Township of Langley Corporate Greenhouse Gas Inventory and Forecast Report with Recommendations for the Development of a Corporate Action Plan

September 2004

EXECUTIVE SUMMARY

This report presents the Township of Langley's corporate greenhouse gas (GHG) emissions inventories, forecast information, potential reduction measures and a list of recommendations.

Global climate change and GHG emissions are international issues that the federal, provincial and municipal levels of government in Canada are working on together to address. Climate change is a term used to describe the climatic consequences of increased warming of the earth's surface as a result of the accumulation of atmospheric greenhouse gases. GHG's essentially form a blanket over the earth's atmosphere, trapping the sun's heat energy near the earth's surface.

The Township joined the Federation of Canadian Municipalities Partners for Climate Protection (PCP) Program in January 2001. PCP is a national program that helps Canadian local governments reduce GHG emissions and improve the quality of life. Currently, 115 Canadian municipal governments have committed to reducing GHG and acting on climate change.

The Township of Langley recognizes the importance of community leadership and is committed to reducing the environmental impact of GHG from its operations and services.

Greenhouse Gas Inventories

In a step to fulfil requirements of the PCP program comprehensive GHG emissions inventories were completed in 1995, 1999 and 2003. The inventories highlight that since 1995 GHG emissions for the corporation have increased by approximately 655 tonnes (total 4,960 tonnes) with largest increase resulting from the building sector.

As the Township continues to grow, new buildings have to be built and upgraded to account for this growth. The 2003 inventory has identified that this sector generated 2,898 tonnes of equivalent CO_2 (eCO_2), an increase of 1,149 tonnes from 1995 levels. In 1999 the Walnut Grove Recreation Centre under went a major expansion that involved the construction of an Olympic sized swimming pool and as a result the electrical consumption at the facility increased by 535% (1995 to 2003). Although GHG emissions have been increasing the numbers would have been considerably higher if the Township had not undertaken a municipal building lighting retrofit at the main RCMP detachment, Operations Centre and Municipal Hall.

The municipal fleet has also seen an increase in the number of vehicles. However because the newer vehicles provide better fuel efficiency the overall GHG emissions have actually been retreating. The main fossil fuels used by the Township are gasoline, diesel and propane. In the late 1990's the Township began to convert certain vehicles from its fleet to propane. This measure was undertaken to reduce the overall fuel expenditure. However, over time the maintenance costs began to substantially increase making this an undesirable alternative. Since 2001, the Township has shifted back to purchasing gasoline based vehicles. Overall, the GHG emissions from the municipal fleet have been reducing.

Similar to the municipal vehicle fleet the number of traffic signals and street lights has increased over the years and GHG emissions have dropped. One of the reasons being since 1999 the Township of Langley in partnership with BC Hydro has been retrofitting all the traditional incandescent traffic signals with new energy efficient light emitting diode (LED) traffic signals. One of the main advantages of LEDs is that they use 90% less energy compared to standard incandescent lamps

As the population in the Township continues to grow, the consumption of water and the amount of liquid waste is also growing. As a general rule, the more water and liquid waste the Township is required to deal with, the greater the energy consumption and GHG emissions. In 2003 water and sewage pumping and treatment stations accounted for 4 percent of the emissions generated through energy consumption. This is a decrease from 1995 where water and sewage emissions accounted for 12

percent of the total emissions for the Township. The reason for the significant decrease in energy consumption post 1995 is largely attributable to the transfer of ownership of the N.W. Langley Sewage Treatment Plant to the Greater Vancouver Sewerage and Drainage District (GVS&DD). In doing so the GVS&DD assumed responsibility for the debt, future capital and operating costs of the treatment plant.

The disposal of waste results in the direct emission of GHG when it is burned in incinerators and when it degrades in landfills and produces methane. Waste generated by municipal operations consists of all employee generated waste at municipal facilities such as parks, recreation buildings, operations centre, fire halls, etc. Unfortunately, no weigh scales are used by the Township when waste is collected from these municipal facilities and therefore no data is available. The volume of waste generated and GHG emissions were estimated for all three inventory years.

Emissions Forecast

Upon completion of the GHG inventories an emissions forecast was prepared based on assumptions of population growth with the Township. A business as usual scenario was developed by simply taking the 2003 figures and extrapolating the same amount up to 2010. This was done assuming a population increase of 13.5% over the next 6 years. GHG emissions for the forecast year of 2010 have been estimated at 5,630 tonnes.

Emission Reduction Target

The emission reduction target is the quantity of GHG emissions that are planned to be reduced by a designated year. The GHG reduction target forms the basis for an emissions reduction program and provides a starting point from which to track progress. The year 1995 has been used as the baseline year for the assessment and monitoring of GHG emissions. The Federation of Canadian Municipalities recommends a 20% reduction below the baseline year from municipal operations within 10 years of joining the program.

While a 20% reduction below the baseline year is ideal, what is most important is to begin by setting a realistic target that is feasible. If the Township were to reduce emissions by 20% from 1995 levels, it would require a reduction of 2,186 tonnes of eCO_2. A more viable goal would be for the Township to reduce their corporate emissions by 20% from 2003 levels by the year 2010. This would result in a reduction of 1,662 tonnes eCO_2. This target can be refined by the Township of Langley when the local action plan is developed.

Potential Reduction Measures

A 13.5% increase in emissions within a 6-year period certainly provides a challenge for reducing GHG levels. However, there are many potential opportunities for change. For example, undertaking annual energy audits, lighting upgrades, green procurement policy, employee energy reduction program, shift to alternative fuels, driver training programs, water conservation, etc. These and other reduction measures will require further evaluation and assessment during the development of the action plan.

Next Steps

This report acts as a benchmark for the municipality while it works towards achieving its emissions reduction target. It is recommended that:

1. Township Council accepts this report and sets a 2010 emissions reduction target.
2. A comprehensive local action plan be developed (milestone 3).
3. Township Council authorize staff to Implement the action plan.
4. Township Council request staff to undertake a similar process for the community component of the PCP program.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

GLOSSARY OF TERMS

ALR – Agricultural Land Reserve

BEST – Better Environmentally Sound Transportation

CCP – Cities for Climate Protection

CH_4 - Methane

CO – Carbon Monoxide

CO_2 – Carbon Dioxide

CRI – Colour Rendering Index

eCO_2 – The various greenhouse gases each has a different impact upon the greenhouse effect and for simplicity and comparison, they are frequently converted to their carbon dioxide equivalence.

FCM – Federation of Canadian Municipalities

GJ - Gigajoules

GVRD – Greater Vancouver Regional District

GVS&DD – Greater Vancouver Sewerage and Drainage District

GVWD – Greater Vancouver Water District

HVAC – Heating, Ventilation and Air Conditioning

ICLEI – International Council of Local Environmental Initiatives

IPCC – International Panel on Climate Change

kW - Kilowatt

LAP – Local Action Plan

LEED – Leadership in Energy and Environmental Design is widely recognized "green" building rating system that allocates points for a diversity of environmental design features including, but not limited to, energy efficiency.

LED – Light Emitting Diode

LFG – Landfill Gas

LPG – Liquified Petroleum Gas

NO_x – Nitrogen Oxide

PCP – Partners for Climate Protection

PFC - Perflurocarbons

PM – Particulate Matter

PSI – Pounds per Square Inch

SA – Single Axel

SO_2 – Sulphur Dioxide

TOL – Township of Langley

VOC – Volatile Organic Compounds

ACKNOWLEDGEMENTS

I would like to gratefully acknowledge the support provided by Mr. Ross Shwaikoski of the Greater Vancouver Regional District and by all the Township of Langley staff.

1.0 INTRODUCTION

The Township of Langley is committed to ensuring it does its part in national and international efforts to address the threat of climate change, and will pursue this commitment in a manner consistent with the directions set out in the Partners for Climate Protection (PCP) program. Langley Township is one of 115 municipalities that have joined the PCP program. Township Council passed a notice of motion on January 15, 2001 to participate in the PCP program (Appendix A). This is a national program that brings Canadian municipal governments together to reduce the local production of greenhouse gas emissions and improve the quality of life.

Global climate change and greenhouse gas (GHG) emissions are international issues that the federal, provincial and municipal levels of government in Canada are working on together to address. Climate change is a term used to describe the climatic consequences of increased warming of the earth's surface as a result of the accumulation of atmospheric greenhouse gases. GHG's essentially form a blanket over the earth's atmosphere, trapping the sun's heat energy near the earth's surface.

The Township of Langley recognizes the importance of community leadership and is committed to reducing the environmental impact of GHG from its operations and services.

The objectives of this report are to:

- conduct inventories of the Townships GHG emissions for 1995, 1999 and 2003;
- identify any existing programs that have reduced Langley's greenhouse gas emissions since 1995;
- project the Township's emissions in 2010; and
- provide some potential emission reduction measures that may be implemented as part of a local action plan.

1.1 The Greenhouse Effect

There is an overwhelming body of scientific evidence that suggests human-induced climatic change arising from the enhanced greenhouse effect is already occurring. It is not a question of whether the earth's climate will change, but rather by how much, how fast and where.

The greenhouse effect is the actual climate system that warms the earth to a temperature that can sustain life. The major problem since the industrial revolution is that anthropogenic activities (produced by human activities) such as burning of fossil fuels, logging, and poor land management practices have lead to an imbalance of GHG in the atmosphere.

The atmosphere, layers of gases and dust particles surrounding the earth, regulates the temperature by absorbing or reflecting back into space energy from the sun. Solar energy that does reach the earth warms the land and oceans, which in turn releases this heat in the form of infrared radiation.

It is this infrared radiation that is absorbed by GHG in the lower atmosphere, warming the earth and creating a greenhouse effect.

Greenhouse gases are composed primarily of water vapour, carbon dioxide and methane. Water vapour is responsible for about three-quarters of the natural greenhouse effect. However, if the greenhouse gases produce a warming process, this effect is amplified by the presence of water vapour and then the temperature rises more. Today there are higher concentrations of GHG in the atmosphere causing more heat to be trapped. This is called the enhanced greenhouse effect. Figure 1 provides a graphical illustration of both the natural and enhanced greenhouse effect.

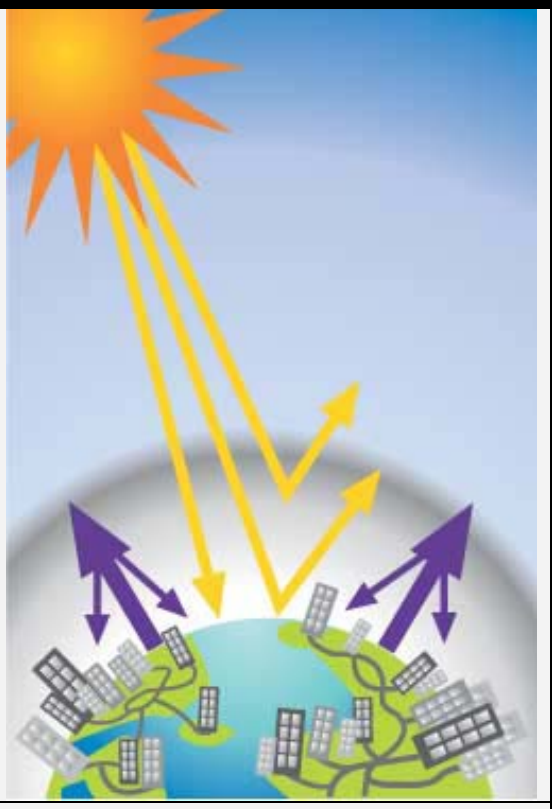
Natural Greenhouse Effect	The Enhanced Greenhouse Effect
	
The earth is covered by a blanket of gases which allow light energy from the sun to reach the surface, where it is converted into heat energy. Most of the heat is re-radiated towards space, but some is trapped by greenhouse gases in the atmosphere. This is a natural effect which keeps the temperature of the earth at a level necessary to support life.	Human activity – particularly burning fossil fuels (coal, oil and natural gas) and land clearing – is generating more of the greenhouse gases. Most scientists are convinced that this will trap more heat and raise the earth's surface temperature.

Figure 1 Natural and Enhanced Greenhouse Effect (Australian Greenhouse Office, 2004)

1.2 Climate Change and British Columbia

The International Panel on Climate Change (IPCC), a group of 2,500 scientists, agree there is new stronger evidence that most of the warming observed over the last 50 years is attributable to human activity. Over the past 100,000 years the earths atmosphere has gradually warmed and cooled but scientists have come to realize that fossil fuel combustion and ecosystem disruption have triggered more rapid climate change. Climate scientists around the world agree that average global temperatures could rise by 1.4 to 5.8 degrees Celsius by the end of this century, see Figure 2 for a graphical representation.

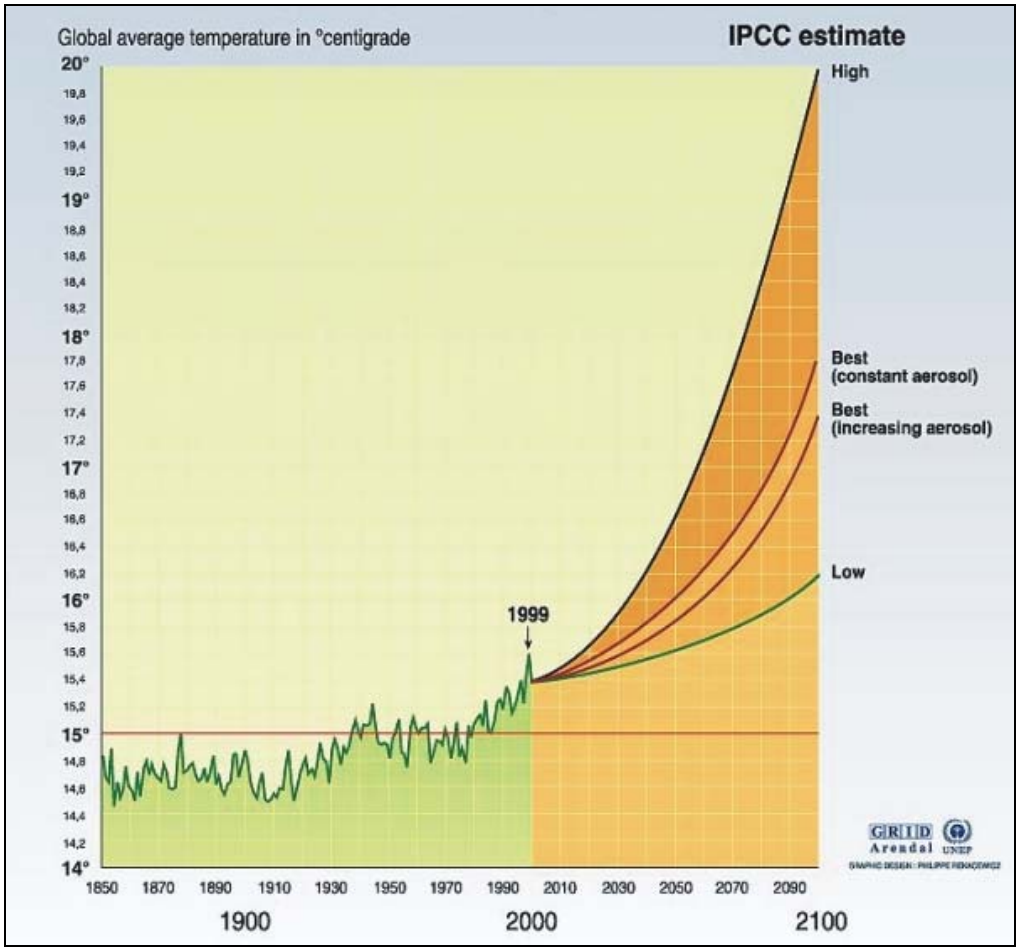


Figure 2 Global Average Temperature in Degrees Centigrade (Global Resource Information Database, 2004)

In 1999 British Columbia produced almost 16 tonnes of GHG per person, mostly through the burning of fossil fuels. According to the "Indicators of Climate Change for British Columbia 2002" report prepared by the Ministry of Water, Land and Air Protection, during the 20th century many properties of the climate have changed, affecting marine, freshwater and terrestrial ecosystems in British Columbia. Average annual temperature warmed by 0.6ºC on the coast, 1.1ºC in the interior and 1.7ºC in northern BC. Based on analysis of historical data the following are a list of some the trends that been observed.

- Night-time temperatures increased across most of BC in spring and summer.
- Precipitation increased in southern BC by 2 to 4 percent per decade.
- Lakes and rivers become free of ice earlier in the spring.
- Sea surface temperatures increased by 0.9ºC to 1.8ºC along the BC coast.
- Sea level rose by 4 to 12 centimeters along most of the BC coast.
- Two large BC glaciers retreated by more than a kilometer each.
- The Fraser River discharges more of its total annual flow earlier in the year.
- Water in the Fraser River is warmer in summer.
- More heat energy is available for plant and insect growth (BC WLAP, 2002).

In 2003, according to Environment Canada, BC's disastrous year of fire, flood and drought topped a list of Canada's worst weather events for the year.

It is impossible to predict exactly what the impacts of climate change will be to Langley, but scientists have identified some of the implications that Langley and other areas in the region can probably expect to face. The following are a list of some of these implications.

- The lower Fraser Valley is projected to experience some of the most significant climate change impacts in BC. Warmer, drier summers will include periods of hot, stagnant weather that will lead to more severe smog episodes (David Suzuki Foundation, 2004).

- The Township of Langley contains over 700km of streams that provide direct and indirect habitat for local fish species, including seven salmonid and two endangered fish species. With climate change: water levels, temperature and peak flow timing of rivers and streams will put further pressures on an already stressed species, such as salmon. According to the David Suzuki Foundation, the Fraser River, one of Canada's largest salmon producers, often reaches temperatures of 22ºC while the salmon are returning to spawn. If the temperature increases by an additional one or two degrees, most of the returning salmon will likely die before spawning.

- Flooding is expected to increase due to increased storm intensity, wetter winters and ocean level rise.

- According to the David Suzuki Foundation (1995 B.C. Environment Study), that health care costs of air pollution in the Lower Fraser Valley alone was estimated to be $830 million in 1990 and is projected to rise to $1.5 billion by 2005 (David Suzuki Foundation, 2004).

1.3 Role of Local Governments

Up to half of Canada's GHG emissions, 350 million tonnes, are under the direct or indirect control or influence of municipal governments (see Figure 3). Municipal operations generate 38 million tonnes of GHG per year through fuel and electricity consumption and decomposition of organic matter from waste (Federation of Canadian Municipalities, 2004). However, local governments are also in a very unique position that allows them to have an impact on reductions in GHG emissions on a broad scale. This is because not only can local governments take action themselves, by reducing energy consumption in municipal operations, but they also have a wide range of tools at their disposal to encourage all other sectors within their jurisdiction to take action on climate change. Regulatory, fiscal, and voluntary mechanisms can all be used effectively to reduce GHG emissions in the wider community. Municipalities can reduce GHG emissions in their community by improving buildings, by utilizing renewable energy sources and through decisions on land use.

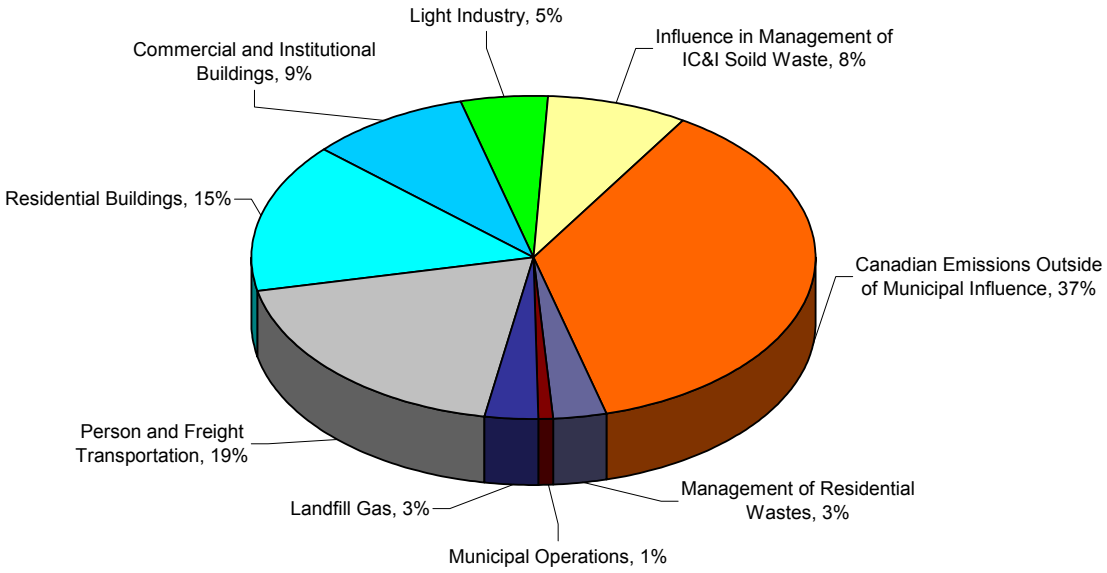


Figure 3 Canadian GHG Emissions Directly and Indirectly Controlled by Municipalities Compared to Total National Emissions 1990 (Pembina Institute, 2004)

1.4 International and National Context

1.4.1 Kyoto Protocol

The Kyoto Protocol, established in 1997, is an international agreement to address climate change by reducing GHG emissions, caused primarily by the burning of fossil fuels. The protocol encourages countries around the world to move to more environmentally responsible ways of producing and using energy, in order to meet their target for emissions reduction.

The Protocol created various targets to reduce overall GHG emissions by a global average of 5.2 percent below 1990 levels in the commitment period of 2008 to 2012. The Protocol will come into effect 90 days after at least 55 Parties of the Convention, which account for at least 55% of the total carbon dioxide emissions for 1990 from Annex I (36 industrialized countries and economies in transition listed in Annex I of the UN Framework Convention on Climate Change) countries have ratified, accepted, approved, or acceded the Protocol. The 55% requirement will be satisfied when Russia ratifies the Protocol. The United States has indicated that it will not ratify the Kyoto Protocol.

1.4.2 Partners for Climate Protection Program

Partners for Climate Protection (PCP) program is a national program that helps Canadian local governments reduce GHG emissions and improve the quality of life. Currently, there are 115 governments nation wide that have committed to reducing GHG and acting on climate change. PCP is the Canadian component of the international Cities for Climate Protection (CCP) network that is made up of more than 600 communities. The PCP program is one of many tools that can be used to assist in reaching the targets set out in the Kyoto Protocol.

PCP offers:

- Five-milestone framework—a proven municipal strategy
- FCM staff support—access to resources and information
- Resources—case studies, templates and newsletters
- Networking—sharing experience with more than 100 communities participating in PCP and with an international network of local governments

The PCP program is discussed in further detail in section 3.0 of this report.

