights owned by the Town and Fortis and operated by Fortis**
Strategy	Reduce the energy used to operate Town owned facilities, buildings and infrastructure
Recommended Action	Implement retrofit program for street lights to replace existing lights with more efficient LED light bulbs.
Rationale	Retrofitting up traffic lights has resulted in an approximately 90 % savings in energy required to operate traffic lights. Retrofitting of streetlights may result in a significant reduction in power consumption.
Expected Impact	
Resource Requirements	Staff time Cost of replacement lights
Potential Barriers to Implementation	
Accountabilities	Manager of Public Works Manager of Engineering
Performance Measures	% street lights using LED or high efficiency bulbs

Action or Program	**ECP-R6 Energy Management & Climate Protection Engagement Program for Town Staff**
Action Type	**Recommended**
Applies To	**Town of Canmore**
Strategy	Increase staff awareness of the importance of energy and climate related issues and initiatives Utilize a comprehensive approach to the monitoring and management of energy use and greenhouse gas emissions
Recommended Action	Develop a targeted energy management awareness orientation session or package for Town staff. The session or package should summarize the Town's key objectives, targets, strategies and actions related to energy management outlined in this plan and the role of staff in achieving the results under the plan. Conduct session or distribute orientation package to all existing and new employees and reinforce the key messages and responsibilities through regular communication, discussion at staff meetings, etc. This initiative may be completed as part of the Community Education and Engagement element of the ESAP.
Rationale	There are currently no formal energy or climate change related initiatives in place although indirect awareness occurs through eco-teams, e-news, TNS e-learning & orientation video.
Expected Impact	
Resource Requirements	Staff time Budget for program development
Potential Barriers to Implementation	
Accountabilities	Sustainability Coordinator
Performance Measures	Staff awareness and behaviours

Recommended Actions – Community

Action or Program	**ECP-R7 Community Energy & Emissions Monitoring and Reporting System**
Action Type	**Recommended**
Applies To	**Residential and ICI Sectors**
Strategy	Increase community awareness of the importance of energy and climate change related issues Increase community commitment to and engagement in initiatives to reduce energy use and greenhouse gas emissions
Recommended Action	The Town should develop and implement a formal system to monitor and report on community energy use and greenhouse gas emissions. The system should be capable of generating an annual report that summarizes key energy and emissions data for the previous year. Due to the difficulties associated with tracking energy use and greenhouse gas emissions associated with the community's use of transportation, the initial focus should be on tracking community natural gas and power consumption as this data is potentially easier to track and results in the majority of greenhouse gas emissions.
Rationale	As 94 % of the community's greenhouse gas emissions originate from the residential, commercial and industrial sectors, tracking community energy use and greenhouse gas emissions is required to confirm whether emissions reduction programs are being effective and whether progress is being made toward community emissions reduction targets.
Expected Impact	
Resource Requirements	May require additional staff time to collect, monitor, and report on data
Potential Barriers to Implementation	Staff time
Accountabilities	Chief Administrative Officer Deputy Chief Administrative Officer Sustainability Coordinator
Performance Measures	Community Monitoring Report

Action or Program	**ECP-R8 Energy Management & Climate Protection Engagement Program for the Community**
Action Type	**Recommended**
Applies To	**Residential and ICI Sectors**
Strategy	Increase community awareness of the importance of energy and climate change related issues Increase community commitment to and engagement in initiatives to reduce energy use and greenhouse gas emissions
Recommended Action	Develop and implement a community-based program to increase individual engagement and participation in initiatives to improve energy management and greenhouse gas emissions from the residential and ICI sectors.
Rationale	The residential and ICI sectors account for approximately 94 % of the community's greenhouse gas emissions and emissions continue to grow. There has been no progress towards the emissions reduction targets established for the community in 2002.
Expected Impact	
Resource Requirements	Staff or contractor to implement the program
Potential Barriers to Implementation	Staff time
Accountabilities	Sustainability Coordinator This program will be implemented as part of the Community Education and Engagement component of this Environmental Stewardship Action Plan.
Performance Measures	Community awareness Decrease in community consumption

Actions for Future Consideration

The following is a list of potential initiatives that could be considered for future implementation after the higher priority recommendations have been implemented. In most cases additional work is required to evaluate the feasibility and benefits associated with implementation of the initiatives identified for future consideration.

Potential actions for future consideration include:

1. Alternative Transportation Program
    a. Intended to allow Town staff to use fleet vehicles outside of business hours for personal use
    b. The staff member would collect point for choosing alternative transportation options to commute to and from work.

2. Green Building or Green Development Incentives Program

3. Green Power Purchasing Pool for the community

4. Air quality initiatives
    a. Air quality has not been a significant focus to date although many of the same initiatives that address GHG emissions also help to maintain air quality

Performance Measurement & Reporting

Performance Indicators

The following performance indicators will be calculated and reported annually:

Town of Canmore

Transportation Fuel

- type and volume of each fuel type used (gasoline, diesel, biodiesel, other)
- calculated energy content for each fuel type used (GJ)
- the inclusion of contractors who provide major services to the Town (Volker Stevin, EPCOR) should be included where feasible

Natural Gas

- volume or energy content of natural gas consumed (total with breakdown by facility)
- calculated energy content of natural gas consumed (total and breakdown by facility)(GJ)

Electrical Power

- kWh of electrical power consumed (total with breakdown by facility)
- calculated energy content of electrical power consumed (total and breakdown by facility) (GJ)
- amount of green power purchased (kWh)

Total Energy

- total energy consumed by Town of Canmore operations (GJ)
- energy consumed by Town of Canmore operations per capita served (GJ/person)

Greenhouse Gas Emissions

- estimate of greenhouse gas emissions avoided through purchase of green energy or deployment of renewable energy (tonnes CO2e)
- calculated greenhouse gas emissions for each fuel type used (tonnes CO2e)
- calculated greenhouse gas emissions resulting from combustion of natural gas (total with breakdown by facility) (tonnes CO2e)
- calculated greenhouse gas emissions resulting from consumption of electrical power (total with breakdown by category or facility) (tonnes CO2e)
- total calculated greenhouse gas emissions resulting from Town of Canmore operations (tonnes CO2e)
- greenhouse gas emissions from Town of Canmore operations per capita served (tonnes CO2e/person)

Community

Transportation

- to date, no feasible way of tracking community use of transportation fuels has been identified

Natural Gas

- volume or energy content of natural gas consumed (total and breakdown by sector – residential, industrial, commercial, institutional)
- calculated energy content of natural gas consumed (total and breakdown by sector – residential, industrial, commercial, institutional)(GJ)

Electrical power

- kWh of electrical power consumed (total with breakdown by sector – residential, industrial, commercial, institutional)
- calculated energy content of electrical power consumed (total and breakdown by sector – residential, industrial, commercial, institutional)(GJ)

Total Energy

- total energy consumed with breakdown by sector (GJ)
- per-capita energy consumption (GJ/person)

Greenhouse Gas Emissions

- calculated greenhouse gas emissions resulting from combustion of natural gas (total with breakdown by sector) (tonnes CO2e)
- calculated greenhouse gas emissions resulting from consumption of electrical power (total with breakdown by sector) (tonnes CO2e)
- total calculated greenhouse gas emissions (tonnes CO2e)
- per-capita greenhouse gas emissions (tonnes CO2e/person)

Where per-capita performance indicators are specified, for comparison purposes they should be calculated using the both the total (combined permanent and non-permanent population) and permanent populations. Canmore's significant non-permanent population and high level of day and overnight visitors makes the use of per-capita numbers problematic regardless of which method is used. For this reason it is suggested that the per-capita indicators be calculated using both methods to allow comparisons to be made.

Although not required at this time, other potential performance indicators could include:

- average carbon intensity of energy used (i.e. tonnes CO2 / GJ)
- % of energy derived from renewable or other low carbon sources
- Number of residents tracking their energy use and actively reducing their emissions
- Number of businesses tracking their energy use and actively reducing their emissions

Data Sources

For Town of Canmore operations, data on transportation fuel consumption will be provided by each of the departments having responsibility for purchasing transportation fuels.

Electrical power and natural gas consumption data for the Town of Canmore's operations will be obtained from the Town's commercial energy suppliers. Currently the Town acquires its power and natural gas through Nexen and can access data on its energy consumption on-line through Nexen's Retail Energy Consumption Reporting System.

Information on community energy use can be obtained from the suppliers of energy to the residential and commercial sectors but is currently difficult to access. The Alberta Urban Municipalities Association (AUMA) is currently working with these suppliers to develop an energy data reporting system that will meet the needs of municipalities.

Reporting

A report will be prepared annually that presents the performance indicators calculated for the energy management and climate protection program for the previous year and summarizes progress towards the goals established for the air quality and climate protection program.

The annual report is to be completed by March 31st following the calendar year for which the data has been collected and performance indicators calculated.

The annual report will be distributed to:

- The Communications and Sustainability Coordinator
- The CAO and Deputy CAO
- Mayor and Council
- The Environmental Advisory Review Committee
- The Biosphere Institute of the Bow Valley

The annual report will also be posted on the Town of Canmore's website.

Accountabilities

Town of Canmore

The Chief Administrative Officer (CAO), Deputy Chief Administrative Officer (Deputy CAO) and Mayor and Council are responsible for reviewing and approving the general direction, strategies and goals outlined in the Environmental Sustainability Action Plan (ESAP) and for ensuring that any actions required to achieve the goals are reviewed and approved prior to implementation. Once specific actions have been approved, there is an ongoing responsibility to ensure that the approved actions are adequately supported and implemented.

The Managers of Recreation and Facility Services, Public Works, Engineering, Planning and Development, and the General Manager of Community Infrastructure are responsible for the regular review and updating of the energy management and climate protection actions and initiatives outlined in the ESAP.

The Managers of Recreation and Facility Services, Public Works and Finance and the Fire Chief are responsible for ensuring that any new actions and initiatives required to achieve the goals in this action plan are reviewed and approved by the CAO, Deputy CAO and Mayor and Council (as appropriate) before implementation.

The Manager of Facilities is responsible for collecting the data required for ensuring the completion of the annual Energy Management and Climate Protection summary report by March 31st of each year.

The Manager of Facilities is also responsible for ensuring that data required to calculate the performance indicators in the annual energy management and climate protection summary report is collected and compiled in time to produce the annual report.

The Sustainability Coordinator is responsible for producing and distributing the annual summary report and coordinating the development and delivery of community education and engagement initiatives related to energy management and climate protection initiatives, in cooperation with the Mangers of Recreation and Facilities and Public Works.

Government of Canada

The Government of Canada is responsible for setting national goals and establishing a federal framework for greenhouse gas emission reduction and climate change protection that support the achievement of Canada`s obligations and commitments made to in the international community.

Province of Alberta

The Province of Alberta’s role is to establish provincial goals, programs and legislation related to greenhouse gas emissions and climate protection that are aligned with and support the attainment of Canada`s national goals and commitments.

Private Sector

The private sector, including residents, local businesses and institutions and visitors, are expected to participate in the Town of Canmore and other initiatives related to energy management and climate protection and to take the necessary steps to minimize the carbon footprint associated with their use of energy and other activities.

Notes

1. Population

Permanent and Non-permanent populations for 2000 and 2008 were obtained from the 2000 and 2008 census reports available at

http://www.canmore.ca/About-Canmore/

As no census report was available for 2007, the permanent and non-permanent populations for 2007 were estimated by taking the mean of the populations from the 2006 and 2008 census reports.

2. Calculation of Town of Canmore (Corporate) Transportation Fuel Use

Town of Canmore (Corporate) transportation fuel consumption numbers for 2007 and 2008 were provided by the Town of Canmore in a series of e-mails and are summarized as follows:

Transportation Fuel	2007	2008
Town Fleet not including EMS		
Regular Gasoline (litres)	37,657	38,627
Diesel (litres)	22,558	31,268
Biodiesel (litres)	18,031	22,994
EMS		
Total Gasoline and Diesel (litres)	31,194	30,148

The following information was provided on biodiesel use:

- A B5 blend (5 % biodiesel) is used in winter (Oct 15 to end of May)
- A B20 blend (20 % biodiesel) is used in summer (June – Oct 15th)

To convert litres of fuel to GJ the following conversion factors were used:

- 1 m3 diesel or biodiesel = 38.68 GJ
- 1 m3 motor gasoline = 34.66 GJ

The fuel consumption conversion factors were obtained from the National Energy Board website at http://www.neb-one.gc.ca/clf-nsi/rnrgynfmtn/sttstc/nrgycnvrsntbl/nrgycnvrsntbl-eng.html#a_s_04_ss_07

A breakdown between diesel and gasoline was not provided for EMS fuel use for the years 2007 and 2008. A 75/25 split between diesel and gasoline was assumed based on a review of more detailed data available for the first half of 2009.

For 2007, the breakdown for EMS transportation fuels was estimated to be

- Diesel = 31,194 litres x 0.75 = 23395 litres x .03868 GJ/litre = 905 GJ

- Gasoline = 31,194 litres x 0.25 = 7798 litres x .03466 GJ/litre = 270 GJ

For 2008, the breakdown for EMS transportation fuels was estimated to be

- Diesel = 31,194 litres x 0.75 = 23395 litres x .03868 GJ/litre = 905 GJ

- Gasoline = 31,194 litres x 0.25 = 7798 litres x .03466 GJ/litre = 270 GJ

3. Town of Canmore Electrical Power Consumption

The original source data in kWh used to establish the 2000 EMAP baseline was not available for review.

Electrical power consumption data for Town of Canmore operations/buildings/facilities for 2007 and 2008 was obtained by the Town of Canmore from Nexen's Retail Energy Consumption Reporting System. The data used to generate this report is contained in two files, copies of which were provided to the Town of Canmore:

- ALL TOC Power Consumption 2007-2009.xls
- EPCOR Water Services Power Consumption 07-09.xls

The following factor was used to convert electrical power consumption to gigajoules

1 kWh = 0.0036 GJ

4. Town of Canmore - Natural Gas Consumption

Natural gas consumption data for Town of Canmore operations/buildings/facilities was obtained from Nexen.

5. Town of Canmore - Calculation of GHG Emissions

The Town of Canmore's PCP Milestone 1 Report was prepared using software provided by the Federation of Canadian Municipalities (FCM). The software uses the following emissions factors to convert energy units into tonnes of CO2e emissions:

- electricity - 278 kg CO2e/GJ
- natural gas - 50 kg CO2e/GJ
- gasoline – 68 CO2e/GJ
- diesel – 70.5 CO2e/GJ

The same emission factors were used to convert 2007 and 2008 gasoline, diesel and natural gas into CO2e emissions.

As the CO2 intensity of the power grid changes over time, updated emission factors for the Alberta Electricity Generation Sector were obtained from tables developed by FCM software based on the values reported in the Government of Canada GHG inventory

2000 0.930 kg/kWh 258 kg/GJ

2006 0.870 kg/kWh 242 kg/GJ

2007 0.820 kg/kWh 228 kg/GJ

2008 A published number was not available so a value of 0.800 kg/kWh was assumed (222 kg/GJ)

Corporate GHG Emissions	**2007 Energy Consumed (GJ)**	**2007 GHG Emissions (tonnes CO2e)**	**2008 Energy Consumed (GJ)**	**2008 GHG Emissions (tonnes CO2e)**
Vehicle Fleet				
Gasoline	1,576	107	1,600	109
Diesel	1,778	125	2,084	147
Biodiesel	697	43	889	55
Subtotal		**275**		**311**
Buildings & Facilities				
Natural Gas	20,582	1,029	21,117	1,056
Electrical Power	8,454	1,928	9,856	2,188
Subtotal		**2,957**		**3,244**
Streetlights				
Electrical Power	155	35	153	34
Subtotal		**35**		**34**
Water & Wastewater Services				
Natural Gas	8,331	417	8,108	405
Electrical power	16,969	3,869	17,532	3,892
Subtotal		**4,286**		**4,297**
Total GHG Emissions		**7,553**		**7,886**

Emissions from gasoline use in 2007

1,576 GJ x 68 kg/GJ = 107, 168 kg (107 tonnes)

Emissions from gasoline use in 2008

1,600 GJ x 68 kg/GJ = 108,800 kg (109 tonnes)

Emissions from Biodiesel

Biodiesel – based on seasonal use assume B20 used 5/12 of time and B5 used 7/12 of time

This gives a blended biodiesel content of 5/12 x 0.20 + 7/12 x 0.05 = .083 + .029 = 11.2 %

Therefore emissions associated with biodiesel use will be 11.2 % less than equivalent amount of regular diesel

Emissions from Biodiesel blend in 2007

697 GJ x 70.5 kg CO2e/GJ x .885 = 43,487 kg (43 tonnes)

Emissions from Biodiesel blend in 2008

889 GJ x 70.5 kg CO2e/GJ x .885 = 55467 kg (55 tonnes)

Avoided emissions for 2007

697 GJ x 70.5 kg CO2e/GJ x .115 = 5650 kg (5.6 tonnes)

Avoided emissions for 2008

889 GJ x 70.5 kg CO2e/GJ x .115 = 7208 kg (7.2 tonnes)

Carbon Offsets resulting from Green Power Purchase Program

To calculate the tonnes of carbon emissions offset through purchase of green power a factor of 1428 kWh = 1 tonne of carbon was used based on information provided by Nexen. This is equivalent to a CO2 emission intensity of 0.700 kg CO2e/kWh.

6. Community's Use of Transportation Fuels

2000 EMAP baseline indicated that the community used the following amounts of transportation fuel in 2000:

- Gasoline = 173,647 GJ
- Diesel = 14,528 GJ
- Total 188,175 GJ

The methodology/assumptions used to develop this estimate could not be verified as the source data and methodology used to develop the estimate was not available for review.

7. Calculation of Community GHG Emissions

Community GHG Emissions	2007 Energy Consumed (GJ)	2007 GHG Emissions (tonnes CO2e)	2008 Energy Consumed (GJ)	2008 GHG Emissions (tonnes CO2e)
Electrical Power	366,570	83,578	394,615	87,604
Natural Gas	1,264,498	63,225	1,335,099	66,754
Total	**1,631,1060**	**146,803**	**1,729,714**	**154,358**

Resource Conservation and Waste Management

Resource Conservation and Waste Management

Desired Future State

We are striving for a future in which the citizens of Canmore, local businesses and visitors understand and value the importance of responsible consumption and, as a result, have significantly reduced their consumption of resources. We actively seek out, demand and use products and services that embody high levels of resource efficiency by providing the same or greater level of service or benefit using significantly lower levels of resources than in the past.

We are moving towards zero waste by reducing, reusing and recycling the materials we consume. This will minimize the amount of waste ultimately requiring treatment or disposal. The community manages the waste it does produce in a responsible and comprehensive fashion. Harm to other systems (air, land, water, and ecosystems) and species is avoided by considering the full range of potential impacts associated with the collection, treatment, transportation and disposal of waste.

Our emphasis on responsible consumption, increased resource efficiency, waste minimization and comprehensive management of material and waste streams has significantly reduced the environmental footprint associated with the community's use of resources and generation of wastes; contributed to improved social well-being; and resulted in improved business performance and new economic opportunities for local businesses and individuals.

Current Reality

Summary

Since the Town of Canmore's Solid Waste Action Plan (SWAP) was developed and adopted in 2003, there have been significant increases in the amount of recycling that occurs in the community and a dramatic increase in the rate and amount of materials being diverted away from landfills.

At the same time however, in 2008 we produced significantly larger volumes of waste, produced more waste per-capita and land filled approximately 50 % more waste than we did in 2001, the SWAP baseline year. A combination of rapid population growth and higher levels of economic activity contributed to these outcomes. As a result, there has been no progress towards the SWAP goal of a 50 % per-capita reduction in the amount of solid waste being sent to land by 2010.

In order to move towards our desired future state, new goals and approaches are required. We will need to broaden our efforts, moving from a focus on waste diversion and recycling programs to a more comprehensive approach that includes an emphasis on responsible consumption, resource efficiency, waste minimization and life cycle management of our resource and waste management streams.

We also need to be strategic about which opportunities we pursue. With limited resources available, we must avoid the temptation to tackle too many things at once. We need to identify and focus on those opportunities that are most likely to have a significant impact on our resource consumption and waste generation activities.

Finally, if we are to move towards our desired future, it will be necessary to achieve a high level of understanding, acceptance and participation among the citizens of Canmore, local businesses and visitors with respect to resource conservation and waste minimization goals and initiatives. As more than 90 % of the wastes generated within the community originate from the residential and ICI sectors, these sectors must become actively engaged in establishing the goals and implementing the programs required to improve the sustainability of our resource consumption and waste management activities.

SWAP Goals and Initiatives

A Solid Waste Action Plan (SWAP) was drafted in 2002 and endorsed by Council in early 2003. The SWAP includes the following goal statement:

"That the Town of Canmore achieve a reduction in per capita Municipal Solid Waste sent to landfill of 50% by the year 2010, using 2001 as the base generation year".

Using Canmore's permanent population of 10,843 in 2001, SWAP determined the level of municipal solid waste being land-filled in the baseline year to be 0.84 tonnes/person/year. Thus, the goal statement envisioned a reduction to 0.42 tonnes /person /year by the year 2010.

Under SWAP a series of potential short, medium and long term initiatives were identified to help achieve this goal including:

- promotion and education initiatives;

- construction, renovation and demolition source separation initiatives;
- leaf and yard waste drop off program;
- East Regional waste transfer station;
- East Regional material recycling facility;
- Three Sisters recycling depot;
- curb-side recycling program;
- regional organics composting program;
- house hold hazardous waste program; and
- an extended producer responsibility program.

A summary of the progress and current status of the above SWAP initiatives is provided in the annual reports prepared by Solid Waste Services (Town of Canmore, 2007; Town of Canmore, 2008).

In summary, progress has been made on the following SWAP initiatives:

- promotion and education initiatives (now a shared responsibility with the Bow Valley Waste Management Commission);
- construction, renovation and demolition source separation initiatives;
- leaf and yard waste drop off program; and
- household hazardous waste program.

To date, no progress has been made on the following SWAP initiatives:

- East Regional waste transfer station;
- East Regional material recycling facility;
- Three Sisters recycling depot;
- curb-side recycling program;
- regional organics composting program; and
- extended producer responsibility program.

The siting of proposed new waste management facilities including the new waste transfer station, materials recycling facility, Three Sisters recycling depot and a site for the proposed organics composting programs have been particularly problematic for a variety of reasons and account for the lack of progress on these initiatives.

Although work was completed to evaluate the merits and costs of implementing a curb-side recycling program, following the evaluation there was limited support for moving ahead with a curb-side recycling program. Instead, other options for enhancing the Town's current recycling programs were explored and there are plans to implement a pilot enhanced recycling program during 2010. Community-wide implementation of an enhanced recycling program will be contingent on the Town's ability to redevelop or replace the existing materials recycling facility to permit handling of the additional waste volumes and/or streams. The current status and direction for the enhanced recycling program is summarized in the following Actions and Initiatives section.

Population Growth

The following table summarizes Canmore's population growth between 2001 and 2008. The population numbers for 2001, 2006 and 2008 are based on census data for those years. The population estimate for 2007 is an estimate based on the mean populations for 2006 and 2008.

Population	2001 SWAP Baseline	2006	2007	2008	Increase from 2001 to 2008
Permanent	10,843	11,599	11,802	12,005	11 %
Non-Permanent	2,273	4,818	5,193	5,567	145 %
Total	**13,116**	**16,417**	**16,995**	**17,572**	34 %

Key observations:

- The non-permanent population has grown significantly since 2001 and now represents approximately one third of Canmore's population
- The high percentage of non-permanent residents suggests that per-capita goals and indicators based on the permanent population only may not provide a complete picture of what is happening in the community

Total Solid Waste Generation

The total and per capita amount of solid waste generated by the community since SWAP was approved is summarized in the table below.

Total Solid Waste Generated	2001 SWAP Baseline	2006	2007	2008
Total Solid Waste Generated (tonnes)	11,232	27,165	26,244	25,277
Change Relative to 2001 (%)		+ 141 %	+ 134 %	+ 125 %
Solid Waste Generated Per Capita Based on Permanent Population Only (tonnes/person/yr)	1.04	2.34	2.22	2.11
Change Relative to 2001 (%)		+ 125 %	+ 113 %	+ 103 %
Solid Waste Generated Per Capita Based on Total (Permanent & Non-Permanent) Population (tonnes/person/yr)	0.86	1.65	1.54	1.44
Change Relative to 2001 (%)		+ 92 %	+ 79 %	+ 67 %

Key observations:

- The total amount of solid waste generated by the community has more than doubled since 2001
- On a per capita basis, the amount of solid waste generated per person is also significantly higher than it was in 2001, indicating that the rate of growth in solid waste volumes has been greater than the rate of population growth. This is true whether the permanent or total population is used as the basis for comparison.
- Much of the growth in waste volumes is due to increased waste volumes generated by the Industrial Commercial and Institutional (ICI) sector, particularly Construction and Demolition (C&D) wastes

- Over the last three years there has been a modest reduction in both the total and per-capita volumes of solid waste being generated but they still remain higher than in 2001
- A significant decrease in the amount of C&D wastes generated is anticipated in 2009 due to current economic conditions which have resulted in significantly lower levels of construction activity

Residential Solid Waste Generation

The amount of residential solid waste generated is summarized in the following table.

Residential Solid Waste Generation	2001 SWAP Baseline	2006	2007	2008
Residential Solid Waste Generated (tonnes)	2,600	2,904	3,193	3,084
Change Relative to 2001 (%)		+ 12 %	+ 23 %	+ 19 %
Residential Solid Waste Generated Per Capita Based on Permanent Population Only (tonnes/person/yr)	0.24	0.25	0.27	0.26
Change Relative to 2001 (%)		+ 4 %	+ 12.5 %	+ 8.3 %
Residential Solid Waste Generated Per Capita Based on Total (Permanent and Non-Permanent) Population (tonnes/person/yr)	0.20	0.18	0.19	0.18
Change Relative to 2001 (%)		-10 %	- 5 %	-10 %

Key Observations:

- Solid waste volumes from the residential collection system have grown at a rate that is consistent with the rate of population growth in the community
- On a per-capita basis, the amount of residential solid waste generated per person has remained relatively constant at between 0.18 and 0.20 tonnes/person/yr based on the combined permanent and non-permanent population
- Due to the challenges associated with using per-capita indicators in a community with such a high percentage of non-permanent population, it is not clear whether the 10 % reduction in per capita residential waste generation is a real per-capita reduction or an artifact of the increased population.

Waste Diversion – Overall Waste Stream

Diversion of waste away from the landfill occurs through recycling and diversion programs operated by the Town of Canmore and the private sector and through diversion programs that occur at the Francis Cooke Regional Landfill and Resource Recovery Centre.

The following table summarizes the diversion rates for the overall solid waste stream.

Waste Diversion	2001	2006	2007	2008

Overall Waste Stream	SWAP Baseline			
Total Waste Generated (tonnes)	11,232	27,165	26,244	25,277
Total Amount Diverted (tonnes)	2,086	13,420	12,432	11,471
Diversion Rate (%)	18.6 %	49.4 %	47.4 %	45.4 %

Key observations

- Since 2001 there has been a significant increase in both the rate of diversion and the total volume of materials being diverted away from landfills
- For the three years from 2006 to 2008 the diversion rate has been between 45 and 50 % although a slight downward trend appears to be evident and should be closely monitored.

Waste Diversion – Town of Canmore & Private Sector Programs

The Town of Canmore currently operates the following recycling and diversion programs:

- recycling depots and related programs;
- leaf and grass waste collection program;
- scrub and brush waste collection program;
- large item clean up;
- community clean up; and
- toxic round up and paint exchange

The total amount of materials handled by the Town of Canmore's recycling programs is summarized in the following table

	2001 SWAP Baseline	2006	2007	2008
Town of Canmore Recycling Depot (tonnes)	N/A	1190	1282	1367

In addition to the above programs, the Canmore Bottle Depot (CBD) is a private operation that accepts all approved beverage containers approved through the Alberta Beverage Container Recycling Corporation. This type of recycling is also increasing. In 2006 the CBD accepted 1,000 tonnes of recyclables, up from 520 tonnes in 2004. In 2007, the CBD diverted a total of 1227 tonnes of recyclable beverage containers.

Approximately 216 households and 80 businesses in Canmore pay additional fees to a private contractor for regular curb-side collection of their recyclable materials. These materials are deposited at the Boulder Recycling Depot and are included in the total materials recycled. (Town of Canmore, 2008h)

Key Observations:

- There has been a significant increase in the total amount of materials being recycled since 2001
- Visual examination of the residential waste stream by Solid Waste Services employees suggests that the residential waste stream still contains a large amount of recyclable materials.

Waste Diversion – Bow Valley Waste Management Commission Programs at Francis Cooke

The following table summarizes the amount of dry waste delivered to the Francis Cooke Landfill and Resource Recovery Centre from the community (residents, businesses and the Town of Canmore) and the disposition of those wastes.

Waste Diversion at Francis Cooke	2001 SWAP Baseline	2006	2007	2008
Total Amount Delivered (tonnes)		19,650	16,849	15,535
Amount Diverted (tonnes)		12,009	9,447	9,326
Amount Land Filled (tonnes)	3,747	7,641	7,419	6,209
% Diverted		61 %	56 %	60 %

Key observations:

- Significant diversion occurs at the Francis Cooke facility although asphalt and concrete account for a large proportion of the materials diverted.
- The diversion rate at the Francis Cooke facility has been relatively constant over the last three years, averaging around 60 %.
- The total amount of dry waste being land filled at the Francis Cooke landfill has been decreasing over the last three years
- The decrease in dry wastes being land filled reflects a decrease in the total volumes being delivered to the land fill and the increased amount of diversion that is occurring at the landfill.

The following table provides a breakdown of the material delivered to the Francis Cooke facility in 2008 by sector.

Wastes Delivered to Francis Cooke in 2008	Town of Canmore	Residential Sector	ICI Sector	Total
Total Material Delivered (tonnes)	410	528	14,598	15,535
% of Material Delivered	3 %	3 %	94 %	100 %
Material Diverted (tonnes)	339	139	8,848	9,326
% Diverted	83 %	26 %	61 %	60 %
Material Land Filled (tonnes)	70	389	5,750	6,209
% Land Filled	17 %	74 %	39 %	40 %

Key observations:

- ICI (Industrial, Commercial and Institutional) wastes accounted for 94 % of the materials delivered to the Francis Cooke facility in 2008
- ICI wastes accounted for 93 % of the materials from the community that were land filled at this facility in 2008

- The ICI wastes are largely Construction and Demolition (C&D) wastes
- The diversion rates in 2008 were highest for wastes delivered by the Town of Canmore and lowest for wastes delivered by the residential sector.
- The diversion rate for ICI material delivered to the facility was 60 % in 2008.

Total Wastes Land Filled

Residential and ICI wastes that contain organic material such as food wastes are sent to landfills in the Calgary area. Most dry C&D wastes which are not diverted through recycling are land filled at the Francis Cooke Regional Class III Landfill and Resource Recovery Centre. The following table provides a summary of the total amount of wastes from the community which are land filled each year.