2.0 COMMUNITY AND CORPORATE PROFILE

2.1 Community

The Township of Langley, located in the lower mainland, is one of the oldest municipalities in British Columbia. It is a multi-functional corporation that provides for the needs, services and expectations of Langley residents. “A Community of Communities, it includes within its incorporation, Fort Langley, Aldergrove, Murrayville, Walnut Grove, Brookswood/Fernridge and Willowbrook/Willoughby.” It is a member of the Greater Vancouver Regional District (GVRD) and is bounded on the west by the City of Surrey, on the north by the Fraser River, on the east by the City of Abbotsford, and on the south by the Canada-U.S. boundary (Figure 4). It comprises 303 square kilometres (122 square miles) and is home to approximately 91,000 people. The Township does not include the separate municipal entity of Langley City.

The Township is known for its rural agricultural areas of which 23,784 hectares of the municipality lie in the Agricultural Land Reserve (ALR). This represents 40 percent of all agricultural land within the Fraser Valley. The rural area of the Township consists of a wide variety of land uses, including agricultural operations, rural and residential development, commercial and industrial uses, natural areas, recreational and institutional uses. Agricultural activities range from commercial farms to hobby farms.

Langley was the first major agricultural centre in British Columbia. In the 1830`s, the Hudson`s Bay Company began to develop approximately 810 hectares (2,000 acres) in an area known as Langley Prairie, as a mixed company farm producing dairy, root crops and grain for local and export use. Through the turn of the century and into the 1920`s, land clearing for agriculture continued.

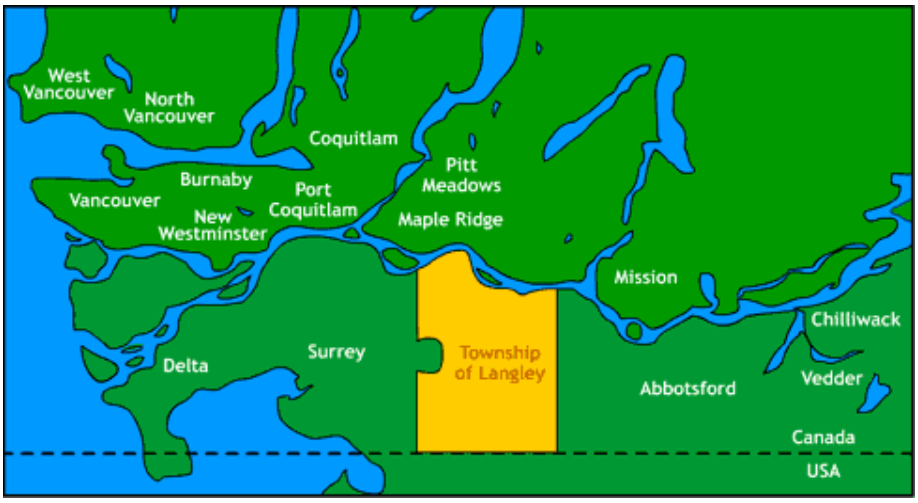


Figure 4 Map of the Township of Langley (TOL, 2004)

In addition to its rural landscape the Township of Langley has experienced significant growth in the urban areas over the past few years, becoming one of the fastest growing municipalities in the GVRD. Figure 5 provides the population statistics for the municipality since 1961. These statistics have been obtained from the Ministry of Management Services (BC Government) and Census Canada. The 2010 population estimate was provided by the Township’s planning department. This is a preliminary number and is subject to change.

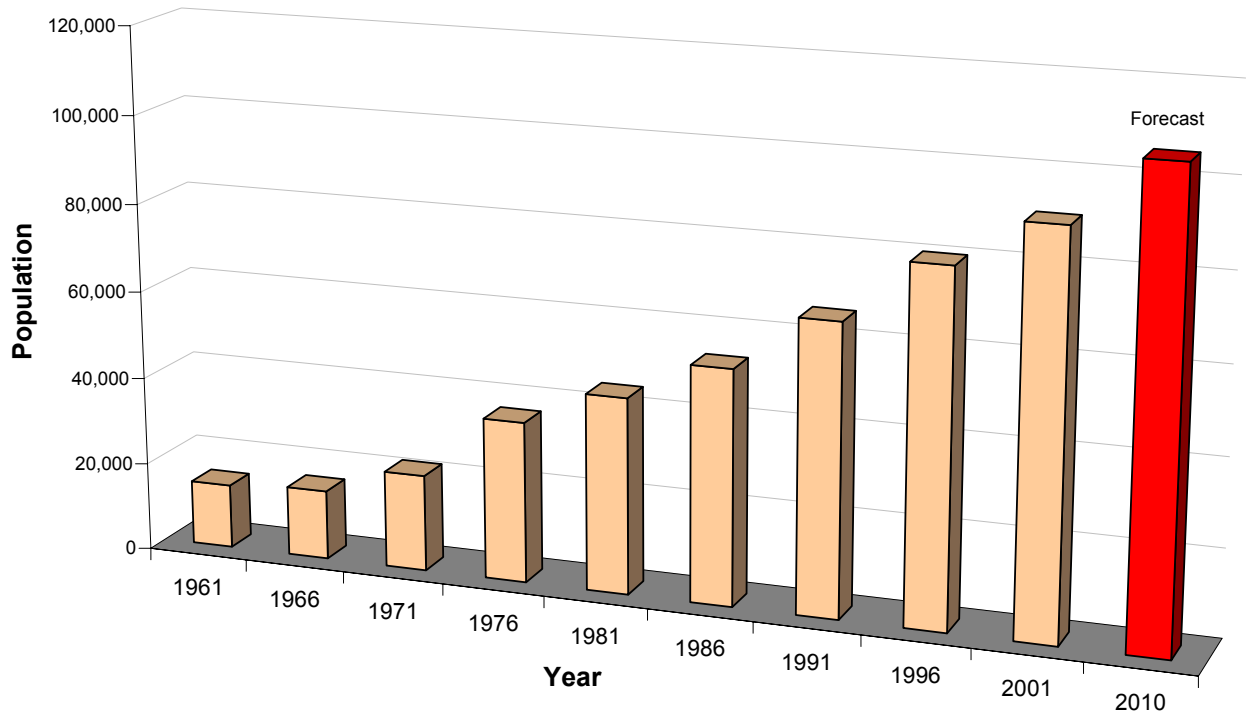


Figure 5 Township Population Statistics 1961 – 2010 (TOL, 2004)

2.2 Corporate

Since 1995 the Township of Langley workforce has increased by approximately 15% (full-time). This includes full-time, regular part-time and auxiliary staff. The following table provides a year by year breakdown of the staff employed by the Township. This information was provided by the Township of Langley Human Resources Department.

Table 1 Personnel Employed by the Corporation of the Township of Langley

Description	1995	1999	2000	2001	2002	2003
Full-Time	303	317	320	329	344	348
Regular Part-Time [a]	24	26	35	34	38	42
Auxiliary	168	367	413	412	444	449
Total	495	710	768	775	826	839

a – someone who works 3 or 4 days per week

3.0 PARTNERS FOR CLIMATE PROTECTION PROGRAM

3.1 Milestone Framework

Milestone One: Creating a Greenhouse Gas Emissions Inventory and Forecast

A greenhouse gas inventory brings together data on community and municipal energy use and solid waste generation in order to estimate greenhouse gas (GHG) emissions in a given year. The forecast projects future emissions based on assumptions about population, economic growth and fuel mix.

The inventory can be used to document energy consumption and waste composition data, and to calculate the resulting greenhouse gas emissions.

An emissions inventory consists of:

- A community inventory: residential, institutional, commercial, industrial, transportation, and solid waste sectors.
- A corporate inventory: municipal government facilities and operations, including buildings, street lighting, water and wastewater treatment, municipal fleet, and corporate and/or community solid waste.

The greenhouse gas inventory is developed by collecting data on:

- Electricity and fossil fuel energy use;
- Transportation (such as vehicle kilometers traveled, fleet composition and fuel(s) consumed); and
- The quantity and composition of waste and disposal methods (Federation of Canadian Municipalities, 2004)

PCP recommends that municipalities choose the baseline year of 1994 or a year for which reliable data is available. The baseline year will serve as a basis for setting an emissions reduction target and act as a point of comparison for the future

For this study only the corporate inventory will be developed and a baseline year of 1995 will be used.

Milestone Two: Setting an Emissions Reduction Target

An emissions reduction target can be established at any time. The target is normally set, however, following the development of an emissions inventory and forecast or after the quantification of existing emissions reduction measures.

The greenhouse gas reduction target forms the basis of a municipality's program objectives and provides a starting point from which to track progress.

The Federation of Canadian Municipalities recommends the following targets:

- A 20 per cent reduction below baseline year GHG emissions for municipal operations within 10 years of joining the CCP program; and
- A six per cent reduction below baseline year GHG emissions for the community within 10 years of joining the CCP program (Federation of Canadian Municipalities, 2004).

As participation in PCP is voluntary, a municipal government may choose to revise its target as it develops its Local Action Plan (LAP).

Milestone Three: Developing a Local Action Plan

A local action plan is a strategic document that outlines how a municipality will achieve its GHG emissions reduction target.

The LAP covers municipal operations and the community. Municipal governments are encouraged to first develop and implement a plan for municipal operations. In doing so, they demonstrate leadership and provide a positive example for the community.

A community-wide local action plan is more complex to develop and implement, as it requires input and co-ordination from many stakeholders, such as citizens' groups, non-governmental organizations and the private sector. The reduction potential from the community at large, however, is significantly greater than from municipal operations.

Milestone Four: Implementing the Local Action Plan

Once the GHG emissions inventory and forecast, reduction target, and local action plan have been prepared, the focus turns to implementation of the LAP. While municipal staff will be responsible for putting the plan into motion and maintaining momentum, in-house personnel, non-governmental organizations and private-sector contractors can complete the implementation of specific projects. The approval and support of council, municipal staff and the community are essential to the plan's success.

Milestone Five: Monitoring Progress and Reporting Results

Progress must be routinely monitored and tracked to ensure that the emissions reduction measures are implemented effectively and on schedule. Municipalities need to quantify emissions reductions that are achieved and compare them against the emissions inventory and forecast.

4.0 BENEFITS OF CLIMATE PROTECTION

The need to reduce GHG emissions and provide climate protection can be divided into quantitative and qualitative benefits. Quantitative benefits are focused on energy and operating cost savings, physical asset renewal, improved municipal service delivery, and improved health of residents and the natural ecosystem. Qualitative benefits are associated with a better working environment (i.e., improved lighting, better indoor air quality, reduced noise, etc.), increased productivity and employee morale, more green space in the community, reduced traffic congestion, a greater quality of life for residents, and an opportunity for municipal governments to show leadership and influence other community stakeholders to take action.

4.1 Economic Benefits

Energy use is typically the major GHG emission source and therefore the most GHG emission reductions come from reduced use of fossil fuels. The City of Hamilton, for example, calculated that while facilities typically provide service over 30 to 40 years, construction costs represent only eight percent of a building's cost. Operating costs, which include maintenance, repairs, replacements, and energy purchases, represent 92 per cent of the lifetime bill (New City of Hamilton, 2001).

The Municipalities Issue Table of the Government of Canada's National Climate Change Process estimated annual municipal energy consumption (including municipal building operations, water supply and sewage treatment, vehicle fleet, and street lighting) typically totals 2 Gigajoules (GJ)/capita. For a city with a population of 100,000, this rule of thumb would indicate an annual energy use of approximately 200,000 GJ to provide these services (National Climate Change Process, 2004).

In addition to reducing energy municipal governments can realize additional financial savings by reducing fleet fuel consumption or changing the type of fuel used.

Besides energy and operating cost savings, municipal governments can often provide better and more economically efficient services by investing in energy efficiency and can extend the lifespan of the buildings and lower insurance expenditures by undertaking a physical asset management program. Physical asset management involves the systematic review of a facility's operations and equipment, and a logical repair or upgrade schedule that focuses on a proactive approach to improvements.

4.2 Environmental and Health Benefits

By reducing GHG emissions and fossil fuel use the Township of Langley can also reduce other harmful emissions that lead to air pollution problems in the Fraser Valley like smog. The burning of fossil fuels is an important source of nitrogen oxides (NO_x), sulphur dioxide (SO_2), particulate matter (PM), volatile organic compounds (VOCs), carbon monoxide (CO) and heavy metals. All of these emissions can be harmful to human health and the environment. In the long term, taking steps to reduce GHG emissions can reduce the likelihood of climate related health problems, such as the spread of vector borne diseases like West Nile virus.

Based on the data presented in an Ontario Medical Association report published in 2000, a computer model entitled "The Illness Costs of Air Pollution" provided forecasts of health and economic damages for expected or desired future air quality conditions in Ontario. The study focused on cardio-respiratory illnesses caused by ozone and airborne particulate matter.

The study forecasted that in the year 2000, Ontario would suffer approximately 1,900 premature deaths, 9,800 hospital admissions, and 13,000 emergency room visits per year as a result of air pollution. The study also estimated that if air quality conditions remained the same to the year 2020,

these illnesses and deaths would increase substantially due to population growth and an aging population, which is more vulnerable to air pollution impacts (Region of Peel, 2004).

These health impacts would result in about $10 billion in annual economic damages. Loss of life and pain and suffering would account for between $4.1 and $4.8 billion of this total. Annual health care costs of air pollution would total approximately $600 million; lost productivity would account for an additional $560 million annually. These economic damages were expected to increase substantially over the next 20 years.

Preliminary research by the U.S. Environmental Protection Agency found that each tonne of carbon reduced yields an average of between $5 and $25 Canadian in health and environmental benefits. This includes the cost savings and the avoided social damage value of reduced air pollutants.

5.0 CORPORATE GREENHOUSE GAS EMISSIONS INVENTORIES

A GHG inventory brings together data on municipal energy use and solid waste generation in order to estimate GHG emissions in a given year. A corporate emissions inventory is comprised of: municipal government facilities and operations, including buildings, street lighting, water and sewage system, vehicle fleet, and corporate solid waste.

The inventory is developed through collection of data on:

- electricity and fossil fuel energy use;
- transportation (such as vehicle kilometers traveled, fleet composition and fuel(s) consumed); and
- quantity and composition of waste and disposal methods.

The purpose of the inventory is to obtain a record of the post and current energy use within the corporation. While emissions due to Township operations represent a relatively small percentage of total GHG emissions in the Langley area, they are the emissions sources over which the municipality has more direct influence and control.

5.1 Corporate Emissions by Organizational Sector

The Township of Langley, as a corporate consumer of energy, is a contributor to GHG emissions. The GHG inventory as presented in Table 2, indicates that the Townships GHG emissions for 2003 totaled 4,960 tonnes of eCO_2. Equivalent CO_2 (eCO_2)is a term used to express emissions of carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and perfluorocarbons (PFC's). This was more than any other inventoried year.

Table 2 Comparison of eCO_2 Emissions for the Corporation of the Township of Langley for Years 1995, 1999 and 2003 (tonnes of eCO_2)

Category	**1995** (tonnes)	**1999** (tonnes)	**2003** (tonnes)
Buildings	1,749	2,033	2,898
Vehicle Fleet	1,540	1,541	1,342
Streetlights	183	107	105
Water/Sewage	475	184	192
Waste	358	390	423
TOTAL	**4,305**	**4,225**	**4,960**

Between 1995 and 2003 corporate emissions increased by an estimated 15.2%. It must be noted that for categories dependant on electrical energy consumption (i.e. buildings, street lighting, and water/sewage), the eCO_2 emissions per unit of electrical energy or carbon-intensity is an important factor that affects the results of the inventory. GHG emissions from the consumption of electricity in the Township's operations are estimated by applying standard emission coefficients. In the case of electricity, there are no GHG emissions at the point of end use. The coefficient is derived by dividing total emissions from electric generating stations in each year by the final demand for electricity in that year. These figures are listed in Table 3 and have been provided by BC Hydro in their annual Greenhouse Gas Report. As a result, the Townships GHG emissions inventory is highly reliant on the carbon-intensity of the power supplied by BC Hydro. Between 1995 and 2003 the carbon-intensity has gone from 61t/Gwh to 24t/Gwh.

Table 3 Greenhouse Gas Emission Coefficients for Electricity Generation by BC Hydro (BC Hydro, 2003)

GHG Intensity (t/GWh)	Actual				Forecast		
	1995	2000	2001	2002	2003	2005	2010
	61	46	63	25	24	44	71

As illustrated in Figure 6 energy use in buildings and fuel consumption in the vehicle fleet accounted for the majority of the GHG emissions in all three inventory years.

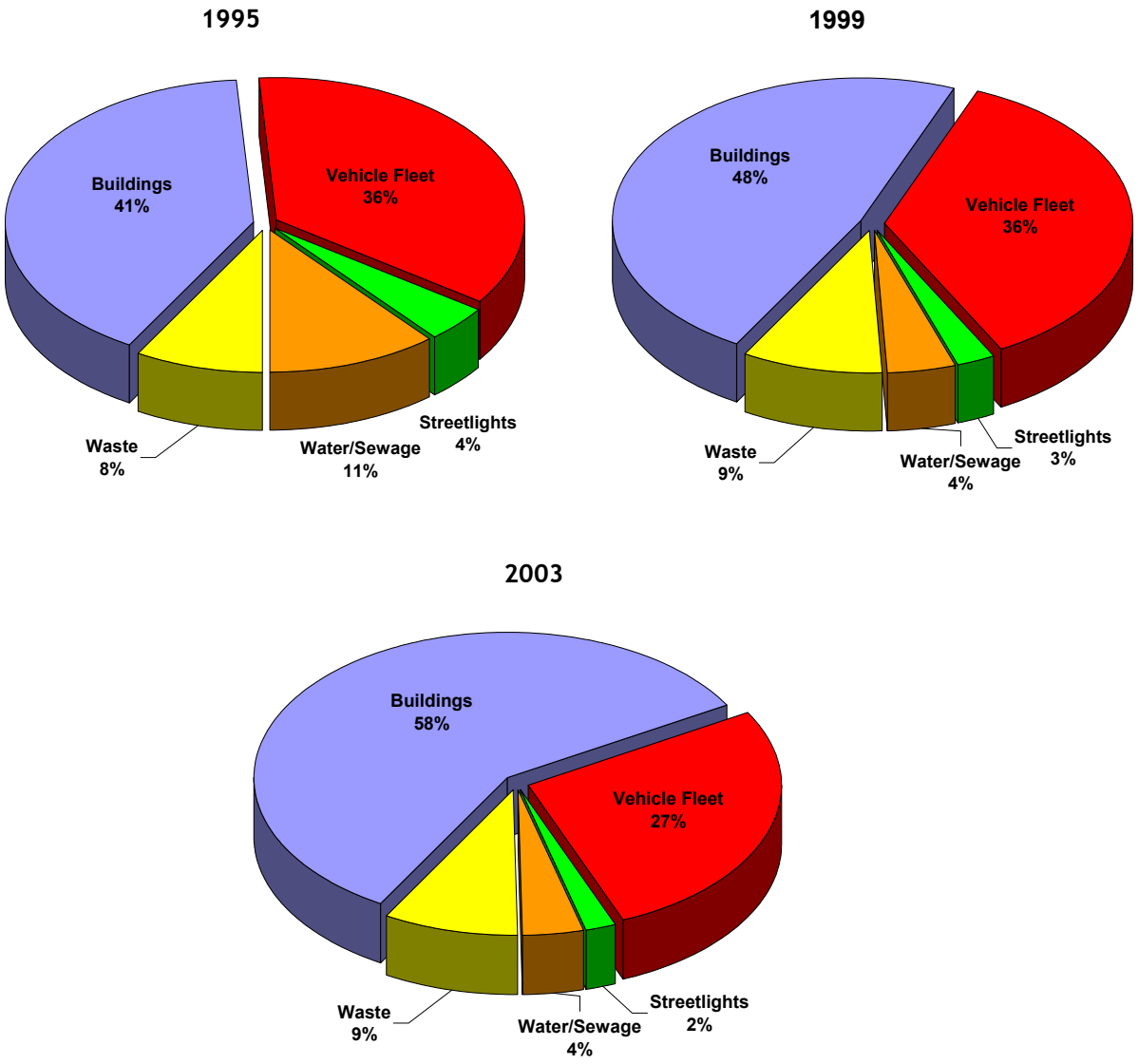


Figure 6 GHG Emissions Generated by the of the Township of Langley for 1995, 1999 and 2003

5.1.1 Buildings

As the Township has been growing in population at a steady rate, new buildings have been built and upgraded to account for this growth. Civic buildings and facilities included in this inventory include both buildings that the Township owns and occupies, as well as those that the Township occupies but does not own. These facilities range from the Municipal Hall, Operations Centre, Community and Recreation Centres, main RCMP detachment, community policing offices, to land holdings for investment and planning purposes. As illustrated in Figure 7 a large component of the Townships corporate GHG emissions are due to energy use from it buildings. In 2003, 58% of the total GHG emissions were attributable to the building sector.

The emissions inventory breaks down emissions from all buildings into electricity (BC Hydro) and natural gas (Terasen Gas). Each energy source creates a different amount of eCO_2, which the CCP software calculates based on the annual usage levels. The following figure illustrates the GHG emissions for the three inventory years.