Wastes Land Filled	**2001 SWAP Baseline**	**2006**	**2007**	**2008**
Residential and ICI Wastes Land Filled at Calgary Area Landfills (tonnes)	5,400	6,104	6,393	7,598
Change Relative to 2001 (%)		+ 13 %	+ 18 %	+ 41 %
C&D Wastes Land Filled at Francis Cooke (tonnes)	3,747	7,641	7,419	6,209
Change Relative to 2001 (%)		+ 104 %	+ 98 %	+ 66 %
Total Solid Waste Land Filled (tonnes)	9,147	13,745	13,812	13,807
Change Relative to 2001 (%)		+ 50 %	+ 51 %	+ 51 %
Solid Waste Land Filled Per Capita Based on Permanent Population Only (tonnes/person/yr)	0.84	1.19	1.17	1.15
Change Relative to 2001 (%)		+ 42 %	+ 39 %	+ 37 %
Solid Waste Land Filled Per Capita Based on Total (Permanent and Non-Permanent) Population (tonnes/person/yr)	0.70	0.84	0.81	0.78
Change Relative to 2001 (%)		+ 20 %	+ 16 %	+ 11 %

In the above table, the residential and ICI municipal solid wastes sent to Calgary area landfills includes residential wastes collected by Town of Canmore Solid Waste Services and commercial wastes collected by private contractors.

Key Observations:

- The total amount of municipal solid waste being land filled annually from the community is currently about 50 % higher than it was in 2001
- Over the three year period from 2006 to 2008 the total amount of municipal solid wastes being land filled has been relatively constant

- In 2008, municipal solid wastes sent to Calgary area landfills accounted for approximately 55 % of the total solid waste land filled
- The amount of municipal solid wastes being sent to Calgary area landfills has been increasing at a rate consistent with total population growth
- On a per capita basis, the amount of municipal solid waste being land-filled is currently higher than it was during 2001
- There has been no progress toward the goal of a 50 % per-capita reduction in the amount of municipal solid waste being land-filled as set out in the SWAP. This holds true whether the per-capita calculation is made using the permanent population as originally done in SWAP or whether the combined permanent and non-permanent population is used.

Goals & Targets

Context

Since 2001 Canmore has been experiencing rapid growth, particularly of the non-permanent population. Although the pace of development activity slowed considerably for 2008 and 2009 due to the current economic conditions, Canmore remains a highly desirable location and growth is expected to continue into the future. Although the timing and pace of development and the estimated population at full build out are not known with certainty, one estimate has suggested that at full build out the total population of Canmore (combined permanent and non-permanent population) may be approximately 30,000 people. To evaluate the impact of this growth on waste generation from the community it has been assumed that build out will occur prior to 2035.

In 2008, the total volume of solid waste generated by the community was approximately 25,277 tonnes which is equivalent to approximately 1.44 tonnes/person based on the total population of the community in 2008. Approximately 13,807 tonnes of this solid waste (0.78 tonnes/person) was land filled. If a similar amount of solid waste was generated and land filled on a per-capita basis as build out was approached sometime before 2035, the community would be generating more than 43,000 tonnes of solid waste and land filling more than 23,000 tonnes of solid waste annually by this time. Even if modest reductions in per capita waste generation and land filling were achieved, the significant growth in population expected to occur by this time would ensure that the total volume of waste being generated and land filled continued to grow.

The targets selected for this section of the ESAP have been selected to ensure that absolute as well as per-capita reductions in waste generation are achieved.

Planning Horizon

Short term goals are those that are to be achieved within 5 years (by 2015)

Medium term goals are those that are to be achieved within 10 years (by 2020)

Long term goals are those that are to be achieved within 25 years (by 2035)

Estimate of Population Growth

Although the rate and timing of future population growth cannot be known with certainty, for the purposes of establishing and evaluating targets related to resource conservation and waste minimization, an average growth rate of 3 % for the total population (combined permanent and non-permanent) population has been assumed with maximum build out occurring around 2030. This growth rate results in the following population estimates for the years of interest:

By 2015 – a total population of approximately 21,600
By 2020 – a total population of approximately 25,050
By 2035 – a total population of approximately 30,000

Total Solid Waste Land-Filled

The amount of municipal solid waste land filled on a per-capita basis was 0.78 tonnes/person in 2008 and 0.70 tonnes/person in 2001 based on Canmore's total population (combined permanent and non-permanent) for those years.

The amount of municipal solid waste being land filled will be reduced to:

- 0.60 tonnes/person/yr by 2015
- 0.45 tonnes/person/yr by 2020
- 0.30 tonnes/person/yr by 2035

The above targets represent reductions of 23 %, 42 % and 62 % respectively in the amount of solid waste being land filled on a per-capita basis compared to 2008 or reductions of 14 %, 36 % and 57 % compared to 2001 levels.

If the above targets are achieved and the population growth is consistent with the estimates provided for each of the target years, the total amount of solid waste land filled each would be as follows:

- 12,960 tonnes in 2015
- 11,272 tonnes in 2020
- 9,000 tonnes in 2035

Although the population of the community is expected to continue to grow, the per-capita targets have been selected to ensure that the total volume of waste being land filled decreases over time, despite the growth in population. For the targets selected and assumed growth in population, the total amount of solid waste land filled in 2035 (total population of approximately 30,000) would be similar to the total amount land filled by the community in 2001 when the population was approximately 13,000. If population growth is lower than expected but similar per-capita land fill rates are achieved, the total volume of solid waste land filled will be lower than the above numbers.

It should be noted that the Government of Alberta has established a goal of decreasing the amount of municipal solid waste sent to landfills from 806 to 500 kg/capita by the year 2010. However the Government of Alberta has acknowledged that this goal will not be reached by 2010. The proposed targets would achieve the Government of Alberta's proposed goal sometime between 2015 and 2020.

Residential and ICI Wastes Sent to Calgary-Area Landfills

The amount of residential and ICI sector waste sent to Calgary area landfills for disposal was 5400 tonnes in 2001 and 7598 tonnes in 2008. Based on the total population at the time, this is equivalent to 0.41 tonnes/person and 0.43 tonnes/person for 2001 and 2008 respectively.

The amount of municipal solid waste from the residential and ICI sectors sent to Calgary area landfills (or other landfills) for disposal will be reduced to:

- 0.35 tonnes/person/yr by 2015

- 0.30 tonnes/person/yr by 2020
- 0.20 tonnes/person/yr by 2035

The above targets represent reductions of 19 %, 30 % and 54 % respectively in the per-capita amounts of residential and ICI wastes being sent to Calgary area landfills compared to 2008 levels.

If the above targets are achieved and population growth is consistent with the estimates provided for each of the target years, the total amount of solid wastes sent to Calgary area landfills would be as follows:

- 7,560 tonnes in 2015
- 7,515 tonnes in 2020
- 6,000 tonnes in 2035

Achieving the above per-capita targets provides for a modest reduction in the total volume of residential and ICI wastes being transported to distant landfills even though the total population of the community grows by more than 70 % between 2008 and 2035. If no reduction in the per-capita amount of residential and ICI wastes transported to distance landfills is achieved between 2008 and 2035, by 2035 more than 12,900 tonnes of residential and ICI wastes would need to be transported annually to distant landfills or other locations for disposal.

C&D Wastes Land Filled at Francis Cooke Landfill

The amount of C&D waste land filled at the Francis Cooke landfill was 3747 tonnes in 2001 and 6209 tonnes in 2008. Based on the total community population for these years, this is equivalent to 0.29 tonnes/person and 0.35 tonnes/person for 2001 and 2008 respectively.

The amount C&D wastes from the residential and ICI sectors and the Town of Canmore land filled at the Francis Cooke landfill will be reduced to:

- 0.25 tonnes/person/yr by 2015
- 0.15 tonnes/person/yr by 2020
- 0.10 tonnes/person/yr by 2035

The above targets represent reductions of 29 %, 57 % and 71 % respectively in the per-capita amounts of C&R wastes land filled at the Francis Cooke landfill compared to 2008 levels.

If the above targets are achieved and population growth is consistent with the estimates provided for each of the target years, the total amount of C&R waste land filled at the Francis Cooke landfill would be as follows:

- 5,400 tonnes in 2015
- 3,757 tonnes in 2020
- 3,000 tonnes in 2035

Achieving the per-capita targets results in a steady decrease in the total amount of C&D wastes land filled at the Francis Cooke landfill.

Observed trends in the amount of C&D wastes delivered to the Francis Cooke Landfill and recent success at improving diversion rates for C&D wastes suggest that the above targets and volumes are achievable. The volume of C&D wastes delivered to the Francis Cooke facility has shows a declining trend between 2006 and 2008 (even before the full brunt of the current economic situation was felt). The diversion rate for C&D wastes at the Francis Cooke Landfill in 2008 was 60 % and BVWMC has a goal of achieving an 80 % diversion rate by 2010. Even without further reductions in the volumes of materials delivered to the Francis Cooke Landfill, achieving an 80 % diversion rate would achieve the desired targets and volumes

Summary Table

The following table summarizes the impact of the selected per-capita targets on the amount of waste that ultimately needs to be land filled.

Year	2001	2008	2015	2020	2035
Total Population	13,116	17,572	21,600 (est.)	25,050 (est.)	30,000 (est.)
Residential & ICI Wastes to Calgary Landfills (tonnes/person)	0.41	0.43	0.35	0.30	0.20
C&D Wastes to Francis Cooke Landfill (tonnes/person)	0.29	0.35	0.25	0.15	0.10
Total Land Filled (tonnes/person)	0.70	0.78	0.60	0.45	0.30
Residential & ICI Wastes to Calgary Landfills (tonnes)	5,400	7,598	7,560	7,515	6,000
C&D Wastes to Francis Cooke Landfill (tonnes)	3,747	6,209	5,400	3,757	3,000
Total Land Filled (tonnes) with proposed targets	9,147	13,807	12,960	11,272	9,000

Strategies

General Strategies

To achieve the community's desired future state, the following general strategies will be pursued:

1. Reduce the community's use of resources by encouraging responsible consumption behaviours and improving the resource efficiency of products and services used by and within the community.

2. Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery.

3. Consider the entire life cycle of activities related to resource use and waste management to ensure that little or no harm is done to the environment (air, land, water, ecosystems).

Strategies for Town of Canmore (Corporate) Operations

- Minimize the resources required to provide services to the community by identifying and utilizing products and services that employ high levels of resource efficiency

- Ensure that Town operations maximize the use of resources and minimize the amount of wastes that ultimately require disposal by reusing, recycling and recovering resources to the maximum extent practical

- Ensure that contract service providers to the Town of Canmore such as EPCOR, Volker Stevin and others employ resource conservation and waste minimization practices consistent with the Town of Canmore's corporate sustainability objectives

- As the majority of resources use and waste production occurs within the community, ensure local businesses, residents and visitors are aware of and have access to a comprehensive range of programs to encourage resource conservation and waste minimization

Priorities for the Town of Canmore

The following actions should be considered as short term priorities for the Town of Canmore:

1. Confirm siting and design options and proceed with development of a new or expanded Materials Recycling Facility in conjunction with the implementation of the proposed enhanced recycling program pilot.

2. Develop, site and implement a program(s) to manage organic wastes such as food wastes and bio-solids from the WWTP

3. Pursue additional improvements in the diversion rate for C&D wastes from the ICI sector
    a. Wastes from the ICI sector, the majority of which are C&D wastes, currently account for 94 % of materials delivered to the Francis Cooke Landfill
    b. An additional 10 % improvement in the diversion rate for ICI C&D wastes would reduce the amount of material land-filled by more than 1400 tonnes annually, which is three times the amount of C&D wastes land-filled annually by the residential sector and town of Canmore combined.

Strategies for the Community

- Increase community awareness of the importance of and opportunities for reducing resource use through adoption of responsible consumption behaviours and use of more resource efficient products and services

- Increase community commitment to and engagement in initiatives to maximize the reuse, recycling and recovery of resources

Priorities for the Community

The following actions should be considered as priorities for the community:

1. Implement enhanced recycling program pilot project in 2010 and assess potential success of community wide deployment.

2. Develop a community education and engagement strategy to increase the community's commitment to and participation in resource conservation and waste management initiatives.

Priority 2 will be developed as part of the Community Education and Engagement component of the Environmental Sustainability Action Plan.

Existing Actions

Action or Program	**RC-E1 Residential Waste Collection**
Action Type	**Existing**
Applies To	**Residential**
Strategy	Consider the entire life cycle of activities related to resource use and waste management to ensure that little or no harm is done to the environment (air, land, water, ecosystems).
Description & Progress	The Town's residential waste collection program is provided by municipal forces. Curb-side collection was eliminated in favour of neighbourhood animal proof garbage bins in 1998. There are a total of 198 residential waste containers located throughout Town. Waste is collected using side-load waste collection vehicles and transferred into a 53 foot transfer trailer at the Boulder Waste Transfer Station. From there the wastes are sent to BFI Calgary Collection and consolidation of wastes at a waste transfer station reduces the number of trips required to transport waste materials to disposal locations, thereby reducing transportation-related emissions.
Accountabilities	Manager of Public Works Supervisor Solid Waste Services
Performance Measures	Total amount of residential waste materials collected (tonnes/yr) Total amount of residential waste materials sent to landfill for disposal (tonnes/yr) Amount of residential waste materials collected per person (tonnes/person/yr) Amount of residential waste materials sent to landfill per person (tonnes/person/yr)
Future Priorities & Actions	Quantify emissions associated with transportation of wastes and include in inventory of GHG emissions.
Supporting Documents & Linkages	

Action or Program	**RC-E2 Town of Canmore Recycling Program**
Action Type	**Existing**
Applies To	**Residential , ICI and Town of Canmore**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery.
Description & Progress	This program is designed to maximize the recovery of materials that can be reused and reduce the amount of materials that ultimately become waste and are disposed of in a landfill. The Town's Recycling Program is a depot based service. The two permanent depot facilities are located at 115 Boulder Crescent and Sobeys Grocery Store on Railway Avenue. Materials collected at the Sobeys Depot are transferred to the MRF on Boulder Crescent for materials preparation and shipping. Both depots are open 24 hours per day, 7 days per week and can be used by residents, businesses and tourists alike. A recycling trailer was added to enhance the recycling program. The mobile Community Recycling Trailer continues to service the town. The CRT is moved between seven locations each day of the week including the three school sites. The three recycling depots accept the following materials: • newsprint & magazines • cardboard & boxboard • mixed paper • metal food cans • glass (clear & coloured) • mixed plastics (excluding film plastic bags & polystyrene) In addition to the above, the Boulder Recycling Depot also accepts the following materials: • automotive batteries • used oil products • fluorescent light tubes & compact fluorescent lights • e-waste • leaf & grass waste • scrub & brush waste • bicycle tires

Accountabilities	Manager of Public Works Supervisor Solid Waste Services
Performance Measures	Amount of materials recycled (tonnes/yr) Amount of materials recycled per person (tonnes/person/yr)
Future Priorities & Actions	Implement Enhance Recycling Program Upgrade/expand Materials Recycling Facility
Supporting Documents & Linkages	

Action or Program	**RC-E3 Large Item Clean Up**
Action Type	**Existing**
Applies To	**Residential**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery. Consider the entire life cycle of activities related to resource use and waste management to ensure that little or no harm is done to the environment (air, land, water, ecosystems).
Description & Progress	In 2009 the Town trialed a weekly Large Item Clean Up Program for residential addresses on Mondays from June 15- November 2. The program will continue in 2010. A registration system to participate with the program was utilized again this year and proved successful in educating the public on acceptable items and relaying other pertinent information. In 2008 approximately 527 homes registered for the two events and 63 tonnes of materials were collected of which 31 tonnes was recyclable scrap metal (i.e. appliances, bikes etc). Providing a collection option for large items reduces the potential for improper disposal, allows for separation/diversion of recyclable materials and provides an opportunity to educate the community on waste management issues and options.
Accountabilities	Manager of Public Works Supervisor Solid Waste Services
Performance Measures	Amount of wastes collected (tonnes/yr) Amount of materials diverted (tonnes/yr)
Future Priorities & Actions	
Supporting Documents & Linkages	

Action or Program	**RC-E4 Community Clean Up**
Action Type	**Existing**
Applies To	**Residential and ICI Sectors**
Strategy	Reduce the community's use of resources by encouraging responsible consumption behaviours and improving the resource efficiency of products and services used by and within the community. Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery. Consider the entire life cycle of activities related to resource use and waste management to ensure that little or no harm is done to the environment (air, land, water, ecosystems).
Description & Progress	Regular Community Clean Ups are organized during which volunteers donate their time to clean up along roadways ditches, watercourses, trails, public fields and parks. The events typically occur in the spring and fall and door prizes and snacks and/or meals are donated by local businesses to encourage and acknowledge volunteer participation. Participating in community clean-ups helps to keep the community free from waste, enhances a sense of community pride and spirit and provides an opportunity to educate the community on waste management related issues.
Accountabilities	Manager of Public Works Supervisor Solid Waste Services
Performance Measures	Amount of wastes collected (tonnes/yr)
Future Priorities & Actions	
Supporting Documents & Linkages	

Action or Program	**RC-E5 Construction and Demolition (C&D) Waste Management Program**
Action Type	**Existing**
Applies To	**ICI sector- construction and renovation contractors, developers**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery.
Description & Progress	A Construction, Renovation & Demolition (CRD) Policy was introduced in 2007. Policy encourages more separation of construction and demolition wastes at project sites (source) allowing these materials to be diverted for other uses or recycling rather than land-filled. Policy is compatible with existing diversion initiatives in place at the Francis Cooke Regional Landfill and Resource Recovery Centre. Current CRD source separation Initiatives include metal, concrete, gypsum, kiln dried lumber, Oriented Strand Board (OSB), asphalt shingles, cardboard Forms are provided when contractor/developer gets their building permit however to date program has experienced low compliance rates as only 5 – 6 % of forms are completed and returned when project complete. This makes it difficult to quantify the success of the C&D policy.
Accountabilities	Bow Valley Waste Management Commission Manager of Public Works Supervisor of Solid Waste Services
Performance Measures	Number & percent of forms completed/returned Average % of materials diverted for C&D projects
Future Priorities & Actions	Increase compliance rate for completion and return of C&D forms when project complete Province looking at deposit system depending upon size of construction project – implementation status unknown but not until at least 2010. Canmore is looking at similar options to stay ahead of potential provincial requirements.
Supporting Documents & Linkages	Construction and Demolition Policy (2007)

Action or Program	**RC-E6 Diversion Programs at Francis Cooke Regional Landfill and Resource Recovery Facility**
Action Type	**Existing**
Applies To	**Residential, ICI and Town of Canmore**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery.
Description & Progress	The Francis Cooke Regional Class III Landfill and Resource Recovery Centre (Francis Cooke Facility) is a dry waste landfill. No food, domestic or household garbage, hazardous wastes or liquids can be disposed at this site. The Francis Cooke Facility has increased their waste diversion efforts. Materials that can be reused or recycled are separated from the waste stream at the landfill and either shipped off-site for recycling or further modified to produce a useful product or material (i.e. wood mulch). The facility currently diverts the following types of materials: • appliances, scrap metal, auto wrecks • concrete, asphalt, drywall/gypsum board • kiln dried wood • scrub and brush • yard, leaf and garden clippings • cardboard • tires In 2006 and 2007 the facility received more than 27,000 tonnes of "traditional" waste materials and diverted and recycled 62 % and 53.8% of these materials in 2006 and 2007 respectively (BVWMC, 2008b). It is important to note however that this is a regional facility so it includes materials not just from Canmore, but also from Banff and the M.D. of Bighorn.
Accountabilities	The Bow Valley Waste Management Commission is responsible for operation of the Francis Cooke facility.
Performance Measures	Total amount of materials diverted at Francis Cooke facility (tonnes/yr) Percentage of materials diverted at Francis Cooke
Future Priorities & Actions	The BVWMC has set a diversion goal of 80% by weight annually for 2010. Much of this is expected to come from construction waste.

Supporting Documents & Linkages	

Action or Program	**RC-E7 Household Hazardous Waste Program – Toxic Round Up & Paint Exchange**
Action Type	**Existing**
Applies To	**Residential sector**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery. Consider the entire life cycle of activities related to resource use and waste management to ensure that little or no harm is done to the environment (air, land, water, ecosystems).
Description & Progress	Regular Toxic Round Ups help reduce the amount of toxic and/or hazardous household wastes that might otherwise be improperly disposed of, such as in a landfill where there is a risk of the toxic compounds entering the environment Currently four Toxic Round Ups are held annually: 2 in Town of Canmore, 1 in MD of Bighorn, 1 in Town of Banff. The following types of products are currently accepted paint, electronics (TV's, computers), expired bear spray, pesticides, herbicides, cleaners, aerosols, poisons, flammables. A paint exchange is part of the Toxic Round Up. Total HHW collected was 36,543 litres in 2008, up significantly from 27,672 litres in 2007 and 28,311 litres in 2006.
Accountabilities	Manager of Public Works Supervisor of Solid Waste Services
Performance Measures	No. of toxic round-ups held annually Amount of household hazardous wastes collected annually (litres or tonnes/yr)
Future Priorities & Actions	BVWMC is investigating need for year round facility for storage and management of household hazardous wastes.
Supporting Documents & Linkages	

Action or Program	**RC-E8 Leaf & Yard Waste Drop Off Program**
Action Type	**Existing**
Applies To	**Residential Sector**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery.
Description & Progress	Providing a collection option for leaf and lawn wastes prevents these wastes from being comingled with the normal residential waste stream and land-filled. A large 10 m3 container is located at the Boulder Recycling Depot from April until November for collection of leaves, grass, hedge clippings and garden waste only. Woody material, lumber and tree stumps are not acceptable. Once full, the roll-off container is transferred to the Bow Valley Waste's regional landfill site for composting. In 2008, the Town collected and diverted 93 tonnes of yard waste from landfill, up from 81 Tonnes in 2007.
Accountabilities	Manager of Public Works Supervisor of Solid Waste Services
Performance Measures	Amount of materials diverted (tonnes/yr)
Future Priorities & Actions	
Supporting Documents & Linkages	

Action or Program	**RC-E9 Scrub and Brush Drop Off Program**
Action Type	**Existing**
Applies To	**Residential Sector**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery.
Description & Progress	Providing a collection option for scrub and brush waste prevents these wastes from being comingled with the normal residential waste stream and land-filled. A large 10 m3 container is located at the Boulder Recycling Depot from April until November for collection of branches, twigs and logs. The material is transferred to the Francis Cooke facility where the material is chipped and distributed as mulch. In 2008, the Town collected and diverted 75 tonnes of this waste material from landfill, up from 64 tonnes in 2006.
Accountabilities	Manager of Public Works Supervisor of Solid Waste Services
Performance Measures	Amount of materials diverted (tonnes/yr)
Future Priorities & Actions	
Supporting Documents & Linkages	

Action or Program	**RC-E10 Green Procurement Policy**
Action Type	**Existing**
Applies To	**Town of Canmore**
Strategy	Reduce the community's use of resources by encouraging responsible consumption behaviours and improving the resource efficiency of products and services used by and within the community. Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery. Consider the entire life cycle of activities related to resource use and waste management to ensure that little or no harm is done to the environment (air, land, water, ecosystems).
Description & Progress	The Green Procurement Policy was developed and implemented in 2007. Use of a green procurement policy ensures that sustainability considerations such as resource efficiency and waste generation & disposal implications are taken into account when purchasing products and services
Accountabilities	All Managers and Supervisors
Performance Measures	
Future Priorities & Actions	This document is full of excellent data to inform purchasing decisions, however is cumbersome to use and is quickly outdated. The Town could consider other options to ensure more effective purchasing controls (i.e. purchasing officer) The Town does a good job bulk purchasing items critical to each of the Service Areas (Finance – Office Supplies with Bow Valley Basics); however enhancements in communication could achieve greater compliance and improved economic and environmental returns.
Supporting Documents & Linkages	Green Procurement Policy

Action or Program	**RC-E11 Commercial Recycling Programs**
Action Type	**Existing**
Applies To	**Residential and ICI Sectors**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery.
Description & Progress	Approximately 75 households, 2 condo developments (400 residential units) and 85 businesses in Canmore pay additional fees to a private contractor for weekly curb-side collection of their recyclable materials. In 2008, the company delivered 52.5 tonnes of recyclable materials to the Boulder Recycle Depot. Cardboard is collected from several commercial businesses that generate a high volume of cardboard via two private hauling companies from Calgary. These haulers transfer cardboard directly to Calgary area recycling facilities. The Canmore Bottle Depot located at 103 Boulder Crescent is a private operation that accepts all beverage containers approved through the Alberta Beverage Container Recycling Corporation. In 2007, the CBD diverted a total of 1227 tonnes of recyclable beverage containers including 1094 Tonnes of glass. These programs maximize the recovery of materials that can be reused and reduce the amount of materials that ultimately become waste and are disposed of in a landfill.
Accountabilities	Private businesses within the ICI sector are responsible for the operation of these programs
Performance Measures	Amount of materials recycled (tonnes/yr)
Future Priorities & Actions	Evaluate potential to increase/maximize number of waste streams collected at downtown businesses
Supporting Documents & Linkages	

Action or Program	**RC-E12 Towards Zero Waste Events**
Action Type	**Existing**
Applies To	**Residential Sector, ICI Sector, Town of Canmore**
Strategy	Reduce the community's use of resources by encouraging responsible consumption behaviours and improving the resource efficiency of products and services used by and within the community. Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery.
Description & Progress	Several community special events have made efforts to significantly reduce the amount of wastes generated by their events by reducing or eliminating the use of single use disposable bottle, plates, cutlery, etc. and providing on-site waste sorting to encourage recycling of materials. The Canmore Folk Music Festival and CAUSE Canada's Rocky Mountain Half Marathon are two examples of such events. By minimizing the amount of wastes generated during an event and providing on-site separation of wastes to facilitate maximum recycling of wastes that are generated, the amount of wastes created by special events can be significantly reduced.
Accountabilities	Event organizers within the residential and ICI sectors and the Town of Canmore
Performance Measures	Number of Towards Zero Waste events held annually % of special events that are Towards Zero Waste events Total amount of materials diverted from landfill
Future Priorities & Actions	Expand the number of events that are zero waste events Consider developing guidelines or a policy that outlines zero waste requirements for community events requiring a Town permit
Supporting Documents & Linkages	

Recommended Actions

Action or Program	**RC-R1 Management of Organic Wastes**
Action Type	**Recommended**
Applies To	**Residential & ICI Sectors**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery. Consider the entire life cycle of activities related to resource use and waste management to ensure that little or no harm is done to the environment (air, land, water, ecosystems).
Recommended Action	The Town should continue to actively explore options for development and implementation of a program to manage organic wastes including but not limited to food wastes from the residential and ICI sectors and bio-solids from the WWTP. The potential role of garburators in the management of organic wastes should be explored. The evaluation should include a consideration of lifecycle impacts on wastewater treatment and bio-solids management.
Rationale	Food wastes and other compostable organic materials currently comprise a significant portion of the materials currently sent to landfill (approximately 30 % of the waste stream). In addition, bio-solids from the WWTP are currently sent to Bowden for composting although this will cease to be an option in 2010 and alternative locations for this material will need to be identified. Approximately 3,000 – 5,000 tonnes of organics and bio-solids are being trucked for offsite disposal or treatment annually. In addition to the expense associated with hauling this material to distance landfill or treatment locations, greenhouse gas emissions are generated through the transportation of this material to distant sites and decomposition of the material once it has been disposed of in the landfill. A technical report on regional organics composting was presented to Council in the spring of 2004. Council adopted the report as information and endorsed moving forward with the key recommendation of developing separate “east” and “west” infrastructure for organics management. Bow Valley Waste proceeded with a pilot organic composting program in the Town of Banff in 2006. The feedstock for this pilot will include food waste organics from the Banff Springs Hotel as well as municipal bio-solids from the Town of Banff. Results from the

	pilot program will assist the Town of Canmore in determining the program most suitable for composting its bio-solids and municipal organic waste.
Expected Impact	Currently spent $440,000 hauling bio-solids to Bowden
Resource Requirements	
Potential Barriers to Implementation	Have been unable to locate a site for a composting facility within Town boundaries. The WWTP site was identified as a suitable site but concerns about odours created resistance to a composting operation at this location. Efforts to site a regional composting facility at the Francis Cooke facility and other sites have also been unsuccessful.
Accountabilities	Deputy Chief Administrative Officer Bow Valley Waste Management Commission Manger of Public Works EPCOR
Performance Measures	Total MSW waste generation for residential and ICI sectors (tonnes)

Action or Program	**RC-R2 Enhanced Recycling Program**
Action Type	**Recommended**
Applies To	**Residential Sector**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery.
Recommended Action	The Town move ahead with implementation of an Enhanced Recycling Program. The current proposal is based on locating large three-stream blue boxes adjacent to the existing brown residential waste collection containers. The blue boxes will be divided into three streams – mixed containers (plastics and metals), mixed fibres (cardboard, paper, box board) and glass. A pilot program is planned for one neighbourhood (Eagle Terrace) in 2010 to evaluate potential effectiveness.
Rationale	Providing more convenient recycling options will increase the rate of recycling that occurs. There was limited support for moving ahead with a curb-side recycling program. Initiation of an Enhanced Recycling Program (ERP) feasibility study and implementation plan was completed in 2007. The recommendation from the consultant was to expand the program to include a curb-side recycling program. Council requested the consultant to further investigate scenario two: siting a dual stream recycling container at each waste container location. The manufacturer of the Town's waste containers is working on a potential design for a tri-stream (fibres, metal/plastic, and glass) recycle container to increase our collection capabilities.
Expected Impact	668 tonnes/year expected to be added to the recycling stream
Resource Requirements	
Potential Barriers to Implementation	Costs of implementing Enhanced Recycling Program cost of purchase and installation of blue boxes capital and operating costs of collection Current Materials Recycling Facility not equipped to handle the materials from the Enhanced Recycling Program. Can't move ahead until MRF modified or replaced.