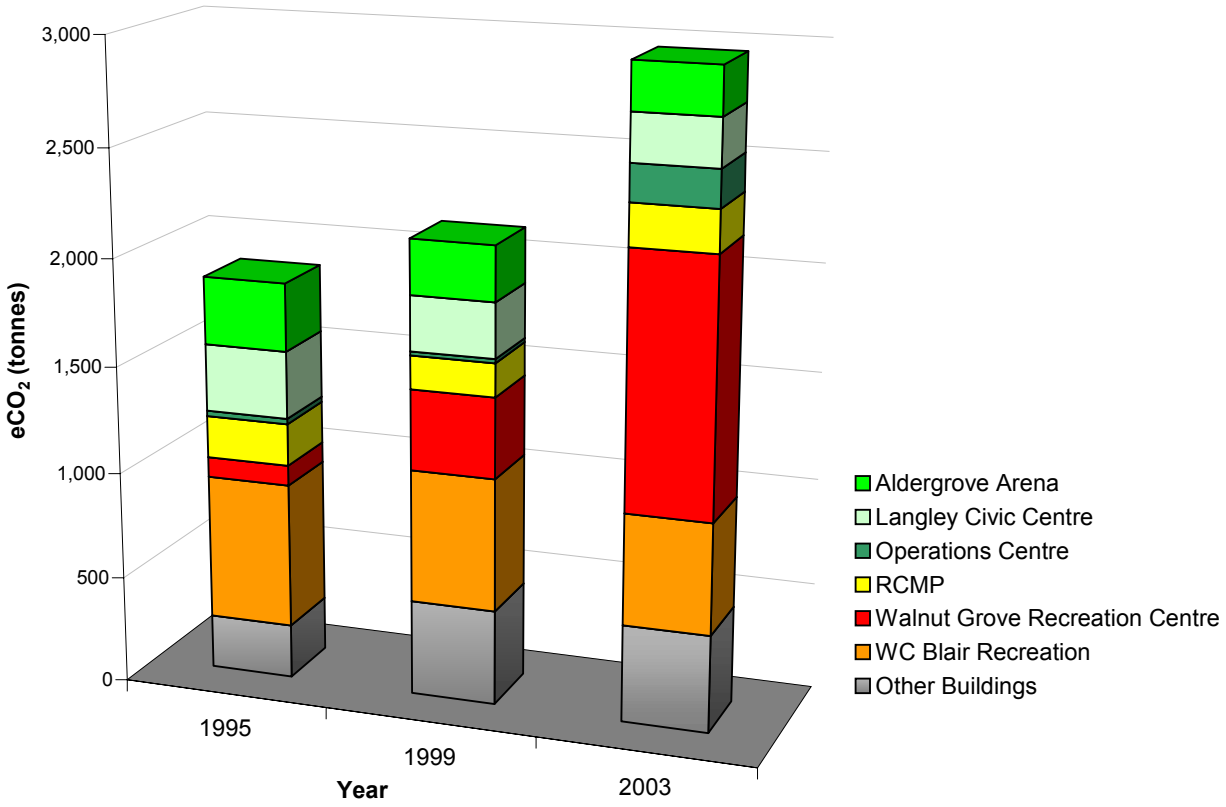


Figure 7 Township of Langley Greenhouse Gas Emissions from Civic Buildings and Facilities

Walnut Grove Recreation Centre

The Walnut Grove Recreation Centre is located at 8889 Walnut Grove Drive originally opened in October of 1994. Included in the facility was a double gymnasium (11,000 sq. ft.), library (3,500 sq. ft.), two meeting rooms (2,000 sq. ft.), large lobby, conference room and staff offices.

In November 1999 Phase 2 was completed. This involved the construction of the following.

- Main tank and deck – 52m long, 8 lanes @ 2.0m, total width 16.6m, tank is 900m^2 (9,688 ft^2) and the deck is 600m^2 (6,458 ft^2)
- Spectator area – 200m^2 (2,153ft^2)
- Leisure Pool – 0.2m to 1m deep. Tank 275m^2 (2,960 ft^2) and deck 200m^2 (2,153ft^2)
- Whirlpool and deck – 100m^2 (1,076ft^2)
- Sauna and steam – 20m^2 (215ft^2)
- Water slide and run-out tank – 140m^2 (1,507ft^2)
- Fitness area, food area and change rooms.

In 1995 the total electrical consumption at this facility was 598,080 kWh since that time the consumption has increased by 535% to 3,199,680 kWh. The significant increase is due to the construction of the swimming pool. More detailed information was not available at the time when this report was prepared.

Municipal Hall

The east wing of the Municipal Hall (4914 221st St.) was originally constructed in 1959, with the west wing added in 1977. The facility has a footprint of approximately 20,000 square feet, and functions as offices for various Township departments (i.e. Administration, Mayor and Council, Property Management, Legislative Services, Collections, Engineering, Drafting, Planning/Development, Building, Licenses, and the Langley Environmental Partners Society). Most of the building systems heating, ventilation and air conditioning (HVAC), are as originally installed. In 1999, the controls for the HVAC systems were converted to computer based digital controls to improve occupant comfort and reduce energy costs.

Operations Centre

The Operations Centre (4700 224th St.) was constructed in 1995 and functions as the works yard for outside crews, as well as office space for departments that are unable to be accommodated in the Municipal Hall due to its limited size. Construction is tilt-up concrete panel walls with a rubber (EPDM) roof. The 36,000 square foot facility encompasses shops, work space and storage for the following departments; Parks, Sewer, Water, Survey, Traffic, Public Works, Mechanics, Stores, and Facilities Maintenance. Office space is provided for Environment, Operations, Parks and Recreation, Purchasing, Human Resources, Computer Information Systems, and Finance departments. The large, adjacent outside yard area accommodates a variety of Township work vehicles, equipment and storage.

5.1.2 Street Lighting

Lighting of public places and streets is a major energy drain for municipalities. The street lighting is divided into the following categories:

1. overhead,
2. ornamental,
3. traffic signals, and
4. park lighting.

Overhead street lighting as defined by the British Columbia Hydro and Power Authority (BC Hydro) Electric Tariff, is lighting of public highways, streets and lanes in cases where BC Hydro owns, installs and maintains the fixtures, conductors, controls and poles. As of 2003 the Township had 1,764 overhead lights. These lights use high pressure sodium bulbs.

Ornamental street lighting is lighting of public highways, streets and lanes in those cases where the customer owns, installs and maintains the fixtures, conductors, controls and poles. As of 2003 the Township had 5,644 ornamental street lights. These lights use high pressure sodium bulbs.

The principle purpose of street lighting is to produce comfortable visibility at night. It is very important to make streets and highways useful during hours of darkness as well as during the day. The proper use of street lighting provides economic and social benefits to the public including:

1. reduction in night time accidents,
2. public health and safety,
3. traffic flow, and
4. promotion of businesses and the use of public facilities during night hours.

Traffic lights/signals are used to control traffic at busy intersections and at pedestrian crossings. Signals are expensive items and must therefore be used selectively and strategically. Traditional signals use incandescent lamps, typically 135kW for red, amber and green and 69kW for pedestrian signals. Since 1999 the Township of Langley in partnership with BC Hydro has been retrofitting these traditional traffic signals with new energy efficient light emitting diode (LED) traffic signals. Section 6.1 provides more detailed information on this program.

In addition to traffic signals and street lighting, the ICLEI CCP protocol/guidelines recommend that park lighting (i.e. sports field lights) also be included within this category.

The following chart summarizes the percentage breakdown of eCO_2 emissions for all street lighting, traffic signals, and park lighting in the Township.

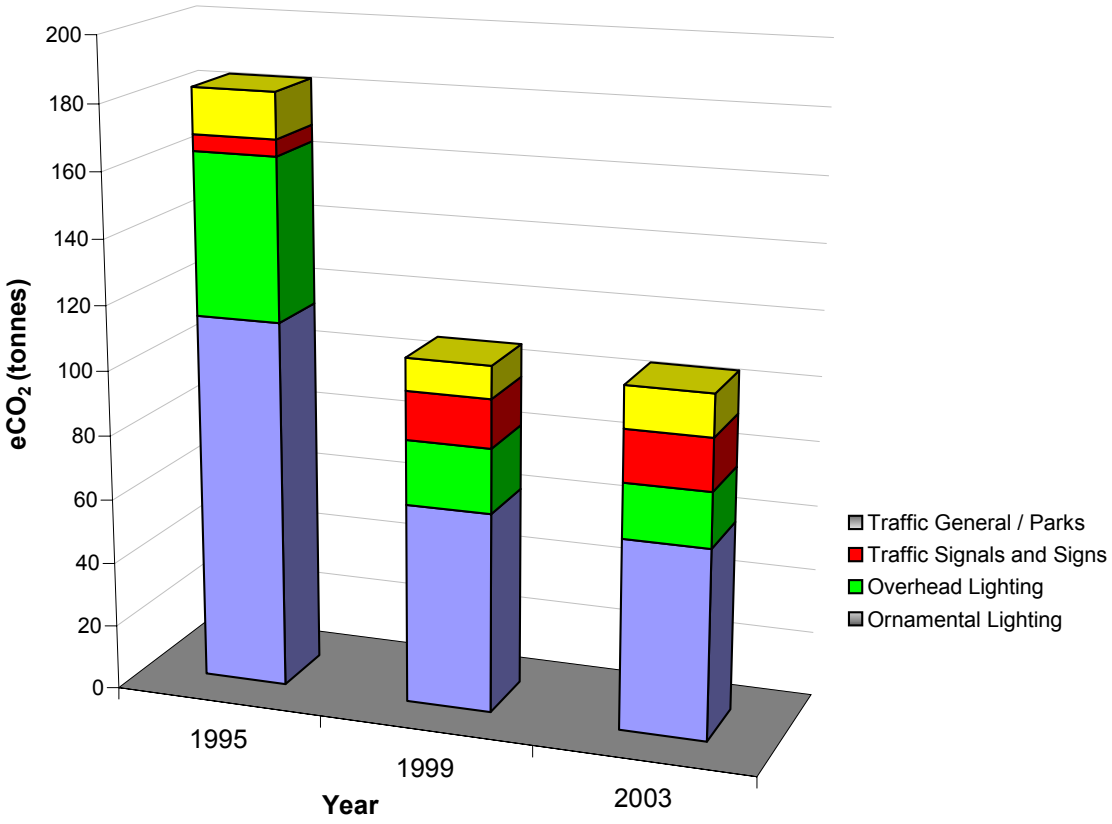


Figure 8 Township of Langley Greenhouse Gas Emissions Generated by Lighting

Between 1995 and 2003 the Township of Langley's electrical consumption for lighting increased by 46%. However, the direct reduction in eCO_2 is a result of significant decrease in carbon-intensity (61t/Gwh to 24t/Gwh). See Table 4 for more detailed information.

Table 4 Electrical Consumption Figures for Street Lighting (Appendix B)

BC Hydro Rate	Description	1995	1999	2003
		kWh	kWh	kWh
1701	Ornamental Street Lighting	1,866,428	2,497,109	2,473,887
1702	Overhead Street Lighting	815,796	816,495	716,886
1704	Traffic Signals and Signs	83,666	590,673	682,232
1220	Traffic General / Parks	232,110	388,000	515,077
	Total	2,998,000	4,292,277	4,388,082

5.1.3 Corporate Vehicle Fleet

Transportation is another major source of GHG emissions within the corporation. The municipal fleet is comprised of vehicles from the Fire Department, Parks and Recreation, and Municipal Operations. The following table provides a breakdown of the corporate fleet for the inventory years.

Table 5 Type of Vehicles Operated by the Township of Langley

Vehicle Type	1995 and 1999	2003
Light Duty Vehicles (under 8,500 lbs)		
Gasoline		
Automobiles and Mini Vans	21	27
Pick-up Trucks and Vans	31	41
Propane		
Pick-up Trucks and Vans	44	30
Gasoline/Propane		
Pick-up Trucks	8	3
Medium Duty Vehicles (8,501 to 14,000 lbs)		
Gasoline		
Cube Vans		6
Single Axel (SA) Service Vehicles		2
Tanker		1
1 Ton Dump Trucks		3
other	1	
Propane		
Cube Vans		3
SA Service Vehicles		1
Flatdecks		3
other	6	9
Diesel		
Cube Van		1
SA Service Vehicles		2
Flatdeck		1
Heavy Duty Vehicles (over 14,000 lbs)		
Diesel		
Flat Decks	3	3
Brushing Truck	-	1
Fire Trucks	11	21
Dump Trucks	11	9
Sweepers	2	2
Gasoline		
Fire Trucks	11	1
Flat Decks	3	-
Airport Tanker	1	1
Propane		
Dump Trucks	3	-
Other (Parks/Construction)		
Diesel	16	26
Propane	-	1
TOTAL	**174**	**198**

Vehicle fleet fuel consumption (gasoline, propane and diesel) and cost were calculated from fuel purchase records maintained by the Township of Langley. For the Fire Department not all of their fueling takes place at the Operations Centre. This amount has been estimated based on the amount of kilometers traveled in a year and the operating hours. The reason why operating hours have also been used is because not all of the fuel consumed by Fire trucks is done while traveling. For the most part a significant amount can be consumed while stationary (e.g. fighting a fire). The Township needs a better system to keep track of off-site fuel consumption by the Fire Department.

RCMP fuel consumption data has not been included in the corporate inventories. In the 1995 and 1999 emissions inventories compiled by the GVRD only the total fuel consumption by fuel type was provided. As a result the amount used by the RCMP vehicles was not able to be determined. In 2003 this information was available and a breakdown of the fuel amount used by the RCMP was provided along with the percentage from the overall fuel consumption (e.g. propane 15% and 55% of gasoline was RCMP). These percentages were then used to determine the volume of fuel used by the RCMP in 1995 and 1999 and then subtracted from the total fleet fuel consumption used in the calculation of GHG emissions.

Data for Township employees who drive their own vehicles for business purposes was provided by the Finance Department. Actual litres of gasoline were calculated by taking total costs for fuel expenditures, dividing it by the reimbursement rate and them multiplying it by the average fuel efficiency (taken as 10.6 litres per 100km). This information was collected using financial statements (e.g. account codes) for the given year. These account codes have been setup so all vehicle mileage expenses are under a particular account code. However, not all departments charge their vehicle mileage expenses to these accounts. It should be noted that the total mileage may in fact be greater that what has been reported.

The following table provides the fuel consumption figures for each fuel type used by the Township of Langley.

Table 6 Fuel Consumption

Fuel Type	1995 [a]	1999	2003
	Fuel (litres)	Fuel (litres)	Fuel (litres)
Clear Diesel	198,766	198,766	184,450
Marked Diesel	18,965	18,965	14,359
Gasoline TOL Fleet	83,097	83,097	218,318
Gasoline Private Vehicle Usage [b]	7,596	7,164	4,859
Propane	478,873	478,873	177,761
Totals	**787,297**	**786,865**	**599,747**

a - Vehicle Fleet data was not readily available for 1995. Although consumption increased from 1995 to 1999, overall fuel efficiency also increased. With this in mind, we are assuming that the 1995 fuel consumption values to be approximately the same as the figures for 1999 (GVRD rationale).
b - This refers to Township employees that drive their own vehicles for business purposes.

Diesel fuel, like most liquid fuel is derived from crude oil. Crude oil is a mixture of hydrocarbon molecules from smaller, lighter molecules to large, heavy molecules. Diesel contains heavier hydrocarbons with a higher boiling point than gasoline. The term diesel fuel refers to any mixture developed to run diesel powered vehicle engines with compression ignition engines (engines that do not use a spark plug to ignite the fuel). Diesel typically contains sulphur and gasoline. Marked diesel is used for specific purposes and is taxed at a lower rate, resulting in lower cost to the user. Fuels used for such purposes are distinguished from other fuels by colouring them with a dye provided by the province. The properties of diesel are no different from the fuel before it was marked.

Gasoline is a petroleum liquid mixture consisting primarily of hydrocarbons used as fuel in internal combustion engines. Gasoline consists of various hydrocarbons (compounds consisting of hydrogen and carbon atoms) derived from petroleum, and sometimes other specialty blend stocks.

Liquefied petroleum gas (LPG), commonly called propane, consists mainly of propane, propylene, butane, and butylenes in various mixtures. It is a by-product of natural gas processing and petroleum refining. A propane-powered vehicle emits fewer reactive organic compounds, less nitrogen oxide, and less carbon monoxide than a similar gasoline-powered vehicle. The use of propane as an alternative fuel in factory-built vehicles can reduce GHG emissions by 20% in light-duty vehicles on a full fuel cycle basis (compared with conventional gasoline). Emissions reduction results from converted vehicles vary and are normally not as high as those built specifically to run on propane. In the late 1990's the Township began to convert certain vehicles from its fleet to propane. This measure was undertaken to reduce the overall fuel expenditure. However, over time the maintenance costs began to substantially increase making this an undesirable alternative. Since 2001, the Township has shifted back to purchasing gasoline vehicles.

The GHG emissions from the vehicle fleet were calculated using the Canadian Cities for Climate Protection Greenhouse Gas Emissions Software, which was produced by Torrie Smith Associates. The software uses the following emission coefficients for fuel use:

Table 7 Fuel based Emissions (Torrie Smith Associates Inc., 2004)

Fuel (unit)	**CO_2 (tonnes/unit)**
diesel (litres)	2.73×10^{-3}
ethanol blended gasoline (litres)	2.22×10^{-3}
gasoline (litres)	2.36×10^{-3}
natural gas (cubic metres)	1.88×10^{-3}
propane (litres)	1.53×10^{-3}

Figure 9 illustrates the GHG emissions that haven been generated through the use of fossil fuels by the Township of Langley fleet.

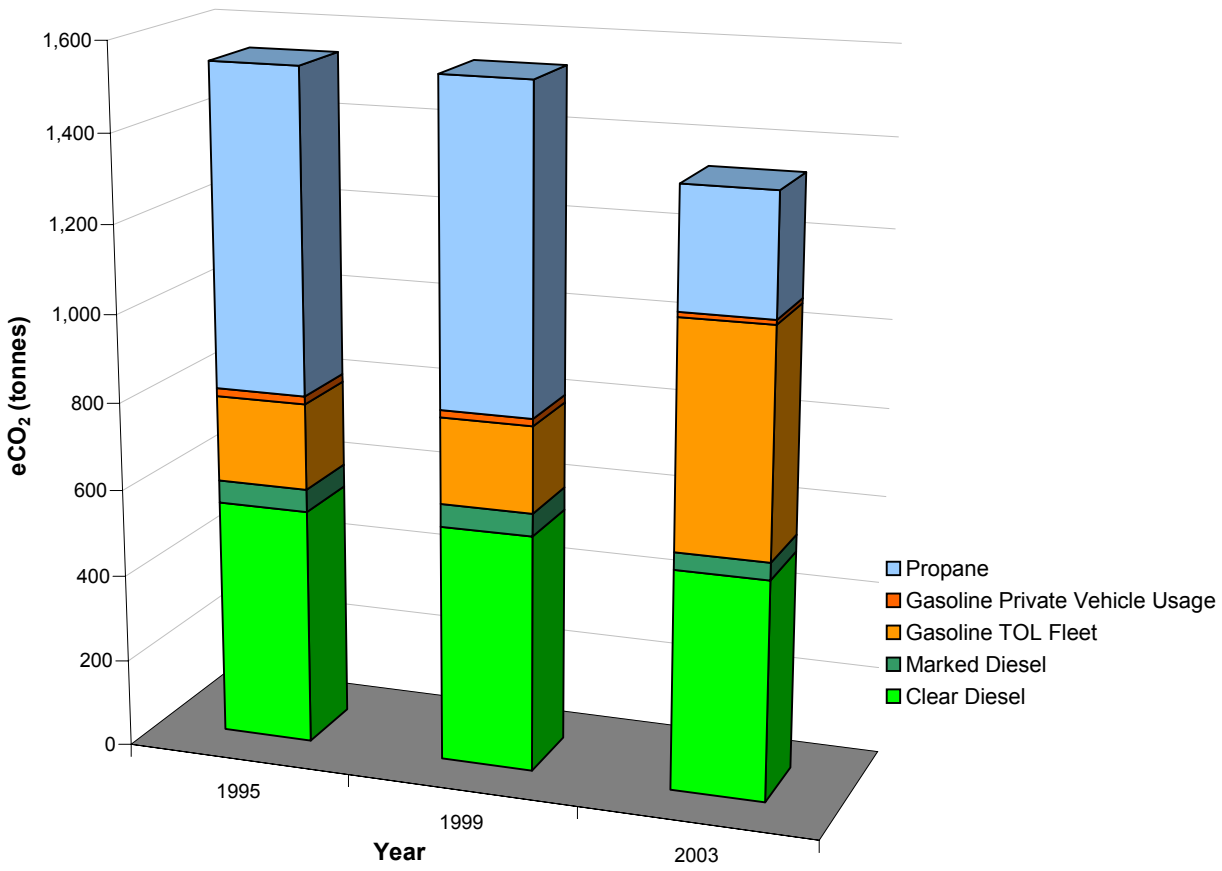


Figure 9 Township of Langley Greenhouse Gas Emissions Generated through Fuel Use

5.1.4 Water and Sewage Systems

Drinking Water System

The Township of Langley's water supply system is comprised of two unconnected components, the East System and the West System. The East system services the community of Aldergrove. All of the water from this system is derived from groundwater. The West water supply system services the communities of Fort Langley, Walnut Grove, Willoughby, Willowbrook, Murrayville, Brookswood and parts of Fernridge. Unlike the East system, the West system is supplied by a mixture of groundwater and water supplied by the Greater Vancouver Water District (GVWD). In addition to the main systems the Township operates two small, isolated water systems that supply residential communities located in the centre of the Township (Tall Timbers and Acadia).

Drainage System

For the purposes of this inventory the stormwater pump stations have also been included in the drinking water section. These are the Salmon River pump station and the West Langley Dyke pump station.

Sewage System

The municipal sanitary sewer system is completely isolated from its stormwater system. The communities of Northwest Langley Industrial Area, Walnut Grove, Willowbrook, Murrayville, Gloucester, and Aldergrove are currently serviced by sanitary sewers. The sewage from the communities in the northwest portion is conveyed to the GVRD's North West Langley Wastewater Treatment Plant located at 10301 201 St. The treatment plant opened in 1976, and is one of five treatment plants serving the Greater Vancouver Regional District. The plant handles on average 8.6 million litres of wastewater daily. In 1996 the Township of Langley transferred responsibility of the North West Langley Sewage Treatment Plant to the Greater Vancouver Sewerage and Drainage District (GVS&DD). In doing so the GVS&DD assumed responsibility for the debt, future capital and operating costs of the treatment plant. The Township continued to operate the treatment plant on a contract basis until 1998 while staffing, budgets, and operating procedures were fully established by the GVS&DD.

As the population in the Township continues to grow, the consumption of water and the amount of liquid waste is also growing. As a general rule, the more water and liquid waste the Township is required to deal with, the greater the energy consumption and GHG emissions. In 2003 water and sewage pumping and treatment stations accounted for 4 percent of the emissions generated through energy consumption. This is a decrease from 1995 where water and sewage emissions accounted for 12 percent of the total emissions for the Township. Figure 10 illustrates the GHG emissions from the water/sewage systems. The reason for the significant decrease in energy consumption (Table 8) post 1995 is largely attributable to the transfer of ownership of the N.W. Langley Sewage Treatment Plant.