	Level of community participation uncertain.
Accountabilities	Manager of Public Works
Performance Measures	Total volume of materials recycled (tonnes)

Action or Program	**RC-E3 Upgraded/Expanded Materials Recycling Facility**
Action Type	**Recommended**
Applies To	**Residential Sector, ICI Sector, Town of Canmore**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery.
Recommended Action	Expand/ upgrade or construct a new Materials Recycling Facility to increase the ability of the facility to handle additional materials and waste streams
Rationale	The current MRF has limitations with respect to the volume and types of material streams that can be handled. Expansion/upgrading or construction of a new MRF is required to support implementation of an expanded/enhanced recycling program.
Expected Impact	Ability to develop and implement Enhanced Recycling Program Ability to collect waste and recycling from downtown businesses
Resource Requirements	
Potential Barriers to Implementation	Siting of a new MRF has been problematic. Cost will also be an issue. May no longer have access to some of the grant funding initially planned. Looking at building on current depot site once Enhanced recycling Facility built.
Accountabilities	Deputy CAO Manager of Public Works
Performance Measures	

Action or Program	**RC-R4 New Waste Transfer Station**
Action Type	**Recommended**
Applies To	**Residential Sector, ICI Sector, Town of Canmore**
Strategy	Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery. Consider the entire life cycle of activities related to resource use and waste management to ensure that little or no harm is done to the environment (air, land, water, ecosystems).
Recommended Action	Site and construct a new waste transfer station
Rationale	The new waste transfer station will not directly increase the diversion rate but would allow existing transfer operations to be relocated, freeing up the space at the existing location that could be used for an expanded Materials Recycling Facility.
Expected Impact	Can move ahead with new/expanded Materials Recycling Facility
Resource Requirements	
Potential Barriers to Implementation	Siting of the proposed new waste transfer station has been problematic.
Accountabilities	Deputy CAO Bow Valley Waste Management Commission Manager Public Works
Performance Measures	

Action or Program	**RC-R5 Towards Zero Waste Policy**
Action Type	**Recommended**
Applies To	**Town of Canmore Operations**
Strategy	Reduce the Town's use of resources by encouraging responsible consumption behaviours and improving the resource efficiency of products and services used. Maximize resource recovery and minimize the amount of waste requiring land fill disposal by encouraging and providing programs for resource reuse, recycling and recovery. Consider the entire life cycle of activities related to resource use and waste management to ensure that little or no harm is done to the environment (air, land, water, ecosystems).
Recommended Action	The Town should develop a Towards Zero Waste policy that outlines requirements for the minimization of wastes produced from Town offices and operations.
Rationale	Minimizing the amount of wastes from Town operations will contribute to reducing the amount of waste from the community that needs to be land filled and will serve as an example to other organizations within the Town.
Expected Impact	
Resource Requirements	
Potential Barriers to Implementation	
Accountabilities	Manger of Public Works Deputy CAO CAO
Performance Measures	

Actions for Future Consideration

The following is a list of potential initiatives that could be considered for future implementation after the higher priority recommendations have been implemented. In most cases additional work is required to evaluate the feasibility and benefits associated with implementation of the initiatives identified for future consideration.

Waste Minimization

- Research/promote purchase of products that are supported by extended producer responsibility initiatives where the supplier agrees to take back the product for re-use or recycling at the end of its useful life

- Establish higher fees for waste that contains recyclable materials (already done to some extent at Francis Cooke)

- Limit the types of materials that can enter the waste stream (e.g. landfill bans)

- Create incentives to separate materials for recycling or composting

- Identify additional funding sources available for waste reduction programs

- Create a forum for sharing of waste reduction strategies

Responsible Consumption

- Establish product-sharing mechanisms to encourage the sharing of products that are only used occasionally (e.g. lawn mowers)

- Develop/promote web-based sites or other mechanisms that promote reuse, such as “free-cycle”

- Provide information kits to residents and businesses on ways to consume in a more sustainable way

- Encourage/support changes to packaging standards that limit product-associated waste

Assist in the development of markets that use waste as a resource.

- Explore/develop opportunities to create “energy from waste” as technologies become available and proven

- Develop/promote opportunities for waste generated from construction activities to be utilized by individuals or other businesses (already done at Francis Cooke)

- Encourage communities to establish recycling days to trade unwanted goods

- Identify/encourage opportunities for industries to utilize by-products (waste) from other industries in their businesses (e.g. waste heat could be used to heat greenhouses that increase local food production)

Support businesses, institutions and other organizations that minimize the amounts of waste generated in their operations.

- Encourage local businesses and organizations to establish green procurement policies to reduce their amounts and types of waste

- Encourage retailers and suppliers to reduce packaging.

- Encourage/promote products that have longer life spans.

Develop education and awareness programs on the importance of reducing waste.

- Develop a comprehensive communication strategy to help citizens understand the impacts of the waste they produce and the alternate choices available

Collaborative Relationships and Regional Partnerships

- Collaborate with other municipalities, organizations and agencies as necessary to effectively and efficiently manage solid waste

- Explore opportunities for waste-related regional partnerships to take advantage of economies of scale.

Performance Measurement & Reporting

Performance Indicators

The following performance indicators will be calculated and reported annually:

Total Solid Waste Generation

- total amount of solid waste generated by the community (tonnes)
- solid waste generation per capita (tonnes/person)

Waste Generation by Sector

- the total amount of solid waste generated by the residential sector (tonnes)
- the amount of wet solid waste generated by the residential sector (tonnes)
- the amount of dry solid waste generated by the residential sector (tonnes)
- the total amount of solid waste generated by the ICI sector (tonnes)
- the amount of wet solid waste generated by the ICI sector (tonnes)
- the amount of dry solid waste generated by the ICI sector (tonnes)
- the total amount of solid waste generated by the Town of Canmore (tonnes)
- the amount of wet solid waste generated by the Town of Canmore (tonnes)
- the amount of dry solid waste generated by the Town of Canmore (tonnes)

Waste Diversion

- the total amount of materials diverted from landfill (tonnes)
- the amount of materials diverted through Town of Canmore recycling and special waste management programs (tonnes)
- the amount and relative percentage of materials recycled through Town of Canmore recycling and special waste management programs (tonnes, %)
- the amount of materials diverted through private sector recycling programs (to the extent known (tonnes)
- the amount of materials diverted through activities at the Francis Cooke Regional Landfill and Materials Recovery Centre (tonnes)
- the diversion rate for the overall waste stream (as a % of total wastes generated)
- the diversion rates for each of the residential sector, ICI sector and Town of Canmore (as a % of wastes generated)

Land-Filled Wastes

- the total amount of solid wastes land-filled by the community (tonnes)
- amount of solid waste land filled per capita (tonnes/person)
- the amount of waste land-filled by the residential sector (tonnes)
- the amount of waste land filled by the ICI sector (tonnes)
- the amount of waste land filled by the Town of Canmore (tonnes)
- total amount of wet wastes land filled (tonnes)
- total amount of dry wastes land filled (tonnes)

Where per-capita performance indicators are specified, they should be calculated using both the total population (permanent and non-permanent population) and the permanent population only as each method has advantages and limitations.

Data Sources

The BVWMC provides an annual report to the Town of Canmore that provides the following information related to waste delivered to the Francis Cooke Regional Landfill and Resource Recovery Centre:

- the total amount of dry wastes delivered to the facility broken down by sector (in tonnes)
- the total amount of dry wastes diverted with a break down by waste type (in tonnes)
- the total amount of dry wastes that are land-filled (in tonnes).

Waste Management Inc, BFI and other private contractors servicing the ICI sector in Canmore are required to provide annual reports to the Town of Canmore summarizing the total amount of waste (in tonnes) transferred from the ICI sector to landfills in Calgary or elsewhere.

Data on the amount and types of materials recycled through program operated by the Town of Canmore is collected by the Town of Canmore Solid Waste Services.

Data on bottle recycling is provided by the Bottle Depot.

Reporting

A report will be prepared annually that presents the performance indicators calculated for the resource conservation and waste management program for the previous year and summarizes progress towards the goals established for resource conservation and waste management program.

The Town of Canmore's Solid Waste Services Department currently produces an annual report that describes waste management activities for the previous year as well as progress on SWAP related initiatives. This report provides a significant level of detail and already includes much of the data required to calculate the resource conservation and waste management indicators listed in the above section on Performance Indicators. Future versions of the annual report should be modified to reflect the goals, actions and performance indicators in this action plan.

The annual report is to be completed by March 31st following the calendar year for which the data has been collected and performance indicators calculated.

The annual report will be distributed to:

- The Sustainability Coordinator
- The CAO and Deputy CAO
- Mayor and Council
- The Biosphere Institute of the Bow Valley
- The Environmental Advisory Review Committee

The annual report will be posted on the Town of Canmore's website.

Accountabilities

Town of Canmore

The Chief Administrative Officer (CAO), Deputy Chief Administrative Officer (Deputy CAO) and Mayor and Council are responsible for reviewing and approving the general direction, strategic objectives and goals outlined in the Environmental Sustainability Action Plan and for ensuring that any actions required to achieve the strategic objectives and goals are reviewed and approved prior to implementation. Once specific actions have been approved, there is an ongoing responsibility to ensure that the approved actions are adequately supported and implemented.

The Manager of Public Works is responsible for the regular review and updating of the resource conservation and waste management actions and initiatives outlined in the Environmental Sustainability Action Plan (ESAP). The Manager of Public Works is also responsible for ensuring that any new actions and initiatives required to achieve the strategic objectives and goals in this action plan are reviewed and approved by the CAO, Deputy CAO and Mayor and Council (as appropriate) before implementation.

The Manager of Public Works is responsible for ensuring the completion of the annual Resource Conservation and Waste Management Report by March 31st of each year.

The Supervisor of Solid Waste Services is responsible for collecting and compiling the data required to calculate the performance indicators in the annual Resource Conservation and Waste Management Report.

The Sustainability Coordinator is responsible for coordinating the development and delivery of community education and engagement initiatives related to resource conservation and waste management initiatives, in cooperation with the Manger of Public Works.

Bow Valley Waste Management Commission

The Bow Valley Waste Management Commission (BVWMC) is responsible for providing waste management services to the Bow Valley including operation of the Francis Cooke Class III Landfill and Resource Recovery Centre. In addition, the BVWMC provides leadership and program development in the areas of waste reduction, recycling, composting and waste management including community education and outreach activities.

The BVMWC is responsible providing the Town of Canmore with an annual report that summarizes the volumes of wastes delivered to the Francis Cooke Regional Landfill and Resource Recovery Centre by residents and businesses located within the Town of Canmore and the disposition of those wastes (land-filled or diverted).

Province of Alberta

The Province of Alberta's role is to provide leadership in product stewardship programs as it has with the beverage container board, Alberta used oil management association and the tire recycling management board.

Private Sector

The private sector, including residents, local businesses and institutions and visitors, are expected to participate in the Town of Canmore and BVWMC's resource conservation and waste management initiatives and to take the necessary steps to minimize the amount of wastes they generate and manage those wastes they do generate in a responsible manner that complies with all appropriate municipal guidelines or bylaws.

Water Management

Water Management

Desired Future State

We are striving for a future in which the citizens of Canmore, local businesses and visitors understand and value the importance of water and have adopted a stewardship role, ensuring the protection of the community's water supply and the integrity of the Bow River Basin watershed and associated hydrologic cycle.

Initiatives to conserve water and improve the efficiency and productivity of water use have been widely implemented, allowing the community to significantly reduce its per-capita water consumption. As a result of these initiatives, the community has been able to accommodate additional population and economic growth with only a modest increase in water use. The Town's water treatment and distribution facilities continue to provide a dependable supply of high quality water at reasonable cost to meet the needs of individuals and businesses. Through careful planning and ongoing maintenance and investment, our water supply system is sufficiently secure, flexible and adaptable to respond to changing conditions and circumstances, including the potential effects of climate change.

By minimizing our water use we leave more water in the Bow River to meet the needs of downstream communities and to maintain the health of aquatic ecosystems. Treatment of wastewater to high standards before discharge to the watershed and effective management of storm water ensure that the community's activities do not result in adverse effects to surface water quality and downstream aquatic habitats. Source protection initiatives and watershed-based management approaches and policies are used to guide development and land use decisions within the community to ensure that streams, rivers, lakes and wetlands remain healthy and are capable of supporting thriving populations of fish, wildlife and aquatic invertebrates.

Current Reality

Summary

The Town's water treatment and distribution facilities currently provide a reliable supply of high quality potable water to residents and local businesses. Water quality meets or exceeds the Guidelines for Canadian Drinking Water Quality and relevant provincial requirements. Total annual water diversions are currently about 50 % of the maximum diversions allowed by the Town's existing water licenses under the Alberta Water Act.

The Town successfully implemented a water metering program between 1996 and 1998 which resulted in a significant reduction in water use. In 2004 the Town developed and implemented a formal Water Demand Management Action Plan (WDMAP). Significant progress has been made towards the goals contained in the WDMAP which include:

- Reducing water distribution system losses to 10% or less
- Reducing residential water consumption on a per capita basis by 20%
- Reducing industrial, commercial and institutional (ICI) consumption by 20% based on an average account usage.

The most significant progress has been reducing residential water consumption and water distribution system losses. Per-capita residential water consumption was 21 % lower in 2008 than in 2000 and total residential water consumption in 2008 was 10 % lower than in 2000 despite the significant population growth that occurred in the community during that time period. Unexplained losses from the water distribution system have been reduced by approximately 50 %, from a high of 32 % in 2003 to 15 - 17 % between 2006 and 2008.

Progress towards improving the efficiency of water use within the Industrial, Commercial and Institutional (ICI) sector is more difficult to determine. While the average water consumption per ICI account decreased by approximately 21 % between 2000 and 2008 (thus meeting the goal for the ICI sector contained in the WDMAP) total water consumption for the ICI sector was approximately 40 % higher in 2008 than it was in 2000. It is not clear whether the observed reduction in average per account use reflects a real improvement in the efficiency of water use by the ICI sector or merely a significant increase in the number of smaller ICI accounts during this period. Total water consumption by Town of Canmore owned and operated facilities was 11 % lower in 2008 than in 2000 despite the Town providing service to a much larger population in 2008 than in 2000.

Although water distribution system losses have been reduced significantly, they are still higher than the WDMAP target of 10% and are a significant source of additional operating costs, energy consumption and related greenhouse gas emissions. As a result, achieving additional reductions in distribution system losses should continue to be a priority.

Although significant progress has been made under the WDMAP, the plan is now more than 5 years old and updating of the plan is required to address the following issues:

- The Town appears to have achieved its goals related to per-capita residential and per-account ICI water use several years ahead of schedule. New more aggressive goals are required in these areas.

- Due to the limitations associated with the use of average per account targets for the ICI sector, it is not clear whether real improvements in water conservation and efficiency have been achieved in this sector. A better understanding of water use and new targets are required for the ICI sector.
- The current program is focused on managing water demand and needs to be expanded to address other aspects of water management and sustainability including sanitary/wastewater treatment, storm water management and the health of aquatic ecosystems.
- Many of the potential future water conservation initiatives identified in the WDMAP have not yet been implemented indicating that a review of the status and need for these initiatives is required.

The Town's waste water treatment plant (WWTP) provides a high level of treatment, ensuring that the treated effluent discharged to the Bow River meets the facility's license conditions and has minimal effect on aquatic ecosystems. Recent expansion and upgrading of the WWTP has further reduced phosphorus and nitrogen loadings to the Bow River and will help ensure that the facility is capable of handling future population growth as well as meeting increasingly stringent provincial and federal effluent discharge requirements.

The high groundwater levels that exist in the downtown area can result in significant infiltration of groundwater into the wastewater collection system. Groundwater infiltration into the wastewater system is also a source of significant additional costs, energy consumption and associated greenhouse gas emissions as a result of the additional volumes of wastewater that need to be treated. High groundwater levels and infiltration of groundwater into the wastewater collection system were contributing factors in the emergency situation which occurred in 2007 which necessitated the release of untreated sewage into the Bow River. Due to the cost and environmental implications associated with groundwater infiltration into the wastewater system, identifying and addressing areas of groundwater infiltration should also continue to be a priority for the Town.

Although the community's total current water use is well below the maximum level allowed under the Town's existing water licenses, the Town's access to the full volume of its water licenses is not assured indefinitely. In 2006, the Alberta Government implemented a moratorium on the approval of additional water diversion licenses for the South Saskatchewan Basin, including the Bow River sub-basin. The high level of existing water allocations in the South Saskatchewan basin, combined with the effects of additional population growth and climate change suggest the following potential risks to the sustainability of our water supply and associated ecosystems:

- The potential for reduced water availability in the Bow River sub-basin due to climate change related effects including glacial retreat and reduced precipitation and run-off
- The potential for future restrictions in allowable diversion volumes to accommodate other more senior diversion licenses, including TransAlta and other downstream users
- The potential for future restrictions in allowable diversion volumes to ensure that the minimum in-stream flow needs required to protect the ecological integrity of the Bow River and its tributaries are maintained
- A deterioration of water quality and the health of aquatic ecosystems due to reduced flows, additional development (clearing of soil and vegetation, increase in impervious surfaces), increased contaminant loads from wastewater discharges and storm run-off and increased diversion of water from the river.

Ensuring the sustainability of our water supply, the hydrological cycle and aquatic ecosystems will require more than simply managing water demand. Achieving the community's desired future state will require a comprehensive approach to water management that includes a focus on:

- Water conservation, efficiency and productivity
- Water source protection
- Sustainability of infrastructure
- Wastewater & stormwater management
- Protection of aquatic ecosystems

Population Growth

The following table summarizes Canmore's population growth between 2000 and 2008. The population numbers for 2000, 2006 and 2008 are based on census data for those years. The population estimate for 2007 is an estimate based on the mean populations for 2006 and 2008. An understanding of population growth is important in understanding per-capita water use.

Population	2000 WDMP Baseline Year	2006	2007	2008	Increase from 2000 to 2008
Permanent	10,517	11,599	11,802	12,005	14 %
Non-Permanent	1,955	4,818	5,193	5,567	185 %
Total	**12,472**	**16,417**	**16,995**	**17,572**	41 %

Key observations:

- The non-permanent population has grown significantly since 2000 and now represents approximately one third of Canmore's population
- The high percentage of non-permanent residents suggests that per-capita goals and indicators based only on the permanent population may not provide a complete picture of what is happening in the community

Water Supply, Treatment & Distribution

Canmore draws its drinking water from two sources: from a groundwater aquifer beneath the Town (at Pump House No. 1) and from the Spray Lakes Reservoir via the Rundle Forebay (at Pump House No. 2). Each source supplies approximately half of the total water for the Town.

Water from PH1 (groundwater) is treated via chlorine injection prior to distribution while water from PH2 (Rundle Forebay) is treated through a combination of chemical coagulation using alum, chlorine injection, gravity filtration and UV disinfection. Over 100 kilometres of water distribution pipes ranging in size from 100 mm to 450 mm (4 inches to 10 inches) in diameter distribute the treated potable water to all areas of Town. The Town's water treatment and distribution system is operated in accordance with an approval issued by Alberta Environment under the Environmental Protection and Enhancement Act (Approval No. 484-02-00). This approval was renewed on June 1, 2009 for a ten year period. EPCOR operates the waterworks system on behalf of the Town of Canmore.

The maximum amount of water that the Town can divert and use from each of the above water sources and the conditions under which this use can occur are specified in a series of water diversion licenses issued to the Town by Alberta Environment under the Water Act. The Town currently has four separate water diversion licenses (two related to PH1 and two related to PH2) as summarized in the following table.

Point of Diversion	License No.	Maximum Annual Diversion	License priority
Pump House 1 Groundwater well 5-33-24-10W5M	00031681-00-00	1,194,010 m3/yr (968 acre-feet/yr)	1980-12-05-01
Pump House 1 Groundwater well 5- 33-24-10-W5M	00031682-00-00	926,345 m3/yr (751 acre-feet/yr)	1996-06-21-001
Pump House 2 Rundle Forebay SE 31-24-10W5M	0031001-00-00	1,554, 195 m3/yr (1260 acre-feet/yr)	1982-06-29-001
Pump House 2 Rundle Forebay SE 31-24-10W5M	00031000-00-00	1,390,134 m3/yr (1127 acre-feet/yr)	1996-10-08-001
Total Allowable Diversion		**5,064,684 m3/yr**	

Key observations:

- Each of the water diversion licenses has a different priority date assigned
- The priority of licenses is important as Alberta utilizes a first in time, first in right approach to water allocation. In the event that water shortages occur and water diversions need to be restricted, older licences will have priority over more recent licenses.
- Canmore is located in an area identified as being potentially water short due to relatively dry conditions and the relatively high level of water allocations for this basin compared to the natural supply (Alberta Water Smart, 2009).
- In August 2006, the Government of Alberta approved the South Saskatchewan River Basin Water Management Plan. Due to concerns about over allocation of water resources, the management plan included and the government adopted a recommendation that Alberta Environment no longer accept new water license applications for the Bow, Oldman and South Saskatchewan sub-basins.
- Most recent water licenses (including water license 00031682 issued to the Town of Canmore) are subject to a condition that a specified minimum flow must be maintained in the source river in order to protect the integrity of aquatic habitat. In the event that flows drop below the minimum threshold specified in the license, it may be necessary to restrict or stop further water diversions.
- Although the surface water and groundwater sources currently used by the Town are both quite productive, receding glaciers and potential reductions in snow pack and spring run-off as a result of climate change suggest that these sources may not be capable of supplying as much water in the future as they currently do. As a result, water diversion volumes could be restricted in the future, highlighting the importance of water conservation initiatives and other adaptive measures with respect to climate change.

- There are other water diversion licenses within the Town limits that were formerly used to supply private residences that are now supplied by the Town (i.e. Spring Creek). The possibility of incorporating these volumes into the Town's licenses should be explored.

Water Demand Management Action Plan Goals and Initiatives

In March 2003, Mayor and Council adopted the following goal statements related to water conservation and efficiency based on recommendations from the Town's Environmental Advisory Review Committee:

- Reduce water distribution system losses from 22.4% to 10%
- Reduce residential water consumption on a per capita basis by 20%
- Reduce industrial, commercial and institutional (ICI) consumption by 20% based on an average account usage

The goals were to be achieved by 2012 using year 2000 as the baseline year.

In 2004, the Town completed a Water Demand Management Action Plan (WDMAP) to serve as a road map for achieving the above water conservation and efficiency goals (Town of Canmore, 2004). The WDMAP included a description of current and possible future initiatives to achieve each of the above water conservation and efficiency goals.

A summary of the current initiatives identified in the WDMAP and their status is provided in the following table.

Current Initiatives	**Status**
Water Distribution System	
Water metering program	A water metering program has been in place for the residential and ICI sectors since 1996-1998.
Water meter calibration program	Water meters are calibrated for largest water users only. There is a need to implement a replacement program for older meters (I.e. > 10 years old).
Electronic leak detection surveys	Conducted biannually or in response to large leak events to identify areas of significant water loss.
Leak repair program	Water main breaks and leaks are fixed as they are found or occur. This initiative includes the replacement of ductile iron pipe which is prone to deterioration and leakage. Areas in which capital projects will be completed are also evaluated in advance of project completion to determine if repairs to deep infrastructure are required at the same time.
Replacement and phase out program for water bleeder valves	The use of system bleeders has been eliminated although residential bleeders are still used.

Water loss audits	Water loss audits are completed annually for the water distribution system by comparing the difference between total water production, metered sales and estimated non-metered uses. The accuracy of water loss audits may be affected by aging/inaccurate meters and there may be a need to increase the resources devoted to meter calibration and replacement or the replacement of pipe.
Residential Water Consumption	
Residential water metering program	A water metering program has been in place for the residential sector since 1996-1998.
Public Information programs	This is an ongoing initiative. A water efficiency brochure was distributed to all residents in 2003 and regular water conservation and efficiency tips appear in the local papers. Signage has been placed near PH1 and PH2 to make people aware that these areas are sources of the Town's drinking water.
Landscape Efficiency	Historically, information on lawn/landscape watering was provided annually in utility bill but this has not been done recently.
School education	Historically, information on water conservation and presentations were made annually to schools. EPCOR currently provides information to schools but is not active in the schools.
Residential Low Flow Toilet Rebate program	A rebate program for installation/replacement of low and ultra low flow toilets was initiated in 2004. Program funds were exhausted in 2009 and there is currently no budget allocated for the continuation of this program.
ICI Water Consumption	
ICI water metering program	A water metering program has been in place for the ICI sector since 1996-1998 although some buildings only have a single meter for multiple units.
Public information	Although there is some overlap in awareness

	resulting from the residential information program, nothing has been developed or implemented specifically for the ICI sector.
Town of Canmore (Municipal) Water Consumption	
Water metering program	A water metering program has been in place for Town owned and operated facilities since 1996-1998. All parks irrigation systems are metered and water consumption tracked to ensure efficient watering practices are employed.
Fixture replacement program	All fixtures in Town operated facilities have been replaced with low flow fixtures.
Other Initiatives	
Water utility rate evaluation	Ongoing. Rates are evaluated each year as part of planning process.

A summary of the possible future initiatives identified in the WDMAP and their status is provided in the table below.

Possible Future Initiatives	**Status**
Water Distribution System	
ICI meter calibration program • Calibrate meters for all industrial, institutional and commercial water customers supplied with service over one inch.	Not implemented. This program could be conducted over a three year period with continual calibration of the largest meters each year. This is important because inaccurate meters are a possible source of unaccounted water and a source of lost utility revenue since meters usually measure less, not more than the actual volume.
Residential meter calibration program • Conduct a sample survey of residential meters because it is not cost effective to individually test all residential meters.	Not implemented but still planned. As it may not be cost-effective to calibrate all residential meters may need to select a sample for calibration with a focus on older meters to see if they need to be replaced.
System-wide leak detection survey • Schedule routine electronic leak detection program for entire system.	Not implemented and no longer planned. Program would be cost-prohibitive and may not make sense for new sections of system. May move to more risk-based program

	based on age of segment.
Pressure & Flow Monitoring System • Strategically place stations throughout the water distribution system to monitor supply pressures and assist in locating large leaks.	Not implemented
Residential Water Consumption	
Public information • Convey outdoor / indoor water reduction tips and leak detection information via brochures, bill stuffers, advertisements.	Not implemented
School programs • Share wise water use messages through print and AV material, website, school presentations, teacher workshops.	Not implemented
Fixture retrofit kits • Promote retrofit kits that contain faucet aerators and water displacement devices for toilet tanks.	Not implemented and no longer planned
Fixture replacement and rebate program • Promote the use of ULF toilets, water saver showerhead, water efficient washing machines by providing full or partial rebates to customers.	Implemented. The low flush toilet rebate program was expanded to include other types of water efficiency fixtures. The funds for this program were exhausted in 2009 and there are currently no funds budgeted for the continuation of this program.
Landscape efficiency • Provide information, advertising, demonstration sites about wise use of water in the lawn and garden.	Not implemented and no longer planned
Home water audits • Provide resources that allow residents to conduct a home water audit.	Not implemented and no longer planned
Water use by-law • Create a by-law that requires the use of water efficient devices and/or landscaping in new development.	Not implemented and not actively being discussed though Built Green and LEED development go a long way to meeting these goals This is an area of provincial jurisdiction under the Alberta Plumbing Code.
ICI Water Consumption	

ICI consumption study • Analyze consumption by customer class and develop targeted programs	Not implemented. Cannot currently segment ICI data by account type, only by account size.
Public Information • Provide information on indoor/outdoor water conservation through brochures, bill stuffers, etc.	Not implemented
Water audits • Supply resources to complete water audits for large consumers. • Share case studies results with other ICI customers	Not implemented
Fixture replacements and rebates • Promote use of water efficient fixtures by providing full or partial rebates	Not implemented. The ICI sector was not eligible for the rebate program developed for the residential sector.
Landscape efficiency • Provide information, advertising, demonstration sites on wise use of water in lawn and garden	Not implemented
Water reuse and recycling • Provide information & expert advice on replacing once through cooling systems, reuse of process water, etc.	Not implemented
Water use bylaw • Create by-law that requires use of water efficient devices and landscaping	Not implemented. The Town has guideline for sustainable landscaping but is unable to require the use of water efficient fixtures due to the provincial plumbing code.
Town of Canmore (Municipal) Water Consumption	
Water audits • Conduct audits at Town owned or operated facilities	Not implemented
Landscape efficiency • Use wise water use planning in the design and maintenance of civic green areas	Have successfully trialed not using any irrigation on entrance way features.
Other Initiatives	
Rate structure review • Evaluate the current rate structure to determine its effectiveness for achieving the required	Not completed

objectives	
Comprehensive Water Conservation Plan • Develop and implement a strategic and comprehensive water conservation plan	Not completed

A summary of progress towards the WDMAP goals is provided in annual reports prepared by the Town of Canmore Public Works Department (Town of Canmore, 2006; Town of Canmore, 2007; Town of Canmore, 2008) and the biannual Community Monitoring Report prepared for the Town of Canmore by the Biosphere Institute of the Bow Valley (Biosphere Institute, 2009) . Although not all of the initiatives identified in WDMAP have been implemented to date, good progress has been made towards all of the water conservation and efficiency goals established in 2003.

Residential Consumption

In 2008, per-capita residential water consumption was approximately 21 % lower than during the 2001 baseline year, achieving the targeted reduction approximately 4 years ahead of schedule.

ICI Consumption

In 2008, water consumption by the ICI sector on a per account basis was approximately 21 % lower than during the 2000 baseline year, achieving the targeted reduction approximately 4 years ahead of schedule.

Distribution System Losses

Between 2006 and 2008, distribution system losses were estimated to be in the range of 12 % to 17 %, down from an estimated loss of 27 % during the 2000 baseline year and losses of more than 30 % during 2002 and 2003.

Total Water Production

The table below summarizes the total volume of water produced for selected years.

	2000 WDMP Baseline Year	**2006**	**2007**	**2008**
PH1 Water Production (m3)	NA	1,046,096	1,087,760	1,034,966
PH2 Water Production (m3)	NA	1,497,526	1,498,255	1,461,413
Total Water Production (m3)	**2,326,895**	**2,543,622**	**2,586,015**	**2,496,379**
Change Relative to 2000		**+ 9 %**	**+ 11 %**	**+ 7 %**
% of Allowable		**50.2 %**	**51.1 %**	**49.3 %**

License Diversion				
Total Water Production per capita – permanent population (litres/person/day)	606	600	600	570
Total Water Production per capita – total population (litres/person/day)	511	424	417	389

Key Observations:

- Total water production was relatively constant between 2006 and 2008 at approximately 2.5 to 2. 6 million cubic meters per year
- Total water production in 2008 was approximately 7 % higher than in 2000
- PH1 accounted for approximately 41- 42 % of the water produced between 2006 and 2008 while PH2 accounted for approximately 58 - 59 % of the total water produced during this period
- The total volume of water produced in each of the years between 2006 and 2008 represented approximately 50 % of the total annual water diversion allowed under the Town's water diversion licenses from Alberta Environment
- The total amount of water produced per capita in 2008 was almost the same as the per-capita amount produced in 2000 if only the permanent population is considered
- The total amount of water produced per capita in 2008 was approximately 20 % lower than the per-capita amount produced in 2000 if the total population is considered
- The Town of Canmore started supplying water to Harvie Heights in 2007. Currently water is supplied only for commercial purposes and the volumes are relatively small (up to 30,000 m3/yr).

It is difficult to compare water consumption numbers for Canmore to those calculated for other communities due to our large non-permanent population and significant visitor numbers. Also, there is a significant difference between Canmore's total metered consumption and total water production numbers and it is not clear what the basis of comparison should be. The AUMA's CEP document indicates that average total demand for 8 of 10 largest municipalities was 411 litres/person/day (2006) and for all 147 municipalities providing data was 488 litres/person/day (2004). These numbers are similar to the above numbers for Canmore.

Total Metered Water Consumption

Canmore successfully implemented a water metering program in 1996 – 1998. The following table summarizes the total metered water consumption for the baseline year and 2006-2008.

Total Metered Water Consumption	2000 WDMP Baseline Year	2006	2007	2008	% of 2008 Consumption
Residential Water	1,010,989	952,901	932,599	909,499	**51 %**

Consumption (m3)					
ICI Water Consumption (m3)	605,596	832,218	870,199	839,527	**47 %**
Town of Canmore Water Consumption (m3)	43,811	62,682	46,225	39,063	**2 %**
Total Metered Water Consumption (m3)	**1,660,396**	**1,847,801**	**1,849,023**	**1,788,089**	
Change relative to 2000		**+ 11%**	**+ 11 %**	**+ 8 %**	
Metered Consumption as a Percentage of Total Water Production	**71 %**	**73 %**	**72 %**	**72 %**	
Per-capita consumption (metered) - permanent population (litres/person/day)	432	436	429	408	
Change Relative to 2000		**+ 1 %**	**- 1 %**	**- 6 %**	
Per-capita consumption (metered) - total population (litres/person/day)	365	308	298	279	
Change Relative to 2000		**- 16 %**	**- 18 %**	**-24 %**	

Key Observations:

- Total metered water consumption was approximately 8 % higher in 2008 than 2000
- Residential and ICI water consumption each account for close to half of the total metered water consumption (51 % and 47 % respectively)
- The percentage of water production accounted for as metered consumption has remained relatively constant at between 73 % and 71 % of total water production
- The 27-28 % of water production that was not metered between 2006 and 2008 included unmetered uses (hydrant flushing, ice rink flooding, etc, estimated losses from known leaks and unexplained distribution system losses.

Residential Water Consumption

The table below summarizes total and per-capita residential water use for the 2000 baseline year and three years from 2006 to 2008.

Residential Water Consumption	**2000 WDMP Baseline Year**	**2006**	**2007**	**2008**
Total Residential Water Consumption (m3)	1,010,989	952,901	932,599	909,499
Change Relative to 2000		**-5.7 %**	**- 7.8 %**	**-10.0 %**
Per capita residential water	263	225	216	208

consumption – permanent population (litres/person/day)				
Change Relative to 2000		**-14 %**	**-18 %**	**-21 %**
Per capita residential water consumption – total population (litres/person/day)	222	159	150	142
Change Relative to 2000		**-28 %**	**-32 %**	**-36 %**

Key Observations:

- The total volume of water used by the residential sector decreased by 10 % between 2000 and 2008 even though the total population of the community grew by 41 % and the permanent population grew by 14 % during this same period
- Per-capita residential water use was 21 % lower in 2008 than in 2000 based on the permanent population and 36 % lower if the total population is considered, exceeding the 20 % reduction goal established for 2012 in the Water Demand Management Plan
- It is too early to tell if the per-capita residential consumption rates observed for 2008 can be sustained or reduced further in subsequent years

Comparison of per-capita residential water consumption data for Canmore with consumption data for other Alberta and Canadian communities is not straight forward as a result of Canmore's large non-permanent population and inconsistencies that may arise in the basis of comparison. For example, within the Town of Canmore some residential consumption in multi-family units may be included within the ICI sector consumption data rather than the residential sector. A recent AUMA document provides the following potential comparisons:

- Average Canadian residential water use is 343 litres per day , for the USA 382 litres/day, for Sweden 200 litres/day and for France = 200 litres/day
- The average residential demand for the 8 or 10 largest municipalities = 232 litres/person/day (2006)
- Average residential demand for 147 municipalities = 271 litres/person/day (2004)

ICI Water Consumption

The following table summarizes ICI water consumption for the 2000 baseline year and recent years of interest.

Industrial, Commercial and Institutional (ICI) Water Consumption	**2000 WDMP Baseline Year**	**2006**	**2007**	**2008**
Total ICI Water Consumption (m3)	605,596	832,218	870,199	839,527
Change Relative to 2000		**+ 37 %**	**+ 44 %**	**+ 39 %**
Number of Accounts	203	307	339	356
Per account ICI water consumption (litres/account/day)	8,173	7,427	7,033	6,461
Change Relative to 2000		**- 9 %**	**- 14 %**	**- 21 %**

Key Observations

- Total water consumption by the ICI sector was been increasing since 2000 and was approximately 40 % higher in 2008 than it was in 2000
- Between 2000 and 2008 the number of ICI accounts increased by approximately 75 %
- On a per account basis, average water consumption for the ICI sector was 21 % lower in 2008 than 2000, exceeding the goal established for 2012 under the Water Demand Management Plan.
- Although there has been a significant reduction in per account water consumption for the ICI sector, targets related to average per account use may not be very meaningful as the addition of a significant number of smaller accounts will itself result in a decrease in average per account use
- Tracking of water consumption for individual accounts over time would provide a more meaningful measure of changes in the efficiency of water use.

Town of Canmore Water Consumption

The Town of Canmore's metered water consumption is summarized in the following table.

Town of Canmore Facility and Parks Water Consumption	**2000 WDMP Baseline Year**	**2006**	**2007**	**2008**
Total Town of Canmore Water Consumption (m3)	43,811	62,682	46,225	39,063
Change Relative to 2000		**+ 43 %**	**+ 6 %**	**- 11 %**
Number of Accounts	20	35	38	40
Per account ICI water consumption (litres/account/day)	6,002	4,906	3,333	2,676
Change Relative to 2000		**- 18 %**	**- 44 %**	**- 55 %**

Key Observations

- The total volume of water used by Town of Canmore owned/operated facilities and parks was 11 % lower in 2008 than in 2000
- On a per account basis, water used for Town owned/operated facilities and parks was 55 % lower in 2008 than 2000, exceeding the goal established for 2012 under the Water Demand Management Plan. It is important to note however that the number of accounts doubled during this same period and if the size of these accounts was lower, this would account for most of the observed per account reduction.
- Water consumption was significantly higher in 2006 than either the baseline year or 2007 and 2008. This may be the result of the Town taking over significant new areas of green space from Three Sisters or unusually dry conditions or a combination of the two factors.
- The Town stopped irrigating parks in 2007 which may account for the significant decrease in water use observed between 2006 and 2007.

Distribution System Losses

The following table summarizes the estimated losses from the water distribution for the 2000 baseline year and the years 2006-2008. Water losses are estimated annually through a water loss audit which compares the total volume of water produced to metered water sales and other known water uses such as fire-fighting, hydrant flushing and water main breaks to develop an estimate of the volume of water unaccounted for.

Distribution System Losses	**2000 WDMP Baseline Year**	**2006[1]**	**2007[2]**	**2008**
Estimated Loss (% of water produced)	28 %	15 %	17 %	17 %
Change Relative to 2000		**-45 %**	**- 37 %**	**-37 %**

[1,2] The distribution system loss values for 2006 and 2007 are taken from the 2008 Public Works Annual Report and differ slightly from the values presented in the 2006 and 2007 Public Works Annual Reports due to a change in the methodology used for the estimation prior to the 2008 report.

Key Observations:

- Historically, water losses from the water distribution system have been in the range of 25 – 30 %, reaching a record high of 32 % in 2003
- Canmore's geology poses a major challenge in locating water leaks as the water lost from leaking pipes quickly disappears into the granular soils, rather than surfacing where it can be easily discovered
- While it is inevitable that some water is lost through leaks, there are several other sources of losses including; theft of water through illegal connections, malfunctioning controls and inaccuracies in meter readings.
- The water conservation goal adopted by Mayor and Council and reflected in WDMAP of reducing distribution system losses to no more than 10 % is consistent with the industry standard recommended by the American Water Works Association (AWWA).
- The implementation of leak detection and repair programs and water loss audits has reduced distribution system losses by approximately 37 – 45 % since the baseline year but losses still remain above the 10 % target
- The estimated distribution system losses have been relatively consistent over the three years from 2006 to 2008
- Although a consistent methodology has been utilized to estimate distribution losses from year to year, the estimates are subject to significant uncertainties
- It is not clear how closely the methodology currently used to estimate the distribution system losses approximates the results that would be obtained using the approach/software developed by the AWWA and recommended by the Alberta Urban Municipalities Association (AUMA).

Wastewater Collection and Treatment Facilities

The Town's wastewater collection network consists of approximately 92 kilometres of gravity and pressure sewer pipes ranging in size from 200 mm (4 inches) to 600 mm (12 inches). The sanitary sewer system is divided into 11 catchment areas. Each catchment area has a lift station that receives sewage

from the gravity pipes. The lift stations are used to pump sewage through force mains (pressure pipes), either directly to the Waste Water Treatment Plant (WWTP) or into another catchment area.

The WWTP was commissioned in 1997 and is a level III tertiary treatment plant with a capacity of 22 million litres per day (approximately 8 million m3/year). In 2000 the Town entered a public-private partnership with EPCOR, who has operated the plant since then. The treatment process includes screening of solids and clarification for primary treatment followed by biological aerated filtration for secondary and tertiary treatment. The treated waste water then passes through a UV disinfection unit prior to being discharging to the Bow River. The WWTP is currently undergoing a $ 10 million multi-year expansion and upgrade to ensure that wastewater is treated to a high standard prior to discharge to the Bow River and that the WWTP has adequate capacity to meet the needs of the community at full build out.

The Town's WWTP operates in accordance with an approval issued by Alberta Environment under the Alberta Environmental Protection and Enhancement Act (Approval No. 483-03-00). The approval for the WWTP was renewed on June 1, 2009 for a ten year period. EPCOR operates the WWTP on behalf of the Town of Canmore.

Wastewater Treatment and Discharge

Wastewater collection and treatment processes are closely monitored to ensure compliance with license conditions and other provincial and federal requirements. As the treated effluent from Canmore's WWTP is discharged into the Bow River it is important to ensure that it is reliably treated to the highest standards to maintain the health of the river and water quality for downstream users and aquatic life.

The following table summarizes the volume of wastewater generated by the community.

WWTP Influent & Effluent	**2000**	**2006**	**2007**	**2008**
Total Annual Influent to WWTP (m3/yr)	1,919,700	2,376,593	2,715,366	2,843,803
Average Daily Influent to WWTP (m3/day)	5,260	6,504	7,430	7,764
Change relative to 2000				
Percent of WWTP Design Capacity	**24%**	**30 %**	**34 %**	**35 %**
Per-capita wastewater production – permanent population only (litres/person/day)	500	561	630	646
Per-capita wastewater production – total population (litres/person/day)	422	396	437	442

Key Observations:

- The total volume of wastewater treated at the WWTP has been increasing and was higher in 2008 than 2000
- Per-capita wastewater also increased between 2006 and 2008
- Between 2006 and 2008 the WWTP operated at approximately one third of its maximum design capacity of 22 million litres/day (8 million m3/yr).

The following table summarizes the volume and characteristics of the treated wastewater discharged to the Bow River.

WWTP Influent & Effluent	**2000**	**2006**	**2007**	**2008**	**AENV Approval Limit**
Total Annual Effluent Discharged (m3)	n/a	2,495,679	3,407,664	3,105,058	
Average Total P concentration in effluent (kg/m3)	0.0007	0.0007	0.0006	0.0005	< 1.0
Annual Total P Loading (kg)	**n/a**	**1,747**	**2,045**	**1,553**	
Average Total Ammonia N in effluent (kg/m3)	0.0021	0.0015	0.0006	0.0006	< 10 (Oct – June) < 5 (July – Sept)
Annual Total Ammonia N loading (kg)	**n/a**	**3,744**	**2,045**	**1,863**	
Average Biological Oxygen Demand (BOD) of effluent	10.3	7.5	5.0	4.8	< 20
Fecal Coliforms in effluent (MPN/100 ml)	105	48	28	23	< 200

Key Observations:

- The average concentrations of total phosphorus, total ammonia nitrogen and fecal coliforms and the Biological Oxygen Demand (BOD) of the treated wastewater discharged to the Bow River all decreased (improved) between 2006 and 2008
- The average concentrations of total phosphorus, total ammonia nitrogen and fecal coliforms and the BOD of the treated wastewater were all well below the maximum levels permitted by the operating approval for the WWTP from 2006 to 2008
- Total phosphorus and total ammonia nitrogen loadings to the Bow River decreased between 2006 and 2008
- The WWTP upgrade includes an assessment of the plant and future upgrades to further reduce phosphorus and nitrogen output into the river. The WWTP will be subject to new (Bow River specific) wastewater guidelines from Alberta Environment.

- When water levels rise in the spring, there is groundwater inflow and infiltration into the sewers, causing the WWTP to treat a higher volume than would otherwise be needed. In 2007 and 2008 the total volume of effluent discharged from the water treatment plant exceeded the total volume of water produced (diverted) by 821,000 m3 and 609,000 m3/yr respectively, suggesting high levels of groundwater infiltration.
- Budget funds were allocated for a two year period to address groundwater infiltration hotspots and some but not all of the known leaks were repaired as part of this program. There are currently no funds allocated to the detection and repair of additional groundwater infiltration hotspots.
- In 2007 the Town declared a state of local emergency due to high groundwater levels causing sewage backups which necessitated the release of untreated sewage into the Bow River

Stormwater Management

The Town of Canmore has approximately 35 km of storm sewers. Most of these are located in the newer subdivisions on the east side of the Trans Canada Highway and west side of the river. Due to the very flat terrain on the valley floor, the older sections of Town do not have storm sewers. In these areas, storm water is collected via drywells which allow the storm runoff to percolate down into the ground and ultimately reach the water table. A number of these drywells are located within the Town's groundwater protection zone, resulting in a potential risk to the quality of groundwater resources.

During storm events and spring run-off, moving water can transport and introduce significant quantities of sediment and other contaminants (i.e. oil, grease and antifreeze from roadways, recently applied pesticides from lawns, salt from roadway or sidewalk de-icing, etc) to surface water bodies or groundwater. The Town of Canmore has a Stormwater Master Plan and oil-grit separators are required on all discharges for new developments. These remove certain pollutants (such as oil and grit) from the storm water before they enter water courses. Recent projects on Three Sisters Drive and at 900 Larch have incorporated swales to increase infiltration and nutrient uptake from stormwater. Older developments all have catchment basins to improve surface water quality.

The Town of Canmore's Snow Removal Policy requires that sand/salt mixtures consist of a maximum of 10% salt by volume in order to reduce the potential for run-off to adversely affect surface water and groundwater quality.

Aquatic Ecosystems

Maintaining the biodiversity and ecological integrity of the Bow Valley ecosystem, including aquatic ecosystems, is a priority identified in the 2006 Mining the Future document. Local aquatic ecosystems have been heavily affected by human activities including fishing, the introduction of non-native species, the construction of hydroelectric facilities and the discharge of wastewater facility effluent and storm water run-off (Biosphere Institute, 2009).

There are two long term monitoring stations that currently provide information on the quality of water in the Bow River in the vicinity of Canmore: an Environment Canada monitoring station at the Banff Park Gate (Harvie Heights) and an Alberta Environment station at Cochrane. Although the upstream site provides good information on water quality flowing into Canmore, there is a very long reach of river

downstream of Canmore to the station at Cochrane and therefore it is hard to isolate the influence of Canmore on downstream water quality (Biosphere Institute, 2009).

A 2004 riparian health assessment rated the riparian areas downstream of Canmore as generally healthy, but with problems due to non-native plant species (Alberta Riparian Habitat Management Program, 2004). The report concluded that the water withdrawals that occur in this reach are minimal and have had no significant impact on overall riparian health.

In 2005, the Bow River Basin Council (BRBC) released a revised report on the state of the Bow River Basin (BRBC, 2005). The report provides an excellent overview of the status and issues along the entire length of the Bow River. Overall, the water quality from Banff through to downstream of Canmore has been rated "excellent" and has not been adversely affected to a significant extent by any major sources of contaminants. While overall water quality is rated as excellent, during precipitation events and snowmelt runoff, the water quality can be of reduced quality due to contaminants entering water bodies via diffuse runoff (Alberta Environment, 2007).

In 2008, the BRBC released Phase One (Water Quality) of the Bow Basin Watershed Management Plan. The plan proposes a series of monitoring and other actions to be implemented between 2008 and 2014 to create a better understanding of both water quality and aquatic ecosystem health for the Bow River including the reach that flows through Canmore (BRBC, 2008). The report notes that at certain times there are insufficient flows to meet all the demands of the river, particularly for lower reaches of the Bow River – resulting in degradation of aquatic and riparian habitat (BRBC, 2008). Climate change and glacial retreat are expected to add further uncertainty to the quantity of flows (BRBC, 2008). As the quantity of flow affects dilution and the assimilative capacity of the river, effects on water quality may also occur. On May 20, 2008, the Town of Canmore's Mayor and Council unanimously passed a motion to support Phase 1 of the Bow Basin Watershed Management Plan. A member of Council is appointed to act as the Town's representative and attends BRBC meetings. The Manager of Public Works and representatives from EPCOR also attend BRBC meetings.

In 2009, the Yellowstone to Yukon (Y2Y) Conservation Initiative issued a report examining aquatic ecology issues in the upper Bow River watershed with a focus on factors affecting the health of native bull and westslope cutthroat trout populations (Blank & Clevenger, 2009). The report identifies existing information, ecological issues, knowledge gaps, research needs and recommended mitigation measures for the Bow River from its headwaters at Bow Lake to the Kananaskis Dam (Biosphere Institute, 2009).

The Y2Y report indicates that once abundant native bull and westslope cutthroat trout have all but vanished from much of the Bow River and its tributaries and are now limited to headwater feeder streams and alpine lakes. The introduction of non-native fish species, the development and operation of hydroelectric facilities on the Bow River and its tributaries and the development of transportation infrastructure are identified as the most significant factors affecting native fish populations in the Bow River and its tributaries. Angling pressure and alterations in water quality due to the discharge of wastewater effluent and storm run-off are also identified as potential issues of concern.

Several non-native trout species now inhabit the Bow River watershed including brown trout, brook trout, rainbow trout (the species for which the Bow River is famous as a fly fishery), Yellowstone cutthroat trout, lake trout (native to some parts and non-native to others) and several hybrid species (Blank & Clevenger, 2009). These non-native species out-compete native species and can result in hybridization of the native population. Development of hydroelectric dams on the Bow River and its

tributaries has created barriers to the movement of fish and has changed the thermal and sediment regime of these water bodies. Operation of the dams also causes water levels and flows in the river to fluctuate dramatically as the dams hold back and then release water for power generation. Rail and road culverts prevent fish and other water-dwelling animals from moving into tributaries to spawn and feed.

Bull trout are ranked as a Species of Special Concern in the Province of Alberta. Species of Special Concern are species that without human intervention may soon become threatened with extinction. At the federal level, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) has not yet evaluated the status of bull trout (Blank and Clevenger, 2009). The westslope cutthroat trout is listed as Threatened in the Province of Alberta (SRD, 2009) and by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC, 2006). The Province is currently developing a Species at Risk Recovery Plan Recovery Plan for the westslope cutthroat trout.

Upgrades to wastewater treatment facilities in the Bow Valley, most notably those at Banff and Canmore have reduced the levels of nutrients in the treated wastewater discharged to the Bow River and this is helping to return the river to more natural conditions. Previously, nutrient-rich discharge had resulted in unnaturally high biomass (including fish) in the ecosystem. Ongoing monitoring of the Bow River is being done by Alberta Environment to study the effects of this nutrient reduction. Alberta Environment reports that there has been public concern about reduced fish growth rates resulting from improved wastewater treatment at Banff and Canmore (Alberta Environment, 2007).

Spring Creek Developments has dug over-wintering holes in Policeman Creek to help all fish survive over winter (Brown trout and Mountain whitefish)(Biosphere Institute, 2009). Most adults spawn and then leave, but most young stay in the creeks for 2 to 3 years. The Spring Creek plan involves re-vegetating with native vegetation, minimizing trail impacts along riparian areas and minimizing the amount of development that occurs within a 6 metre buffer zone from the creek bed. These actions are expected to improve the overall health of these creeks.

Other Town initiatives to raise community awareness regarding the importance of watershed protection include the placing of signage within the wellhead protection area and along the Bow River loop (in partnership with EPCOR) and programs to encourage people to pick up after their dogs.

Goals & Targets

Context

The Government of Alberta's Water for Life management strategy includes the following major objectives:

- Safe, secure drinking water supply
- Healthy aquatic ecosystems
- Reliable, quality water supplies for a sustainable economy

As part of the Water for Life strategy, the Government of Alberta established a general program goal of increasing the efficiency of water use by 30 % from 2005 levels by 2015.

At its November 2009 convention, the Alberta Urban Municipality Association (AUMA) adopted a resolution encouraging its members to develop Water Conservation, Efficiency and Productivity (CEP) Plans. The recommended contents of the CEP plans are outlined in guidance documents prepared by AUMA and are aligned with the Water for Life water management strategy and the Alberta Water Council's Recommendations for Water Conservation, Efficiency and Productivity Sector Planning (Alberta Water Council, 2008). The Town of Canmore is a member of the AUMA and has endorsed the program to develop CEP plans.

The guidance documents for the AUMA CEP plans include the following short term targets:

1. By 2010, all AUMA member municipalities with water systems in place will report water use data through Alberta Environment's electronic Water Use Reporting System (WURS)

2. By Dec 31, 2011, AUMA member municipalities will develop Conservation, Efficiency and Productivity Plans according to the following participation rates:
    - 100% of municipalities with populations greater than 10,000
    - 75% of municipalities with populations between 2500 and 10,000
    - 50% of municipalities with populations under 2500

3. By Dec 31, 2011, AUMA member municipalities will estimate their Infrastructure Leakage Index (ILI) and identify ways to reduce leaks according to the following participation rates:
    - 100% of municipalities with populations greater than 10,000
    - 75% of municipalities with populations between 2500 and 10,000
    - 50% of municipalities with populations under 2500

4. By Dec 2011, AUMA member municipalities will implement incentives and/or disincentives of their own choosing to increase the uptake of water efficient fixtures and technologies. Different programs may apply to new and existing developments. Participation rates will be:
    - 100% of municipalities with populations greater than 10,000
    - 75% of municipalities with populations between 2500 and 10,000
    - 50% of municipalities with populations under 2500.

The Town of Canmore has already made significant progress on several of the initiatives recommended by AUMA in the CEP plan guidance documents. Also, the draft CEP plan documents included a targeted

30 % improvement in overall water efficiency and productivity from 2005 levels by 2015 consistent with the general program goal for the Water for Life strategy.

The following desired outcomes are identified in the BRBC's Phase One (Water Quality) Bow Basin Watershed Management Plan (BRBC, 2008):

- Surface water quality meets requirements of the aquatic ecosystem and human uses
- Riparian and wetlands systems are intact, restored, healthy and valued
- Rivers and streams are free of —nuisance growth of aquatic vegetation
- Human influences are mitigated where these influences could negatively affect aquatic ecosystems
- Aquatic and riparian ecosystems are protected during all flow periods but particularly during critical high and low flow periods
- Source waters throughout the Bow River basin are protected for all uses
- The public understands and values the Bow River basin for its ecological, economic, cultural and spiritual values

The establishment of water management targets and performance indicators and comparison of performance indicators for Canmore to those of other communities and regions is complicated by the following factors:

- Canmore has a significant and growing non-permanent population which is unique compared to most other communities and makes the interpretation of per-capita numbers challenging
- Canmore also receives a significant number of day time and overnight visits (tourists) which are not reflected in the population estimates used for calculating per-capita performance indicators
- When comparing data between communities it is often not clear if the basis of comparison is the same (for instance is total water production or metered sales being used to calculate per-capita consumption)
- Targets are often established using different baseline years
- Not all residential water consumption may be captured in the metered sales associated with residential (small) meters – some multi-family units are captured as part of the ICI sector
- There is currently a limited understanding of ICI water consumption use and current data systems are not able to provide the detailed information required to provide a more in-depth understanding of ICI water consumption patterns.

As a result of the above issues, a combination of absolute and per-capita targets and performance indicators are preferred and must be interpreted with some caution as each method has its advantages and limitations.

Planning Horizon

Short term goals are those that are to be achieved within 5 years (by 2015)
Medium term goals are those that are to be achieved within 10 years (by 2020)
Long term goals are those that are to be achieved within 25 years (by 2035)

Approach to Water Conservation and Efficiency Targets

The main components of the water balance for the Town are as follows:

Total Water Production (Total Consumption) = Total Metered Sales + Estimate of Unmetered Uses + Estimate of Distribution System Losses

The distribution system losses are estimated as the difference between total water production and the sum of the metered sales and estimated unmetered uses. Unmetered uses include water that is associated with fire-fighting, hydrant flushing and water main breaks.

Total metered sales include metered sales to the residential sector, ICI sector and Town of Canmore buildings and facilities. In 2008 the residential sector and ICI sector accounted for 51 % and 47 % of metered sales respectively, while Town of Canmore buildings and facilities only accounted for 2 % of metered sales.

Total metered sales accounted for 72 % of the total amount of water produced in 2008 while unmetered water uses and distribution system losses together accounted for 28 % of total water use.

Total Water Consumption

By 2015

Reduce total annual per-capita water production by:

- 30 % from 2000 levels (uses existing baseline)

Alternative targets could include reducing total include:

- 30 % from 2005 levels (the general program goal suggested under Alberta's Water for Life program)
- 30 % from 2006 levels (the general goal recommended by AUMA)

The recommended target represents an additional 8 % reduction in per capita water production from 2008 levels. Although this target is less aggressive than the AENV and AUMA goals it recognizes previous efficiency gains the Town has made which may make it more difficult for the community to achieve the AENV or AUMA targets. The AUMA goal would require an additional 23 % reduction from 2008 levels.

It is worth noting that the Town's total water production in 2008 was approximately 2,496,379 m3 which is equivalent to a total per-capita water production (consumption) of 389 litres/person/day or 142 m3/person/year based on the total population. The per-capita consumption in 2008 was 24 % lower than in 2000 and 8 % lower than in 2006. If there were no further increases in efficiency and the total population increased to 30,000 by 2035, total water production would need to be approximately 4,261,972 m3/yr. This is equivalent to 84 % of the maximum diversion allowed under the Town's existing water licenses

By 2020

Reduce annual per-capita water production (consumption) by

- 40 % from 2000 levels

If this target is achieved, in 2020 per-capita consumption would be 307 litres/person/day - a 21 % reduction from 2008 levels.

By 2035

Reduce annual per-capita water production (consumption) by

- 50 % from 2000 levels

If this target is achieved, this would have the effect of reducing total per-capita water consumption from 511 litres/person/day in 2000 to 256 litres/person/day in 2035 – a reduction of 34 % from 2008 levels. Total water consumption for the community in 2035 would be approximately 2,655,375 m3/yr – only slightly higher than the total production in 2008 and equivalent to 52 % of the maximum allowable diversion under the town's existing licenses.

Residential Water Consumption

Total residential water consumption was 10 % lower in 2008 than 2000 and average per-capita residential use was 21 % or 36 % lower in 2008 than 2000 depending upon whether the permanent or total population is used to calculate per-capita use.

By 2015

Reduce per-capita residential water consumption by

- 30 % from 2000 levels (uses existing baseline)

If the total population is used as the basis of the calculation, the first target has already been achieved. If the only the permanent population is used a further reduction of 11 % from 2008 levels is required.

By 2020

Reduce per-capita residential water consumption by

- 40 % from 2000 levels (uses existing baseline)

By 2035

Reduce per-capita residential water consumption by

- 50 % from 2000 levels (uses existing baseline)

A 50 % reduction in per-capita residential water consumption from 2000 levels would reduce per-capita consumption from 222 litres/person/day to 111 litres/person/day – a 22 % reduction from 2008 levels.

ICI Water Consumption

Total water consumption by the ICI sector was approximately 40 % higher in 2008 than in 2000, roughing paralleling the increase in the community's total population. In contrast, total water consumption for the residential sector and Town of Canmore buildings and facilities decreased by 10 % and 11 % respectively between 2000 and 2008 despite the increase in population.

As previously discussed, the use of average per-account targets for the ICI sector is not a useful approach unless the number/type of accounts is held constant over time. However without more detailed (account specific) information it is not possible to create more meaningful per-account performance indicators. One option is to wait until more detailed information is available before establishing performance indicators and performance targets for the ICI sector. The other is to use absolute targets (as suggested below) although the use of absolute targets may have limitations during periods of significant economic growth.

By 2015

Reduce total annual ICI water consumption by

- 10 % from 2008 levels

By 2020

Reduce total annual ICI water consumption by

- 20 % from 2008 levels

By 2035

Reduce total annual ICI water consumption by

- 30 % from 2008 levels

An alternative and less stringent target would be to maintain total ICI water consumption constant at 2008 levels. This would have the effect of requiring all growth within the ICI sector to occur without increasing water consumption levels.

Town of Canmore (Corporate) Consumption

By 2015

- Reduce water losses from the water distribution system to 10 % or less
- Reduce groundwater infiltration into the wastewater collection system by 20%

The first goal is a restatement of the current WDMAP goal which has not yet been achieved

The second goal, aimed at reducing groundwater infiltration into the wastewater treatment is a potentially important goal but could be difficult to accurately measure.

By 2020

- Maintain water losses from the water distribution system at 10 % or less
- Reduce groundwater infiltration into the wastewater collection system by 50 % or limit it to a maximum of xx

By 2035

- Maintain water losses from the water distribution system at 10 % or less
- Reduce groundwater infiltration into the wastewater collection system by 80 % or limit it to a maximum of xx

As the Town of Canmore buildings and facilities only account for a small percentage of water use and have already seen water efficiency retrofits, it is not clear how much room there is for additional improvements. Consequently no targets have been proposed as it may be more important to focus on other areas where larger gains are possible such as distribution system losses and groundwater infiltration.

Wastewater Discharge

Although no specific targets related to wastewater quality have been proposed as part of this version of the ESAP, further improvements in the quality of wastewater discharge are possible as part of future facility upgrades. Specific targets should be developed in conjunction with the development of the Environmental Performance Plan required by the wastewater treatment plant's recently amended operating approval from Alberta Environment.

Possible targets related to wastewater discharge include:

- Targets related to the maximum annual concentration of phosphorus, ammonia nitrogen, fecal coliforms, BOD, TSS in the effluent discharged
- Targets related to the maximum total annual loading of phosphorus or ammonia nitrogen to the Bow River

Aquatic Health

Targets related to aquatic ecosystem health should be developed in the future. Potential targets to be considered include:

- Rates of flow in the Bow River remain above minimum in-stream flow needs or Conservation Objectives established to protect integrity of aquatic ecosystems

- Effective impervious areas are reduced equal to or below xx % to restore natural hydrograph and become less susceptible to flooding.

- Watershed health — as measured by loss of wetlands, water quality, non-compliance with pollution standards, in-stream flow and groundwater levels — improves.

All of the above targets would likely be difficult or costly to measure. The best approach for the establishment and monitoring of performance indicators and targets related to the health of aquatic ecosystems will likely be ongoing participation in the work being completed by the Bow River Basin Council.

Strategies

General Strategies

In order to achieve the community's desired future state, the following strategies will be employed:

1. Minimize the community's consumption of water through the implementation of water conservation, efficiency and productivity initiatives
2. Protect the quality of the community's water supply and the integrity of the hydrologic cycle
3. Maintain and enhance water and wastewater infrastructure
4. Protect and enhance the health of aquatic ecosystems

Strategies for the Town of Canmore (Corporate) Operations

- Improve the efficiency of the water treatment and distribution system by reducing water distribution system losses
- Improve the efficiency of the wastewater treatment system by reducing groundwater infiltration into the wastewater system
- Minimize water consumption by Town owned and operated facilities
- Ongoing investment in maintenance and upgrading of water treatment and distribution systems to ensure a reliable supply of high quality potable water
- Ongoing investment in maintenance and upgrading of the wastewater collection and treatment system to ensure that a high level of treatment is achieved and adverse effects on surface water quality and aquatic habitats are minimized
- Effective management of surface and storm water run-off to ensure that run-off does not result in adverse effects to the health of aquatic ecosystems
- Use engineering and community design practices to improve water conservation and the ecological integrity of the built environment
- Identify and secure sources of external (non municipal tax) funding to support water conservation, efficiency and productivity projects and initiatives
- Collaborate with adjoining municipalities, the Province and other groups (such as the Bow River Basin Council) to protect upstream and downstream surface water quality and to conserve water.