Table 8 Water/Sewage Energy Consumption in 1995, 1999 and 2003

Description	1995 (kWh)	1999 (kWh)	2003 (kWh)
Sewage	3,406,658	1,164,865	896,612
Water/Drainage	4,381,179	3,860,158	4,486,511
Total	**7,787,837**	**5,025,023**	**5,571,043**

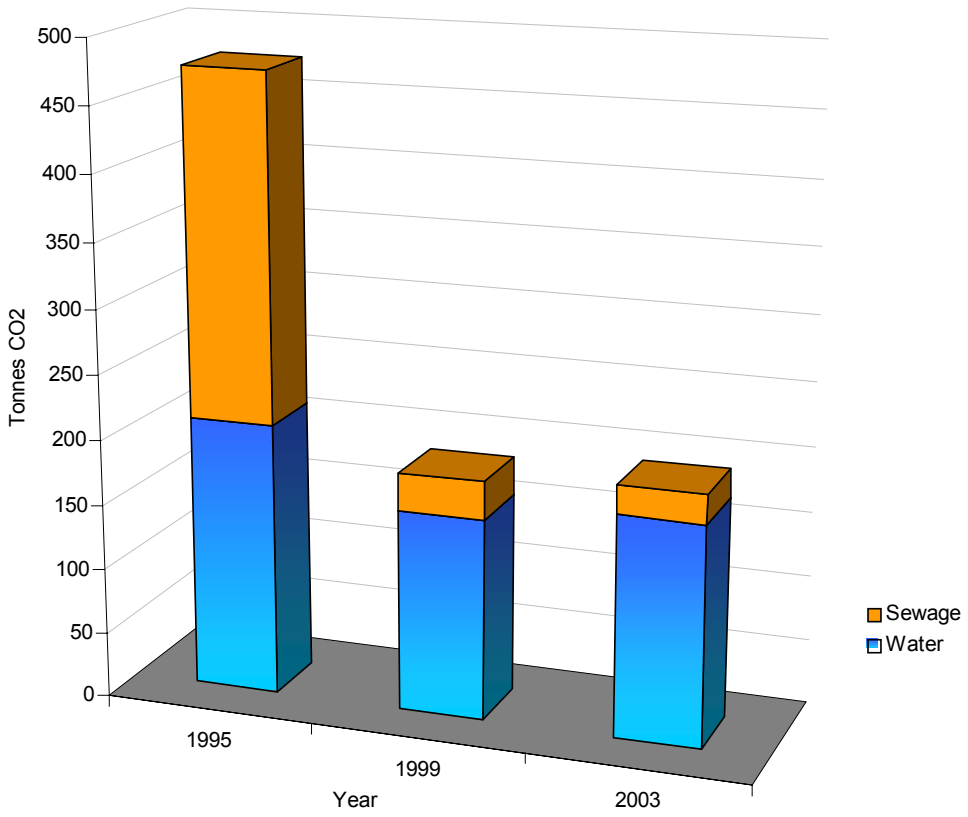


Figure 10 Township of Langley Greenhouse Gas Emissions from Water/Sewage

Table 9 Township of Langley Drinking Water, Drainage and Sewage Facilities (TOL, 2004)

Drinking Water		Sewer	
Facility	**Location**	**Facility**	**Location**
Acadia Water Supply	4745 - 242A Street	WG Sewer Lift Station	21210 96 Avenue
Aldergrove Well #3	2879 - 272 Street	28 Ave. Sewage Lift Station	27540 28 Avenue
Aldergrove Well #4	27155 - 32 Avenue	Sewage Lift Station	4353 200A Street
Aldergrove Well #6	2520 - 272 Street	Sewage Pump Station	23750 Fraser Hwy.
Aldergrove Well #7	27190 25 Avenue	Sewer Pump Station	21341 Old Yale Road
Aldergrove Well #8	2625 - 272 Street	West Langley S.L.S.	21205 56 Avenue
East Aldergrove Reservoir	27600 - Quinton Rd.	Sewage Lift Station	20555 62 Avenue
West Aldergrove Reservoir	3150 - 262B Street	Sewer Lift Station	203 St. 62 Avenue
Aldergrove W.T.P.	27590 - 28 Avenue	Milner Sewage Lift Station	6650 Glover Road
Brookswood Well #2	3518 - 198 Street	Lift Station	8395 216 Street
Brookswood Well #4	3497 - 197 Street	Sewer Lift Station	20513 95A Avenue
Brookswood Well #7	20600 - 32 Avenue	Lift Station	9046 214B Street
Brookswood Well #8	3458 - 200 Street	Lift Station	9001 216 Street
Brookswood Well #9	20679 - 32 Avenue	Fort Langley Lift Station	23345 Mavis Avenue
Brookswood Well #10	19810 - 36 Avenue	Lift Station	9800 208 Street
Brookswood P.R.V. Station	19620 - 36 Avenue	Sewer Lift Station	20452 98 Avenue
Brookswood Reservoir	20679 - 32 Avenue	Sewer Lift Station	27170 28B Avenue
Murrayville Well #1	4505 - 224 Street	Gloucester Treatment Plant	5676 272 Street
Murrayville Well #2	22566 - Old Yale	Sewer Lift Station	26827 24 Avenue
Murrayville Reservoir	22566 - Old Yale	Sewer Lift Station	2502 272 Street
Salmon River Uplands Well #1	5776 - 245A Street	Sewer Lift Station	26600 28 Avenue
Salmon River Uplands Well #3	5900 - 252 Street		
Strawberry Hill Reservoir	21212 - 85 Avenue		
201 Street P.R.V.	9700 - 201 Street		
Tall Timber Water Supply	23990 - 58A Avenue		
West Langley Wells #1 & 2	88 Avenue Salmon R.		
Willoughby Pump #1	20650 - 68 Avenue		
Willoughby Booster	20400 - 73A Avenue		
Willoughby Reservoir	20438 - 73A Avenue		
Drainage			
Facility	**Location**		
Salmon River Pump Station	22500 96 Avenue		
West Langley Dyke P.S.	20461 102B Avenue		

5.1.5 Waste

The disposal of solid waste results in the direct emission of GHG when it is burned in incinerators and when it degrades in landfills and produces methane. Waste generated by municipal operations consists of all employee generated waste at municipal facilities such as parks, recreation buildings, operations centre, fire halls, etc. Unfortunately, no weigh scales are used when waste is collected from these municipal facilities and therefore no data is available. The volume of waste generated was converted into tonnes based on 200kg/m^3. This is recommended for municipalities that do not know the actual weights.

Since actual information on waste composition in the Township was unavailable, typical values of municipal waste provided in the PCP software were used:

Paper Products	38%
Food Waste	13%
Plant Debris	10%
Wood and Textiles	4%
All Other Waste	35%

The CCP protocol specifies that waste generated from municipal operations consists of all employee generated waste plus waste generated at municipal government facilities such as parks, recreation buildings, etc. and which end up the responsibility of the local government to haul away. The reported GHG emissions are based on the estimated volume of waste generated at corporate facilities, see the following table for the estimated tonnes of waste generated.

Table 10 Tonnes of Waste Generated at Municipal Facilities in 2003

Bin Size Cu.yds	Annual Pick-Ups	Location	Est. Weight (tonnes)
6	36	Aldergrove Park, 27155 32 Ave.	35
6	36	Fort Langley, 23055 St. Andrews	35
6	36	Williams Park, 6595 238 Street	35
6	36	Noel Booth Park, 20244 36 Ave.	35
6	36	Walnut Grove Park, 8937 Walnut Grove Drive	35
6	36	Willoughby Park 206 Street and 84 Avenue	35
6	36	McLeod Athletic Park, 216 Street and north of 56 Ave.	35
6	52	Aldergrove Kinsmen Centre, 26770 29 Ave.	50
6	52	WC Blair Rec. Centre, 22200 Fraser Highway	50
4	52	Langley Lawns Cemetery, 4375 208 Street	33
4	52	Walnut Grove Community Centre, 8889 Walnut Grove Dr	67
8	52	RCMP Building 22180 48A Ave.	67
6	24	West Langley Community Hall, 96 Ave. and 208 Street	23
8	52	Operations Centre, 4700 224th Street	266
4	24	Fire Hall #7, 3876 248 Street	15
4	24	Fire Hall #5, 20355 32 Ave.	15
4	52	Fire Hall #6, 22170 50 Ave.	33
2	52	Aldergrove CPO, 26970 Fraser Highway	17
		TOTAL	**878**

To reduce the amount of corporate waste generated the Township has in place an office paper recycling program. The program was started in 1999 and since its inception 242 tonnes of office paper has been recycled.

Some Township facilities also have composting bins setup for office food scraps. However, there is no formal program in place, it is a voluntary initiative. The following figure illustrates the GHG emissions from corporate waste.

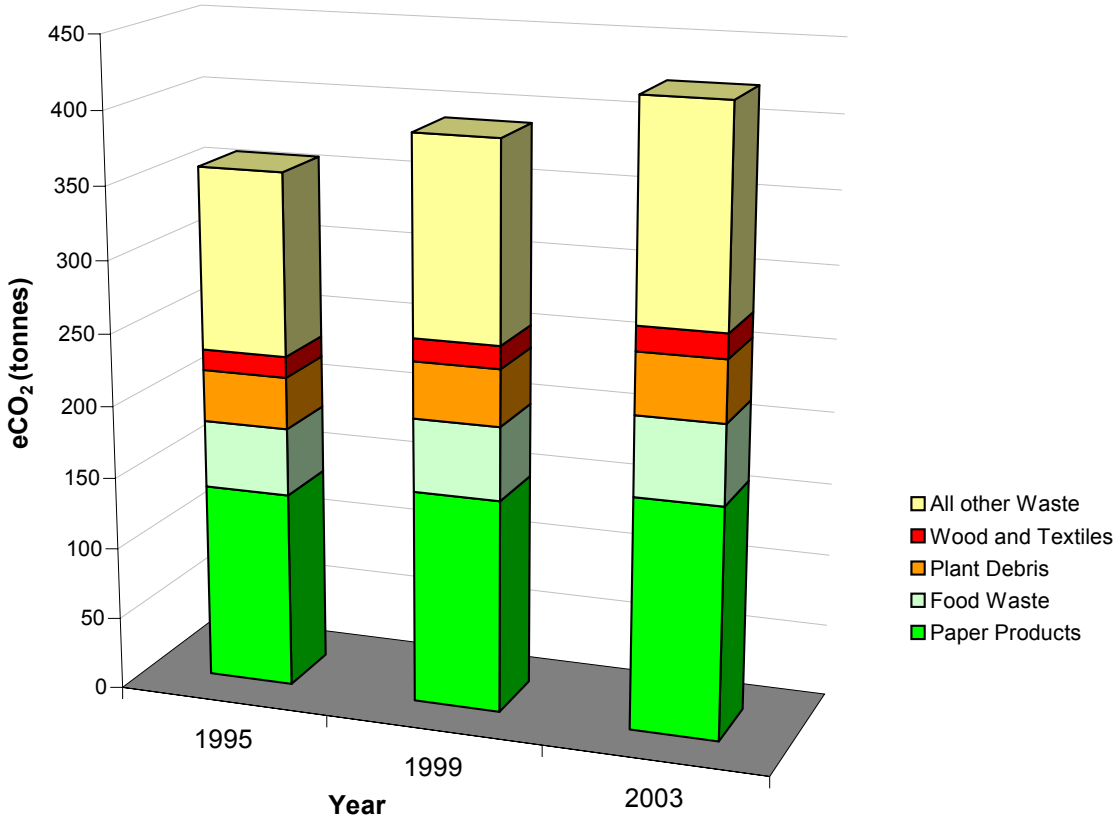


Figure 11 Township of Langley Greenhouse Gas Emissions Generated through Waste

6.0 REDUCTION MEASURES ALREADY UNDERTAKEN

6.1 BC Hydro Traffic Light Program

The Township of Langley has 56 full traffic signals throughout the municipality, all of which used incandescent light bulbs to illuminate the vehicle and pedestrian signals. In 2001, through the BC Hydro Power Smart Traffic Light program, the Township of Langley upgraded all of its incandescent traffic signals to energy efficient light emitting diode (LED) traffic signals. The incandescent lights have a shorter life span and therefore have to be replaced more frequently resulting in higher maintenance costs.

An LED is a semiconductor device that uses solid state electronics to produce coloured light. The LEDs are more efficient than incandescent lamps for two key reasons. First, energy is not wasted as heat. Unlike incandescent lamps, LED lamps do not create light through the production of heat. Second, energy is not wasted by filtering. Incandescent lamps produce white light; filters are needed to block all light energy except for the colour required. LEDs create coloured light directly.

An LED traffic signal module incorporates an array of coloured LED lamps assembled on an electronic board. The module is then installed into the casing of the existing traffic signal replacing the incandescent lamp and reflector assembly for the respective colour.

While LED modules are initially more expensive than incandescent lamps, they have many benefits that result in a lower overall lifecycle cost. The advantages of LEDs include:

- Use 90% less energy compared to standard incandescent lamps
- Last 7 -10 years resulting in less labour devoted to re-lamping
- Produce colour directly without a filter for greater visibility in fog, sun and rain
- Reduce emergency call-outs due to increased reliability
- Less susceptible to mechanical failure - Rugged solid state construction
- Easy to retrofit - the LED module installs directly into the casing of existing traffic signals (BC Hydro, 2004)

The BC Hydro Power Smart Traffic Light program provided the capital cost to replace the red, green and “don’t walk” signals with LED lights in all traffic signals, and the Township of Langley agreed to pay back BC Hydro 50% of the capital cost over five years, without interest. The amber (yellow) traffic lights and pedestrian walk signals were not replaced because they are on for a shorter period of time, they use less electricity and do not provide a reasonable return on the investment over the life cycle of LED lights. However, according to the Townships traffic department replacing the amber lights with LED lights provides a significant cost savings in maintenance. Therefore, the Township is planning to replace all amber lights with LED’s.

In addition to converting street lights to LED, the Township is also considering some of the following measures.

- Installing UPS (power backup systems at signals).
- Use of LED road markers (cat's eyes) that will reduce the need for street lights in certain areas.
- Installing flat glass street light heads that direct the light downward.
- Updating lighting levels. This will probably reduce the number of lights currently required under the Subdivision Control Bylaw in new developments.

6.2 Municipal Building Lighting Retrofit

In February 2002 BC Hydro as part of their Building Performance Program conducted an energy audit of the RCMP Main Detachment, Operations Centre and Municipal Hall. The audit consisted of a preliminary walk-through survey of the building and a detailed survey of certain high energy consuming systems in the building. The detailed survey covered the HVAC (heating, ventilation and air conditioning) system and control and interior lighting systems for the facility. Exterior security lighting was also reviewed. All lighting retrofit measures implemented were aimed at reducing electrical energy consumption.

The benefits of implementing such measures are:

- Reduced energy consumption.
- Reduced lighting maintenance due to the use of longer life lamp sources, fewer lamps and ballasts, and new products with manufactures' warranty.
- Reduced heat load in common areas during summer months, providing increased tenant comfort.
- Improved colour from fluorescent retrofit. Colour Rendering Index (CRI) improves from 61 for the T12 fluorescent lamps to 85 for the 800 series T8 lamps.
- The use of electric ballasts for fluorescent fixtures, which operate at over 20,000 cycles, will eliminate the 60 cycle flicker associated with magnetic ballasts.

6.2.1 RCMP Main Detachment

Prior to the upgrade of the lighting system to energy efficient technologies the RCMP detachment consisted primarily of T12 fluorescent and incandescent lighting luminaries. The annual energy use for these luminaries was estimated at 585,774 kWh. After T12 fluorescent lighting fixtures were upgraded to T8 fluorescent technology the energy savings was estimated to be 273,568 kWh.

6.2.2 Operations Centre

Based on the recommendations in the audit the Township Operations Centre lighting system was upgraded to reduce the overall lighting wattage and electrical energy cost. Prior to the upgrade the lighting system demand was 34.67 kW and following the upgrade the demand decreased to 20.63 kW, a savings of 14.04 kW. The energy use was also reduced and resulted in a savings of 42,098 kWh. In addition to the lighting upgrade occupancy sensors were also installed in all of the common areas (i.e. washrooms, meeting rooms, assembly rooms, etc.) and offices.

6.2.3 Municipal Hall

All incandescent bulbs were replaced with compact fluorescent bulbs and occupancy sensors were also installed in all common areas and select offices.

6.3 Municipal Building Ultra Low Flush Toilet Retrofits

In December 2002, the Township of Langley installed eleven ultra low flush toilets in the Municipal Hall. Prior to the installation of the toilets, water use in the Municipal Hall averaged 3.63 cubic meters per working day (800 gallons per day). Post installation water demand dropped to an average of 1.75 cubic meters per day (400 gallons) or the equivalent of a 50% decrease, see Figure 12. On this basis, the volume of water saved is estimated to be 430 cubic meters (95,000 gallons) per year.

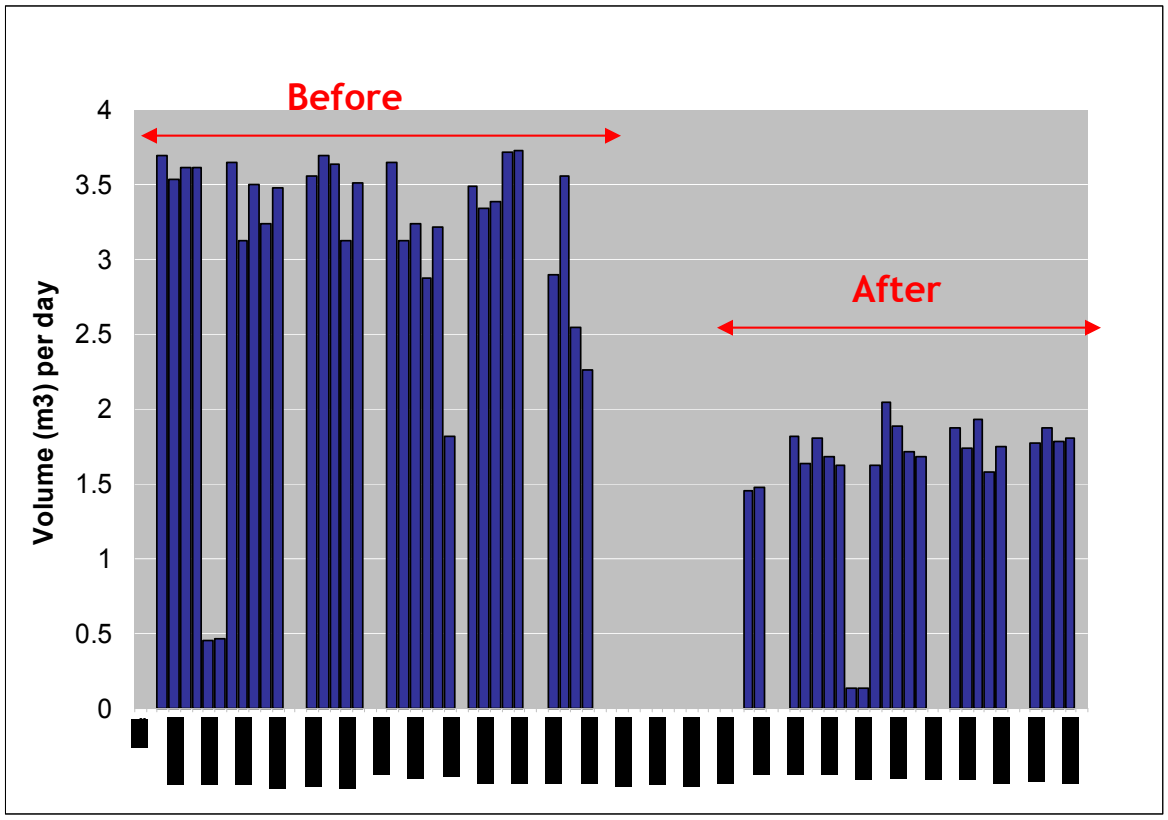


Figure 12 Municipal Hall Water Consumption (TOL, 2003)

Following the findings of this pilot project the Township facilities maintenance staff audited and retrofitted (where possible) ultra low flush toilets and water conservation devices in all municipal facilities, see the following Table 11 for more detailed information.

Table 11 Ultra Low-Flush Toilet and Low Flow Urinal Retrofits (TOL, 2004)

Facility	Ultra-Low Flush Toilet	Low Flow Urinals
Operations Centre	15	7
RCMP Main Detachment	12	5
Langley Civic Centre	27	17
W.C. Blair Recreation Centre	14	4
Aldergrove Kinsmen Comm. Centre	10	5
Aldergrove Community Area	15	3
Municipal Hall	11	-
Total	**104**	**41**

6.4 Landfill Gas Utilization

The Jackman Landfill, located in south east Langley began receiving waste in 1956. In 1973 the Township of Langley assumed ownership of the site and continued operation of the landfill until 1990 at which time is was closed.

Municipal solid waste and agricultural waste from surrounding households and farms was accepted at the site. At closure, a total of approximately 500,000 tonnes of solid waste had been buried in the 14 hectare site. The average depth of waste in the site is approximately 12 metres with a 1 metre thick cap and no lining.

The Landfill Gas (LFG) collection system was installed to control odours and to prevent migration of gas into the ground surrounding the landfill. Collection and flaring of LFG created a potential opportunity to make use of the gas. The Township entered into a joint venture with Norseman Engineering to develop the collected LFG as a resource.

Norseman identified nearby Topgro Greenhouses Ltd. as a potential end user of the gas. Topgro's commercial greenhouse facility is located approximately 1.5 kilometres from the landfill. Norseman constructed a compressor station and pipeline to the Topgro facility. Utilization of LFG at the Topgro greenhouses began in January 1995.

The Jackman LFG utilization system is comprised of the following components:

- LFG collection field
- Compressor station and pipeline
- Dual-fuel boiler

LFG is collected from 48 vertical gas extraction wells arrayed over the entire landfilled area. A network of pipes on the landfill connects the wells to a central compressor station.

At the compressor station, a 250 horsepower piston compressor applies a vacuum to the gas wells and discharges the collected gas under pressure to the Topgro Greenhouses via a 1.5 kilometer dedicated pipeline.

At Topgro, three boilers are used to heat water that is circulated through the greenhouses to maintain optimal growing temperatures throughout the year. Two of the boilers operate on natural gas while one of the boilers has been modified to operate on both LFG and natural gas.

During the summer months, LFG is burned in the dual-fuel boiler to produce carbon dioxide (CO_2). This is used in the greenhouses to promote healthy and rapid plant growth. LFG supplies nearly all of the CO_2 required by the greenhouse facility.

Since the plants are very sensitive to certain airborne contaminants, assessment of the products of combustion from LFG is a priority. Extensive testing performed over a period of years confirmed the suitability of the emissions from the dual-fuel boiler. The use of LFG derived CO_2 is continuing on an experimental basis with on-going testing.

Recent declines in the quantity of LFG collected from the landfill have given rise to consideration of expansion of the gas collection well-field. Gas recovery during the last six years has been as follows:

Table 12 Landfill Gas Recovery (TOL, 2003)

Year	Gas Collected (Cubic Metres)
1998	4,263,000
1999	2,075,640
2000	1,427,708
2001	692,144
2002	884,205
2003	580,280

Note: In 2002 new wells boosted production but operational problems with the delivery system resulted in a reduced volume in 2003.