Priorities for the Town of Canmore (Corporate) Operations

The following actions should be considered as priorities for Town of Canmore (corporate) operations:

1. Expand and refine the content of the Water Management section of the ESAP to provide a comprehensive water conservation, efficiency and productivity plan (CEP Plan) that meets the objectives and content requirements recommended by AUMA.
2. Continue efforts to reduce water distribution system losses. Consider completing a simple cost-benefit analysis to assess the adequacy of current annual resources devoted to this issue.

3. Continue efforts to reduce groundwater infiltration into the wastewater collection and treatment system. Consider completing a simple cost-benefit analysis to assess the adequacy of the current resources devoted to this issue.
4. Complete a formal risk analysis to identify potential risks to the water treatment and distribution system to meet Alberta Environment approval conditions for the waterworks system.
5. Develop and implement an Environmental Performance Plan (EPP) for the wastewater system to meet Alberta Environment approval conditions for the wastewater system.

Strategies for the Community

- Increase community awareness and commitment to initiatives to improve watershed protection and water conservation, efficiency and productivity
- Increase awareness and commitment of the ICI sector to initiatives to improve water conservation, efficiency and productivity
- Develop and implement programs or initiatives to minimize water consumption by the residential sector
- In cooperation with the ICI sector, develop and implement programs or initiatives to minimize water consumption by the ICI sector
- Use economic and financial tools (rate structure, full cost accounting) to encourage water conservation and efficiency
- Use best management practices to improve watershed protection and water conservation

Priorities for the Community

The following actions should be considered as priorities for the community:

1. Develop a community education and engagement strategy to increase the community's commitment to and participation in water conservation, efficiency and productivity initiatives.
2. Review the former Water Conservation Rebate Program to determine if this program should be continued and funded in the future.
3. Review and revise existing water metering/billing/data systems for the ICI sector in order to provide more useful information on water consumption patterns within the ICI sector.
4. Complete a review of ICI water consumption patterns and ICI initiated water conservation, efficiency and productivity initiatives to develop a better understanding of current ICI water use and potential opportunities for conservation and efficiency improvements.
5. Work with the ICI sector to develop and implement programs and initiatives to improve water conservation and the efficiency and productivity of water use.

Priority 1 will be developed as part of the Community Education and Engagement component of the Environmental Sustainability Action Plan.

Existing Actions

Action or Program	**WM- E1 Water Metering Program**
Action Type	**Existing**
Applies To	**Residential sector, ICI sector and Town of Canmore owned and operated facilities**
Strategy	Minimize the community's consumption of water through the implementation of water conservation, efficiency and productivity initiatives
Description & Progress	Water meters were introduced into all homes and businesses between 1996 and 1998. The introduction of water metering resulted in a significant decrease in water consumption. Some multi-unit complexes currently only have a single meter for multiple users. Water meter calibration is currently only performed for large commercial water users. There is a potential that metering inaccuracies are contributing to unexplained water losses for the water distribution system.
Accountabilities	Manager of Public Works EPCOR
Performance Measures	Total annual metered water sales (m3/yr) Average annual per-capita metered water sales (litres/person/day) Total annual residential water consumption (m3/yr) Per-capita residential water consumption (litres/person/day) Total annual ICI water consumption (m3/yr) Total annual Town of Canmore water consumption (m3/yr)
Future Priorities & Actions	The meter calibration program may need to be expanded and formalized. Issues to be considered include: • Assess need to expand scope of meter calibration program to cover all meters over 1 inch in size. • Assess need for and scope of potential meter calibration program for the residential sector, possibly based on selecting a sample of meters for calibration. • Assess need to develop and implement a meter replacement program for older water meters.
Supporting Documents & Linkages	

Action or Program	**WM-E2 Leak Detection & Repair Program – Water Distribution System**
Action Type	**Existing**
Applies To	**Town owned and/or operated water distribution system**
Strategy	Minimize the community's consumption of water through the implementation of water conservation, efficiency and productivity initiatives Maintain and enhance water and wastewater infrastructure
Description & Progress	All water distribution systems are subject to some leakage and unexplained losses. The highly permeable ground in the Canmore area creates unique challenges for locating distribution system leaks as the leaking water does not always come to the surface where the location of the leakage can be identified. In addition, the distribution system includes more than 20 km of old ductile iron pipe which is prone to leakage. The Town has conducted water loss audits annually since 2000 to estimate losses from the water distribution system. Distribution system losses reached a high of 32 % in 2003 but have since been reduced to 15 – 17 % for the years 2006 to 2008. Since 2006, the Town of Canmore has provided annual funding for crews from EPCOR to complete a semi-annual leak detection and repair program. Acoustic equipment is used to check for underground leaks and water losses and leaks are repaired as they occur or are located. The leak detection program is a targeted, rather than system-wide, program that focuses on areas of suspected water loss. Areas in which capital projects are scheduled to occur are also evaluated ahead of project implementation to determine if repairs to deep infrastructure may be required at the same time. The Town has a $1,000,000/yr program for deep utility repair. Under the Water Conservation, Efficiency and Productivity (CEP) plans being promoted by AUMA, all urban municipalities with a population of more than 10,000 are to estimate their Infrastructure Leakage Index (ILI) and identify ways to reduce leaks by Dec 31, 2011.
Accountabilities	Manager of Public Works EPCOR
Performance Measures	% unexplained water loss based on water balance
Future Priorities & Actions	Confirm that methodology used to estimate water distribution system

	losses is consistent with methodology development AWWA and endorsed by AUMA (Infrastructure Leakage Index) Calculate and report Infrastructure Leakage Index and report as required by AUMA CEP plans annually A simple cost/benefit analysis should be conducted to assess whether the level of resources being devoted to this program are appropriate
Supporting Documents & Linkages	

Action or Program	**WM-E3 Groundwater Infiltration Detection & Repair Program – Wastewater System**
Action Type	**Existing**
Applies To	**Town owned and/or operated wastewater collection system**
Strategy	Minimize the community's consumption of water through the implementation of water conservation, efficiency and productivity initiatives Maintain and enhance water and wastewater infrastructure
Description & Progress	Due to the high groundwater levels that occur in some areas of Town (i.e. downtown core) groundwater can infiltrate into the wastewater collection system, significantly increasing the amount of wastewater requiring treatment. This results in increased operating costs, energy consumption and associated greenhouse gas emissions. High groundwater levels and infiltration of groundwater into the wastewater collection system was responsible for the emergency conditions which occurred in 2007 and that necessitated the release of untreated sewage into the Bow River. The Town has implemented a 5 year program ($100,000/yr) to locate and repair groundwater infiltration hotspots. This program Identifies and repairs sources of significant groundwater inflow into the wastewater treatment system to reduce the amount of groundwater entering the wastewater treatment plant. Although some hotspots were identified and repaired during the first two years of this program, there were not funds available for this program for 2010. The Town also has a $1,000,000/yr program for deep utility repair.
Accountabilities	Manager of Public Works EPCOR
Performance Measures	To be developed – may be able to provide an estimate by using difference between total water production and volume of effluent discharged from WWTP.
Future Priorities & Actions	A simple cost/benefit analysis should be conducted to assess whether the level of resources being devoted to this program are appropriate

Supporting Documents & Linkages	

Action or Program	**WM-E4 Water Fixture Retrofit Program**
Action Type	**Existing /Complete**
Applies To	**Town owned and operated building and facilities**
Strategy	Minimize the community's consumption of water through the implementation of water conservation, efficiency and productivity initiatives
Description & Progress	The Town has implemented a program that replaces existing fixtures in Town owned or operated facilities with new more efficient water fixtures. This improves the efficiency of water use and reduces wastewater volumes. To date the Town has installed 114 low flow fixtures (such as dual flush toilets, low flow showerheads, and low flow faucets) in its facilities to reduce water use.
Accountabilities	Manager of Public Works Manager Recreation and Facilities
Performance Measures	# of fixtures installed Per-account water use Total annual water use for Town owned/operated facilities
Future Priorities & Actions	
Supporting Documents & Linkages	

Action or Program	**WM-E5 Wastewater Treatment Plant Upgrade/Expansion Program**
Action Type	**Existing**
Applies To	**Town owned/EPCOR operated Wastewater treatment plant**
Strategy	Maintain and enhance water and wastewater infrastructure Protect and enhance the health of aquatic ecosystems
Description & Progress	The wastewater treatment plant has been undergoing a multi-year upgrading and expansion program including: ○ replacement of influent grit screens for improved solids removal ○ construction of a flow equalization tank and future septage receiving station to reduce risk of overflow and shocks to the plant biology from over-strength sewage ○ construction of 2 new Biological Aeration Filter cells and BAF filtration recirculation system ○ solids characterization ○ upgraded process water line ○ additional influent pumping capacity. These upgrades have resulted in an improvement in operating and treatment performance and will help ensure the facility is able to meet new more stringent discharge criteria and meet the demands of population growth.
Accountabilities	Manager of Public Works EPCOR
Performance Measures	Average annual phosphorus concentration in effluent Average annual ammonia nitrogen concentration in effluent Average annual fecal coliform concentration in effluent Average annual Biological Oxygen Demand (BOD) of effluent Average annual total suspended solids (TSS) in effluent
Future Priorities & Actions	
Supporting Documents & Linkages	

Action or Program	**WM-E6 Environmental Performance Plan - Wastewater System**
Action Type	**Existing**
Applies To	**Waste Water System owned by Town, operated by EPCOR**
Strategy	Maintain and enhance water and wastewater infrastructure Protect and enhance the health of aquatic ecosystems
Description & Progress	An Environmental Performance Plan (EPP) is being developed to satisfy the requirements of the recently amended AEPEA operating approval for the Town's waste water system. The EPP must be submitted to the Director by June 1, 2010 for approval and be implemented by September 1, 2010. Thereafter, an updated EPP must be submitted to the Director by February 28 of each year. Completion and implementation of the of the EPP will ensure that wastewater from Canmore's wastewater system is treated in accordance with best practical technology and that effluent discharged to the Bow River will have minimal effect on downstream water quality.
Accountabilities	Manager of Public Works EPCOR
Performance Measures	To Be Determined – further reductions in phosphorus and ammonia levels in effluent are expected to result from development and implementation of the EPP
Future Priorities & Actions	
Supporting Documents & Linkages	Environmental Enhancement & Protection Act Approval No. 483-03-00 Environmental Protection Plan

Action or Program	**EM-E7 Water Conservation Rebate Program**
Action Type	**Existing /Complete**
Applies To	**Residential sector**
Strategy	Minimize the community's consumption of water through the implementation of water conservation, efficiency and productivity initiatives
Description & Progress	The Water Conservation Rebate Program was launched in 2004 and provides financial incentives for the adoption and/or retrofitting of fixtures that will improve the efficiency of water use and minimize wastewater volumes. The program offers $5-$75 rebates for the installation of water saving fixtures and toilets. In 2007, 181 low flow replacement toilets were installed and in 2008 a total of 202 were installed. Between 2004 and 2008 the program had reimbursed a total of $48,080. Funding for this program was exhausted in 2009 and currently no funds have been budgeted to continue this program in 2010 or beyond.
Accountabilities	Manager of Public Works Sustainability Coordinator Deputy CAO Finance – Utility billing
Performance Measures	# of fixtures installed/rebates issues Dollar value of rebates issued Per-capita residential water use Total average annual residential water use
Future Priorities & Actions	A cost-benefit analysis should be completed to determine if future funding of this program is warranted.
Supporting Documents & Linkages	

Action or Program	**WM-E8 Source Water Protection Program**
Action Type	**Existing**
Applies To	**Town of Canmore**
Strategy	Protect the quality of the community's water supply and the integrity of the hydrologic cycle
Description & Progress	The Town has a Source Water Protection Overview report developed by EPCOR in 2003. The goal of source water protection is to understand and mitigate potential risks to source water supplies through a watershed and aquifer approach. The report provides recommendations for protecting the community's water sources. Recommendations include development of: • a source water technical advisory committee • a long term well production and piezometer water quality and quantity monitoring program • storm water management plan • Guidelines for industry's operating located within the Town's wellhead protection area; and • Public awareness programs. **Wellhead Protection Area** The Land Use Bylaw currently identifies a Wellhead Protection Area that is protected through the guidelines contained in the Land Use Bylaw. **Flood Risk Areas Development Constraints** Development within the areas identified as Flood Risk Areas (Floodways and Floodway Fringe areas) are restricted through regulations in the Land Use Bylaw.
Accountabilities	Manager of Public Works EPCOR Sustainability Coordinator
Performance Measures	
Future Priorities & Actions	Implement initiatives identified in the Source Water Protection Overview report that have not yet been implemented such as revisions to wellhead protection plan, public awareness programs and

	monitoring. The current Wellhead Protection Zone regulations should be reviewed by the Town to consider broader groundwater protection issues in the community. This should be on a larger scale than the Wellhead Protection Zone and consider protection on a comprehensive watershed basis.
Supporting Documents & Linkages	Source Water Protection Overview Report, 2003.

Action or Program	**WM-E9 Storm Water Management Program**
Action Type	**Existing**
Applies To	**Town owned and operated storm sewer system**
Strategy	Protect and enhance the health of aquatic ecosystems Mimic nature and reduce contribution to downstream flooding
Description & Progress	The Town of Canmore has approximately 35 km of storm sewers. Most of these are located in the newer subdivisions on the east side of the Trans Canada Highway and west side of the river. Due to the very flat terrain on the valley floor, the older sections of Town do not have storm sewers. In these areas, storm water is collected via drywells which allow the storm runoff to percolate down into the ground and ultimately reach the water table. The Town of Canmore has guidelines for storm water management. Oil and grit separators are required on all discharge for new developments. These take certain pollutants out before they can enter the water courses. Older developments all have catchment basins to improve surface water quality. The Town of Canmore's Snow Removal Policy requires that sand/salt mixtures consist of a maximum of 10% salt by volume in order to reduce the potential for run-off to adversely affect surface water and groundwater quality. In recent years there has been a move to deal with storm water management locally through the use of swales and other design features.
Accountabilities	Manager of Engineering Manager of Public Works
Performance Measures	None at this time
Future Priorities & Actions	Reduce potential sources of contaminants (oil/grease, antifreeze, salt, pesticides, other)
Supporting Documents & Linkages	

Action or Program	**WM-E10 Conservation, Efficiency and Productivity (CEP) Plan**
Action Type	**Existing**
Applies To	**Residential sector, ICI sector, Town of Canmore buildings and facilities**
Strategy	Minimize the community's consumption of water through the implementation of water conservation, efficiency and productivity initiatives
Description and Progress	The Town of Canmore is a member of AUMA and has endorsed the development of CEP plans by AUMA members. The essential ingredients for a CEP plan are: • a water use profile which describes current water use patterns, • a goal for future water use, • an evaluation of the CEP opportunities, with special emphasis on the priorities of the AUMA plan (leak detection, efforts to increase the uptake of water efficient fixtures and technologies and water use reporting), • a rationale for why each CEP opportunity will or will not be acted upon, • an action plan detailing when various CEP initiatives will be done, with special emphasis on the priorities, and • an outline of what monitoring and evaluation activities will be done and when. Development and implementation of this (Water Management) section of the ESAP is intended to serve as the Town of Canmore's Conservation, Efficiency and Productivity Plan to satisfy AUMA's requirements.
Accountabilities	Manager of Public Works Sustainability Coordinator
Performance Measures	Total per-capita water use Total annual residential water use Per-capita residential water use Total ICI water use Water distribution system losses (%)
Future Priorities and Actions	
Supporting Documents and Linkages	

Recommended Actions

Action or Program	**WM–R1 Water Consumption Study for ICI Sector**
Action Type	**Recommended**
Applies To	**ICI Sector**
Strategy	Minimize the community's consumption of water through the implementation of water conservation, efficiency and productivity initiatives
Recommended Action	Complete an analysis of water consumption data for the ICI sector to develop a better understanding of water consumption patterns within this sector and to identify opportunities for water conservation and efficiency improvements.
Rationale	While total water consumption for the residential sector and Town of Canmore buildings and facilities decreased between 2000 and 2008 despite an increase in population, water consumption by the ICI sector increased by 40 % during this same period. It is not currently possible to sort water consumption data for the ICI sector by type of account making it difficult to identify consumption patterns and make meaningful comparisons of water consumption data within account types. A better understanding of ICI water consumption is needed to identify and target conservation efforts for this sector. A review of ICI consumption data and modification of reporting capabilities will allow significant water users to be identified and for comparisons of water use between accounts within a sector to identify potential efficiency opportunities.
Expected Impact	Improvements in water conservation and efficiency of water use within the ICI sector
Resource Requirements	Staff time
Potential Barriers to Implementation	Staff resources Availability of data sets
Accountabilities	Manager of Public Works
Performance Measures	Total annual ICI water consumption Per- account ICI water use

Action or Program	**WM- R2 Risk Assessment for Waterworks System**
Action Type	**Recommended**
Applies To	**Waterworks system owned by Town of Canmore, operated by EPCOR**
Strategy	Protect the quality of the community's water supply and the integrity of the hydrologic cycle Maintain and enhance water and wastewater infrastructure
Recommended Action	Complete a source to tap risk assessment of the Town's waterworks system to ascertain the integrity, reliability and long term sustainability of the Town's drinking water supply system.
Rationale	Completion of a source to tap risk assessment for the waterworks system is a requirement of the Alberta Environmental Protection and Enhancement Act Approval for the Town's waterworks system amended in 2009. Completion and submission of a risk assessment is required every five years from the date of the approval.
Expected Impact	
Resource Requirements	Staff time Budget for Consultant (consultant to be approved by Director)
Potential Barriers to Implementation	Staff time Budget
Accountabilities	Manager of Public Works
Performance Measures	

Actions For Future Consideration

Examine feasibility of bylaw requiring use of native plants or xeriscaping for landscaping of new private developments

Consider updating of existing Water Bylaw to reflect conservation and efficiency objectives including but not limited to the use of water efficient fixtures, restrictions on outdoor water use, etc)

Water use audits for Town operated facilities, residential sector, ICI sector

Greywater reuse/recycling initiatives – greywater is not currently permitted for residential use in Alberta but the Alberta Government is developing framework to permit the use of reclaimed water

Increased use of financial and economic tools (full cost accounting, rebates, etc)

Develop/use engineering and community design policies and initiatives to improve water conservation and ecological integrity

- Develop and get Council to approve Engineering Design Guidelines
- Encourage community design that maximizes the use of recycled water.
- Designate what percentage of land should remain permeable (without paved surfaces).
- Reduce the effects of soil compaction, erosion, lack of topsoil, loss of soil aerating organisms and vegetation removal on permeability.
- Use green infrastructure design and technology to restore and enhance riparian areas and wetlands.
- Apply green infrastructure management where land use and wastewater management regulate and augment water flows in wetlands.

Water recycling initiatives

- Reduce use of treated water for water of lawns/gardens by encouraging use of rainwater/non-treated water
- Promote rooftop rainwater catchment systems and gardens (such as current rain barrel program) and water-retaining eco-roofs.

Performance Measurement & Reporting

Performance Indicators

The following performance indicators will be calculated and reported annually:

- Total annual volume of water produced from each source (m3/yr)
- % of license allocation used (% of allowable allocation)
- Total annual metered sales (m3)
- Total residential water consumption (m3/yr)
- Per-capita residential water consumption – permanent population (litres/person/day)
- Per-capita residential water consumption – total population (litres/person/day)
- Total annual ICI water consumption (m3/yr)
- Total Town of Canmore water consumption (m3/yr)
- Water consumption of major Town facilities (Rec Centre, Civic Centre, Public Works, etc)
- Estimate of unmetered water use (main breaks, firewater, etc) (m3/yr)
- Estimated losses from water distribution system (% of total water production)
- Estimated groundwater infiltration to wastewater treatment system
- Total annual wastewater generated (influent) (m3/yr)
- Total annual wastewater discharged (effluent) (m3/yr)
- Annual average phosphorus concentration in effluent discharged (mg/litre)
- Total annual phosphorus loading to Bow River (kg or tonnes/yr)
- Annual average ammonia nitrogen concentration in effluent discharged (mg/litre)
- Total annual ammonia nitrogen loading to Bow River (kg or tonnes/year)
- Annual average fecal coliform concentration in effluent discharged (MPN/100ml)
- Annual average Biological Oxygen Demand (BOD) in effluent discharged (mg/litre)
- Annual average Total Suspended Solids (TSS) in effluent discharged (mg/litre)
- Number of accidental spills or releases (events/yr)
- Number of approval contraventions (events/yr)

The tracking of average per account water use as a performance indicator for the ICI sector should be discontinued as it does not provide useful information on changes in the rate of water consumption of the efficiency of water use unless the number of accounts remains the same. Data systems should be modified to allow for the tracking of individual accounts or a group of the accounts which do not change over time.

Data Sources

The majority of data required to calculate the above performance indicators is currently tracked by the Town of Canmore's Public Works department or EPCOR which operates the water treatment and distribution and wastewater treatment facilities for the Town.

Reporting

A report will be prepared annually that presents the performance indicators calculated for the water management program for the previous year and summarizes progress towards the goals established for the program.

The Town of Canmore's Public Works Department currently produces an annual report that describes water and wastewater management activities for the previous year as well as progress on WDMAP related initiatives. This report provides a significant level of detail and already includes much of the data required to calculate the water management indicators listed in the above section on Performance Indicators. Future versions of the annual report should be modified to reflect the goals, actions and performance indicators in this action plan.

The annual report should include a simplified water balance that shows total water production = metered sales plus estimate of unmetered uses plus estimate of distribution system losses.
The annual report is to be completed by March 31st following the calendar year for which the data has been collected and performance indicators calculated.

The annual report will be distributed to:

- The Communication and Sustainability Coordinator
- The CAO and Deputy CAO
- Mayor and Council
- The Biosphere Institute of the Bow Valley
- The Environmental Advisory Review Committee

The annual report will also be posted on the Town of Canmore's website.

In addition to the above reporting requirements, the Town is required to report water use and other data related to the performance of the waterworks and wastewater treatment facilities annually to Alberta Environment.

Accountabilities

Town of Canmore

The Chief Administrative Officer (CAO), Deputy Chief Administrative Officer (Deputy CAO) and Mayor and Council are responsible for reviewing and approving the general direction, strategies and goals outlined in the Environmental Stewardship Action Plan and for ensuring that any actions required to achieve the goals are reviewed and approved prior to implementation. Once specific actions have been approved, there is an ongoing responsibility to ensure that the approved actions are adequately supported and implemented.

The Manager of Public Works, Manager of Engineering, and EPCOR are responsible for the regular review and updating of the water management actions and initiatives outlined in the Environmental Sustainability Action Plan (ESAP).

The Manager of Public Works and Manager of Engineering are responsible for ensuring that any new actions and initiatives required to achieve the goals in this action plan are reviewed and approved by the CAO, Deputy CAO and Mayor and Council (as appropriate) before implementation.

The Manger of Public Works is responsible for ensuring the completion of the annual Water Management summary report by March 31st of each year.

The Communications and Sustainability Coordinator is responsible for producing and distributing the annual summary report, coordinating the development and delivery of community education and engagement initiatives related to water management initiatives, in cooperation with the Manger of Public Works.

Province of Alberta

The Province of Alberta's role is to establish provincial goals, programs and legislation related to water and wastewater management activities to achieve the outcomes in Alberta's Water for Life Strategy. The government of Alberta is also responsible for allocating water resources to specific users through the issuance of water diversion licenses and for the approval and monitoring of facilities used to treat and distribution potable water and collect and treat sanitary wastewater.

Government of Canada

The Government of Canada is responsible for setting national standards for drinking water quality and for the protection of aquatic habitat.

Private Sector

The private sector, including residents, local businesses and institutions and visitors, are expected to participate in the Town of Canmore's water management initiatives and to take the necessary steps to improve water conservation and the efficiency and productivity of their water use.

Toxin Reduction

Toxin Reduction

Desired Future State

We are striving for a future in which we have halted the progressive build-up of chemicals and substances produced by society that may be harmful to human health or the environment. Potentially harmful substances and chemicals are being eliminated, reduced or managed in ways that they do not disperse and accumulate in the environment. We have significantly reduced and are working to eventually eliminate the use of persistent synthetic chemicals and other compounds that are known to be toxic to humans or the environment including herbicides, pesticides, trace metals and synthetic organic compounds. Where alternatives are available, we use materials that are less environmentally harmful, preferring those substances that are natural, abundant, non-toxic and renewable.

Current Reality

Summary

The Town of Canmore approved a Cosmetic Pesticide Free Action Plan (CPFAP) in 2004 which was based on the goal of the Town becoming cosmetic pesticide free by 2014.

While the CPFAP and associated goal statement refer to reducing cosmetic pesticide use, the term pesticide is a general term that can include herbicides, insecticides, fungicides, rodenticides and other substances. Although the CPFAP goal statement refers to reducing pesticide use, the intent and associated actions identified in the CPFAP appear to be limited to efforts to reduce and eliminate the use of herbicides for the aesthetic or cosmetic control of vegetation species (weeds) rather than the broader issue of reducing or eliminating other types of pesticides. While the Town of Canmore has made progress on reducing herbicide use within its corporate operations, the majority of initiatives proposed in the CPFAP to reduce the use of cosmetic herbicides within the broader community have not yet been implemented and there are currently no systems in place that would allow for monitoring of herbicide use within the community or progress towards the CPFAP goal.

There has been recent interest by some citizens and groups within the Town in implementing a ban on the use of cosmetic herbicides in order to accelerate progress towards their reduction and eventual elimination. While a carefully designed and effectively enforced ban would likely accelerate the elimination of cosmetic herbicides, the resources required to design, implement and enforce such a ban could be considerable. After significant study and deliberation, the City of Calgary recently decided that it would not implement a proposed ban on cosmetic herbicides citing issues related to cost, difficulty of enforcement and jurisdiction. While reducing and where possible eliminating the use of cosmetic pesticides is a desirable goal that should be pursued as part of the Town of Canmore's sustainability initiatives, it may not be practical to eliminate all uses of these products. Furthermore the complexity, cost and difficulty of developing and enforcing a ban suggest that this may not be the best approach for Canmore.

In addition to cosmetic pesticides, there are numerous other household and commercial products that we use that may contain chemicals or substances that are potentially hazardous to human health or the environment.

In order to achieve our desired future, we need to identify, reduce and where possible eliminate the use of products that contain substances that may be harmful to human health or the environment with a focus on substances that are directly toxic (poisonous) or are known or suspected to be carcinogenic (cause cancer), mutagenic (cause genetic disorders) or teratogenic (cause abnormalities in physical development). Due to uncertainties with respect to the potential human health and environmental effects of many man-made chemicals and compounds and the potential for additive or synergistic effects, a precautionary approach is required, utilizing less toxic alternatives where they are available.

In order for the community to significantly reduce its use of herbicides and other toxic substances, significant citizen initiative and participation will be required. The Town will need to encourage and facilitate grassroots environmental initiatives that seek to move the community as a whole towards the use of less toxic substances and products where alternatives exist.

Cosmetic Pesticide Free Action Plan

In May 2004 the Town of Canmore implemented a Cosmetic Pesticide Free Action Plan (CPFAP). The following goal statement was adopted for the CPFAP:

> The Town of Canmore will be free of cosmetic pesticides by 2014.

In the CPFAP, cosmetic pesticides were defined as a pesticide that is applied for the purposes of beautification or aesthetic enhancement, regardless of the environmental impact. Pesticides used to control noxious weeds in accordance with Alberta's Weed Control Act were exempt from the requirements of the CPFAP. It is worth noting that the definition of pesticide used in the CPFAP is sufficiently broad to potentially preclude the use of any product (including natural substitutes such as vinegar, salt solutions, etc.) if the primary purpose is vegetation control for aesthetic purposes.

No baseline data was available or collected to establish baseline conditions for the CPFAP due to the challenges associated with collecting data on pesticide use within the community.

The CFAP includes a number of short and long term strategies designed to allow the Town to achieve the goal statement. The short term strategies were to be implemented between 2004 and 2007 while the longer term strategies were to be implemented between 2007 and 2014.

The current status of the short term strategies is provided in the following table.

Short Term Strategies (2004-2007)	Status
Cosmetic Pesticide Free Workshops for Commercial Businesses	Not implemented. Although there is still a desire by Town staff to conduct such workshops, there are no immediate plans or budget available for this initiative.
Development of a CPF Stakeholder Group	Some initial discussions and meetings occurred but then some participants pulled out, another group lost funding, etc. Not currently active.
Development & Distribution of Educational and Promotional Information and Programs including: • In-school education program for all grades • Participating in local and regional CPF programs • Completing an advertising schedule • Designing and distributing information brochures and flyers • Presenting CPFAP at events & trade shows • Developing and implementing a recognition and awards program.	Not implemented. The amount of effort required to develop and distribute educational materials was underestimated. Although this initiative is still on the books, there are no immediate plans or budget available for this initiative.

The status of the longer term strategies identified in the CPFAP is summarized in the table below.

Long Term Strategies (2007-2014)	Status
Development of a CPF Principals accreditation program.	Not Implemented.
Development of a standard CPF guidelines document.	Not implemented.

Although the CPFAP includes a general discussion on how progress towards the 2014 goal might be measured at the community level (level of commercial participation in workshops, door to door surveys, etc.), no performance measurement or reporting system has been developed to date that would allow community progress towards the goal to be monitored.

Town of Canmore (Corporate) Herbicide Use

The Town of Canmore has not used herbicides for the control of nuisance weeds (cosmetic purposes) on Town-owned properties since before 2003.

The Town does use herbicides to control or eliminate noxious and restricted weeds on Town-owned properties as required by the provincial Weed Control Act with all applications being completed by licensed applicators in accordance with provincial regulations. The Town also employs an extensive hand weed pulling program to complement the spraying program and to minimize the amount of herbicides required.

The Town also uses a limited amount of Round-Up (2,4-D) and other similar herbicides (Vantage) to create a vegetation free zone along the perimeter fence at the ball diamonds. This is done for safety rather than aesthetic or cosmetic reasons.

The total amount of herbicide used by the Town of Canmore to control noxious and restricted weeds and for safety purposes from 2003 to 2010 is shown in the table below.

Year	Product	Purpose	Amount Applied (litres)
2003	Killex	Noxious & Restricted	29.5
	Killex 500	Noxious & Restricted	1.5
	Transline	Noxious & Restricted	2.6
	Round Up	Ball Diamond Warning Tracks	11.8
	Dycleer	Noxious & Restricted	1.5
	Slyguard 309	Noxious & Restricted	1.08
		2003 Total	**47.98**
2004	Transline	Noxious & Restricted	7.13
	Ambush	Noxious & Restricted	5.5
		2004 Total	**12.63**
2005	Transline	Noxious & Restricted	3.6

Year	Product	Purpose	Amount Applied (litres)
	Kri Kill	Noxious & Restricted	6.3
	Tordon 22K	Noxious & Restricted	7.7
	Vantage/Round Up	Ball Diamond Warning Tracks	9
		2005 Total	**26.6**
2006	Transline	Noxious & Restricted	3.8
	Round Up	Ball Diamond Warning Tracks	15.7
	Milestone	Noxious & Restricted	0.9
	Trillion	Noxious & Restricted	6.6
	Tordon 22K	Noxious & Restricted	10.8
		2006 Total	**27**
2007	Transline	Noxious & Restricted	5.2
	Tordon 101	Noxious & Restricted	22.5
		2007 Total	**27.7**
2008	Tordon 22K	Noxious & Restricted	3
	Milestone	Noxious & Restricted	11.25
	Tordon 101	Noxious & Restricted	28
	Round Up	Ball Diamond Warning Tracks	11
		2008 Total	**53.25**
2009	Rocon	Cemetery Gopher Control	30.4
	Lontrel 360	Noxious & Restricted	6.95
	Milestone	Noxious & Restricted	5.6
		2009 Total	**42.95**
2010	Round Up	Ball Diamond Warning Tracks	6.0
	Milestone	Noxious & Restricted	8.2
		2010 Total	**14.2**

The amount of herbicides required to control noxious and restricted weeds varies annually depending upon weather conditions, the nature and extent of recent soil disturbances and the addition of new lands to the Towns inventory of park lands. Wet years typically produce more infestations that need to be controlled while an increase in soil disturbances associated with construction activities creates new areas for invasive weed species to colonize. The Town has been able to significantly reduce the amount of herbicide required to control noxious and restricted weeds by employing hand pulling. The Town also uses a 3-year cycle for weed control activities resulting in some variation in the amount of herbicides used in any given year.

The observed increase in herbicide use during 2008 is attributed to it being a relatively wet year compared to other recent years and the Town assuming control of more land from Three Sister Mountain Village (TSMV) in 2008. The additional lands acquired from TSMV often have a higher weed

burden because they have been recently disturbed and because the movement of construction equipment tends to distribute any weed seeds in the soil.

The Parks Department utilizes an integrated pest management approach using pest monitoring, mechanical eradication, turf cultural programming and fertilization to minimize the need for inorganic chemical fertilizers. The Town currently uses 60% organic fertilizer on sports fields however it has not been possible to move to 100 % organic fertilizer due to Canmore' short growing season and the wear and tear that field experience due to their frequent use. In the future, if certain thresholds of nuisance weed species are reached on playing fields it may be necessary to control these weeds using chemical herbicides similar to those used for cosmetic purposes. The alternative would be to re-sod the field which would be a more expensive option and would require shutting down the playing field for an extended period while re-growth occurs.

In addition to the above activities, the Town of Canmore currently utilizes contract service providers to provide some municipal services (i.e. EPCOR for water and wastewater services and Volker Stevin for road maintenance). Herbicide use by these contractors is not currently monitored by the Town to ensure conformance with the Town's CPFAP goal.

Community Herbicide and Pesticide Use

Little information is currently available on the volume and nature of herbicide and pesticide use within the community and there are no plans or systems in place to gather this type of information. The two most significant uses of herbicides are likely to be use by individual landowners on private residential properties and use by commercial applicators or landscaping companies on residential and commercial properties.

With respect to the application of chemical herbicides by individual residential property owners, the only available data for Canmore comes from a 2009 presentation to Mayor and Council by the Pink and Green Ribbon Health Campaign. As part of this presentation, data was presented that the purchase of pesticides from one store in Canmore in 2008 amounted to 2,311 units and it was suggested that this represented approximately 30 % of the Canmore market.

Although landscaping companies and other organizations that utilize commercial pesticide applicators to apply chemical herbicides or pesticides are required to keep records on herbicide applications, this information is not readily available to the public and no efforts were made to access or review this information during preparation of the ESAP. Consequently, no information is currently available on the volume or type of herbicides used by these companies within the community of Canmore. Similarly, no detailed information is currently available on the use of herbicides by the three existing golf courses within the Town or by other industrial, commercial or institutional organizations that might utilize herbicides to maintain right of ways (CPR, ATCO, Altalink) or grounds (school boards, hospital, hotels, etc.)

Government of Alberta Phase Out of Weed and Feed Products

In 2008 the Government of Alberta announced its intention to phase out the sale of fertilizer-herbicide combination products (known as weed and feed). Effective January 1, 2010, these products will no

longer be sold in Alberta. This is expected to reduce the amount of herbicides used in urban areas and help ensure that herbicides are only used where required.

Herbicide and Pesticide Bans

Several jurisdictions in North America have implemented bans to reduce or eliminate the use of certain types of herbicides with varying levels of effectiveness. Although the implementation of regulations or bylaws can accelerate the reduction or elimination of herbicide use, developing and implementing a pesticide ban is a complex issue that requires careful consideration as it may be difficult and/or costly to monitor and enforce and may have unintended consequences.

As an example of unintended consequences, natural products that are used for the control of pests or invasive weeds would also be considered to be pesticides or herbicides if used for that purpose. Hence a poorly worded ban could eliminate the use natural products such as vinegar, corn gluten, etc.

An example of the potential complexity of a ban on cosmetic pesticides can be found in the Cosmetic Pesticides Ban Act enacted by the Province of Ontario in 2009. The Act and associated regulations are a complex piece of legislation. The Act and regulations establish 11 separate classes of pesticides and are supported by a 40 page classification guide. The regulations include 118 sections and include exemptions for public health and safety (including the protection of public works structures), golf courses, specialty turf, specified sports fields, arboriculture and to protect natural resources, if certain conditions are met. There are also exceptions for agriculture, forestry, research and scientific purposes, and uses of pesticides for structural exterminations (e.g., in and around homes to control insects) and uses of pesticides required by other legislation.

There are also questions about the science behind the bans on pesticides. In Canada, pest control products are regulated by Health Canada and are among the most stringently regulated substances in Canada. Health Canada has indicated that the concerns around cosmetic pesticides are not supported by modern science. For instance, a recent in-depth review of 2,4-D (used in Round Up and other herbicide products) by Health Canada found no evidence of harm to human health when the product was used as directed.

As previously stated, after considerable study and deliberation, the City of Calgary recently decided that it would not implement a proposed ban on cosmetic herbicides citing issues related to cost, difficulty of enforcement and jurisdiction. Canmore would face similar issues in attempting to develop and implement a ban on cosmetic herbicides.

Other Toxic Products and Substances

In addition to cosmetic pesticides, there are numerous other household and commercial products that we use that may contain chemicals or substances that are potentially hazardous to human health or the environment.

Common products that may include toxic chemicals or substances and that require special attention include: fuels, herbicides, insecticides, rodenticides, cleaning products (some glass cleaners, floor strippers), solvents, degreasers, paints, paint thinners, paint strippers, wood preservatives, waterproofing compounds, wood preparation and sealing products, wood stains and antifreeze. Many other consumer products contain chemicals or substances that may be toxic including bisphenol A

(found in plastics, anti-rust paints, liners in tin cans), polyvinyl chloride (clothing, pipe, electric wires, plastic pipe), cadmium (nickel-cadmium batteries, solar panels, pigments, coatings, platings, stabilizer in plastics), lead (automotive batteries, solder) and mercury (fluorescent lamps, used to manufacture some types of cosmetics). The use and disposal of these products has the potential to result in adverse effects to human health or to allow toxic substances to accumulate in the environment.

As an example, Japanese scientists recently reported finding bisphenol A in seawater and sand along the shorelines of more than 20 countries (Globe and Mail, April 2 2009). Its presence in seawater comes from the breakdown of plastic trash being dumped into the sea and from the use of the compound in anti-rusting paints applied to the hulls of ships. Bisphenol A is known to mimic the female hormone estrogen in living systems and has received increasing attention in recently years. Several countries have banned the substance from certain types of products or are considering bans.

Goals & Targets

Context

The Town of Canmore does not currently use herbicides for cosmetic or aesthetic purposes and minimizes its use of herbicides for the control of noxious and restricted weeds by employing a variety of practices including mechanical control and hand pulling programs.

There is no baseline data currently available on herbicide use within the broader community that can be used to establish quantitative goals for herbicide reduction or monitor progress towards any goals that are established. Due to the difficulty and cost of monitoring herbicide use in the community, the goals that have been selected are broad goals that would require voluntary participation by businesses and/or individuals.

Planning Horizon

Short term goals are those that are to be achieved within 5 years (by 2015)

Medium term goals are those that are to be achieved within 10 years (by 2020)

Long term goals are those that are to be achieved within 25 years (by 2035)

Targets for the Town of Canmore (Corporate)

By 2015

- Continue approach of zero use of chemical herbicides for cosmetic purposes
- Map and monitor extent of areas where chemical herbicides are used to control noxious and restricted weeds
- Develop a formal Integrated Pest Management (IPM) plan for Town of Canmore operations

By 2020

- Continue approach of zero use of chemical herbicides for cosmetic purposes
- Further goals to be developed

By 2035

- Continue approach of zero use of chemical herbicides for cosmetic purposes
- Further goals to be developed

Street Sweeping Recovery

- Increase the recovery of the volume of winter sanding material used per year to 55% in 2015;
- Increase the recovery of the volume of winter sanding material used per year to 60% in 2020; and
- Increase the recovery of the volume of winter sanding material used per year to 65% in 2035.

Winter sanding material is a mixture of sand and de-icing product to mitigate ice and ice build upon public roadways. The active de-icing ingredient is made up of a 3-5% salt to sand blend that may be harmful to vegetation and aquatic life if permitted to migrate into green space and watersheds. Winter sand captured in storm drainage systems can silt and create increased maintenance costs; winter sweeping can reduce the accumulation and impact.

Targets for the Community

By 2015

- 50 % of residences voluntarily report that they do not use chemical herbicides to maintain their properties
- Approach retailers and commercial applicators to confirm willingness to provide annual data on herbicide sales or applications
- Collect three years of baseline data on residential herbicide sales and commercial herbicide applications
- Establish herbicide reduction goal

By 2020

- To be developed

By 2035

- To be developed

Depending upon the willingness of retailers and commercial applicators to provide information on herbicide sales and applications within the community and the nature of information they are willing to provide, more specific quantitative goals related to herbicide or pesticide use could be developed in the future. Examples of possible goals include:

- the total volume of domestic herbicides sold by local retailers has been reduced by xx % from 2012 levels

- the total kg of active ingredients in herbicides sold by local retailers has been reduced by xx % from 2012 levels

If retailers are willing to participate, the first goal is relatively easy to monitor and provides a general indication of the trends in pesticide use. The second goal would be more meaningful than the first goal but would also require more effort to monitor.

Strategies

General Strategies

In order to achieve the community's desired future state, the following strategies will be employed:

1. Minimize and where possible eliminate the use of chemical herbicides

2. Identify a list of other potentially toxic chemicals and substances that should be targeted for reduction or elimination

3. Minimize and where possible eliminate the use of household products that contain chemicals or substances that are harmful to human health or may accumulate in the environment

4. Minimize and where possible eliminate the use of commercial or industrial products that may be harmful to human health or may accumulate in the environment

5. Ensure that products containing potentially harmful chemicals or substances that cannot be eliminated are managed in such as way that the harmful chemicals or substances are not allowed to disperse or accumulate in nature.

Strategies for the Town of Canmore (Corporate) Operations

- Continue the practice of not using herbicides for cosmetic or aesthetic purposes

- Continue efforts to minimize all herbicide use while meeting the requirements of the Alberta Weed Act Control Act

- Utilize integrated pest management practices to minimize the need for herbicides

- Ensure contract service providers (EPCOR, Volker Stevin, etc) are aware of and conform to the requirements of the Alberta Weed Control Act and the Town of Canmore's expectations with respect to herbicide use and integrated pest management practices

- Identify and reduce or eliminate products used by the Town that contain chemicals or substances that may be harmful to human health or may accumulate in the environment

- Where potentially hazardous chemicals or substances cannot be eliminated, ensure that these products are handled in a manner that does not allow these chemicals or substances to be dispersed in the environment

- For public spaces, continue to use landscaping standards that emphasize the use native vegetation species to reduce the potential for invasive species and minimize the need for herbicides
- For private properties, consider implementing landscaping standards and guidelines that emphasize the use of native vegetation species to reduce the potential for invasive species and minimize the need for herbicides

It is important to note that the first strategy listed above does not preclude the occasional use of chemical herbicides to maintain sports fields. Although the use of chemical herbicides on playing fields will be minimized through good turf management practices, the use of chemical herbicides may occasionally be required to maintain the performance (rather than the aesthetics) of the playing surface. If the option of using chemical herbicides were not available, then only option to restore the playability of a sports field where significant weed infestation has occurred might be to re-sod the playing field. This would involve considerable expense and would require shutting down the field until re-growth had occurred.

It is also important to note that inorganic fertilizers are not the same as chemical herbicides and hence the above strategies do not preclude the use of inorganic fertilizers to maintain sport fields or other areas of vegetation maintained by the Town. Although the Town has and will continue to maximize its use of organic fertilizers, for some applications inorganic fertilizers are more suitable.

Priorities for the Town of Canmore (Corporate) Operations

1. Develop and implement a formal Integrated Pest Management (IPM) plan for Town owned or operated facilities

2. Complete a review of products and substances used throughout Town operations (including contracted facilities) to identify products that contain potentially hazardous substances that should be reduced or eliminated

3. Identify more environmentally friendly alternatives for products that contain hazardous chemicals or substances and switch to these products where the alternatives are able to satisfy the Town's cost and performance needs

Strategies for the Community

- Develop a better understanding of current herbicide use in community by encouraging retailers to voluntarily provide a summary of the types and volumes of herbicides sold

- Develop a better understanding of current herbicide use in the community by encouraging commercial applicators and/or large industrial, commercial or institutional users to voluntarily provide a summary of the types and volumes of herbicides used

- Develop and implement a community education and engagement to increase awareness and commitment to reducing herbicide use

- Encourage local retailers to stock alternative vegetation control products or chemical herbicides that avoid the most toxic and persistent ingredients

- Encourage individual property owners and local businesses to become herbicide free by establishing a voluntary registry for those who no longer use herbicides

- Increase amount of native vegetation species used for landscaping

- Establish/promote a voluntary Code of Practice for landscaping companies that addresses the use of herbicides and native species

- Work with local nurseries to encourage the stocking and promotion of native vegetation species that are more resistant to invasive species and requires less herbicide use

- Work with local landscaping companies to promote the use of native vegetation in landscaping that is more resistant to invasive species and requires less herbicide use

- Reduce and where possible eliminate the use of toxic or hazardous chemicals and materials from all aspects of the residential and ICI sector

- Where toxic substances or materials cannot be eliminated, ensure that these materials are handled in a manner that minimizes dispersion of these substances into the environment.

Priorities for the Community

1. Develop a community education and engagement strategy to increase the community's commitment to and participation in efforts to minimize the use of herbicides and other potentially toxic substances

2. Work with local retailers and pesticide applicators to develop a better understanding of current herbicide use in the community

3. Identify specific herbicide products or active ingredients that should be targeted for reduction or elimination based on toxicity, mobility, persistence in the environment and other criteria

Priority 1 will be developed as part of the Community Education and Engagement component of the Environmental Sustainability Action Plan.

Existing Actions

Action or Program	**TR-E1 Integrated Pest Management (IPM) Practices**
Action Type	**Existing**
Applies To	**Town of Canmore Facilities and Properties**
Strategy	Utilize integrated pest management practices to minimize the need for herbicides
Description & Progress	The Parks Department currently uses an integrated approach to pest management to minimize the amount of herbicides and chemical fertilizers required to control invasive species including noxious and restricted weeds. IPM practices include pest monitoring, mechanical eradication, hand-pulling of invasive species, turf cultural programming and fertilization using a combination of organic and inorganic fertilizers. Town staff currently provide some vegetation control and management services on properties or right of ways owned or controlled by others (Canadian Pacific Railway, Alberta Transportation, TransAlta). CPR and Alberta Transportation provide annual funding to augment vegetation control activities such as hand pulling programs.
Accountabilities	Manager of Public Works Supervisor Parks
Performance Measures	Volume of herbicides used annually Total kg of active ingredients in herbicides applied annually
Future Priorities & Actions	The IPM program should be formalized and documented. To the extent feasible, the IPM program should be expanded to all of the Town's vegetation control activities. Appointment of municipal weed inspector(s) so the Town complies with the Alberta Weed Control Act. Review relationship and funding arrangements for vegetation control services provide for third parties properties and rights of way.
Supporting Documents & Linkages	Level of Service A-F / IMP Expectations Document

Action or Program	**TR-E2 Landscaping with Native Vegetation**
Action Type	**Existing**
Applies To	**Town of Canmore Operations – Public Spaces**
Strategy	Increase amount of native vegetation species used for landscaping
Description and Progress	Current landscaping standards used by the Town of Canmore for public spaces emphasize the use of native species wherever possible. Native vegetation communities are typically more resistant to invasive species than non-native communities and therefore require less herbicide to control invasive species. Native communities also require less water and are generally more salt tolerant than non-native communities. Where feasible, the planting of native vegetation should be encouraged. The focus should be on creating resilient vegetation communities that require minimal inputs rather than on creating non-native communities that requiring ongoing management and the use of chemical herbicides and fertilizers to maintain.
Accountabilities	Supervisor Parks Sustainability Coordinator Manager Engineering
Performance Measures	To be developed
Future Priorities & Actions	The proposed Urban Forest Management Plan to be developed in 2010 will also address the issues of native and invasive species. The results of the UFMP should be used to refine the strategies and goals contained in the ESAP.
Supporting Documents and Linkages	Urban Forest Management Plan, Town of Canmore Landscape Design Guidelines

Action or Program	**TR-E3 Landscaping with Native Vegetation**
Action Type	**Existing**
Applies To	**Residential and ICI Sector**
Strategy	Increase amount of native vegetation species used for landscaping
Description and Progress	The Supervisor of Parks currently works with local nurseries and landscaping companies to encourage the stocking and use of native vegetation species that are more resistant to invasive species and requires less herbicide use. Native vegetation communities are typically more resistant to invasive species than non-native communities and therefore require less herbicide to control invasive species. Native communities also require less water and are generally more salt tolerant than non-native communities. Where feasible, the planting of native vegetation should be encouraged. The focus should be on creating resilient vegetation communities that require minimal inputs rather than on creating non-native communities that requiring ongoing management and the use of chemical herbicides and fertilizers to maintain. Although Town staff promote the use of native species for landscaping of private properties, there are no landscaping standards or legal requirements that require the use of native species on private lands.
Accountabilities	Supervisor Parks Sustainability Coordinator Manager Engineering
Performance Measures	To be developed
Future Priorities & Actions	Consider development and implementation of landscaping standards and/or bylaw that would require the use of native vegetation species for landscaping of private properties.
Supporting Documents and Linkages	Urban Forest Management Plan, Town of Canmore Landscape Design Guidelines

Recommended Actions

Action or Program	**TR-R1 Toxics Inventory and Reduction Program**
Action Type	**Recommended**
Applies To	**Town of Canmore Owned and Operated Facilities**
Strategy	Identify and reduce or eliminate products used by the Town that contain chemicals or substances that may be harmful to human health or may accumulate in the environment Where potentially hazardous chemicals or substances cannot be eliminated, ensure that these products are handled in a manner that does not allow these chemicals or substances to be dispersed in the environment
Recommended Action	Complete a review of products and substances used throughout Town operations (including contracted facilities) to identify products that contain potentially hazardous substances that should be reduced or eliminated. Identify more environmentally friendly alternatives for products that contain hazardous chemicals or substances and switch to these products where the alternatives are able to satisfy the Town's cost and performance needs.
Rationale	Many consumer and commercial products contain chemicals or substances that may be harmful to human health or may accumulate in the environment. Where possible use of these products should be reduced or eliminated in favour of less toxic alternatives.
Expected Impact	**Decrease in hazardous substances in Town operations** **Data tracking and ability to meet goals**
Resource Requirements	Staff time
Potential Barriers to Implementation	Staff time
Accountabilities	Manager of Public Works Manager of Facilities Sustainability Coordinator
Performance Measures	To be developed

Action or Program	**TR-R2 Community Herbicide Use – Collection of Baseline Data**
Action Type	**Recommended**
Applies To	**Residential and ICI Sectors**
Strategy	Develop a better understanding of current herbicide use in the community by encouraging retailers to voluntarily provide a summary of the types and volumes of herbicides sold. Develop a better understanding of current herbicide use in the community by encouraging commercial applicators and/or large industrial, commercial or institutional users to voluntarily provide a summary of the types and volumes of herbicides used.
Recommended Action	Approach retailers, commercial applicators and organizations that manage significant green spaces (golf course, CPR, etc) within the Town to determine their willingness to provide information on herbicide use. An alternative approach would be to see what information on commercial herbicide use can be accessed through Alberta Environment.
Rationale	Very little information is currently available on the use of herbicides in the community. A better understanding of herbicide use in the community would allow priorities to be identified and more specific goals to be established. The information obtained would also provide the baseline information against which future progress could be measured.
Expected Impact	Better data tracking and ability to meet goals
Resource Requirements	Staff time or budget for contractor Might be possible to get community group or organization to take this on
Potential Barriers to Implementation	Staff time Willingness of retailers to provide information on pesticide sales Willingness of commercial applicators or commercial users to provide information on herbicide applications
Accountabilities	Sustainability Coordinator
Performance Measures	Total volume of herbicides sold annually by local retailers Total kg of active ingredients applied by commercial applicators

Action or Program	**TR-R3 Herbicide Free Voluntary Registry**
Action Type	**Recommended**
Applies To	**Residential and ICI Sector**
Strategy	Encourage individual property owners and local businesses to become herbicide free by establishing a voluntary registry for those who no longer use herbicides.
Recommended Action	Develop a voluntary registry for individual property owners or members of the ICI sector who no longer use herbicides and want to declare themselves herbicide free.
Rationale	Collecting data on individual pesticide use is impractical. Providing a voluntary registry for those who have gone pesticide free provides a way to assess progress towards minimizing pesticide use. The existence of the registry can also be used to help promote initiatives to reduce or eliminate herbicide use.
Expected Impact	Data tracking and ability to meet goals
Resource Requirements	Staff time May be possible to get local organization to take this on Advertising funds
Potential Barriers to Implementation	Staff time Level of community awareness and participation
Accountabilities	Sustainability Coordinator
Performance Measures	Number of households declaring themselves pesticide free Number of businesses declaring themselves pesticide free

Actions for Future Consideration

The following actions should be evaluated for possible future implementation:

- Development and implementation of landscaping standards and a bylaw that requires the use of native vegetation species on private properties to reduce the potential for invasive species and minimize the need for herbicides

Performance Measurement & Reporting

Performance Indicators

Town of Canmore (Corporate) Operations

For each herbicide application on property owned or controlled by the Town of Canmore, the Town will report the following information:

- product name of herbicide applied
- volume of each herbicide applied
- name and concentration of each active ingredient in the herbicide applied
- total kg of each active ingredient applied
- reason for the herbicide use.

Although a convenient measure, the tracking of pesticide volumes has a number of limitations. The volume of herbicide required will depend in part on the concentration of the active ingredient in the formulation. If a less concentrated solution is used, a larger volume may need to be applied to achieve the same level of control. Similarly, using a less aggressive active ingredient may require larger volumes to be applied or repeated treatments to achieve the same effect.

Therefore the key performance indicator will be:

- the total kg of active ingredients applied annually to Town of Canmore owned or controlled properties

Community Measures

As discussed previously, the monitoring of performance indicators related to community herbicide use would require retailers and licensed applicators to voluntarily provide reports on the types, formulations and volumes of herbicides sold/applied. Consequently, performance indicators for the community will be confirmed once the willingness of retailers and commercial applicators to provide the required information is known.

Potential performance measures could include:

Community

- percentage of households declaring their properties to be herbicide free

Retailers

- total volume or number of units of herbicide sold annually or
- total kg of active ingredients sold annually

Licensed applicators & commercial operations:

- total kg of active ingredients applied annually

Data Sources

For herbicides applied on lands owned or controlled by the Town of Canmore, information on product names, formulation and volumes applied is available from the licensed applicator or Town staff who applied the herbicide.

Data on pesticide use within the community may be available from retail sellers, commercial applicators or commercial users however their willingness to provide this type of information needs to be confirmed.

Reporting

A report will be prepared annually that summarizes information relating to the Town's use of herbicides for the previous year. The report will include the information identified in the performance indicator section and progress towards any relevant goals. To the extent that information on community herbicide use is available from retailers or commercial applicators, this information should also be reported in the annual report.

The annual report is to be completed by March 31st following the calendar year for which the data has been collected and performance indicators calculated.

The annual report will be distributed to:

- The Communication and Sustainability Coordinator
- The CAO and Deputy CAO
- Mayor and Council
- The Biosphere Institute of the Bow Valley
- The Environmental Advisory Review Committee

The annual report will also be posted on the Town of Canmore's website.

Accountabilities

Town of Canmore

The Chief Administrative Officer (CAO), Deputy Chief Administrative Officer (Deputy CAO) and Mayor and Council are responsible for reviewing and approving the general direction, strategies and goals outlined in the Environmental Stewardship Action Plan and for ensuring that any actions required to achieve the goals are reviewed and approved prior to implementation. Once specific actions have been approved, there is an ongoing responsibility to ensure that the approved actions are adequately supported and implemented.

The Manager of Public Works and Manager of Facilities are responsible for the regular review and updating of the toxics reduction actions and initiatives outlined in the Environmental Stewardship Action Plan (ESAP).

The Manager of Public Works and Manager of Facilities are also responsible for ensuring that any new actions and initiatives required to achieve the goals in this action plan are reviewed and approved by the CAO, Deputy CAO and Mayor and Council (as appropriate) before implementation.

The Manager of Public Works is responsible for ensuring the completion of the annual Toxics Reduction summary report by March 31st of each year.

The Sustainability Coordinator is responsible for producing and distributing the annual summary report, coordinating the development and delivery of community education and engagement initiatives related to toxics reduction, in cooperation with the Manger of Public Works and Manager of Facilities.

Province of Alberta

The Province of Alberta's role is to establish provincial goals, programs and legislation related to the control of pesticides, herbicides, rodenticides and other toxic substances of concern.

Government of Canada

The Government of Canada, through Health Canada, is responsible for the regulation of pest control products including the assessment of potential health effects associated with their use.

Private Sector

The private sector, including residents, local businesses and institutions and visitors, are expected to participate in the Town of Canmore and other initiatives related to pesticides and other toxics and to take the necessary steps to minimize their use of substances that may be hazardous to human health or the environment.

Community Education & Engagement

Community Education & Engagement

Desired Future State

We are striving for a future in which Canmore has become a truly sustainable community. Residents, businesses and organizations within the Town as well as visitors to our community all understand the importance of the choices they make in creating a resilient and sustainable community and have taken the actions necessary to ensure the long term success of our community.

As a result of the leadership of individuals, businesses and organizations within the community we have significantly reduced our environmental footprint. Consumption patterns, use of non-renewable resources and the generation and management of wastes and emissions are all being managed in ways that can continue indefinitely into the future without causing deterioration of the environment or harm to human health.

Citizens, businesses and organizations within the community have demonstrated an ability to work together and use creativity and innovation to tackle tough sustainability issues such as reducing carbon emissions and the generation of wastes. By working together we have created a community of sustainability practitioners that learn from and support each other and that continue to be a source of positive change within the community.

Current Reality

Summary

While the Town of Canmore has made good progress towards improving the sustainability of its own (corporate) operations, the Town's operations only account for a small fraction of the community's environmental footprint (air emissions, water consumption, solid waste generation, etc.). More than 90 % of the community's environmental footprint results from the choices and activities of residents, local businesses and organizations and visitors. If progress is to be made towards creating a truly sustainable community, then educating and actively engaging a significant portion of the community must be a priority.

Currently however, there is no comprehensive plan or approach in place for educating and engaging the community on sustainability issues. Although the Town's existing Environment Care programs contain a number of proposed initiatives intended to educate and engage the community, the majority of these community education initiatives have not been implemented due to limited resources and other competing priorities. While the Town does provide education on sustainability issues through newspaper articles and various other activities (Toxic Round Ups, etc), these efforts are ad hoc in nature or focused on specific events and are not guided by a comprehensive approach to community education that includes clearly defined objectives.

Although the Town has adopted and makes use of The Natural Step (TNS) sustainability framework to guide its decisions and activities, it is not clear to what extent this framework is understood or used by others in the community. The momentum resulting from the 2004 TNS Early Adopters Program has largely dissipated and the hoped for roll out of this program to the broader community has not occurred. While various individuals, businesses and organizations within the community are implementing sustainability initiatives, it is difficult to assess the scope and impact of these actions on the sustainability of the community. Opportunities for shared learning and collective action are also not being realized or maximized.

Through the Mining the Future visioning process and the public processes related to development of the Community Sustainability Plan, the concepts of sustainability and excellence in environmental stewardship were both identified as priorities by the community. The need for a comprehensive approach to community education on environmental sustainability issues was also identified. However, just as the Town's corporate activities only account for a small fraction of the community's environmental footprint, the Town also does not have the resources to lead and manage all of the sustainability initiatives required to create a sustainable community.

To make progress towards creating a sustainable community, individuals, businesses and organizations within the community will need to:

- help shape and buy-in to the community's sustainability objectives;
- be willing to take a leadership role in specific sustainability initiatives; and
- be willing to modify their behaviour in order to help achieve the community's sustainability objectives.

Without broad participation by the community, the community's stated desire for a sustainable community and excellence in environmental stewardship will not be realized.

In order to achieve the necessary level of community participation in sustainability initiatives, a comprehensive approach to community education and engagement is required. While the Town does not have the resources necessary to lead and manage all of the required sustainability initiatives, the Town can and should continue to lead by example and be a catalyst for further progress towards sustainability. Overseeing the development and implementation of a comprehensive community sustainability education and engagement program that results in increased community participation and leadership and provides a mechanism for coordinating the various grassroots sustainability initiatives that are occurring in the community is one way for the Town of Canmore to effectively leverage the resources it does have.

The Natural Step

In November 2004, the Town of Canmore and local participating organizations officially launched The Natural Step to a Sustainable Canmore. This sustainability program was led and coordinated by the Biosphere Institute of the Bow Valley and was based on The Natural Step sustainability framework.

As part of The Natural Step to a Sustainable Canmore initiative, a series of education and training workshops were provided for participating organizations, allowing them to create a common vision for a sustainable Canmore and supporting sustainability plans for their organizations. Participating organizations signed an Early Adopter Agreement and worked together to develop the visions and plans required to move their organizations and the community collectively towards the desired sustainability vision. Early Adopters included the Town of Canmore, the Biosphere Institute, the Radisson Hotel, Elizabeth Rummel School, Alpine Insurance, Tourism Canmore, Three Sisters Mountain Village, the Canmore Seniors Association, Polar Pin and the Rocky Mountain Flatbread Company.

The Town of Canmore continues to use The Natural Step as a guiding framework for decision making and makes use of the TNS e-learning program as an introduction to sustainability concepts for Town staff. It is unclear however to what extent TNS is still being used within the other Early Adopter organizations. The planned approach of having the Early Adopters roll out to the program to other organizations within their industry or sector also does not appear to have occurred.

Environmental Care Programs

Between 2003 and 2005, the Town of Canmore, with the assistance of the Environmental Advisory Review Committee (EARC), developed and implemented a series of environmental programs collectively known as the Environmental Care Programs. These programs were developed prior to the Town's formal adoption of The Natural Step and included an Energy Management Action Plan, Water Demand Management Plan, Solid Waste Action Plan and a Cosmetic Pesticide Free Action Plan.