Project Highlights Include:

- Innovative approach to optimize landfill gas use takes advantage of proximity of the landfill to a commercial greenhouse
- Landfill gas is used to heat commercial greenhouses in winter and produce carbon dioxide to encourage plant growth in summer
- Reduces landfill gas emissions by approximately 18,000 tonnes of carbon dioxide equal to emissions of more than 4,400 automobiles.

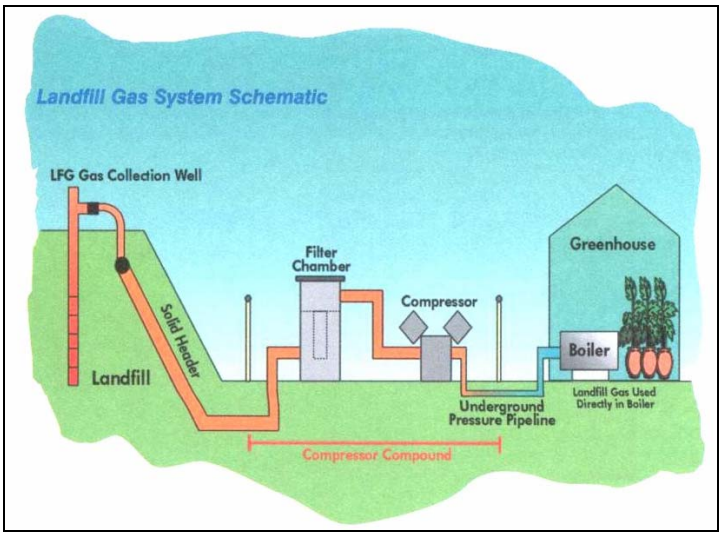


Figure 13 Jackman Landfill Gas Utilization Schematic (Environment Canada, 1998)

6.5 Computerized Irrigation Control System

In late 2002 and early 2003 the Township of Langley Parks and Recreation Department installed a computerized irrigation control system at McLeod Athletic Park. The system has a main computer in the Operations Centre that is connected to a weather station that measures wind speed and direction, rainfall, soil moisture, etc. The computer determines the amount of irrigation required based on the weather information and the flow rates for each individual irrigation system. The computer signal is transferred via telephone line to a central processing unit at the park, where the information is sent by radio signal to each individual field controller.

Prior to the computerized irrigation system being installed, irrigation was controlled in Township parks by individual controllers that had to be manually turned off in the event of rain and that did not adjust the amount of water based on soil moisture. The controllers were set to run each irrigation station for a set time and for specific days of the week (TOL, 2004).

Records for 2003 show that, despite being on the driest years on record, water use at McLeod Park decreased from 6,866,000 gallons in 2002 to 5,429,460 gallons in 2003, or a savings of almost 1.5 million gallons of water. Other benefits of the computerized system is that fields can be turned off with a simple key stroke of the computer, the system provides an alert if there are broken irrigation heads, and the computer can be accessed from home by staff.

This computerized system is being expanded in 2004 to include all Township sports fields in Walnut Grove as well as Fort Langley Park and Milner Park. In addition, the Township is providing flow sensors and field control units in two fields to be constructed in South Aldergrove Park.

6.6 Street Tree Planting Program

Trees play an important role in reducing pollution levels in the atmosphere that goes well beyond aesthetics. Trees act as sinks for CO_2 as well as providing shade that can act to keep pavement cool in the summer and lower temperatures in urban areas. Parkland also provides aesthetic and recreational opportunities to local residents. The Township currently maintains trees along roadways and in the municipal parks. And because of their ability to absorb carbon dioxide and produce oxygen, trees can be considered the "lungs of the community."

Based on street tree inventory figures compiled over the past ten years, on average 1,044 street trees have been planted each year between 1990 and 2000.

6.7 Rain Barrel Program

The Township of Langley offers residents "Watersaver" rain barrels at a subsidized price of $35.00. The rain barrels hold 230 litres and can reduce summer demand on the municipal water system. Rain barrels collect and store water from eaves and downspouts for later use in gardens and yards.

7.0 EMISSIONS FORECAST

The emissions forecast is an estimate of the GHG emissions that would occur in a specified target year given business as usual conditions in absence of any measures to reduce GHG emissions. As recommended by International Council Local Environmental Initiatives Cities for Climate Protection Campaign (ICLEI CCPC) protocol the target year to forecast to has been set at 2010.

The business as usual scenario was developed by simply taking the 2003 figures and extrapolating the same amount up to 2010. This was done assuming a population increase of 13.5% over the next 6 years.

The chart below outlines the primary sources of GHG emissions which were generated by the Township's own functions as a corporation in 1995, 1999, 2003 and forecast to the target year of 2010. GHG emissions for the forecast year of 2010 have been estimated at 5,630 tonnes.

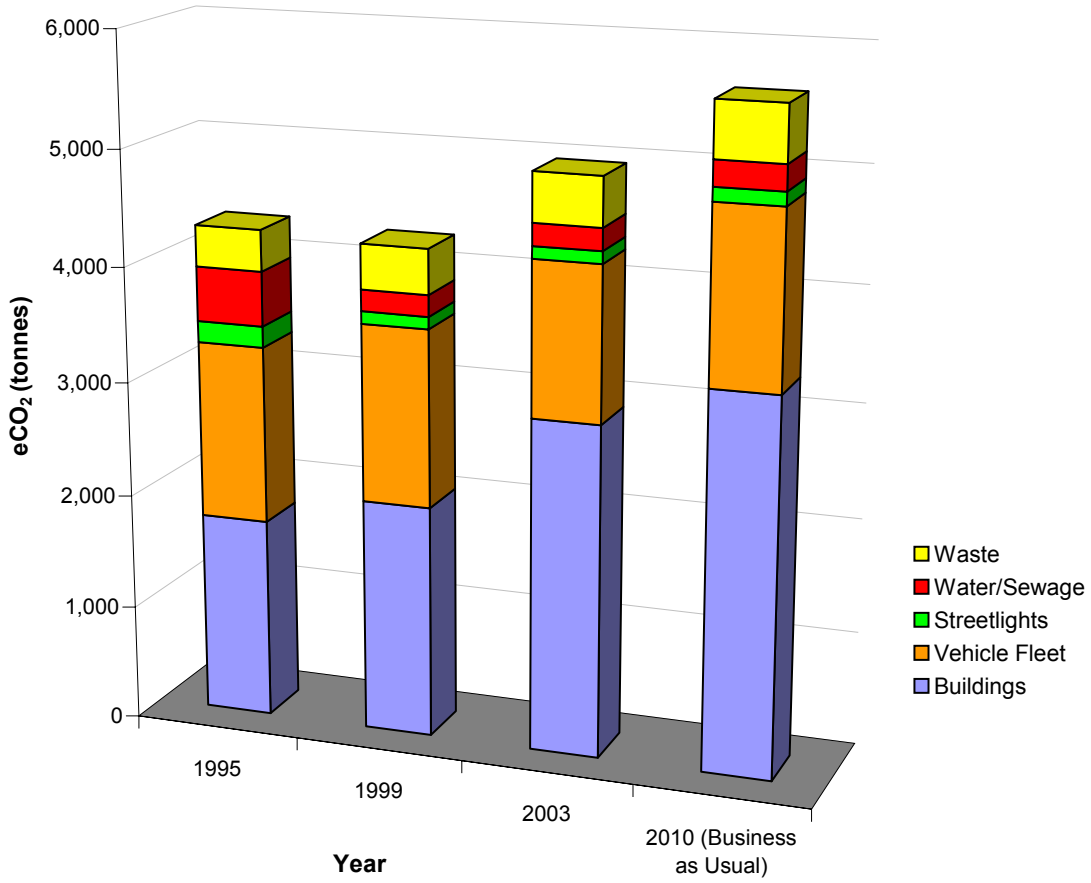


Figure 14 Township of Langley Emissions Forecast to 2010

7.1 Major Purchases and/or Construction Planned in the Future (2004 to 2010)

The acquisition, renovation and construction of major buildings within the next six years can significantly impact the GHG emissions forecast target set for 2010. As previously mentioned the business as usual scenario was developed by simply taking the 2003 figures and factoring in a 13.5% population increase in the next six years. No long term plans were reviewed to determine the impact that may result.

On May 20, 2004 the Township of Langley completed the acquisition of a building located at 20338 – 65th Avenue in Willowbrook. The building has previously been marketed as the 203rd Street Professional Building, and is located on the southeast corner of 203rd Street and 65th Avenue. The new civic facility will be deigned to include a community library, recreation facility, community policing office and municipal services and offices.

The emissions forecast presented in this report does not specifically evaluate the impact from this building or other major acquisitions within the next six years.

8.0 EMISSION REDUCTION TARGET

The emission reduction target is the quantity of GHG emissions that are planned to be reduced by a designated year. The GHG reduction target forms the basis for an emissions reduction program and provides a starting point from which to track progress. As a general rule, an emissions reduction target is expressed as a percentage reduction below the quantity of emissions released in the baseline year. The year 1995 has been used as the baseline year for the assessment and monitoring of GHG emissions. The Federation of Canadian Municipalities (FCM) recommends a 20% reduction below the baseline year from municipal operations within 10 years of joining the program.

While a 20% reduction below the baseline year is ideal, what is most important is to begin by setting a realistic target that is feasible. If the Township were to reduce emissions by 20% from 1995 levels (baseline year), it would require a reduction of 2,186 tonnes of eCO_2. A more viable goal would be for the Township to reduce their corporate emissions by 20% from 2003 levels by the year 2010. This would reduce a reduction of 1,662 tonnes eCO_2. This target can be refined by the Township of Langley when the local action plan is developed.

The following graph shows that GHG emissions from the Township's operations are expected to reach 5,630 tonnes under a business as usual scenario by 2010. Target #1 illustrates the 20% reduction based on 2003 emissions and Target #2 represents the FCM 20% reduction below the baseline year. The potential emission reduction measures presented in section 9.0 of this report will assist the Township in reducing GHG emissions by 2010. The reduction measures presented in the following section will require further evaluation and assessment.

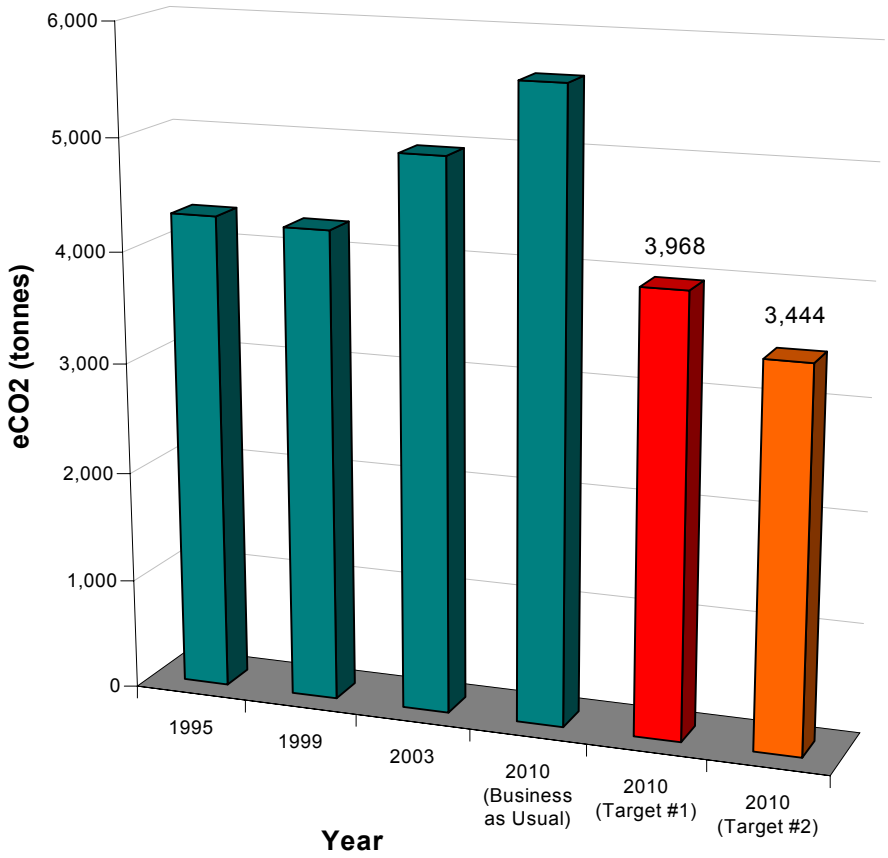


Figure 15 Township of Langley Emissions Reduction Target for 2010

9.0 POTENTIAL EMISSION REDUCTION MEASURES

A 13.5% increase in emissions within a 6-year period certainly provides a challenge for reducing GHG levels. However, there are many potential opportunities for change. The following sub-sections highlight some of these potential opportunities.

9.1 Buildings

9.1.1 Annual Energy Audits

Energy audits play an important role in identifying energy conservation opportunities. While audits do not provide the final answer to the problem, they do help to identify the existing potential for energy conservation, and allows organizations to concentrate their efforts in this area in a focused manner.

The Township should undertake annual energy audits in each of the municipal buildings. The Township should rate each of the buildings based on the level of efficiency and assign a priority in order to update all buildings with the most efficient technology feasible.

9.1.2 Building Maintenance

The Township should develop a building maintenance program for all of its buildings. Maintenance should consider energy efficiency options, as this is generally an ideal time to consider staged retrofits and changes that may be implemented as part of regular fitting replacement/maintenance activities. For example, when an incandescent light bulb fuses it could be replace with a compact fluorescent.

9.1.3 Green Design for New and Replacement Civic Buildings

Reducing energy consumption in existing municipal facilities is the key to reducing overall emissions. To limit the future impact of new and replacement civic buildings requires that buildings in excess of 500 square meters be designed to meet the minimum equivalent of LEED (Leadership in Energy and Environmental Design) silver standard.

LEED is a “green” building rating system that allocates points for a range of environmental design features. Requiring that new or replacement civic facilities are designed to meet the equivalent of a minimum LEED standard ensures that they incorporate a broad spectrum of sustainable building construction.

9.1.4 Employee Energy Reduction Program

Develop and implement an energy awareness campaign for Township employees. According to BC Hydro adopting energy saving habits in the office can save significant amounts of money and electricity. Turning off equipment when not in use improves workers' comfort by reducing fan noise and heat generation.

9.1.5 Lighting Upgrades

The Township should continue upgrading interior building lighting to more energy efficient models.

9.1.6 Municipal Green Procurement Policy

Adopting and implementing a municipal green procurement policy will ensure that newly purchased items have the greatest energy efficiency for their use. A procurement policy that commits the Township to energy efficiency will provide important environmental and economic benefits. The policy

should include both major purchases such as the Township's fleet of vehicles, as well as day to day purchases. The policy should also include purchases from recycled materials. Recycled products typically require less energy to produce than new products, and many recycled products cost less than new ones.

9.1.7 Green Roofs on Municipal Buildings

Green roofs, also known as "eco-roofs" or roof top gardens are a complete system of vegetation, soil, drainage and a waterproof membrane. Green roofs are attractive and can keep buildings cooler, save energy, and extend the useful life of a roof. A rooftop garden cuts the energy use within the building, especially for cooling. The insulation a garden helps to conserve both heating and cooling energy. Green roofs absorb rainfall and reduce urban runoff that otherwise would collect pollutants and empty into sewers. Green roofs filter and moderate the temperature of any water that is released to a storm sewer. The Township should examine the possibility of constructing green roofs on municipal buildings.

9.1.8 Energy Performance Contracts

Energy performance contracts enable clients to carry out comprehensive facility upgrades without any up-front capital investment and no financial risk. The contractors guarantee the energy and operating savings, which pay for the project. Where possible the Township should develop contracts that are performance based.

9.2 Transportation / Corporate Fleet

With a fleet of approximately 200 vehicles (from light duty cars to heavy duty diesel trucks) and thousands of litres of fuel consumed, the fleet represents one of the largest opportunities to reduce its GHG emissions. Furthermore, by greening the fleet, the Township leads by example, helping the community and businesses toward cleaner and greener transportation choices.

9.2.1 Driver Training Program "Smart Drive" for Fuel Efficiency

Smart driving procedures such as reducing idling, linking trips, a well maintained engine, properly inflated tires, and accelerating slowly can significantly increase fuel efficiency for both cars and trucks. Implementing a driver training program for employees will help improve driving habits, reduce fuel consumption, and emissions.

According to a US Department of Transportation study completed in 2001, 32 percent of light trucks are driven with one or more substantially under-inflated tires. Studies have shown that one tire under inflated by two pounds per square inch (psi) will increase fuel consumption by one percent (NHTSA, 2001).

Cars and trucks, which are idling unnecessarily, contribute carbon dioxide to the atmosphere thereby contributing to GHG emissions and global warming. A gasoline vehicle idling for two hours burns two gallons of gas and emits approximately 44 pounds of eCO_2 into the atmosphere. A diesel vehicle idling for two hours burns approximately one or two gallons of fuel and emits 22-44 pounds of eCO_2.

The City of Edmonton launched a driver training program to encourage employees to improve their driving habits. This included a fuel efficient driving course targeted at operators of high fuel consumption vehicles. The City estimates that this program has saved $600,000 per year, and has

reduced their annual fuel consumption by 1.2 million litres (Natural Resources Canada, 2004).

The Township of Langley should:

1) Implement an employee education program that focuses on efficient driving habits.
2) Participate in the Better Environmentally Sound Transportation (BEST) "Idle Free Workplaces Campaign" to reduce unnecessary vehicle idling and the Natural Resources Canada anti idling campaign.
3) Participate in the FleetSmart program offered by Natural Resources Canada (NRCan) to help fleet operators reduce vehicle operating costs, improve their organizations competitiveness and help the environment.

9.2.2 Shift to Alternative Fuels

The B.C. Municipal Fleet Managers Group initiated a pilot program to use a clean burning fuel partly made of natural oils. The municipalities participating in the program include Burnaby, Delta, the City of North Vancouver, Richmond, and Vancouver (as well as the Resort Municipality of Whistler). The alternative fuel being used in this pilot program is bio-diesel, produced from renewable resources like soybeans or waste vegetable oil. Blended with diesel fuel, the fuel significantly lowers emissions of carbon monoxide, hydrocarbons, particulate matter and toxic contaminants compared to petroleum diesel fuel. The Township should examine the possibility of converting its diesel fleet to bio-diesel and purchasing Hybrid vehicles.

9.2.3 Right Vehicle/Right Job

Matching duty requirements of staff to the smallest possible vehicle for the task is an effective fuel saving strategy. Additionally, fleet managers should evaluate opportunities to downsize the fleet. Eliminating excess vehicles discourages non-critical trips and encourages efficient use of the remaining vehicles. Substantial cost savings can be achieved by not having to purchase, maintain, depreciate and park vehicles.

9.3 Streetlights

The Township should assess its streetlights to see if it would be possible to retrofit them with new, lower-wattage, flat lens fixtures. The City of Calgary undertook a similar program and now these street lights are:

- *Saving energy and money.* The new flat-lens fixtures use less energy, helping to keep operating costs down.
- *Reducing greenhouse gas emissions.* Using less electricity reduces the emissions.
- Reducing glare to increase visibility. Glare from street lights is significantly reduced with the new flat-lens street-light fixtures, increasing visibility by directing light onto the roadway and preventing it from shining into the eyes of motorists.
- *Reduce excessive lighting and light pollution.* New ways of designing and providing street lighting have been developed in the last several years.

- *Maintaining a safe level of lighting*. Street lighting on residential and collector roads will continue to meet minimum Illuminating Engineering Society (IES) guidelines (City of Calgary, 2004).

9.4 Water/Sewage Facilities

Public demand on the municipal water and sewage system significantly impacts electrical consumption and subsequently GHG emissions. If less water is consumed in a community, then less energy is required to power water distribution and sewage system. To extend the life of the current system the Township should consider implementing the following measures.

1. Research the feasibility of a residential water metering program. A user pay system would encourage water conservation and reduce the demand on the public water delivery system.

2. Expand the current Water Wise education program.

3. Energy efficient specifications for new construction of the sewage and water system.

4. Improve energy efficiency of equipment.

9.5 Waste

9.5.1 Waste Prevention Program

Recovering materials to reuse in the production of new goods (recycling) prevents disposal in landfills and incinerators. The Township should develop a corporate recycling program that goes beyond just office paper. The following list provides some examples.

- Print documents double-sided - this will greatly reduce the amount of paper used.
- Re-use blank sides of paper for scrap or fax paper.
- Reduce paper waste by using email instead of faxes/mail.
- Use your own mug instead of a plastic mug.
- Recycle glass, plastic bottles and tins.

Composting is a simple, natural, and organic way to reduce the amount of garbage the Township sends to landfills.

- Compost all park, street and other landscaping debris for reuse by the Parks and Recreation Department.
- Recover food waste in cafeterias and kitchens for composting

9.6 Other Measures

9.6.1 Commuter Options for Township of Langley Employees

Similar to the highly successful Trip Reduction Program implemented by the Greater Vancouver Regional District (GVRD) the Township should consider ways that employees can travel to or from work, other than by driving alone in their car. Some of these options can include walking, jogging, cycling, public transit, carpooling, vanpooling and a compressed work week. While these emissions are not measured in the corporate component of the PCP program, it is still important to reduce overall

emissions to demonstrate leadership and responsibility. The Township should develop and manage a variety of commuter trip reduction programs.

Some of the benefits are:

- Easier employee recruitment and retention
- Improved employee productivity
- Improved employee wellness
- Reduced parking requirements (i.e. Operation Centre)
- Better public relations

9.6.2 One Tonne Challenge

The One Tonne Challenge is a federal initiative that request individuals to reduce their annual greenhouse gas emissions (GHGs) by one tonne. The average Canadian produces five tonnes of GHGs each year so one tonne is a reduction of about 20 per cent. Township staff should be encouraged to take this challenge to demonstrate leadership for the community.

9.6.3 Website Development

The goal of the web site would be to encourage both municpal staff and the general public to reduce their emissions of GHG's. The web site should contain resources, specific tools, and information on ways to achieve these reductions.

9.6.4 Purchase Green Power

Green Power Certificates (Power Smart) provide a simple, practical way for organizations to tangibly demonstrate its corporate values and help lead the way to a more sustainable future. BC Hydro is now selling Green Power Certificates from 100% generated-in-BC green electricity to domestic business customers on a pilot basis. The Township should consider purchasing Green Power Certificates. According to BC Hydro Green Power Certificates benefit your organization by:

1. Crediting you with the environmental and social attributes associated with your purchase, including greenhouse gas and other emissions avoided.
2. Allowing you to say your company has offset the impacts of the electricity you use.
3. Helping you achieve environmental performance targets.
4. Demonstrating to your stakeholders and employees that your organization is committed to a sustainable future.

9.6.5 Award Program for Municipal Employees

Establish an award program for municipal employees who make suggestions that significantly promote energy efficiency and energy cost savings and minimize the municipalities' impact on climate change. Award recipients could be recognized with a certificate from the Township and could be given an additional vacation day.

9.6.6 Commuter Challenge

The commuter challenge is a friendly competition between Canadian communities to encourage as many people as possible to use sustainable and active modes of transportation. Township staff should participate in this challenge and provide leadership for the community.

10.0 CONCLUSION

This corporate greenhouse gas inventory report acts as a benchmark for the municipality of Langley while it works towards achieving its emissions reduction target for 2010. It is clear that the Township has been undertaking a variety of emission reduction measures over the years, but to achieve the reduction target further reduction measures will be needed.

It is recommended that the Township undertake the following steps to reduce GHG emissions from its operations.

1. That Township Council accepts this report and sets a 2010 emissions reduction target.
2. That a comprehensive local action plan be developed (milestone 3).
3. That Township Council authorize staff to implement the action plan.
4. That Township Council request staff to undertake a similar process for the community component of the PCP program.

REFERENCES

Australian Greenhouse Office, 2004 http://www.greenhouse.gov.au/science/faq/page5.html

BC Hydro, *BC Hydro Greenhouse Gas Report*, December 2003.

City of Calgary, 2004
http://content.calgary.ca/CCA/City+Hall/Business+Units/Roads/Street+Lights/FAQ.htm

City of Vancouver, *Corporate Climate Change Action Plan - The Climate Friendly City*, 2004.

David Suzuki Foundation,2004 http://www.davidsuzuki.org/Climate_Change/BC/Impacts.asp

Environment Canada, *Landfill Gas Utilization Jackman Landfill Site*, March, 1998 Issue No.5 of 6.

Federation of Canadian Municipalities - Partners for Climate Protection,
http://kn.fcm.ca/ev.php?URL_ID=2805&URL_DO=DO_TOPIC&URL_SECTION=201&reload=1088310705

Golder Associates, *Phase I Water Resources Management Strategy Township of Langley*, January 1999.

Greater Vancouver Regional District, http://www.gvrd.bc.ca

Global Resource Information Database, 2004 http://www.grida.no/db/maps/prod/level3/id_1461.htm

International Council for Local Environmental Initiatives Energy Services, *The Business Case for Cutting Greenhouse Gas Emissions from Municipal Operations*, June 2003.

International Council for Local Environmental Initiatives, http://www.iclei.org/co2/index.htm

National Climate Change Process, 2004
http://www.nccp.ca/NCCP/national_process/issues/municipalities_e.html

National Highway Traffic Administration,
http://www.nhtsa.dot.gov/nhtsa/announce/press/pressdisplay.cfm?year=2001&filename=pr46-01.html

Natural Resources Canada, 2004 http://oee.nrcan.gc.ca/fleetsmart/successStories/

New City of Hamilton, Corporate Buildings & Real Estate Department. *State of the City's Infrastructure*. Council Presentation, February 20, 2001.

Pembina Institute, 2004 http://www.climatechangesolutions.com/municipal/default.shtml?o=intro

Province of British Columbia, http://www.bcstats.gov.bc.ca/data/dd/facsheet/facsheet.htm

Region of Peel, 2004 http://www.peelregion.ca/health/smog/

Torrie Smith Associates Inc., 2004 http://www.torriesmith.com/

Township of Langley, 2004 http://www.tol.bc.ca

Township of Langley, *Jackman Landfill Status Report for 2002*, March 3, 2003.

Township of Langley, *Ultra Low Flush Toilet – Water Conservation*, March 17, 2003.

Township of Langley, *Memorandum – Computerized Irrigation Control System*, May 27, 2004.

Personal References

MacKay, Linda (BC Hydro)

Haycock, Russ (FCM)

Shwaikoski, Ross (GVRD)

Short, David (Terasen Gas Industrial Billing)

Paquette, Lorraine (Terasen Gas Consolidated Billing)

Lindhal, Bill (TOL Parks Operations Manager)

West, Bud (TOL Solid Waste Co-ordinator)

McQueen, John (TOL Equipment Supervisor)

Erickson, Earl (TOL Facilities Manager)

APPENDIX A

Township of Langley Regular Council Minutes January 15, 2001

Township of Langley - Regular Minutes

Monday, January 15, 2001

Township of Langley
Est. 1873

REGULAR MEETING OF
TOWNSHIP COUNCIL

Monday, January 15, 2001 at 7:00 p.m.
in the Langley School District Boardroom
4875 – 222 Street, Langley, BC

MINUTES

PRESENT: Mayor K. Alberts

Councillors M. Arnason, M. Barnard, D. Drysdale, M. Kositsky, B. Long and K. Richter

M. Bakken, A. De Feo, D. Erickson, R. Kray, T. Lyster, J. Winslade and C. Peacock, Recording Secretary

The meeting was called to order at 7:00 p.m.

A. ADOPTION OF MINUTES

1. Regular Meeting
December 18, 2000

Moved by Councillor Richter,
Seconded by Councillor Barnard,
That the Minutes of the Regular Council meeting held December 18, 2000 be adopted as circulated.

CARRIED

R.

Notice of Motion

OTHER BUSINESS

Councilor Kositsky provided the following notice of motion:

That Council participate in the Partners for Climate Protection Program and endorse the following resolution:

WHEREAS a global reduction in emissions of greenhouse gases (GHG) is necessary to protect against climate change and possible adverse effects on human health, the physical environment, economy and quality of life;

WHEREAS industrialized countries, gathered at the United Nations Conference on Environment and Development in 1992, ratified a Convention on Climate Change committing countries to stabilizing greenhouse gas emissions at 1990 levels by the year 2000;

WHEREAS industrialized countries, realizing initial commitments were inadequate to protect the Earth's climate system, agreed in December 1997 to the Kyoto Protocol which, if ratified, commits Canada to reducing its greenhouse gas emissions six per cent below 1990 levels between 2008 - 2012;

WHEREAS current forecasts predict that Canada's greenhouse gas emissions could be in the order of 13 per cent above 1990 levels by the year 2000 if no action is taken, thus falling short of its commitments;

WHEREAS Federation of Canadian Municipalities and the International Council for Local Environmental Initiatives have established a Partners for Climate Protection to provide a forum for municipal governments to demonstrate their leadership on climate change issues and undertake to share their knowledge and experience with other municipal governments;

WHEREAS Partners for Climate Protection members commit to working towards reducing greenhouse gas emissions in municipal operations by 20 per cent below 1990 levels, and at least six per cent reductions below 1990 levels throughout their municipal area within ten years of joining the program;

BE IT RESOLVED THAT the Township of Langley communicate to FCM its support for the Partners for Climate Protection Program and its interest in participating in the PCP Program.

— Endorsed by council in 2001

APPENDIX B

Electrical and Natural Gas Consumption Data

Account Number	Acct Closed Date	Category	Sub-Category	Account Description	Rate Code	Service Address	1995	1999	2003
							(kwh)	(kwh)	(kwh)
00003089164		Buildings	Fire	Fire Hall No.4	1200	20253 72 Avenue			104,280
22319460101		Buildings		Aldergrove Kinsemen Community Centre	1200	26770 29 Avenue	159,840	160,080	184,640
21382299191		Buildings	Parks	Walnut Grove Park (Water Park and Washrooms)	1200	8937 Walnut Grove Drive	25,500	37,860	50,940
22303409201		Buildings	Parks	Aldergrove South Park	1200	W OF 27A Avenue 269 Street	16,400	33,040	36,000
21333500091		Buildings		Operations Centre	1200	4700 224 Street	417,614	779,040	785,880
21343200181		Buildings	Fire	Fire Hall No.6	1200	22170 50 Avenue		368,520	417,000
21343249001		Buildings		Municipal Hall	1200	4914 221 Street	501,200	295,200	357,400
21343297003		Buildings		WC Blair Recreation	1200	22200 Fraser Highway	1,688,400	1,386,960	1,470,480
21343299491		Buildings	RCMP	RCMP	1200	22180 48A Avenue	1,059,840	979,920	875,160
22301331201		Buildings		Aldergrove Arena	1201	2882 272 Street	1,044,300	1,007,700	625,800
21382200061		Buildings		Walnut Grove Recreation Centre	1210	8889 Walnut Grove Drive	598,080	1,286,880	3,199,680
00000278394		Buildings	RCMP	RCMP Green HQ	1220	22323 48 Avenue		43,628	75,180
00001045384		Buildings		LEPS Trailer	1220	4700 224 Street Trailer			7,869
00001695144		Buildings	Fire	Fire Hall No.3	1220	26316 30A Avenue			91,680
00001715684		Buildings	RCMP	Aldergrove (Community Policing Office)	1220	26978 Fraser Highway			63,503
00002590894		Buildings		Brookswood Library	1220	20049 40 Avenue			4,093
00002756004		Buildings	Parks	Williams Park (Shelter)	1220	6595 238 Street Park			218
00002840464		Buildings	Parks	Park Washrooms (Denny Ross Memorial Park)	1220	21900 Old Yale Road			18,353
00003200674		Buildings	RCMP	RCMP Sub Office	1220	4061 200 Street (109)			20,557
00003501164		Buildings		Murrayville Library	1220	22071 48 Avenue (100)			121,560
21311300421		Buildings	Fire	Fire Hall No.5	1220	20355 32 Avenue	75,441	54,043	45,184
21322171981		Buildings	Parks	Cemetery (Building)	1220	4393 208 Street	8,248	14,998	11,741
21330300081		Buildings	Parks	Old Fire Hall Now Parks and Rec (Brookswood Park)	1220	4035 200 Street	12,027	33,835	28,602
00003453204		Buildings	Parks	South Aldergrove Park	1220	26817 27 Avenue			2,546
21350701171		Buildings	Parks	Langley Meadows Park (Irrigation Controller)	1220	19907 64 Avenue	0	0	27
21352100172		Buildings	Parks	McCleod Athletic Park (Washrooms)	1220	5745 216 Street	7,983	18,127	19,679
21381700651		Buildings	Parks	McClughan Park	1220	9035 206 Street		1,645	0
22304443401		Buildings		Methane Burner	1220	1099 272 Street	10,160	5,691	3,850
22320330011		Buildings	Parks	Ball Park	1220	27155 32 Avenue	4,403	8,210	9,492
22320330611		Buildings	Parks	Ball Park	1220	27155 32 Avenue	7,560	7,200	11,160
21343400111		Buildings		Airport	1220	5333 216TH Street (Pole)	4,587	24,515	26,723
21343400281		Buildings		Airport	1220	5385 216 Street	1,078	20,273	21,969
21343400381		Buildings		Airport	1220	5385 216 Street	1,258	4,849	3,885
21343400451		Buildings		Airport	1220	5225 216 Street (HELI.)	250	742	970
22307350501		Buildings	Fire	Fire Hall No.7	1220	3876 248 Street	19,558	25,721	21,693
21331480031		Buildings		Brookswood Library	1220	20045 40 Avenue	28,110	22,756	25,270
21332304051		Buildings	Parks	Murrayville Cemetery (Building)	1220	21405 44 Avenue	2,257	4,115	5,459
21343400041		Buildings		Airport	1220	5385 216 Street	1,080	30,360	30,720
21365135961		Buildings	Parks	Williams Park (Washrooms)	1220	6595 238 Street (Rest)	58,636	32,656	21,107
21372150201		Buildings	Parks	Willoughby Park (Washrooms)	1220	20542 84 Avenue	42,600	33,900	21,720
21373100281	21-May-03	Buildings	Fire	Fire Hall No.4 (no longer there)	1220	20409 80 Avenue	27,589	28,293	13,699
21381507031		Buildings		West Langley Hall	1220	9400 208 Street		26,018	25,746
21381507531		Buildings	Fire	Fire Hall No.8	1220	9580 208 Street		54,834	61,381
21383203191		Buildings	RCMP	RCMP Sub Office	1220	8850 Walnut Grove Drive (108)	10,933	19,298	19,980
21384445091		Buildings		Museum	1220	23398 Mavis Avenue	37,021	33,701	37,451
21384445231		Buildings		Museum	1220	23398 Mavis Avenue	51,067	58,606	51,913
21384451231		Buildings	Fire	Fire Hall No.2	1220	23191 96 Avenue	27,380	27,870	24,674
21385235591		Buildings		Fort Langley Community Pool	1220	23055 St. Andrews Avenue	18,781	15,903	19,241
21385235601		Buildings		Cemetery (Building)	1220	23105 St. Andrews Avenue	3,961	5,321	4,463
22301417903	31-Mar-03	Buildings	RCMP	Aldergrove RCMP Sub Office	1220	3085 271 Street	13,843	19,038	3
33142104201		Buildings	Parks	Brown Park (Irrigation)	1401	5022 240 Street	5,126	1,574	4,558

Account Number	Acct Closed Date	Category	Sub-Category	Account Description	Rate Code	Service Address	1995	1999	2003
21331855741		Buildings		Civic Centre	1755	20699 42 Avenue	1,803,000	1,304,400	1,490,400
21330300063	05-May-02	Buildings	RCMP	Brookswood RCMP Sub Office		4061 200 Street (112)		24,866	
21373100271	19-Jul-02	Buildings	Fire	Fire Hall No.4 (no longer there)		20409 80 Avenue	20	16	
22301418003	31-Mar-03	Buildings	RCMP	Aldergrove RCMP Sub Office		3087 271 Street	12,135	5,162	0
00000756624	30-Sep-01	Buildings		LEPS Trailer		4700 224 Street Trailer		88	
00001103404	07-Jan-00	Buildings				7017 202B Street		14,671	
21343200821	14-Jun-99	Buildings		Municipal Hall		4914 221 Street (RR)	2,609	1,028	
21343253141	15-May-99	Buildings				4914 222 Street		9,600	
22320455301	03-Jul-02	Buildings				2900 272 Street	26,958	28,669	
	24-Jul-95	Buildings				4061 200T Street (102)	5,149		
	22-Apr-97	Buildings		Heritage House		21860 Old Yale Road (B)	1,906		
	25-Sep-98	Buildings				22313 48 Avenue	32,992		
	05-Dec-95	Buildings				21447 51B Avenue	4,633		
	15-Feb-95	Buildings		Municipal Hall		4914 221 Street	11,242		
	12-Feb-99	Buildings		Municipal Hall		4914 221 Street	21,551	4,113	
	15-Mar-95	Buildings		Municipal Hall		4914 221 Street	65,040		
	25-Feb-98	Buildings				9580 208 Street	73,469		
80635		Buildings				4061 200 Street	29,730	103,918	
	27-Nov-95	Buildings				22259 48 Avenue	26,955		
21343400091	31-Dec-00	Buildings		Airport (Account was closed)		5385 216 Street (U/S)	10,968	15,179	
00001832124		Streetlights	Parks	MAP Grandstand (Softball Lights)	1200	21485 58 Avenue			75,120
00003491874		Streetlights	Parks	Mcleoad Athletic Park (Baseball and Sports fields)	1200	21400 58 Avenue			53,460
21321283431		Streetlights	Parks	Noel Booth Park (Washroom and Sports field Lights)	1200	20244 36 Avenue	76,800	111,120	95,280
21345235231		Streetlights	Parks	Brown Park (Washrooms, Soccer and Ball Lights)	1200	5022 240 Street	42,400	82,880	94,480
21352100351		Streetlights	Parks	McCleod Athletic Park Grandstand (Lights)	1220	21541 57A Avenue		17,040	21,360
21321100191		Streetlights	Parks	Bell Park (Security Lights)	1220	3800 205A Street	2,784	2,156	2,788
21361310412		Streetlights	Parks	Milner Rugby Lights	1220	6860 Glover Road		20,941	12,974
21372150221		Streetlights	Parks	Willoughby Park (Security Lights)	1220	20542 84 Avenue (A)	2,443	431	1,651
21382200441		Streetlights	Parks	Walnut Grove Park (Soccer and Ball Lights)	1220	8937 Walnut Grove Drive	45,660	48,660	42,660
21382601121		Streetlights	Parks	James Kennedy Park (Security Lights)	1220	8995 213 Street		13,448	15,571
22320330111		Streetlights	Parks	Aldergrove Park Lights	1220	27155 32 Avenue	23,374	38,057	26,387
00000329514		Streetlights	Traffic	Traffic Signals	1220	20002 88 Avenue		13,348	18,199
00000439754		Streetlights	Traffic	Traffic Signals	1220	8645 Glover Road		96	1,710
00000496464		Streetlights	Traffic	270 Street Kiosk	1220	Route 1A E/O 270 Street		0	5,928
00000496494		Streetlights	Traffic	273 Street Kiosk	1220	Route 1A at 273 Street			5,392
00000675624		Streetlights	Traffic	Willoughby PRV Kiosk	1220	20415 82 Avenue		85	509
00001575024		Streetlights	Traffic	Traffic Signals	1220	20302 64 Avenue			10,728
00003671654		Streetlights	Traffic	Christmas Lighting	1220	6595 238 Street Kiosk			741
00003844894		Streetlights	Traffic	Traffic Signals	1220	1939 264 Street			1,102
21332101891		Streetlights	Traffic	Traffic Signals	1220	4400 208 Street		8,760	8,760
21343250101		Streetlights	Traffic	2 Lights	1220	4915 221 Street	2,810	2,179	1,954
21383200441		Streetlights	Traffic	Park & Ride	1220	20300 88 Avenue	35,639	28,319	17,843
21384295911		Streetlights	Traffic	Wilson Townline Road - Hall No.2 Light	1220	23191 96 Avenue	200	480	480
33170021061		Streetlights	Overhead	Overhead Street Lighting	1701	Overhead Street Lighting	611,207	607,090	537,287
33170022081		Streetlights	Overhead	Overhead Street Lighting	1701	Overhead Street Lighting	204,589	209,405	179,599
33170021051		Streetlights	Ornamental	Ornamental Street Lighting	1702	Ornamental Street Lighting	1,465,196	1,947,293	1,929,695
33170022071		Streetlights	Ornamental	Ornamental Street Lighting	1702	Ornamental Street Lighting	401,232	549,816	544,192
00000211684		Streetlights	Traffic	Traffic Signals	1704	19865 96 Avenue		9,848	10,417
00000266624		Streetlights	Traffic	Traffic Signals	1704	9150 200 Street		9,570	11,484
00000315294		Streetlights	Traffic	Traffic Signals	1704	20402 96 Avenue		14,103	4,509
00000329254		Streetlights	Traffic	Traffic Signals	1704	24000 Fraser Highway		10,739	11,244
00000329304		Streetlights	Traffic	Traffic Signals	1704	23200 Fraser Highway		10,660	11,244

Account Number	Acct Closed Date	Category	Sub-Category	Account Description	Rate Code	Service Address	1995	1999	2003
00000329364		Streetlights	Traffic	Traffic Signals	1704	22200 Fraser Highway		13,859	15,348
00000329374		Streetlights	Traffic	Traffic Signals	1704	21600 Fraser Highway		18,187	15,253
00000329384		Streetlights	Traffic	Traffic Signals	1704	66 Avenue 200 Street		13,327	14,424
00000329394		Streetlights	Traffic	Traffic Signals	1704	200 Street Willowbrook		19,917	15,768
00000329454	01-Apr-99	Streetlights	Traffic	Traffic Signals	1704	Route 10 Langley Bypass		2,227	
00000329474		Streetlights	Traffic	Traffic Signals	1704	200 Street 64 Avenue		13,386	17,784
00000329484		Streetlights	Traffic	Traffic Signals	1704	Glover Road and Jardine Road		383	516
00000329494		Streetlights	Traffic	Traffic Signals	1704	80 Avenue and 200 Street		14,827	20,214
00000329504		Streetlights	Traffic	Traffic Signals	1704	83 Avenue and 200 Street		2,305	3,142
00000329524		Streetlights	Traffic	Traffic Signals	1704	68 Avenue and 200 Street		683	814
00000329534		Streetlights	Traffic	Traffic Signals	1704	70 Avenue and 200 Street		1,366	1,628
00000329544		Streetlights	Traffic	Traffic Signals	1704	200 Street and 72 Avenue		13,332	15,884
00000329574		Streetlights	Traffic	Traffic Signals	1704	7730 Glover Road		187	252
00000329624		Streetlights	Traffic	Traffic Signals	1704	Glover Road/88 Avenue		11,453	12,660
00000330384		Streetlights	Traffic	Traffic Signals	1704	Route 1A at 276 Street		11,434	15,360
00000330854		Streetlights	Traffic	Traffic Signals	1704	Route 1A at 273A Street		5,439	5,712
00000330894		Streetlights	Traffic	Traffic Signals	1704	Route 1A at 268 Street		10,413	6,852
00000330914		Streetlights	Traffic	Traffic Signals	1704	Route 1A and 248 Street		11,943	11,244
00000330924		Streetlights	Traffic	Traffic Signals	1704	24400 Fraser Highway		5,404	11,952
00000331004		Streetlights	Traffic	Traffic Signals	1704	Route 1A AT 272 Street		12,393	15,888
00000333214		Streetlights	Traffic	Traffic Signals	1704	19600 Fraser Highway		16,025	21,288
00000412244		Streetlights	Traffic	Traffic Signals	1704	7202 208 Street		7,592	12,480
00000429704		Streetlights	Traffic	Traffic Signals	1704	8002 208 Street		7,626	12,791
00000589644		Streetlights	Traffic	Traffic Signals	1704	8999 208 Street		2,387	4,235
00000666154		Streetlights	Traffic	Traffic Signals	1704	9155 202 Street		886	2,167
00001551514		Streetlights	Traffic	Traffic Signals	1704	200 Street and 44 Avenue			17,700
00001632684		Streetlights	Traffic	Traffic Signals	1704	5600 216 Street			19,032
00001940394		Streetlights	Traffic	Traffic Signals	1704	Fraser Highway E/O 270 Street			4,378
00002007574		Streetlights	Traffic	Traffic Signals	1704	21099 72 Avenue			600
00002538424		Streetlights	Traffic	Traffic Signals	1704	9400 210 Street			3,850
00002818834		Streetlights	Traffic	Traffic Signals	1704	1600 200 Street			2,319
00002818874		Streetlights	Traffic	Traffic Signals	1704	1600 208 Street			1,919
00002818894		Streetlights	Traffic	Traffic Signals	1704	1600 216 Street			1,833
00002818904		Streetlights	Traffic	Traffic Signals	1704	1600 224 Street			1,833
00002818914		Streetlights	Traffic	Traffic Signals	1704	1600 232 Street			1,833
00002818924		Streetlights	Traffic	Traffic Signals	1704	1600 240 Street			1,833
00002840854		Streetlights	Traffic	Traffic Signals	1704	1600 272 Street			2,364
00002840864		Streetlights	Traffic	Traffic Signals	1704	1600 256 Street			2,364
00002840874		Streetlights	Traffic	Traffic Signals	1704	1600 248 Street			2,364
00003051714		Streetlights	Traffic	Traffic Signals	1704	9475 201 Street			11,308
00003076894		Streetlights	Traffic	Traffic Signals	1704	20220 64 Avenue			7,260
00003105474		Streetlights	Traffic	Traffic Signals	1704	27515 Fraser Highway			13,944
00003389814		Streetlights	Traffic	Pedestrian Signs	1704	3500 200 Street			3,276
00003389834		Streetlights	Traffic	Pedestrian Signs	1704	20250 36 Avenue			3,276
00003422514		Streetlights	Traffic	Pedestrian Signal	1704	9010 Glover Road			648
00003719644		Streetlights	Traffic	Traffic Signals	1704	88 Avenue / 210 Street			15,183
00003778474		Streetlights	Traffic	Traffic Signals	1704	6201 204 Street			1,862
00004073984		Streetlights	Traffic	Traffic Signals	1704	3200 200 Street			604
00004385464		Streetlights	Traffic	Traffic Signals	1704	270 Street 32 Avenue			1,788
00004393574		Streetlights	Traffic	Traffic Signals	1704	19798 Willowbrook Drive			517
00004404664		Streetlights	Traffic	Traffic Signals	1704	56 Avenue at 248 Street			28
21311100081		Streetlights	Traffic	4 Way Intersection	1704	2400 200 Street		2,364	2,364