Although each of the Environmental Care Programs included proposed initiatives or actions intended to educate or engage the community and hence help achieve the community related goals outlined in the respective Environmental Care Programs, the majority of these initiatives have not been implemented due to limited resources and competing priorities.

Mining the Future

In 2005 and 2006, the community participated in a visioning process that resulted in the production of a vision document for the community titled Mining the Future – A Vision for Canmore.

The Mining the Future process identified sustainability as one of three key foundational values for the community. Within the vision document, sustainability is defined as the integration of our social, economic and environmental activities in ways that enable us to meet our needs today without compromising the ability of future generations to meet their own needs. The vision document also identifies environmental stewardship as one of five key guiding principles for the community.

A series of goals and decision-making criteria are identified within the vision document for each of the guiding principles. The goals identified for environmental stewardship include:

1. Maintaining the biodiversity and ecological integrity of the Bow Valley ecosystem

2. Encouraging and supporting programs and activities intended to create an educated and engaged public that embraces environmental stewardship

3. Defining and promoting the entire spectrum of cultural and ecological values associated with our mountain landscape

4. Acknowledging and respecting the needs of both humans and wildlife regarding the use of the natural landscape

5. Acknowledging there are geographic and ecological limits in the Bow Valley, and that the reality of limits must be considered in discussions regarding continued use of the landscape by people and other species

6. Connecting Canmore's role as a gateway community to Provincial and National Parks to the regional ecosystem; maintaining regional connectivity of the surrounding landscape

7. Exercising leadership in environmental excellence through innovation and creativity.

The vision document identifies the following decision-making criteria as being important for achieving the community's environmental stewardship goals. Will the decision to be made:

1. Enhance community understanding of the responsibilities and tradeoffs involved with living with wildlife in the Bow Valley

2. Provide opportunities for individuals to participate responsibly in wilderness recreational activities

3. Use the precautionary principle

4. Be made with community collaboration on environmental issues

5. Define the environmental and social impacts on an economic endeavour

6. Maintain regional wildlife connectivity, ecological integrity and biodiversity (do no harm)

Canmore Community Sustainability Plan

Following adoption of the Mining the Future community vision document in 2006, the Town initiated a process to develop a Community Sustainability Plan (CSP). The CSP was developed with considerable community input and was intended to serve as the Town's Municipal Development Plan as required under Alberta's Municipal Government Act. The document was also designed to guide the community on its path toward greater sustainability by integrating the community's vision with municipal planning and decision making.

Although the draft CSP was withdrawn in 2009 and subsequently never adopted as an official guiding document for the Town, during development of the CSP Canmore residents communicated their desire to see their community become a leader in environmentally sustainable practices. The following areas were identified by Canmore citizens as key elements of environmental stewardship:

- protecting the natural landscape and wildlife; particularly environmentally sensitive areas, wildlife corridors and habitat patches
- green building design
- water conservation
- waste management
- energy efficiency and conservation; and
- reducing and eventually eliminating pesticide use.

The need for a comprehensive environmental sustainability education plan for the community to support initiatives in these areas was also identified during the CSP process.

Sustainable Action Canmore

In 2009 the Town of Canmore and the Biosphere Institute of the Bow Valley completed a door to door social marketing campaign to promote sustainability and sustainable action in Canmore.

The Sustainable Action Canmore program involved going to each household in the community to talk to the residents about sustainability and asking them to make a commitment to completing at least one action that would help move the community towards sustainability. Potential actions included changing a light bulb, using a low flow shower head, using reusable bags or checking the air pressure in their vehicle's tires. To support this action the residents were given their choice of receiving a compact fluorescent light bulb, low flow shower head, reusable bag or an air pressure gauge.

During the campaign, canvassers spoke with 3,140 people at their doors and 2,588 of these people took one of the action items and pledged to use it. Another 276 already had all items, so signed a

sustainability pledge instead. Another 344 households, not home for either round of canvassing, picked up their action items at booth events or drop-ins. To date, 2,933 Canmore households have taken an action item and pledged to use it. With a participation rate of 92 %, the results were better than the 75 % participation rate expected based on an earlier pilot program.

The next part of the program will involve phoning each participating household to ask if they have used their action item and to see if they would take another action.

Other Town of Canmore Sustainability Education Initiatives

The Town provides ongoing education on specific sustainability initiatives such as water conservation and recycling through newspaper articles and various Town sponsored or organized activities and events.

As an example, the following promotion and education programs related to solid wastes and recycling were undertaken in 2008:

- 2008 Town of Canmore Calendar which included Waste & Recycling events was available for the public at the Civic Centre, Public Works and the Boulder Recycle Depot.
- A one page handout, highlighting Waste & Recycling Events was available for the public at the Civic Centre, Public Works, and the Boulder Recycle Depot.
- Recycling depot / Class III landfill tours were provided to six grade 4 classes in September / October.
- Promotion placard system for large collection vehicle to service as 'mobile billboard'.
- One on one – coverage at Boulder Recycling Depot 10 hours a day, 7 days a week to assist customer and answer questions.
- All special events and notices were advertised on the Town of Canmore website, Bow Valley Waste website and in the local newspapers.
- 'Sandwich board' advertising was located in six high traffic areas.

These initiatives are often ad hoc in nature or related to specific events and are not guided by a comprehensive approach to community education with clearly defined objectives. It is also difficult to assess how effective these methods are at changing individual and organizational behaviour.

Biosphere Institute Programs

The Biosphere Institute of the Bow Valley has historically and continues to provide programs to educate and engage the community on sustainability issues.

In addition to partnering with the Town of Canmore for the Sustainable Action Canmore program in 2009, the Biosphere Institute currently operates a number of other programs including Bow Valley WildSmart, Bow Valley Climate Kids and Bow Valley Mountain Air. In addition, the Biosphere Institute continues to operate the Sustainability Hub website, a legacy of the two-year Natural Step to a Sustainable Canmore program.

Examples of previous sustainability programs run by the Biosphere Institute include the Natural Step to a Sustainable Canmore program, the One Tonne Challenge and the Bow Valley Save-A-Watt program. These programs were all for a defined period of time and were discontinued when government funding for the programs was exhausted or discontinued.

Bow Valley Waste Management Commission Programs

The Bow Valley Waste Management Commission (BVWMC) currently provides a range of educational initiatives and programs to support its mission to "promote and provide responsible recycling, composting and waste management programs."

Current programs include but are not limited to:

- maintaining the BVWMC website;
- developing and publishing educational materials and reports on a range of waste management issues in the Bow Valley including recycling and composting;
- the availability of audio-visual materials related to waste reduction and resource recovery initiatives and programs; and
- making BVWMC's Zero Waste Coordinator available for presentations to schools, businesses, etc..

In addition to providing educational programs related to responsible recycling, composting and waste management activities, the BVWMC is also involved in fostering partnerships with the public, community associations, business sector, government and non-government organizations and acts as a regional link in the areas of recycling and waste management working with partners beyond the Bow Valley.

Community Sustainability Branding

The use of branding can increase public awareness of issues and corporate objectives. Since 2004 the Town of Canmore has made use of branding to raise awareness of sustainability issues in the community and to establish the Town's reputation as a leader working to address sustainability issues. The Natural Step to a Sustainable Canmore, the recent process to create a Community Sustainability Plan and the 2009 Sustainable Action Canmore program all make use of sustainability branding.

The Canmore Sustainable Economic Development and Tourism Strategy currently being developed provides a more recent example of the use of sustainability branding. In the most recent version of the draft plan (April 2009), the tourism industry proposes to establish a reputation for a high level of environmental sustainability by 2015. The draft plan also discusses the promotion of local knowledge based industries related to environmental and sustainability information, innovation and research as possible priorities.

Goals & Targets

Context

In order for the community to achieve its environmental sustainability and stewardship objectives and desired future state, a significant majority of the community must be able to recognize personal and organizational behaviours and activities which are not sustainable over the long term and be committed to modifying these behaviours and activities in ways that move the community towards sustainability. Achieving this level of awareness and willingness to change will however, be very difficult.

Developing and implementing programs and initiatives to educate and engage the community on sustainability issues is one way to initiate this shift towards greater awareness, willingness to change and adoption of more sustainable behaviours (increased regulation is another). By making individuals and organizations more aware of the consequences of the choices they make and the alterative choices that are available, it may be possible to replace unsustainable behaviours with sustainable behaviours and move the community towards sustainability.

General Goals

The general goals of the community education and engagement element of the ESAP are to:

- Develop formal community education and engagement programs and initiatives that support the attainment of the sustainability goals outlined in each of the other sections of the ESAP;

- Achieve awareness and active participation of the majority of the residential population in activities or initiatives that move the community towards sustainability; and

- Achieve awareness and active participation of the majority of local businesses and organizations in activities or initiatives that move the community towards sustainability.

Quantitative Goals and Targets

Quantitative goals and targets have not been developed for the Community Education and Engagement element of the ESAP at this time. In the future, more specific quantitative goals and targets could be developed once the resources available for community education and engagement programs have been confirmed and program priorities established. It is recommended that the community be engaged to help establish priorities and future goals related to education and engagement.

Examples of potential future goals include:

- a targeted community education and engagement program related to Energy and Climate Protection has been developed and implemented by 2012

- more than 50 local businesses or organizations within the community have participated in targeted sustainability information and education programs by 2015

- more than 50 % of the residential population has participated in one or more formal sustainability information and education programs by 2015

- more than 10 new sustainability programs have been developed and implemented by local businesses, community groups or individuals by 2015

It is important to recognize however that the ultimate success of community education and engagement activities related to sustainability will be determined by monitoring the performance indicators developed in other sections of the ESAP including but not limited to those developed for total and per-capita energy use, greenhouse gas emissions, water consumption, wastes land-filled, pesticides used and others.

Strategies

General Strategies

In order to increase the level of community engagement and participation in activities and initiatives that move the community towards sustainability, the following general strategies will be employed:

1. Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability.

2. Provide opportunities for community dialogue about sustainability issues and provide opportunities for residents, businesses and organizations to provide input into community sustainability goals, strategies and actions.

3. Provide information and education to the community on potential solutions and actions that can be taken to replace unsustainable behaviours and activities with sustainable behaviours and activities.

4. Promote and provide opportunities for individuals, businesses and organizations to participate in sustainability programs and initiatives.

5. Encourage grassroots development and leadership of sustainability initiatives that address key community sustainability issues.

6. Provide mechanisms for the sharing of information and coordination of sustainability initiatives lead by different individuals, businesses or organizations.

Strategies for the Town of Canmore (Corporate) Operations

- Continue to use TNS e-learning program to introduce new staff to sustainability concepts

- Provide additional, more in-depth sustainability training to interested Town staff in order to increase level of internal expertise

- Increase staff ownership of ESAP by using staff meetings, website and other means to provide opportunities for employee input into sustainability goals, strategies and actions identified in the ESAP

- Utilize the Town's Sustainability Committee to identify, develop, review or implement initiatives related to community education and engagement

- Utilize the Environmental Advisory Review Committee to identify, develop or review initiatives related to community education and engagement

- Consider increasing the level of resources currently available for community education and outreach initiatives related to sustainability

- Identify other organizations that may be willing to partner with the Town on community education and outreach initiatives related to sustainability (such as the Biosphere Institute, local businesses, etc.)

- If it becomes possible to increase the level of resources available, one option would be to split the current Communication and Sustainability Coordinator's position into two full time positions. By creating a full time environmental or sustainability position, this individual would be able to spend a portion of their time on sustainability initiatives associated with Town of Canmore (Corporate) operations and the remainder of their time on community education and outreach programs.

Priorities for Town of Canmore (Corporate) Operations

The following actions should be considered as priorities for Town of Canmore (corporate) operations:

1. Provide opportunities for Town staff to review and discuss the ESAP and provide input into the goals, strategies and actions in the ESAP

2. Ensure ownership and accountabilities for the various elements of the ESAP are understood.

Strategies for the Community

- Use a web-based platform and on-line surveys to create opportunities for the community to provide input into the desired future state and goals, strategies and actions in the ESAP

- Use presentations and community cafes to create opportunities for the community to provide input into the desired future state and the goals, strategies and actions in the ESAP

- Provide education and training to residents and local businesses and organizations on the use of The Natural Step sustainability framework and other sustainability tools

- Develop targeted community information and education programs for each of the community's sustainability objectives including programs for energy and greenhouse gas emissions, water, resource consumption and wastes, toxics and wildlife/biodiversity. These programs should include information on the specific actions residents, businesses, organizations and visitors can take to move the community towards sustainability

- Promote and establish the use of neighbourhood Eco-teams as a way to encourage residents to work together and to support one another in addressing sustainability objectives

- Identify and develop an inventory of existing sustainability programs and initiatives within the community

- Identify individuals and local businesses and organizations who are or may be willing to champion or lead specific sustainability initiatives
- Develop and maintain a sustainability website or wiki that can serve as the single definitive source of information on sustainability initiatives within the community (Town operated and other) and allowing the sharing of sustainability success stories

- Create an annual community sustainability event or conference to share information on sustainability initiatives and success stories

- Identify sources of government grants and other resources (such as the resources available through NGOs) that can be used to support community education and engagement initiatives related to sustainability

- Enhance the visibility of sustainability issues and initiatives by making sustainability a key component of the branding used for the Town of Canmore

- Continue to enhance the visibility of sustainability issues and initiatives by integrating sustainability concepts into other plans and programs such as the Canmore Sustainable Economic Development and Tourism Strategy currently being developed

Priorities for the Community

The following actions should be considered as short-term priorities for the community:

1. Provide opportunities for the community to review and provide input into the desired future state, goals, strategies and actions contained in the ESAP

2. Develop a sustainability website or wiki to provide a single source of information on sustainability programs and initiatives within the community

3. Develop an inventory of existing sustainability programs and initiatives within the community

4. Identify potential sustainability leaders and partners within the community.

Existing Actions

Action or Program	**CEE-E1 Sustainable Action Canmore**
Action Type	**Existing**
Applies To	**Residential Sector**
Strategies	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability. Provide information and education to the community on potential solutions and actions that can be taken to replace unsustainable behaviours and activities with sustainable behaviours and activities.
Description & Progress	The Sustainable Action Canmore program was implement in 2009 and involved going to each household in the community to talk to the residents about sustainability and asking them to make a commitment to completing at least one action that would help move the community towards sustainability such as changing a light bulb, using a low flow shower head, using reusable bags or checking the air pressure in their vehicle's tires. To support this action the residents were given their choice of receiving a compact fluorescent light bulb, low flow shower head, reusable bag or an air pressure gauge. During the campaign, canvassers spoke with 3,140 people at their doors and 2,588 of these people took one of the action items and pledged to use it. Another 276 already had all items, so signed a sustainability pledge instead. Another 344 households, not home for either round of canvassing, picked up their action items at booth events or drop-ins. To date, 2,933 Canmore households have taken an action item and pledged to use it. With a participation rate of 92 %, the results were better than the 75 % participation rate expected based on an earlier pilot program. The next part of the program will involve phoning each participating household to ask if they have used their action item and to see if they would take another action.
Accountabilities	Sustainability Coordinator

Performance Measures	Participation rate (%) % of actions completed % of individuals willing to complete follow up actions
Future Priorities & Actions	Complete follow up calls to confirm % of actions completed and willingness to completing additional action
Supporting Documents & Linkages	

Action or Program	**CEE-E2 Bow Valley WildSmart Community Program**
Action Type	**Existing**
Applies To	**Residential Sector, Visitors**
Strategies	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability. Provide information and education to the community on potential solutions and actions that can be taken to replace unsustainable behaviours and activities with sustainable behaviours and activities.
Description & Progress	WildSmart is a coalition of community members, government entities, environmental organizations and businesses that provide education/outreach programs and help support direct management activities that aid in increasing public safety and enjoyment as well as contribute towards sustainable wildlife populations. The program has a goal of reducing conflicts between humans and wildlife and includes a conservation strategy for the Bow Valley. The three pillars of this conservation strategy are Education and Outreach, Attractant Management and Aversive Conditioning.
Accountabilities	Biosphere Institute of the Bow Valley
Performance Measures	
Future Priorities & Actions	
Supporting Documents & Linkages	www.wildsmart.ca

Action or Program	**CEE-E3 Bow Valley Waste Management Commission (BVWMC) Programs**
Action Type	**Existing**
Applies To	**ICI Sector, Residential Sector, Visitors**
Strategies	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability. Provide information and education to the community on potential solutions and actions that can be taken to replace unsustainable behaviours and activities with sustainable behaviours and activities.
Description & Progress	The BVWMC currently provides a variety of educational initiatives and programs to support its mission to "promote and provide responsible recycling, composting and waste management programs." Current programs include but are not limited to: • Maintaining the BVWMC website • Development and publication of educational materials on a range of waste management issues such as recycling, composting, etc. • Availability of audio-visuals materials related to waste reduction and resource recovery • Availability of the BVWMC's Zero Waste Coordinator to make presentations to schools, businesses, etc . In addition to providing education with respect to responsible recycling, composting and waste management activities, the BVWMC is also focused on fostering partnerships with the public, community associations, business sector, government and non-government organizations and acts as a regional link in the areas of recycling and waste management working with partners beyond the Bow Valley.
Accountabilities	Bow Valley Waste Management Commission
Performance Measures	
Future Priorities & Actions	
Supporting Documents & Linkages	www.bvwaste.ca

Recommended Actions

Action or Program	**CEE-R1 Sustainability Website**
Action Type	**Recommended**
Applies To	**Residents, Businesses, Organizations, Visitors**
Strategies	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability. Provide opportunities for community dialogue about sustainability issues and provide opportunities for residents, businesses and organizations to provide input into community sustainability goals, strategies and actions. Provide information and education to the community on potential solutions and actions that can be taken to replace unsustainable behaviours and activities with sustainable behaviours and activities. Promote and provide opportunities for individuals, businesses and organizations to participate in sustainability programs and initiatives. Provide mechanisms for the sharing of information and coordination of sustainability initiatives lead by different individuals, businesses or organizations.
Recommended Action	Develop a sustainability website or wiki that provides a single source of information on sustainability initiatives within the community.
Rationale	There are many existing sustainability initiatives operated by the Town and other businesses and organizations but information on many of these initiatives is difficult to find.
Expected Impact	Developing a single web-based site that provides information on sustainability initiatives will allow for greater awareness, shared learning and coordination of activities.
Resource Requirements	Staff time Budget for set and maintenance of website
Potential Barriers to Implementation	Staff time Budget
Accountabilities	Communications and Sustainability Coordinator
Performance Measures	

Action or Program	**CEE-R2 Inventory of Sustainability Initiatives**
Action Type	**Recommended**
Applies To	**Residents, Businesses, Organizations**
Strategies	Provide mechanisms for the sharing of information and coordination of sustainability initiatives lead by different individuals, businesses or organizations. Promote and provide opportunities for individuals, businesses and organizations to participate in sustainability programs and initiatives
Recommended Action	Identify and develop an inventory of existing sustainability programs and initiatives within the community including those operated by the Town of Canmore and others.
Rationale	There are many existing sustainability initiatives operated by the Town and other businesses and organizations within the community but information on many of these initiatives is difficult to find.
Expected Impact	Identify and developing an inventory of community sustainability initiatives will allow for greater awareness, shared learning and coordination of activities.
Resource Requirements	Staff time or budget for consultant
Potential Barriers to Implementation	Staff time Budget
Accountabilities	Communications and Sustainability Coordinator
Performance Measures	

Action or Program	**CEE-R3 The Natural Step Sustainability Framework Education/Outreach Program**
Action Type	**Recommended**
Applies To	**Residents, Businesses, Organizations**
Strategy	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability.
Recommended Action	Provide education on The Natural Step (TNS) framework to residents, businesses and organizations.
Rationale	Although the Town of Canmore and participants in the Natural Step to a Sustainable Canmore Program Early Adopters Program are familiar with the TNS framework, others in the community are likely not familiar with the TNS framework and how it can be used to approach sustainability issues.
Expected Impact	Increased familiarity with the TNS framework may encourage others (particularly businesses and organizations) to use it to integrate sustainability considerations into their decision making and planning processes.
Resource Requirements	Staff time Budget for TNS staff/consultants
Potential Barriers to Implementation	Budget
Accountabilities	Communication and Sustainability Coordinator
Performance Measures	

Action or Program	**CEE-R4 Sustainability Partners/Leadership Program**
Action Type	**Recommended**
Applies To	**Residents, Businesses, Organizations**
Strategy	Encourage grassroots development and leadership of sustainability initiatives that address key community sustainability issues.
Recommended Action	Identify businesses, organizations and individuals who are or may be willing to lead or partner in community sustainability initiatives.
Rationale	The Town does not have the resources to lead and manage all of the various sustainability initiatives required to address community sustainability issues. Furthermore, the majority of the community's environmental footprint is created by the activities of residents, businesses, organizations and visitors rather than the Town of Canmore's corporate operations.
Expected Impact	Identifying others who may be willing to lead or share responsibility for managing community sustainability initiatives will leverage the Town of Canmore's available resources and allow more to be accomplished with the same resources.
Resource Requirements	Staff time
Potential Barriers to Implementation	Staff time
Accountabilities	Communication and Sustainability Coordinator
Performance Measures	

Action or Program	**CEE-R5 Annual Sustainability Conference/Event**
Action Type	**Recommended**
Applies To	**Residents, Businesses, Organizations, Visitors**
Strategy	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability. Provide information and education to the community on potential solutions and actions that can be taken to replace unsustainable behaviours and activities with sustainable behaviours and activities. Promote and provide opportunities for individuals, businesses and organizations to participate in sustainability programs and initiatives. Encourage grassroots development and leadership of sustainability initiatives that address key community sustainability issues. Provide mechanisms for the sharing of information and coordination of sustainability initiatives lead by different individuals, businesses or organizations.
Recommended Action	Develop an annual sustainability event or conference that can be used to share experiences implementing sustainability initiatives and highlight successes.
Rationale	Highlighting and sharing sustainability experiences raises the profile of sustainability initiatives and provides opportunities for shared learning and coordination of initiatives.
Expected Impact	Increased participation in sustainability initiatives. Increased awareness and adoption of successful approaches to sustainability issues.
Resource Requirements	
Potential Barriers to Implementation	Staff time Budget
Accountabilities	Communications and Sustainability Coordinator
Performance Measures	

Action or Program	**CEE-R6 Energy and Climate Change Education and Engagement Program**
Action Type	**Recommended**
Applies To	**Residential, Businesses, Organizations, Visitors**
Strategy	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability. Provide opportunities for community dialogue about sustainability issues and provide opportunities for residents, businesses and organizations to provide input into community sustainability goals, strategies and actions. Provide information and education to the community on potential solutions and actions that can be taken to replace unsustainable behaviours and activities with sustainable behaviours and activities. Promote and provide opportunities for individuals, businesses and organizations to participate in sustainability programs and initiatives.
Recommended Action	Develop a targeted community education and engagement program specific to the goals, strategies and actions contained in the Energy and Climate component of the ESAP.
Rationale	In order to make progress towards the goals contained in the Energy and Climate component of the ESAP the community needs to be aware of the goals, strategies and actions in the plan and the specific actions that can be taken to help achieve the goals. The community education and engagement plan for this component of the ESAP should include: • The connection between energy consumption and climate change and air quality • The goals, strategies and actions contained in the ESAP • Alternatives for reducing energy use, improving the efficiency of energy use and reducing GHG emissions by switching to low carbon fuels/energy
Expected Impact	Increased understanding of the impact of personal and organizational choices on the climate change and air quality. Increased awareness and adoption of sustainable behaviours.
Resource Requirements	Staff time or consultant resources to develop and deliver the materials and program.
Potential Barriers to Implementation	Staff time Budget for program development and implementation

	Community interest in participating
Accountabilities	Communications and Sustainability Coordinator
Performance Measures	

Action or Program	**CEE-R7 Resource Conservation and Waste Management Education and Engagement Program**
Action Type	**Recommended**
Applies To	**Residential, Businesses, Organizations, Visitors**
Strategy	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability. Provide opportunities for community dialogue about sustainability issues and provide opportunities for residents, businesses and organizations to provide input into community sustainability goals, strategies and actions. Provide information and education to the community on potential solutions and actions that can be taken to replace unsustainable behaviours and activities with sustainable behaviours and activities. Promote and provide opportunities for individuals, businesses and organizations to participate in sustainability programs and initiatives.
Recommended Action	Develop a targeted community education and engagement program specific to the goals, strategies and actions contained in the Resource Conservation and Waste Management component of the ESAP.
Rationale	In order to make progress towards the goals contained in the Resource Conservation and Waste Management component of the ESAP the community needs to be aware of the goals, strategies and actions in the plan and the specific actions that can be taken to help achieve the goals. The community education and engagement plan for this component of the ESAP should include: • The connection between resource consumption, waste generation and sustainability • The goals, strategies and actions contained in the ESAP • Alternatives for reducing, reusing, recovering and recycling resources
Expected Impact	Increased understanding of the impact of personal and organizational choices on the resource consumption and waste management activities. Increased awareness and adoption of sustainable behaviours.
Resource Requirements	Staff time or consultant resources to develop and deliver the materials and program.

Potential Barriers to Implementation	Staff time Budget for program development and implementation Community interest in participating
Accountabilities	Communications and Sustainability Coordinator
Performance Measures	

Action or Program	**CEE-R8 Water Management Education and Engagement Program**
Action Type	**Recommended**
Applies To	**Residents, Businesses, Organizations, Visitors**
Strategy	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability. Provide opportunities for community dialogue about sustainability issues and provide opportunities for residents, businesses and organizations to provide input into community sustainability goals, strategies and actions. Provide information and education to the community on potential solutions and actions that can be taken to replace unsustainable behaviours and activities with sustainable behaviours and activities. Promote and provide opportunities for individuals, businesses and organizations to participate in sustainability programs and initiatives.
Recommended Action	Develop a targeted community education and engagement program specific to the goals, strategies and actions contained in the Resource Conservation and Waste Management component of the ESAP.
Rationale	In order to make progress towards the goals contained in the Water Management component of the ESAP the community needs to be aware of the goals, strategies and actions in the plan and the specific actions that can be taken to help achieve the goals. The community education and engagement plan for this component of the ESAP should include: • The connection between water use, water availability, water quality and aquatic habitats • The goals, strategies and actions contained in the ESAP • Alternatives for reducing water consumption, ensuring reliability of supply, protecting the quality of our water supply and protecting aquatic habitats.
Expected Impact	Increased understanding of the impact of personal and organizational choices on the sustainability of our water supply and aquatic habitats. Increased awareness and adoption of sustainable behaviours.
Resource Requirements	Staff time or consultant resources to develop and deliver the materials and program.
Potential Barriers to Implementation	Staff time Budget for program development and implementation

	Community interest in participating
Accountabilities	Communications and Sustainability Coordinator
Performance Measures	

Action or Program	**CEE-R9 Toxics Reduction Education and Engagement Program**
Action Type	**Recommended**
Applies To	**Residents, Businesses, Organizations, Visitors**
Strategy	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability. Provide opportunities for community dialogue about sustainability issues and provide opportunities for residents, businesses and organizations to provide input into community sustainability goals, strategies and actions. Provide information and education to the community on potential solutions and actions that can be taken to replace unsustainable behaviours and activities with sustainable behaviours and activities. Promote and provide opportunities for individuals, businesses and organizations to participate in sustainability programs and initiatives.
Recommended Action	Develop a targeted community education and engagement program specific to the goals, strategies and actions contained in the Toxics Reduction component of the ESAP.
Rationale	In order to make progress towards the goals contained in the Toxics Reduction component of the ESAP the community needs to be aware of the goals, strategies and actions in the plan and the specific actions that can be taken to help achieve the goals. The community education and engagement plan for this component of the ESAP should include: • The connection between the use of toxic compounds and products (such as pesticides) and the potential for deterioration in environmental quality or adverse effects to human health • The goals, strategies and actions contained in the ESAP • Alternatives for eliminating or reducing the use of toxic substances
Expected Impact	Increased understanding of the impact of personal and organizational choices on environmental quality and human health. Increased awareness and adoption of sustainable behaviours.
Resource Requirements	Staff time or consultant resources to develop and deliver the materials and program.
Potential Barriers to Implementation	Staff time Budget for program development and implementation

	Community interest in participating
Accountabilities	Communications and Sustainability Coordinator
Performance Measures	

Action or Program	**CEE-R10 Resident's Guide to Sustainable Living**
Action Type	**Recommended**
Applies To	**Residents**
Strategy	Provide information and education to the community on sustainability concepts and issues so that residents, businesses, organizations and visitors in the community develop an understanding of the key sustainability challenges facing the community and how the choices they make move the community away from or towards sustainability.
Recommended Action	Develop a resident's guide to sustainable living that provides an introduction to sustainability issues in the Bow Valley, the importance the community places on sustainable living and identifies recommended practices and key sustainability resources.
Rationale	Both new and some existing residents within the community may not be familiar with the community's sustainability objectives and programs.
Expected Impact	Creating and distributing a resident's guide would increase awareness of : • sustainability issues in the community • the importance the community places on sustainability • sustainability programs and resources available in the Bow Valley
Resource Requirements	Staff time or consultant resources to develop the materials. Budget to publish and distribute the guide.
Potential Barriers to Implementation	Staff time Budget for content development, production and distribution. Willingness of residents to read the guide.
Accountabilities	Communications and Sustainability Coordinator
Performance Measures	

Actions for Future Consideration

The following actions should be evaluated for possible future implementation:

- establishment of neighbourhood eco-teams
- use of community presentations and community cafes
- presentations to local businesses and organizations on the ESAP
- the use of innovative mechanisms to fund sustainability initiatives and drive changes in personal and organizational behaviours (such as a levy on taxes for specific initiatives)
- annual sustainability award(s)
- establishment of local sustainability or eco-certification process for businesses

Performance Measurement & Reporting

Performance Indicators

Specific performance indicators related to Community Education and Engagement should be selected once the resources available for this element of the ESAP have been confirmed and priorities established.

Potential performance indicators include:

- the number of formal sustainability workshops or events /events held
- the number of individuals, businesses or organizations participating in sustainability workshops, events or programs
- the number of local businesses or organizations participating in sustainability workshops, events or programs
- the number of sustainability related publications developed and distributed
- the number of community sustainability programs or initiatives initiated or managed by the Town of Canmore
- the number of community sustainability programs or initiatives initiated or managed by individuals, organizations or businesses (i.e. that are not run by Town of Canmore staff)

Data Sources

The data required to calculate the performance indicators will be tracked by the Communications and Sustainability Coordinator.

Reporting

A report will be prepared annually that summarizes the community education and engagement activities that occurred in the previous year and any relevant performance indicators.

The annual report is to be completed by March 31st following the calendar year in which the community education and engagement activities took place and performance indicators calculated.

The annual report will be prepared by the Communications and Sustainability Coordinator and will be distributed to:

- The CAO and Deputy CAO
- Mayor and Council
- The Environmental Advisory Review Committee
- The Town of Canmore Sustainability Committee
- The Biosphere Institute of the Bow Valley

The annual report will also be posted on the Town of Canmore's website.