Account Number	Acct Closed Date	Category	Sub-Category	Account Description	Rate Code	Service Address	1995	1999	2003
21312100291		Streetlights	Traffic	Traffic Signals	1704	3750 208 Street	3,605	8,652	2,842
21320271121		Streetlights	Traffic	Traffic Signals	1704	3850 200 Street	3,680	8,832	10,248
21320401351		Streetlights	Traffic	Traffic Signals	1704	3600 200 Street	9,305	22,332	12,348
21322101451		Streetlights	Traffic	Traffic Signals	1704	4000 208 Street		15,768	4,418
21330370101		Streetlights	Traffic	Traffic Signals	1704	4100 200 Street	4,295	10,308	11,616
21330370611		Streetlights	Traffic	Traffic Signals	1704	4200 200 Street	4,635	11,124	11,616
21330371071		Streetlights	Traffic	Traffic Signals	1704	4000 200 Street	5,015	12,036	10,920
21350501511		Streetlights	Traffic	Traffic Signals	1704	19702 64 Avenue	3,130	7,512	14,136
21350501551		Streetlights	Traffic	Traffic Signals	1704	19701 Willowbrook Drive	5,596	12,672	4,112
21361100201		Streetlights	Traffic	Traffic Signals	1704	20498 64 Avenue		10,512	10,512
21361100341		Streetlights	Traffic	Traffic Signals	1704	64 Avenue 200 Street	365	876	18,972
21380000381		Streetlights	Traffic	Traffic Signals	1704	92A Avenue 200 Street	7,090	17,016	14,424
21380001091		Streetlights	Traffic	Traffic Signals	1704	9300 Block 200 Street		24,360	17,364
21380089451		Streetlights	Traffic	Traffic Signals	1704	96 Avenue 200 Street	5,840	14,016	10,200
21381100051		Streetlights	Traffic	Traffic Signals	1704	88 Avenue 204 Street	4,368	13,104	13,371
21381500061		Streetlights	Traffic	Traffic Signals	1704	88 Avenue 208 Street	505	1,212	14,204
21382200021		Streetlights	Traffic	Traffic Signals	1704	88 Avenue Walnut Grove Drive	6,375	15,300	12,705
21382200211		Streetlights	Traffic	Traffic Signals	1704	88 Avenue Walnut Grove Drive	264	528	484
21382200551		Streetlights	Traffic	Traffic Signals	1704	9055 212 Street		12,264	3,412
21382600881		Streetlights	Traffic	Traffic Signals	1704	21479 88 Avenue	438	915	915
21382699131		Streetlights	Traffic	Traffic Signals	1704	88 Avenue 212 Street	6,515	16,372	14,803
21382800481		Streetlights	Traffic	Traffic Signals	1704	8801 216 Street	5,692	17,265	15,653
21391201151		Streetlights	Traffic	Traffic Signals	1704	20802 96 Avenue	665	15,768	4,239
21391202441		Streetlights	Traffic	Traffic Signals	1704	20168 96 Avenue		18,576	4,905
22314370212		Streetlights	Traffic	Traffic Signals	1704	Route 1 AT Route 13		10,224	10,224
22320300021		Streetlights	Traffic	Traffic Signals	1704	32 Avenue 272 Street	6,288	18,864	4,755
21372105091		Streetlights	Traffic	Fire Hall No.4 Outside Light	1755	20409 80 Avenue			
00000163404		Water/Sewage	Water	Aldergrove Water Treatment	1200	27540 28 Avenue		338,160	527,280
00001171074		Water/Sewage		?	1200	5676 272 Street PMP2			89,640
21311315501		Water/Sewage	Water	Brookswood Well No.7	1200	20650 32 Avenue	18,560	66,240	215,200
21312102731		Water/Sewage	Water	Brookswood Well No.9	1200	20701 32 Avenue	64,200	84,000	316,680
21320201251		Water/Sewage	Water	Brookswood Water PRV	1200	19620 36 Avenue	48,600	43,080	54,360
21320203201		Water/Sewage	Water	Brookswood Water No.10	1200	19820 36 Avenue	207,040	237,120	212,800
21320400511		Water/Sewage	Water	Brookswood Water Well No.4	1200	3482 197 Street	87,660	49,902	5,444
21323280021		Water/Sewage	Water	Murrayville Well No.1	1200	4451 224 Street	153,985	126,960	196,560
21335150251		Water/Sewage	Water	Murrayville Well No.2	1200	22566 Old Yale Road	101,520	144,900	164,160
21361299011		Water/Sewage	Water	Water Pump	1200	6795 206 Street	145,620	53,280	110,520
21371200311		Water/Sewage	Water	Willoughby Booster Station	1200	20400 73A Avenue	86,040	72,900	77,580
21373215001		Water/Sewage	Water	NWL Well	1200	22709 88 Avenue	797,040	885,600	1,229,400
21373400241		Water/Sewage	Water	NWL Reservoir Station	1200	21212 85 Avenue	336,960	269,760	313,920
21384451511		Water/Sewage	Water	Salmon River Pump Station	1200	Salmon River West Langley	68,040	256,800	125,040
21391250181		Water/Sewage	Sewage	WG Sewer Lift Station	1200	21210 96 Avenue	150,720	233,400	228,960
21392147611		Water/Sewage	Water	West Langley Dyke Pump Station	1200	20461 102B Avenue	61,520	61,200	62,880
22303303411		Water/Sewage	Sewage	Aldergrove Sewage Treatment Plant	1200	27540 28 Avenue	80,827	257,220	314,640
22303487652		Water/Sewage	Water	Aldergrove Water Well No.8	1200	2623 272 Street	293,160	147,360	221,760
22308353701		Water/Sewage	Water	Aldergrove Water Reservoir	1200	3170 262B Street	62,720	51,840	55,760
22310469502		Water/Sewage	Water	Water Pump SRU No.1	1200	5800 245A Street	427,320	316,080	91,260
22315309632		Water/Sewage	Water	Aldergrove Pump No.7	1200	2520 272 Street	75,840	211,080	208,560
22315320201		Water/Sewage	Water	Aldergrove Water Well No.7	1200	27190 25 Avenue	199,980	241,200	191,520
21312102711		Water/Sewage	Water	Brookswood Water Reservoir	1220	20771 32 Avenue	13,540	16,576	15,912
21320400371		Water/Sewage	Water	Drainage Pump Station	1220	19698 33A Avenue	1,973	12,848	75
21320449291		Water/Sewage	Water	Brookswood Water Well No.8	1220	3458 200 Street	2,884	3,286	4,455

Account Number	Acct Closed Date	Category	Sub-Category	Account Description	Rate Code	Service Address	1995	1999	2003
21331800011		Water/Sewage	Sewage	Sewage Lift Station	1220	4353 200A Street	1,855	2,518	1,618
21335136501		Water/Sewage	Sewage	Sewage Pump Station	1220	23750 Fraser Highway	228	1,344	1,597
21342260131		Water/Sewage	Sewage	Sewer Pump Station	1220	21341 Old Yale Road	193	134	192
21345260401		Water/Sewage	Water	Acadia Water	1220	4745 242A Street	10,268	11,134	19,817
21345422452		Water/Sewage	Water	Tall Timbers Water	1220	23990 58A Avenue	63,140	69,331	71,535
21352175501		Water/Sewage	Sewage	West Langley Sewer Lift Station	1220	21200 56 Avenue	107,923	13,549	13,952
21361100281		Water/Sewage	Sewage	Sewage Lift Station	1220	20555 62 Avenue	2,467	5,905	1,249
21361104001		Water/Sewage	Sewage	Sewer Lift Station	1220	203 Street 62 Avenue	90,720	86,040	77,040
21361398151		Water/Sewage	Sewage	Lift Station	1220	6656 Glover Road (Pump)	16,210	19,733	21,544
21371212251		Water/Sewage	Water	Willoughby Reservoir Water	1220	20450 73A Avenue	4,199	2,513	1,091
21373200311		Water/Sewage	Sewage	Lift Station	1220	8395 216 Street	5,704	7,755	8,477
21381314211		Water/Sewage	Sewage	Sewer Lift Station	1220	20513 95A Avenue	1,233	1,300	1,389
21382699231		Water/Sewage	Sewage	Lift Station	1220	9046 214B Street	6,561	10,071	13,524
21382800451		Water/Sewage	Sewage	Lift Station	1220	9001 216 Street	14,940	16,380	12,780
21384400351		Water/Sewage	Sewage	Lift Station	1220	23345 Mavis Avenue		29,880	30,840
21391000131		Water/Sewage	Water	Valve	1220	19603 96 Avenue	306	230	431
21391000551		Water/Sewage	Water	Pressure Reducing Valve	1220	9620 201 Street	10,026	9,243	4,288
21392100011		Water/Sewage	Sewage	Lift Station	1220	9800 208 Street	3,470	2,314	2,922
21392121002		Water/Sewage	Sewage	Sewer Lift Station	1220	20452 98 Avenue	16,708	17,873	18,574
22301313701		Water/Sewage	Sewage	Sewer Lift Station	1220	27170 28B Avenue	4,811	4,101	4,893
22301331101		Water/Sewage	Water	Aldergrove Pump No.3	1220	2800 272 Street	105,704	54,669	79,662
22310300011		Water/Sewage	Water	Water Pump SRU No.3	1220	5945 252 Street	18,960	6,960	1,920
22313428301		Water/Sewage	Water	Aldergrove Reservoir	1220	Quinton Road W/O	6,946	8,991	7,384
22314387002		Water/Sewage	Sewage	Gloucester Sewage Treatment Plant	1220	5676 272 Street	291,240	413,880	14,760
22315309941		Water/Sewage	Sewage	Sewer Lift Station	1220	26827 24 Avenue	3,944	18,343	18,215
22315310101		Water/Sewage	Sewage	Sewer Lift Station	1220	2502 272 Street	2,816	4,106	4,853
22319454321		Water/Sewage	Sewage	Sewer Lift Station	1220	26600 28 Avenue	9,208	19,019	14,953
22320340001		Water/Sewage	Water	Aldergrove Well Pump No.4	1220	3201 272 Street	20,248	6,915	87,177
	24-Nov-96	Water/Sewage	Sewage	North West Langley Sewage Treatment Plant		201 Street 102B Avenue NW	2,594,880		
	05-Dec-97	Water/Sewage	Sewage	Aldergrove Sewage Treatment Plant		27540 28 Avenue	868,800		
	22-Mar-95	Water/Sewage	Water	West Langley Pump Dyke Station		20461 102B Avenue	18,380		
						CONSUMPTION TOTALS	**18,906,305**	**17,841,930**	**20,534,704**
						COST	**$1,156,292.41**	**$1,157,647.28**	**$1,290,576.69**
		Buildings				Buildings	8,120,468	8,524,630	10,575,579
		Streetlights				Street Lights	2,998,000	4,292,277	4,388,082
		Water/Sewage				Water/Sewage	7,787,837	5,025,023	5,571,043
					1701	Ornamental Street Lighting	1,866,428	2,497,109	2,473,887
					1702	Overhead Street Lighting	815,796	816,495	716,886
					1704	Traffic Signals and Signs	83,666	590,673	682,232
					1220	Traffic General / Parks	232,110	388,000	515,077
							2,998,000	4,292,277	4,388,082

2003 Gas Consumption Data

Description	Address	Category	Account Number	January	February	March	April	May	June	July	August	September	October	November	December	Total
Murrayville Library	100 / 22071 48 Avenue	Building	909385	7.3	18.1	10.2	10.4	2.2	0.1	0	0	0	7.7	19.5		75.5
RCMP Sub Office	108 8850 Walnut Grove Drive	Building	909385	5.6	14.3	13.6	8.4	0.9	0	0	0	0	0.7	22.5		66
RCMP Community Office	109 / 4061 200 Street	Building	909385	5.5	5.3	5.6	2.9	0.7	0	0.2	0	0	0	2	4.6	26.8
Aldergrove Arena	2882 272 Street	Building	909385							2359.7		372	283		354.6	3369.3
Fire Hall #7	3876 248 Street	Building	909385	74.1	88.2	69.5	58.3	45.9	13.9	7.1		2.4	12.2	48.4	85.9	505.9
Cemetery	4393 208 Street	Building	909385	10.6	12.8	12.5	12.5	5	2.9	1.4	2.3	0.3	2.1	9.8	15	87.2
Operations Centre	4700 224 Street	Building	909385	649.8	526.4	539.6	356	211.6	65.1	23.2	9.9	2.8	27.6	663.2		3075.2
Municipal Hall	4914 221 Street	Building	909385	154.5	128.5	128.6	94.9	79.6	47.3	5.8	3.2	6.3	24.5	144.5	185.8	1003.5
MAP	5730 214A Street	Building	909385	84.9	55.1	61.2	47.4	26.5	11.4	3.8	1.7	1.5	1.3	25.4	117	437.2
Williams Park	6595 238 Street	Building	909385	13.8	14.5	14.6	12.8	6.9	6.7	2.9	4.3	3.1	7.9	13.1	15.8	116.4
Walnut Grove Park	8937 Walnut Grove Drive	Building	909385	10.7	27.3	25.8	37.3	35.1	13.2	9.3	5.4	5.2	8.3	47.1		224.7
West Langley Hall	9400 208 Street	Building	909385	29.7	24.3	23.2	17.8	7	2.8	3.3	3.1	2.1	7	35.5		155.8
Fire Hall #8	9580 208 Street	Building	909385	35.9	35.2	18.3	25.5	10.9	1.3	1.4	1.4	1.3	7	34.7		172.9
Brookswood Library	20045 40 Avenue	Building	909385	26.5	33.9	24.8	8.2	0.3	0.1	0	0	0	0.5	12	25.2	131.5
Noel Booth Park	20244 36 Avenue	Building	909385	6.2	4.7	4.4	3.3	1.8	0.9	0.5	1.3	0.6	1.3	3	7.1	35.1
Fire Hall #4	20253 72 Avenue	Building	909385	138.5	100.6	126.9	91.4	45	15	2.2	1.8	3.4	19.6	73.3	122.8	740.5
Fire Hall #5	20353 32 Avenue	Building	909385	81.1	84	74.9	69.4	35.8	10.9	3.9		4.7	5.9	51.7	94	516.3
Willoughby Park	20542 84 Avenue #2	Building	909385	7.2	5.7	3.5	5.9	2.5	0.8	0.3	0.2	0.9	2.4	7.4	7	43.8
Willoughby Park	20542 84 Avenue #1	Building	909385	3.4	3.2	3	2.9	2.7	2.4	2.2	2.4	1.7	2.8	3.6	3	33.3
Civic Centre	20699 42 Avenue	Building	909385	496.5	462.8	514.4	366.1	204.7	77.4	59.5	78.8	242.7	247.3	404.1	548.9	3703.2
Cemetery	21405 44 Avenue	Building	909385	11.7	11.2	7.1	5.8	4.3	1.9	0.2	0.7	1.6	3.8	8.6		56.9
Property Management	21594 48 Avenue	Building	909385	0	0	0	0	0	0	0	0	0	0	0	0	0
Fire Hall #6	22170 50 Avenue	Building	909385	145	107.5	115.5	111.1	39.3	13.8	4.6	2.2	14.6	28.8	84.7	136	803.1
RCMP	22180 48A Avenue	Building	909385	478.9	435.2	476.3	415	374.2	207.5	26.9	24.7	27.7	161.2	434.1	434.9	3496.6
RCMP Green HQ	22323 48 Avenue	Building	909385	16	13.4	22.4	17.2	7.5	3.4	0.4	1.4	1.2	6.8	8.2		97.9
Fort Langley Pool	23055 St. Andrews	Building	909385	14.4	20.8	18.3	14.6	14.6	50.6	77	92.5	29.2	10.1	20.4	26.3	388.8
Fort Langley Cemetary	23105 St. Andrews	Building	909385	10.7	7.9		9.6	1	0.8	0.8	0.9	0.8	1.4	6.9	8.5	49.3
Fire Hall #2	23191 96 Avenue	Building	909385	47.2	47.3	36.5	26.6	15.3	4.4	2.5	3.2	2.5	2.9	29.5	47	264.9
Museum	23398 Mavis Avenue	Building	909385	66.5	39.3	49.5	18.2	22.3	6.8	8.2	5.6	10.1	16.1	39.4	52.8	334.8
Fire Hall #3	26316 30A Avenue	Building	909385	41.3	80.6	76.9	49.1	9.3	7.2	4.7	3.4	2.8	6.8	56.6	66.1	404.8
Aldergrove Kinsemen Com. Centre	26770 29 Avenue	Building	909385	116.7	46.5	71.5	63.5	37.3	32.1	11.4	7.5	19.3	20.5	93.3		519.6
RCMP Sub Office	26978 Fraser Hwy	Building	909385	8.3	9.9	8.5	5.9	2.4	0.4	0.1	0.2	0.7	3.2		15	54.6
Aldergrove Ball Park	27155 32 Avenue	Building	909385	11.9	68.9	28.7	16.8	8	100.7	128.9	132.8	23.5	8.7	35.5		564.4
Aldergrove Water Treatment Plant	27580 28 Avenue	Water/Sewage	909385	171.1	172.9	160	54.5	117.5	101.8	2.6	41.6	36	75	78.3	173.3	1184.6
Park	21860 Old Yale Road	Building	909385	9	7.3	9.2	5.3	3	1.7	0.3	0	0	1.8	12.3		49.9
LEPS Trailer	TRL 4700 224 Street	Building	909385	8.1	8.2	5.1	3.1	1.7	0.5	0.7	0.6	0.5	1.3	3		32.8
Fire Training	TRNG 4700 224 Street	Building	909385	25.9			127.3	22	10.6	5.3	10.5	19.9	23.3	60.2		305
	Total Consumption (GJ)			3024.5	2721.8	2760.1	2175	1404.8	816.4	2761.3	443.6	841.4	1040.8	2591.8	2546.6	23,128.1
	Total Cost			$31,704.87	$30,404.25	$29,845.11	$25,548.95	$22,931.76	$13,542.80	$7,838.71	$21,923.76	$9,634.93	$12,393.67	$24,656.12	$44,120.46	$274,545.39
WC Blair Pool	22200 Fraser Highway	Building	8215001891	933.1	947.8	1,002.3	904.7	828.4	667.1	573.6	599.2	629.9	767.4	958.0	961.4	9,772.9
	Cost			$8,228.90	$8,338.45	$8,971.10	$9,828.54	$9,110.50	$7,592.54	$6,712.64	$6,953.56	$7,242.47	$8,536.45	$10,330.14	$10,362.12	$102,207.41
Walnut Grove Recreation Centre	8889 Walnut Grove Drive	Building	8215011211	2,065.0	1,995.8	2,056.4	1,813.9	1,600.1	1,483.1	1,385.2	1,351.1	1,295.3	2,005.7	2,726.0	2,769.9	22,547.5
	Cost			$17,259.00	$16,743.32	$17,329.70	$18,998.59	$16,986.56	$15,885.50	$14,964.19	$14,643.28	$14,118.16	$20,803.56	$27,582.12	$27,995.26	$223,309.24
	Total Conumption			6,022.6	5,665.4	5,818.8	4,893.6	3,833.3	2,966.6	4,720.1	2,393.9	2,766.6	3,813.9	6,275.8	6,277.9	55,448.5
	Total Cost			$57,192.77	$55,486.02	$56,145.91	$54,376.08	$49,028.82	$37,020.84	$29,515.54	$43,520.60	$30,995.56	$41,733.68	$62,568.38	$82,477.84	$600,062.04