Accountabilities

Town of Canmore

The Chief Administrative Officer (CAO), Deputy Chief Administrative Officer (Deputy CAO) and Mayor and Council are responsible for reviewing and approving the general direction, strategies and goals outlined in the Environmental Stewardship Action Plan and for ensuring that any actions required to achieve the goals are reviewed and approved prior to implementation. Once specific actions have been approved, there is an ongoing responsibility to ensure that the approved actions are adequately supported and implemented.

The Sustainability Coordinator is responsible for coordinating the development and delivery of Town initiated community education and engagement initiatives related to environmental stewardship and sustainability.

The Sustainability Coordinator is responsible for the regular review and updating of the community education and engagement actions and initiatives outlined in the Environmental Stewardship Action Plan (ESAP).

The Sustainability Coordinator is also responsible for ensuring that any new Town initiated actions or initiatives required to achieve the goals in this action plan are reviewed and approved by the CAO, Deputy CAO and Mayor and Council (as appropriate) before implementation.

The Managers of Recreation and Facility Services, Public Works, Planning & Development, Community Infrastructure, Engineering and Community Enrichment and other Town staff are responsible for supporting the Sustainability Coordinator in the development of community education and engagement initiatives within their respective areas of responsibility.

The Sustainability Coordinator is responsible for producing and distributing the annual Community Education and Engagement summary report by March 31st of each year.

Town of Canmore Sustainability Committee

The Town of Canmore's internal Sustainability Committee is responsible for reviewing the annual reports prepared for each element of the ESAP (including the Community Education and Engagement report), for monitoring progress towards the sustainability goals in the ESAP and for providing suggestions or recommendations to the Communications and Sustainability Coordinator on ways to improve the ESAP.

Environmental Advisory Review Committee

The Environmental Advisory Review Committee is responsible for reviewing the annual reports prepared for each element of the ESAP (including the Community Education and Engagement report), monitoring progress towards the goals in the ESAP and providing advice or formal recommendations to the Sustainability Coordinator, Town staff and Mayor and Council (as appropriate) on ways to improve the ESAP.

Biosphere Institute

The Biosphere Institute will continue to initiate, promote and manage community sustainability programs consistent with its mandate and objectives, including partnering with the Town of Canmore on such programs where it is advantageous to do so.

Subject to future direction from the Town of Canmore, the Biosphere Institute will continue to produce a biannual Community Monitoring Report for the Town of Canmore. The Community Monitoring Report will incorporate the results of the annual reports completed for each element of the ESAP.

Private Sector

The private sector, including residents, local businesses and organizations and visitors, are expected to actively participate in Town of Canmore and other community sustainability initiatives and to take the necessary steps to minimize the environmental footprint of their activities. Where appropriate, the private sector is also encouraged to take a leadership role in identifying, initiating and leading sustainability initiatives that will help move the community towards its desired future state.

Appendix

Background and Linkages

Development of Environmental Care Programs

Between 2003 and 2005, the Town of Canmore, with the assistance of the Environmental Advisory Review Committee (EARC), developed and implemented a series of environmental programs collectively referred to as the Environmental Care Programs. The following Environmental Care Programs were developed and implemented: an Energy Management Action Plan, a Water Demand Management Plan, a Solid Waste Action Plan a Cosmetic Pesticide Free Action Plan, and a Snow Management Goal. Each of the plans included one or more goal statements and a series of actions intended to achieve the goal statements.

The Natural Step to a Sustainable Canmore

In November 2004, the Town of Canmore and local participating organizations officially launched The Natural Step to a Sustainable Canmore. This sustainability program was led and coordinated by the Biosphere Institute of the Bow Valley and was based on The Natural Step sustainability framework.

As part of The Natural Step to a Sustainable Canmore initiative, a series of education and training workshops were provided for participating organizations, allowing them to create a common vision for a sustainable Canmore and supporting sustainability plans for their organizations. Participating organizations signed an Early Adopter Agreement and worked together to develop the visions and plans required to move their organizations and the community collectively towards the desired sustainability vision. Early Adopters included the Town of Canmore, the Biosphere Institute, the Radisson Hotel, Elizabeth Rummel School, Alpine Insurance, Tourism Canmore, Three Sisters Mountain Village, Polar Pin, the Canmore Seniors Association, and the Rocky Mountain Flatbread Company.

Mining the Future

During 2005 and 2006, the community participated in a visioning process that resulted in the production of a vision document for the community titled *Mining the Future – A Vision for Canmore*.

The Mining the Future process identified sustainability as one of three key foundational values for the community. Within the vision document, sustainability is defined as the integration of our social, economic and environmental activities in ways that enable us to meet our needs today without compromising the ability of future generations to meet their own needs. The other foundational values identified through the Mining the Future process include the concepts of diversity and connectedness.

The vision document also identifies environmental stewardship as one of five key guiding principles for the community. Other key guiding principles include our identity, economic sustainability, social fabric and civic engagement and leadership.

A series of goals and decision-making criteria are identified within the vision document for each of the guiding principles. The goals identified for environmental stewardship include:

8. Maintaining the biodiversity and ecological integrity of the Bow Valley ecosystem

9. Encouraging and supporting programs and activities intended to create an educated and engaged public that embraces environmental stewardship

10. Defining and promoting the entire spectrum of cultural and ecological values associated with our mountain landscape

11. Acknowledging and respecting the needs of both humans and wildlife regarding the use of the natural landscape

12. Acknowledging there are geographic and ecological limits in the Bow Valley, and that the reality of limits must be considered in discussions regarding continued use of the landscape by people and other species

13. Connecting Canmore's role as a gateway community to Provincial and National Parks to the regional ecosystem; maintaining regional connectivity of the surrounding landscape

14. Exercising leadership in environmental excellence through innovation and creativity.

The vision document identifies the following decision-making criteria as being important for achieving the community's environmental stewardship goals. Will the decision to be made:

7. Enhance community understanding of the responsibilities and tradeoffs involved with living with wildlife in the Bow Valley

8. Provide opportunities for individuals to participate responsibly in wilderness recreational activities

9. Use the precautionary principle

10. Be made with community collaboration on environmental issues

11. Define the environmental and social impacts on an economic endeavour

12. Maintain regional wildlife connectivity, ecological integrity and biodiversity (do no harm)

Sustainability Declaration

On April 4, 2006 the Mayor and Councillors of the Town of Canmore signed a sustainability declaration committing Council to creating the conditions necessary for a sustainable future.

The sustainability declaration incorporates the language and philosophy of The Natural Step (TNS) sustainability framework by indicating that the Town will strive to:

- Reduce and eventually eliminate our contribution to the progressive build-up of materials that are extracted from the Earth's crust;
- Reduce and eventually eliminate our contribution to the progressive build-up of synthetic materials produced by society;
- Reduce and eventually eliminate our contribution to the ongoing physical degradation of nature; and
- Reduce and eventually eliminate our contribution to conditions that undermine people's ability to meet their basic needs.

Canmore Community Sustainability Plan

Following adoption of the Mining the Future community vision document in 2006, the Town initiated a process to develop a Community Sustainability Plan (CSP). During 2008 and 2009, a draft CSP was developed with considerable community input. The CSP document was intended to serve as the Town's Municipal Development Plan as required under Alberta's Municipal Government Act and to help guide the community on its path toward greater sustainability by integrating the community's vision from the Mining the Future process with municipal planning and decision making.

In late 2009, development of the CSP document was halted and Council decided to postpone further consideration of the CSP. Although the CSP was not finalized or implemented as originally envisioned, during development of the draft CSP, Canmore residents communicated their desire to see their community become a leader in environmentally sustainable practices. The following areas were identified by Canmore citizens as key elements of environmental stewardship:

- protecting the natural landscape and wildlife; particularly environmentally sensitive areas, wildlife corridors and habitat patches;
- green building design;
- water conservation;
- waste management;
- energy efficiency and conservation; and
- reducing and eventually eliminating pesticide use.

The need for a comprehensive environmental sustainability education plan for the community to support initiatives in these areas was also identified during the CSP process.

Review of Environmental Care Programs

In 2008, the Environmental Advisory Review Committee completed a review of the Town of Canmore's Environmental Care Programs including the Energy Management Action Plan, Water Demand Management Plan, Solid Waste Action Plan and the Cosmetic Pesticide Free Action Plan. The Snow Management Goal has been met for several years so it was not included in the review. The purpose of the review was to assess progress towards achieving the goals outlined in the plans and to assess alignment of the goals and strategies in the plans with The Natural Step sustainability framework and the Mining the Future community vision document, both of which were adopted or developed after development of the Environmental Care Programs.

In October 2008, the Environmental Advisory Review Committee completed its review of the Environmental Care Programs and provided a series of recommendations to Town Administration and Mayor and Council regarding the programs. EARC's recommendations included the need to:

- update the goals and actions in the plans;
- integrate the various plans into a single sustainability action plan using a common framework;
- incorporate relevant content and create appropriate linkages with the Town's other key sustainability documents including the Mining The Future and Community Sustainability Plan (CSP) documents;
- more closely align the plans with The Natural Step planning framework and sustainability principles;
- develop and implement a formal performance measurement and reporting system for the various components of the plan; and
- identify clear accountabilities for achieving results under the plan.

Development of the Environmental Sustainability Action Plan

This Environmental Sustainability Action Plan (ESAP) has been developed to update, integrate and expand the Town's strategies, programs and initiatives related to environmental stewardship and to ensure effective implementation of the community's vision related to environmental stewardship. A formal performance measurement and reporting system is also being developed as part of this plan.

Approved by Administration and Mayor and Council, this plan will replace the Town's previous Environmental Care programs.

Planning Framework

Purpose

This section of the Environmental Sustainability Action Plan (ESAP) provides guidance on how to integrate the ESAP into the Town of Canmore's planning framework using The Natural Step and the Planning Cycle as a foundation. To achieve this purpose, this section explains how The Natural Step (TNS) was used to develop the ESAP and how the ESAP can be implemented and continually improved upon using the Planning Cycle.

In addition, this document highlights the relationship between the ESAP and the Town's Natural Step Master Plan, the Town of Canmore Business Plan and the Town's corporate budgeting/planning processes.

The Natural Step Framework – Key Concepts

The Town has formally adopted TNS as a planning framework to provide strategic direction and guide its sustainability strategies and activities. The following three components serve as the basis of the TNS framework.

1. **The Funnel:** Society currently operates in a manner that is placing increasing pressure on a diminishing supply of natural resources. While society's demand for resources and ecosystem services has been steadily increasing, these resources have a continually declining capacity for renewal and ability to supply essential life-supporting goods and services. The result is an effect wherein society is entering deeper into a funnel; the deeper we go, the less room or options we have to manoeuvre or operate before we hit a wall.

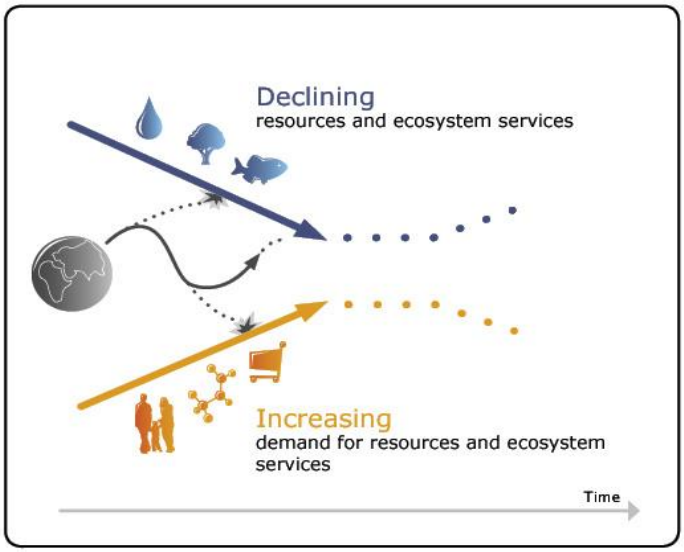

Illustration derived from www.naturalstep.org

Individuals, companies, municipalities and countries must take action to open the walls of the funnel by becoming less dependent on the conditions that are leading to the current state.

2. **The 4 System Conditions:** These represent the conditions necessary for environmental and social sustainability. Addressing these conditions is analogous to opening the walls of the funnel.

   In a sustainable society, nature is not subject to systematically increasing:

   1. Concentrations of substances extracted from the Earth's crust;
   2. Concentrations of substances produced by society;
   3. Degradation by physical means, and in society;
   4. Human needs are met worldwide.

3. **Strategies for avoiding the funnel:** To comply with the 4 system conditions and thus work towards opening the walls of funnel, the following concepts act as a guideline for strategic planning, problem solving, creating dialogue and taking action.

   Step by step approach: The TNS approach to avoiding the funnel involves identifying current activities that violate the system conditions, then working towards substituting these with other activities that either don't violate the conditions, or can be modified in the future to not violate them. This is an ongoing process requiring continuous improvement.

   - **Flexible Platforms:** Replacement activities should essentially be stepping stones that can be continually built upon in the future to comply with the system conditions. These activities should be flexible, keeping as many options open as possible.

   - **Low hanging fruit:** Give priority to flexible platforms that will provide a fast enough financial return in order to economically link the short-term with the long-term.

Developing Strategies for Avoiding the Funnel

The Natural Step provides a sequential approach to strategic planning called the A-B-C-D Model that is used to develop strategies for avoiding the funnel. The ESAP was developed using this model as a guideline and requires that future amendments to the plan undergo a similar process. The model is based on backcasting, wherein a desired future state is envisioned, then goals, strategies and actions are developed that work towards achieving this state. The following section details the A-B-C-D model.

The Natural Step A-B-C-D Model - A Backcasting Process

A) Awareness and Visioning

First, develop a common awareness amongst members of the organization/community about:

- the four system conditions
- the funnel as a metaphor
- strategies for avoiding the funnel
- the importance of natural systems in providing essential services

Second, using this knowledge of sustainability as a guideline, members decide on a shared vision of what a desired sustainable future would look like. This desired future state is what all future actions and strategies strive to achieve.

B) Baseline Mapping

In order to improve upon current, unsustainable conditions, members have to define specifically what the organization/community is doing today to support or to violate the four system conditions. This includes examining and recording current actions or programs that are addressing or violating the sustainability criteria defined by the four system conditions.

C) Creative Solutions

Once a baseline is established, the step by step approach is utilized to creatively identify potential solutions to the sustainability violations discovered in the baseline mapping process, always keeping in mind the desired future state. Members are encouraged to come up with creative goals, strategies and actions that would lead to the desired future state (backcasting).

D) Decide on Priorities

After evaluating the creative solutions identified in step C, members must decide which are the most important to meeting business and sustainability objectives. Backcasting is used to determine if each goal, strategy and action is, or will be, contributing to reaching the desired future state. Solutions that represent flexible platforms and low hanging fruit should be given priority. Approved goals, strategies and actions are integrated into a formal strategic plan.

Development and Content of the ESAP

The ESAP contains focus areas relating to:

- Energy and Climate Protection
- Resource Conservation and Waste Management
- Water Management
- Toxics Reduction
- Community Education and Engagement.

In the future, an ESAP component focused on the protection of environmentally sensitive areas and biodiversity may also be created.

Each of these focus areas contains the following sections:

- Desired Future State
- Current Reality
- Goals/Targets
- Strategies
- Existing Actions
- Recommended Actions
- Actions for Future Consideration
- Performance Measurement and Reporting

- Accountabilities

Desired Future State

In keeping with the principles outlined in the A-B-C-D Model, step A (Awareness and Visioning) requires that Town staff and members of the community have a firm understanding of the TNS approach to sustainability, including:

- The four system conditions
- The funnel as a metaphor
- Strategies for avoiding the funnel
- An understanding of the importance of natural systems in providing essential services

This knowledge is then used to create a vision for a sustainable Canmore. Each focus area of the ESAP contains a desired future state relating to that particular focus area. These elements were developed using the above TNS concepts as a framework, but also integrating the community's vision for sustainability obtained through the Mining the Future and Community Sustainability Plan (CSP) processes. Going forward, Town staff and members of the community need to be aware of this vision and ensure it remains aligned with overall Town sustainability objectives.

Current Reality

Each focus area of the ESAP examines the Town's current reality with respect to that particular focus area by providing information and data about Town of Canmore corporate operations and community actions that are violating the system conditions, as well as information about programs that were designed to address sustainability issues. The development of the Current Reality section is consistent with step B of the TNS A-B-C-D Model (Baseline Mapping). The key trends of this analysis should be understood by Town staff and community members.

Having already established an outlook of the Town's current reality in the ESAP, going forward the focus will be on the regular monitoring and reporting of relevant performance indicators specified in the ESAP and comparison of this data with both the baseline (Current Reality) data and the desired goals.

Goals

The information gathered in the baseline mapping process was used in the ESAP to develop a series of goals aimed at addressing system violations and contributing to achieving the desired future state. Goal setting is consistent with step C of the TNS A-B-C-D model (creative solutions). Performance indicators will demonstrate progress toward achieving these goals.

During the goal setting process, efforts were made to identify short term (1- 5 years), medium term (5-10 years) and long term (10-40 years) goals and targets for Town of Canmore corporate operations and for the community, including businesses, residents and the institutional sector, that would move Canmore as a whole towards the desired future state. As the ESAP is implemented, over time new goals may need to be added to the plan and existing goals may need to be modified to reflect changing circumstances.

It is important to keep in mind that according to TNS, the goal of sustainability is to first reduce, then eliminate the progressive build up of substances or the deterioration of the natural environment, suggesting that an absolute reduction of these impacts is ultimately required. Historically, the Town of Canmore's sustainability initiatives have focused on achieving modest per capita reductions of waste generation, greenhouse gas emissions, water and resource consumption and other related indicators. However as the Current Reality sections of the ESAP demonstrate, when population growth is taken into account, the total amount of waste generated, water and energy consumed and greenhouse gas emissions created by the community all continue to increase. In order to achieve true sustainability, more aggressive goals will be required and there will need to be a focus on achieving absolute, rather than just per-capita, reductions in resource consumption and the associated environmental impacts.

Strategies

Each focus area of the ESAP contains multiple strategies aimed at achieving the established goals and reaching the desired future state. These strategies were developed during step C of the TNS A-B-C-D model (Creative Solutions) wherein creative thinking was used to come up with ways to overcome the current system violations discovered in the baseline mapping process. Although it may not be possible to carry out all of these strategies in the short term, they serve as potential tactics that may be implemented at a future date.

Going forward, Town staff and members of the community should be regularly encouraged to brainstorm additional strategies to overcome sustainability issues discovered through the analysis of relevant performance indicators. The additional strategies identified during this process should be evaluated to determine appropriate priorities and selected and approved strategies and priorities should be incorporated into the ESAP.

Actions

Each focus area of the ESAP lists existing actions the Town of Canmore is undertaking to achieve its environmental objectives. Where appropriate, existing actions being taken by others (such as the Bow Valley Waste Management Commission, Biosphere Institute of the Bow Valley) are also included. In addition, the ESAP contains a series of recommended actions as well as actions for future consideration, both of which were developed during step C of the TNS A-B-C-D process (Creative Solutions) wherein creative thinking, best practices and input from staff were used to come up with specific actions aimed at carrying out strategies.

Going forward, the regular collection and analysis of information relating to relevant performance indicators will inform the creation of further actions aimed at carrying out the defined strategies. Conversely, other actions may become outdated, requiring removal from the ESAP.

To maximize the effectiveness of this process and to stay in line with the principles of TNS, creative thinking/brainstorming from all levels of the organization and community should be encouraged to refine and update the ESAP on a regular basis. The potential actions identified during this process should be evaluated to determine priorities, focusing initially on low hanging fruit and flexible platforms that are technically and financially feasible. Improvements or modifications to existing or previously recommended actions, new recommended actions and additional actions for future consideration resulting from this process should be incorporated into the ESAP.

The following template is a guideline for developing additional recommended actions (actions in the ESAP appear in this format):

Action or Program	ex. Herbicide Free Voluntary Registry
Action Type	ESAP action categories are Existing Actions, Recommended Actions, and Actions for Future Consideration • Does it build on an existing action? • Is it a recommended action that can be considered for immediate implementation? • Is it an action that requires further study before a recommendation or decision on its implementation can be made?
Applies To	Which Town department(s) or sectors(s) of the community does the action apply to?
Strategy	Which strategy in the ESAP does the action support?
Recommended Action	What is being recommended? What are the specific details of the recommended action?
Rationale	Why is this action necessary?
Expected Impact	What is the expected outcome of the action? How will it satisfy one or more of the 4 system conditions and help to achieve sustainability?
Resource Requirements	What human, financial or other resources will be required to carry out the action?
Potential Barriers to Implementation	What are the potential barriers to implementing the action? • Staff time of community volunteers • Financial resources • Organizational or community inertia or resistance • Other?
Accountabilities	Who is accountable for implementing this action? Who will need to provide secondary support (i.e. resources, data, budget, etc.)
Performance Measures	What specific indicators can be measured to monitor implementation of the action and determine progress towards achieving the relevant ESAP goal?

Performance Measurement and Reporting

The ESAP contains a performance measurement and reporting system for each focus area that clearly identifies performance indicators, the locations of data, the frequency of measurement and reporting, and accountabilities for gathering and reporting data. Additional future actions will require the development of additional performance indicators and measurement and reporting mechanisms.

The following is a guideline for the development of future monitoring and reporting systems:

Selection of Performance Indicators

It is recommended to select no more than 3 to 5 indicators for each strategy area. Indicators should be able to be collected on a regular basis with reasonable level of effort.

Performance Measurement

When developing performance measurement systems:

- Data sources for performance measurement are identified
- Frequency of data collection is determined
- Identify who is responsible for collecting the data
- Most indicators should be calculated and reported on at least annually

Reporting Mechanisms

Identify the mechanisms by which the data will be reported, for example:

- Annual Reports
- Biannual Community Monitoring Report
- Website
- State of Town Report

Report Contents

The following should be included in the reports:

- Present data collected for various performance indicators in a graphical form that makes identification of key trends possible
- Describe current situation
- Describe recent successes
- Describe what strategies and actions were successfully implemented and which were not
- Describe short term trends (since last report)
- Describe medium term trend (3 to five years)
- Describe any barriers to success that were encountered which hindered progress (resources, technical limitations, etc.)

Accountabilities

Each focus area of the ESAP contains a section detailing the specific responsibilities for carrying out the initiatives under that element of the ESAP.

ESAP Implementation - The Planning Cycle

The purpose of the ESAP is to guide the Town's sustainability initiatives relating to the focus areas contained in the document. Going forward, the Planning Cycle – a commonly used management framework that strives for continuous improvement – should guide the ESAP's implementation and ongoing future development.

The Planning Cycle

1. Plan
2. Implement
3. Monitor
4. Revise

The use of the Planning Cycle will keep the document current and allow it to be continuously improved upon so that ultimately the Town can move towards sustainability.

Plan

With the development of the draft ESAP, a significant step in the planning process has been completed.

The next step in the planning process will be to make the ESAP available to the community for further discussion and input before it is formally adopted. Although development of the document has been informed by the results of the Mining the Future community visioning process, the results of the community participation processes associated with development of the draft Community Sustainability Plan and input from key Town staff and the Environmental Advisory Review Committee, the draft ESAP will benefit from review and input from a broader cross-section of the community.

Implement

Once the plan is formally adopted, Town staff and members of the community will become responsible for its implementation. Due to the significant number of strategies and actions contained in the ESAP and the long planning horizon involved (up to 40 years for some elements of the ESAP), it will not be possible (or necessary) to implement all of the proposed strategies and actions in the short term. It will therefore be necessary to establish priorities and the actions selected will need to reflect the available resources.

Monitor

Annual monitoring and reporting of the performance indicators in the ESAP is critical for assessing the success of the strategies and actions implemented and for monitoring progress towards the goals and desired future states outlined in the ESAP. Each element of the ESAP requires the collection and annual reporting of performance indicators related to that focus area. The annual reports should be made

available to the community and reviewed annually by Town administration and elected officials to assess progress towards and barriers to sustainability.

Revise

The goals, strategies and actions in the ESAP should be reviewed and updated on a regular basis (biannually) to ensure that the plan remains current and reflects changing circumstances. This will include building upon existing elements as well as creating new goals, strategies and actions over time. Regular review and updating of the ESAP allows the plan to be continually improved based on the experiences gained.

Due to the challenges associated with updating and maintaining hardcopy (paper) based action plans, consideration should be given to maintaining the ESAP in an online format. An on-line format would improve accessibility and make updating of the action plans easier.

Integrating the ESAP into the Town of Canmore's Planning Framework

ESAP Linkage with The Natural Step Master Plan

The Town's TNS Master Plan contains a series of action plans for each Town department that incorporate elements of the original Environmental Care Programs as well as elements of TNS. The Environmental Care programs will be replaced by the ESAP, which has expanded on these programs and more fully incorporated the principles of TNS. Once the ESAP is adopted as an official Town document, the various departments' action plans will need to be updated to support the initiatives in the ESAP.

The Action Plans for each department evaluate the alignment of each departmental initiative with the four system conditions of TNS. Going forward, it is recommended to link each initiative in the departmental action plans with specific actions and strategies of the ESAP rather than linking them with the four system conditions. This will result in greater alignment with the sustainability objectives outlined in the ESAP, which are developed using the TNS framework.

ESAP Linkage with the Town of Canmore's Business Plan

The Town of Canmore’s Business Plan is developed annually to ensure alignment of the Town’s operations with the community’s vision. During Mining the Future, one of the key community values identified was sustainability. Since the ESAP contains the goals, strategies and actions for achieving environmental sustainability, it will serve to operationalize the community's vision. Consequently, relevant goals, strategies and actions outlined in the ESAP should be integrated with the Town's formal Business Plan.

ESAP Linkage with Capital Budgeting Process

The Town's annual and long term capital budgeting processes also need to be aligned with the initiatives in the ESAP. This will be done through the capital budget justification sheets.

Ownership of the ESAP

For the ESAP to be effective and of lasting value, Town staff and the community will need to take ownership of the plan.

While the input of Town staff and the Environmental Advisory Review Committee was used to develop the current version of the ESAP, a broader level of staff and community involvement in and ownership of the ESAP is required to ensure that the plan achieves the level of individual, organizational and community buy-in and support necessary for effective implementation and long term success. Furthermore, to be useful over the long term, the ESAP needs to be viewed as living document that is referred to, discussed, used and updated on a regular basis to ensure that it remains current and responsive to changing circumstances.

Achieving the required level of individual and organizational buy-in within the Town of Canmore will require that everyone who may be impacted by the plan or are responsible for implementing some aspect of the plan believes that the plan is necessary, appropriate and supported by others within the organization, particularly those at higher levels. Ownership of the plan will therefore require the effective and ongoing participation of town staff and elected officials at all levels including employees, Managers and Supervisors, the Sustainability Coordinator, the Chief Administrative Officer, Deputy Chief Administrative Officer and Mayor and Council.

The following is a summary of the general accountabilities relating to the development, maintenance and implementation of the ESAP.

Mayor and Council

Mayor and Council are responsible for:

- Reviewing and endorsing the overall direction of the ESAP and ensuring its alignment with the overall corporate and community vision for a sustainable Canmore
- Approving the resources required to implement the actions and initiatives outlined in the ESAP as part of the annual budgeting process, as appropriate
- Regular monitoring of progress towards achieving the goals and targets under the ESAP
- Regular reporting to the community on progress under the ESAP

Chief Administrative Officer & Deputy Chief Administrative Officer

The CAO and Deputy CAO are responsible and accountable for:

- Reviewing and endorsing the overall direction of the ESAP and ensuring its alignment with the overall corporate and community vision for a sustainable Canmore (with Mayor and Council)
- Advancing budget requests for the resources required to implement the actions and initiatives outlined in the ESAP as part of the annual budgeting process, as appropriate
- Reviewing department plans to ensure alignment with the objectives of the ESAP
- Ensuring the Accountability Agreements of Service Area Managers reflect relevant goals, strategies and actions under the ESAP
- Ensuring that the approved actions are adequately supported and implemented

- Establishing priorities and allocating available resources when there are conflicting priorities between the demands of the ESAP and other Town initiatives
- Regularly reviewing department and overall Town progress towards implementing and achieving the goals, strategies and actions under the ESAP
- Ensuring that the strategies and actions in the ESAP are reviewed at least every two years to determine if there is a need for modification.
- Ensuring that the desired future states and goals/targets in the ESAP are reviewed at least every five years, or sooner if circumstances permit.

Supervisors and Managers

Supervisors and Managers are responsible and accountable for:

- Identifying and recommending a set of proposed and prioritized short, medium and long term goals, strategies and actions that will contribute to achieving the desired future states and goals outlined in the ESAP
- Aligning department plans and budgets with the goals, strategies and actions contained in the ESAP
- Coordinating the collection of data relating to performance indicators on an ongoing basis.
- Monitoring, reviewing and reporting to the CAO, Deputy CAO and Mayor and Council on the status of departmental initiatives under the ESAP, including areas where progress has been made and areas that have been unsuccessful.
- Regularly reviewing the ESAP to ensure that the objectives, targets and actions outlined in the plan remain relevant and reflect the priorities and resources of the Town of Canmore and its citizens.
- Completing annual summary progress reports for their respective departments by March 31st of each year.

Sustainability Coordinator

The Sustainability Coordinator is responsible and accountable for:

- Working with Managers and Supervisors to coordinate, identify and recommend a set of proposed and prioritized short, medium and long term goals, strategies and actions that will contribute to achieving the desired future states and goals outlined in the ESAP
- Coordinating programs and actions related to community education and engagement
- Producing an annual summary report of progress toward community education and engagement initiatives by March 31st of each year.
- Reviewing and updating community education and engagement initiatives.
- Facilitating the regular review and updating of the ESAP by the Supervisors, Managers, CAO, Deputy CAO and Mayor and Council
- Implementing and maintaining a performance monitoring and reporting system to ensure regular and systematic performance monitoring and reporting under the ESAP
- Coordinating the compilation, distribution and review of an annual ESAP progress and performance monitoring report
- Ensuring that the Environmental Advisory Review Committee receives regular reports and updates on progress under ESAP

Employees

Employees are responsible and accountable for:

- Identifying and recommending potential goals, strategies and actions that will contribute to achieving the desired future states outlined in the ESAP
- Implementing and supporting approved strategies and actions under the ESAP

Sustainability Committee

The Town of Canmore's internal Sustainability Committee is responsible and accountable for:

- Reviewing the annual reports prepared for each element of the ESAP and monitoring progress towards the desired future states and goals in the ESAP
- Providing suggestions and recommendations to the Sustainability Coordinator on ways to improve the ESAP, including potential new goals, strategies and actions.

Environmental Advisory Review Committee

The Environmental Advisory Review Committee is responsible and accountable for:

- Providing advice or formal recommendations to the Sustainability Coordinator, Town staff and Mayor and Council (as appropriate) on ways to improve the ESAP, including potential new goals, strategies and actions.

The Community

Community members, including residents, businesses, institutions and visitors are encouraged to:

- Identify new goals, strategies and actions that will help move the community towards its desired future state and sharing them with the Sustainability Coordinator, Mayor and Council
- Actively participate in existing sustainability programs and actions developed by the Town of Canmore and other organizations
- Develop, support or lead sustainability initiatives that will contribute to achieving the desired future states and goals outlined in the ESAP.