W.C. Blair Pool					
Account	**Rate**	**Service Address**	**Bill Date**	**Consumption GJ**	**Total Cost**
8215001891	5	22200 Fraser Hwy	1-Oct-97	947.7	$ 2,495.29
8215001891	5	22200 Fraser Hwy	1-Nov-97	1,089.7	$ 2,869.18
8215001891	5	22200 Fraser Hwy	1-Dec-97	1,214.7	$ 3,198.30
8215001891	5	22200 Fraser Hwy	1-Jan-98	1,258.6	$ 3,058.40
8215001891	5	22200 Fraser Hwy	1-Feb-98	962.8	$ 2,339.60
8215001891	5	22200 Fraser Hwy	1-Mar-98	1,226.4	$ 2,980.16
8215001891	5	22200 Fraser Hwy	1-Apr-98	1,448.0	$ 3,518.64
8215001891	5	22200 Fraser Hwy	1-May-98	1,346.9	$ 3,272.97
8215001891	5	22200 Fraser Hwy	1-Jun-98	566.3	$ 1,376.11
8215001891	5	22200 Fraser Hwy	1-Jul-98	462.6	$ 1,124.12
8215001891	5	22200 Fraser Hwy	1-Aug-98	487.3	$ 1,184.14
8215001891	5	22200 Fraser Hwy	1-Sep-98	117.0	$ 284.31
8215001891	5	22200 Fraser Hwy	1-Oct-98	943.4	$ 2,292.46
8215001891	5	22200 Fraser Hwy	1-Nov-98	1,262.9	$ 3,068.84
8215001891	5	22200 Fraser Hwy	1-Dec-98	1,341.5	$ 3,259.84
				11,423.7	**$ 27,759.59**
8215001891	5	22200 Fraser Hwy	1-Jan-99	1,029.1	$ 2,962.77
8215001891	5	22200 Fraser Hwy	1-Feb-99	1,136.7	$ 3,272.56
8215001891	5	22200 Fraser Hwy	1-Mar-99	1,047.7	$ 3,016.33
8215001891	5	22200 Fraser Hwy	1-Apr-99	925.6	$ 2,664.80
8215001891	5	22200 Fraser Hwy	1-May-99	1,006.6	$ 2,898.00
8215001891	5	22200 Fraser Hwy	1-Jun-99	925.3	$ 2,663.94
8215001891	5	22200 Fraser Hwy	1-Jul-99	809.4	$ 2,330.27
8215001891	5	22200 Fraser Hwy	1-Aug-99	809.0	$ 2,329.11
8215001891	5	22200 Fraser Hwy	1-Sep-99	1,028.3	$ 3,442.74
8215001891	5	22200 Fraser Hwy	1-Oct-99	1,029.7	$ 3,447.44
8215001891	5	22200 Fraser Hwy	1-Nov-99	1,018.7	$ 3,410.61
8215001891	5	22200 Fraser Hwy	1-Dec-99	1,101.1	$ 3,686.48
				11,867.2	**$ 36,125.05**
8215001891	5	22200 Fraser Hwy	1-Jan-00	1,172.1	$ 4,465.70
8215001891	5	22200 Fraser Hwy	1-Feb-00	1,003.7	$ 3,824.10
8215001891	5	22200 Fraser Hwy	1-Mar-00	1,050.8	$ 4,003.55
8215001891	5	22200 Fraser Hwy	1-Apr-00	812.7	$ 3,096.39
8215001891	5	22200 Fraser Hwy	1-May-00	817.7	$ 3,115.44
8215001891	5	22200 Fraser Hwy	1-Jun-00	590.8	$ 2,250.95
8215001891	5	22200 Fraser Hwy	1-Jul-00	691.6	$ 4,172.42
8215001891	5	22200 Fraser Hwy	1-Aug-00	713.9	$ 4,306.96
8215001891	5	22200 Fraser Hwy	1-Sep-00	754.6	$ 4,552.50
8215001891	5	22200 Fraser Hwy	1-Oct-00	1,000.0	$ 6,033.00
8215001891	5	22200 Fraser Hwy	1-Nov-00	970.4	$ 5,854.42
8215001891	5	22200 Fraser Hwy	1-Dec-00	964.6	$ 5,819.43
				10,542.9	**$ 51,494.86**
8215001891	5	22200 Fraser Hwy	1-Jan-01	1,247.7	$ 10,553.04
8215001891	5	22200 Fraser Hwy	1-Feb-01	1,062.6	$ 8,987.47

8215001891	5	22200 Fraser Hwy	1-Mar-01	1,172.7	$ 9,918.69
8215001891	5	22200 Fraser Hwy	1-Apr-01	1,005.6	$ 8,505.37
8215001891	5	22200 Fraser Hwy	1-May-01	964.8	$ 8,160.28
8215001891	5	22200 Fraser Hwy	1-Jun-01	781.7	$ 6,611.62
8215001891	5	22200 Fraser Hwy	1-Jul-01	636.8	$ 5,386.06
8215001891	5	22200 Fraser Hwy	1-Aug-01	591.0	$ 4,998.67
8215001891	5	22200 Fraser Hwy	1-Sep-01	859.4	$ 7,268.80
8215001891	5	22200 Fraser Hwy	1-Oct-01	1,012.3	$ 7,214.67
8215001891	5	22200 Fraser Hwy	1-Nov-01	1,035.0	$ 7,376.45
8215001891	5	22200 Fraser Hwy	1-Dec-01	1,209.3	$ 8,618.68
				11,578.9	**$ 93,599.80**
8215001891	5	22200 Fraser Hwy	1-Jan-02	1,231.7	$ 8,015.90
8215001891	5	22200 Fraser Hwy	1-Feb-02	1,107.0	$ 7,204.36
8215001891	5	22200 Fraser Hwy	1-Mar-02	1,046.3	$ 6,809.32
8215001891	5	22200 Fraser Hwy	1-Apr-02	698.0	$ 4,542.59
8215001891	5	22200 Fraser Hwy	1-May-02	664.6	$ 4,325.22
8215001891	5	22200 Fraser Hwy	1-Jun-02	517.1	$ 3,365.29
8215001891	5	22200 Fraser Hwy	1-Jul-02	552.7	$ 3,596.97
8215001891	5	22200 Fraser Hwy	1-Aug-02	455.2	$ 2,962.44
8215001891	5	22200 Fraser Hwy	1-Sep-02	336.3	$ 2,188.64
8215001891	5	22200 Fraser Hwy	1-Oct-02	766.5	$ 4,988.38
8215001891	5	22200 Fraser Hwy	1-Nov-02	806.3	$ 5,247.40
8215001891	5	22200 Fraser Hwy	1-Dec-02	1,020.2	$ 6,639.46
				9,201.9	**$ 59,885.97**
8215001891	5	22200 Fraser Hwy	1-Jan-03	933.1	$ 6,072.61
8215001891	5	22200 Fraser Hwy	1-Feb-03	947.8	$ 6,168.29
8215001891	5	22200 Fraser Hwy	1-Mar-03	1,022.3	$ 6,686.87
8215001891	5	22200 Fraser Hwy	1-Apr-03	904.7	$ 7,435.73
8215001891	5	22200 Fraser Hwy	1-May-03	828.4	$ 6,808.62
8215001891	5	22200 Fraser Hwy	1-Jun-03	667.1	$ 5,482.89
8215001891	5	22200 Fraser Hwy	1-Jul-03	573.6	$ 4,714.42
8215001891	5	22200 Fraser Hwy	1-Aug-03	599.2	$ 4,924.83
8215001891	5	22200 Fraser Hwy	1-Sep-03	629.9	$ 5,177.15
8215001891	5	22200 Fraser Hwy	1-Oct-03	767.4	$ 6,307.26
8215001891	5	22200 Fraser Hwy	1-Nov-03	958.0	$ 7,873.80
8215001891	5	22200 Fraser Hwy	1-Dec-03	961.4	$ 7,901.74
				9,792.9	**$ 75,554.21**

Walnut Grove Recreation Centre

Rate	Service Address	Bill Date	Consumption GJ	Total Cost
5	8889 Walnut Grove Drive	1-Feb-00	2,522.20	$ 9,609.58
5	8889 Walnut Grove Drive	1-Mar-00	2,035.50	$ 7,755.25
5	8889 Walnut Grove Drive	1-Apr-00	1,781.60	$ 6,787.89
5	8889 Walnut Grove Drive	1-May-00	2,028.40	$ 7,728.21
5	8889 Walnut Grove Drive	1-Jun-00	1,182.20	$ 4,504.18
5	8889 Walnut Grove Drive	1-Jul-00	1,000.80	$ 6,037.83
5	8889 Walnut Grove Drive	1-Aug-00	630.00	$ 3,800.79
5	8889 Walnut Grove Drive	1-Sep-00	856.50	$ 5,167.27
5	8889 Walnut Grove Drive	1-Oct-00	1,446.40	$ 8,726.13
5	8889 Walnut Grove Drive	1-Nov-00	1,868.50	$ 11,272.66
5	8889 Walnut Grove Drive	1-Dec-00	2,243.20	$ 13,533.22
			17,595.30	**$ 84,923.01**
5	8889 Walnut Grove Drive	1-Jan-01	1,881.10	$ 15,910.34
5	8889 Walnut Grove Drive	1-Feb-01	1,662.50	$ 14,061.43
5	8889 Walnut Grove Drive	1-Mar-01	1,824.60	$ 15,432.46
5	8889 Walnut Grove Drive	1-Apr-01	1,637.60	$ 13,850.82
5	8889 Walnut Grove Drive	1-May-01	952.70	$ 8,057.93
5	8889 Walnut Grove Drive	1-Jun-01	949.10	$ 8,027.49
5	8889 Walnut Grove Drive	1-Jul-01	559.60	$ 4,733.09
5	8889 Walnut Grove Drive	1-Aug-01	819.60	$ 6,932.17
5	8889 Walnut Grove Drive	1-Sep-01	759.50	$ 6,423.85
5	8889 Walnut Grove Drive	1-Oct-01	2,029.60	$ 14,464.96
5	8889 Walnut Grove Drive	1-Nov-01	1,620.40	$ 11,548.59
5	8889 Walnut Grove Drive	1-Dec-01	2,276.30	$ 16,223.19
			16,972.60	**$ 135,666.32**
5	8889 Walnut Grove Drive	1-Jan-02	1,986.60	$ 12,928.79
5	8889 Walnut Grove Drive	1-Feb-02	1,719.70	$ 11,191.81
5	8889 Walnut Grove Drive	1-Mar-02	2,145.70	$ 13,964.21
5	8889 Walnut Grove Drive	1-Apr-02	1,821.80	$ 11,856.27
5	8889 Walnut Grove Drive	1-May-02	1,509.90	$ 9,826.43
5	8889 Walnut Grove Drive	1-Jun-02	1,204.20	$ 7,836.94
5	8889 Walnut Grove Drive	1-Jul-02	1,102.20	$ 7,173.11
5	8889 Walnut Grove Drive	1-Aug-02	1,135.40	$ 7,389.18
5	8889 Walnut Grove Drive	1-Sep-02	1,354.30	$ 8,813.79
5	8889 Walnut Grove Drive	1-Oct-02	1,851.80	$ 12,051.51
5	8889 Walnut Grove Drive	1-Nov-02	1,890.40	$ 12,302.72
5	8889 Walnut Grove Drive	1-Dec-02	2,135.00	$ 13,894.59
			19,857.00	**$ 129,229.35**
5	8889 Walnut Grove Drive	1-Jan-03	2,065.00	$ 13,439.03
5	8889 Walnut Grove Drive	1-Feb-03	1,995.80	$ 12,988.66
5	8889 Walnut Grove Drive	1-Mar-03	2,056.40	$ 13,450.91
5	8889 Walnut Grove Drive	1-Apr-03	1,813.90	$ 14,908.45
5	8889 Walnut Grove Drive	1-May-03	1,600.10	$ 13,151.22
5	8889 Walnut Grove Drive	1-Jun-03	1,483.10	$ 12,189.60
5	8889 Walnut Grove Drive	1-Jul-03	1,385.20	$ 11,384.96
5	8889 Walnut Grove Drive	1-Aug-03	1,351.10	$ 11,104.69
5	8889 Walnut Grove Drive	1-Sep-03	1,295.30	$ 10,646.07
5	8889 Walnut Grove Drive	1-Oct-03	2,005.70	$ 16,484.85
5	8889 Walnut Grove Drive	1-Nov-03	2,726.00	$ 22,404.99
5	8889 Walnut Grove Drive	1-Dec-03	2,769.90	$ 22,765.81
			22,547.50	**$ 174,919.24**

APPENDIX C

Torrie Smith Software Reports

Corporate GHG Emissions Inventory and Forecast

Sector	1995 Equivalent CO_2 tonnes	1999 Equivalent CO_2 tonnes	2003 Equivalent CO_2 tonnes	2010 (Business as Usual) Equivalent CO_2 tonnes	2010 (Target #1) 20% Reduction Target	2010 (Target #2) 20% Reduction Target
Buildings	1,749	2,033	2,898	3,289		
Vehicle Fleet	1,540	1,541	1,342	1,523		
Streetlights	183	107	105	119		
Water/Sewage	475	184	192	218		
Waste	358	390	423	480		
Total	4,305	4,255	4,960	5,630	3,968	3,444
Less 20%	*861*		*992*	1,662		
Reduction Target from 1995	3,444	3,444	3,444	3,444		
Reduction Target from 2003			3,968	3,968		

Sector	1995 Equivalent CO_2 tonnes	1999 Equivalent CO_2 tonnes	2003 Equivalent CO_2 tonnes
Other Buildings	252	445	455
WC Blair Recreation	677	621	518
Walnut Grove Recreation Centre	95	376	1,191
RCMP	197	156	194
Operations Centre	25	19	171
Langley Civic Centre	315	255	219
Aldergrove Arena	200	169	181
	1,761	2,041	2,929

Sector	1995 Equivalent CO_2 tonnes	1999 Equivalent CO_2 tonnes	2003 Equivalent CO_2 tonnes
Waste	358	390	423
Paper Products	136	148	161
Food Waste	47	51	55
Plant Debris	36	39	42
Wood and Textiles	14	16	17
All other Waste	125	137	148

Sector	1995 Equivalent CO_2 tonnes	1999 Equivalent CO_2 tonnes	2003 Equivalent CO_2 tonnes
Water	210	155	170
Sewage	265	29	22

Sector	1995 Equivalent CO_2 tonnes	1999 Equivalent CO_2 tonnes	2003 Equivalent CO_2 tonnes
Ornamental Street Lighting	114	62	59
Overhead Street Lighting	50	20	17
Traffic Signals and Signs	5	15	16
Traffic General	14	10	13
	183	107	105

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Summary Report

	Equiv CO_2 (tonnes)	Equiv CO_2 Equiv CO	Energy GJ)	Cost ($)
Buildings	1,749	40.6	54,674	~~576,140~~
Vehicle Fleet	1,540	35.8	23,771	~~21,821~~
Streetlights	183	4.2	10,793	~~0~~
Water/Sewage	475	11.0	28,036	~~321,046~~
Waste	358	8.3		~~0~~
Other	0	0.0		
Total	4,305	100.0	117,274	~~919,007~~

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Buildings				
21447 51B Avenue				
Electricity	0	0.0	17	~~296~~
Subtotal	0	0.0	17	~~296~~
21447 51B Avenue Hydro Account #81238				
21860 Old Yale Road B				
Electricity	0	0.0	7	~~122~~
Subtotal	0	0.0	7	~~122~~
21860 Old Yale Road B Hydro Account #80718				
22259 48th Avenue				
Electricity	2	0.0	97	1,722
Subtotal	2	0.0	97	~~1,722~~
22259 48th Avenue Hydro Account #187756				
22313 48th Avenue				
Electricity	2	0.0	119	~~2,108~~
Subtotal	2	0.0	119	~~2,108~~
22313 48th Avenue Hydro Account #80718				
4061 200th Street (102)				
Electricity	2	0.0	107	~~1,900~~
Subtotal	2	0.0	107	~~1,900~~
4061 200th Street (102) Hydro Account #80635				
4914 221st Street				
Electricity	6	0.1	362	0
Subtotal	6	0.1	362	0
4914 221st Street Hydro Account #81301 - 21,551 kWh's Hydro Account #207228 - 2,609 kWh's Hydro Account #81300 - 11,242 kWh's Hydro Account #81302 - 65,040 kWh's				
9308 208th Street				

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Electricity	1	0.0	75	~~1,338~~
Subtotal	1	0.0	75	~~1,338~~

9308 208th Street
Hydro Account #273434

9580 208th Street

Electricity	4	0.1	264	~~4,695~~
Subtotal	4	0.1	264	~~4,695~~

9580 208th Street
Hydro Account #83844

Airport

Electricity	1	0.0	68	~~1,212~~
Subtotal	1	0.0	68	~~1,212~~

5385 216th Street Their are 5 Hydro Accounts associated with the Airport.
#21-3434-00041 - 1,080 KwH's
#21-3434-00091 - 10,968 KwH's
#21-3434-00111 - 4,587 KwH's
#21-3434-00281 - 1,078 KwH's
#21-3434-00381 - 1,258 KwH's
Total Consumption is 18,971 KwH's

Aldergrove Communty Centre

Electricity	10	0.2	575	~~10,214~~
Natural Gas	33	0.8	659	~~3,390~~
Subtotal	42	1.0	1,235	~~13,604~~

26770 29th Avenue
Hydro & Gas Account #22-3194-60101

Aldergrove RCMP Sub Office

Electricity	2	0.0	94	~~1,660~~
Subtotal	2	0.0	94	~~1,660~~

3085 271st Street - Hydo account #22-3014-17903
3087 271st Street - Hydro account #22-3014-18003
Top account consumption = 13,843 KwH's
2nd account consumption = 12,135 KwH's
TotalConsumption = 25,978 kWh's

Aldergrove South Park

Electricity	1	0.0	59	~~1,048~~
Subtotal	1	0.0	59	~~1,048~~

West of 27A Avenue 269th Street
Hydro Account #22-3034-09201

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Aldergrove are (elec)				
Electricity	64	1.5	3,759	~~66,731~~
Natural Gas	136	3.2	2,755	~~12,793~~
Subtotal	200	4.6	6,515	~~79,524~~

2882 272nd Street
Hydro and Gas Account #22-3013-31201

Ball Park 271 St.				
Electricity	1	0.0	43	~~764~~
Natural Gas	30	0.7	608	~~2,898~~
Subtotal	31	0.7	651	~~3,662~~

27155 32nd Street
Hydro Account #22-3203-30011 - 4,403 kWh's
Hydro Account #22-3014-18003 - 7,560 kWh's
Gas Account #22-3203-30011 - 607.5 GJ's

Bell Park				
Electricity	0	0.0	10	~~178~~
Subtotal	0	0.0	10	~~178~~

3800 205A Street
Hydro Account #21-3211-00191

Blair Pool				
Electricity	103	2.4	6,078	~~107,889~~
Natural Gas	574	13.3	11,625	0
Subtotal	677	15.7	17,703	~~107,889~~

Blair Pool located at 22200 Fraser Highway.
Hydro Account #21-3429-97003
This is a Rate 2000 Gas Account Account #8215011211 Hydro Account #21-3432-97011 Mass Account #01-0001-02001
1995Gasconsumption was unavailable, therefore it was estimated by comparing the power consumption in 1999 to 1995 and using that factor along with the 1999 gas consumption to determine the estimated gas consumption.
1995 Gas consumption was estimated to be 11,625 GJ's.

Brookswood Library				
Electricity	2	0.0	101	~~1,796~~
Natural Gas	9	0.2	189	~~1,104~~
Subtotal	11	0.3	290	~~2,900~~

20045 40th Avenue
Hydro & Gas Account #21-3314-80031

Brookswood Park

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Electricity	1	0.0	43	769
Subtotal	1	0.0	43	769

4035 200th Street
Hydro Account #21-3303-00081

Note: This was an Old Fire Hall that is now Brookswood Park.

Brown Park

Electricity	0	0.0	18	0
Subtotal	0	0.0	18	0

5022 240th Street
Hydro Account #33-1421-04201 - 5,126 kWh's

Civic Centre

Electricity	110	2.6	6,491	115,212
Natural Gas	205	4.8	4,150	18,936
Subtotal	315	7.3	10,640	134,148

Civic Centre located at 20699 42nd Avenue
Hydro & Gas Account #21-3318-55741

Fire Hall #5

Electricity	5	0.1	272	4,821
Subtotal	5	0.1	272	4,821

Fire Hall #5 located at 20355 32nd Avenue
Hydro Account #21-3113-00421

FI Cemetary

Electricity	0	0.0	14	253
Natural Gas	3	0.1	69	486
Subtotal	4	0.1	83	739

23105 Saint Andrew Street
Hydro & Gas Account #21-3852-35601

FI Community Pool

Electricity	1	0.0	68	1,200
Subtotal	1	0.0	68	1,200

23055 Saint Andrew Street
Hydro Account #21-3852-35591

Hall #2

Electricity	2	0.0	99	1,750

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Natural Gas	10	0.2	204	~~1,162~~
Subtotal	12	0.3	302	~~2,912~~

23191 96th Street
Hydro & Gas Account #21-3844-51231

Hall #3

Electricity	2	0.0	97	~~1,723~~
Subtotal	2	0.0	97	~~1,723~~

2900 272nd Street
Hydro & Gas Account #22-3204-55301
No gas consumption in 1995

Hall #4

Electricity	2	0.0	99	~~1,764~~
Subtotal	2	0.0	99	~~1,764~~

20409 80th Avenue
Hydro Account #21-3731-00271 - 20 kWh's
Hydro Account #21-3731-00281 - 27,589 kWh's
Gas Account #21-3731-00281 - 0.0 GJ's

Hall #7

Electricity	1	0.0	70	~~1,250~~
Natural Gas	17	0.4	338	~~1,828~~
Subtotal	18	0.4	408	~~3,078~~

3876 248th Street
Hydro & Gas Account #22-3073-50501

Heli Pad

Electricity	0	0.0	1	~~16~~
Subtotal	0	0.0	1	~~16~~

5225 216th Street
Hydro Account #21-3434-00451

Langley Lawns cemetary

Electricity	1	0.0	30	~~527~~
Subtotal	1	0.0	30	~~527~~

4393 208th Street
Hydro & Gas Account #21-3121-11111
No Gasconsumption in 1995

Methane Burner

Electricity	1	0.0	37	~~649~~

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	1	0.0	37	~~649~~

1099 272nd Street
Hydro Account #22-3044-43401

**NOTE: Hydro cost figures where not available for 1995 therefore they where left out. Most cost figures for 1999 are available and therefore the approximate costs in 1995 can quite easily be estimated.

Murrayville Cemetary

Electricity	0	0.0	8	~~144~~
Natural Gas	3	0.1	66	~~474~~
Subtotal	3	0.1	74	~~618~~

21405 44th Avenue
Hydro & Gas Account #21-3323-04051

Museum

Electricity	5	0.1	317	~~3,263~~
Natural Gas	18	0.4	369	~~1,958~~
Subtotal	24	0.5	686	~~5,221~~

23398 Mavis Avenue
Hydro Account #21-3844-45091 - 37,021 kWh's
Hydro Account #21-3844-45231 - 51,067 kWh's
Gas Account #21-3844-45231 - 368.5 GJ's

Noel Booth Park

Natural Gas	1	0.0	26	~~271~~
Subtotal	1	0.0	26	~~271~~

20244 36th Avenue
Gas Account #21-3212-83431

Operations Centre

Electricity	25	0.6	1,503	~~26,686~~
Subtotal	25	0.6	1,503	~~26,686~~

4700 224th Street
Hydro Account #21-3335-00091

Park at 5745 216th Street

Electricity	0	0.0	29	~~510~~
Subtotal	0	0.0	29	~~510~~

5745 216th Street
Hydro Account #21-3521-00172

Park at 6860 Glover Road

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Electricity	0	0.0	14	257
Subtotal	0	0.0	14	257

6860 Glover Road
Hydro Account #21-3613-10412

Park at 8937 Walnut Grove Dr

Electricity	2	0.0	92	0
Natural Gas	15	0.3	296	1,615
Subtotal	16	0.4	388	1,615

8937 Walnut Grove Drive
Hydro Account #21-3822-99191 - 25,500 kWh's
Gas Account #21-3822-99191 - 295.9 GJ's

RCMP

Electricity	65	1.5	3,815	67,724
Natural Gas	132	3.1	2,671	12,291
Subtotal	197	4.6	6,486	80,015

22180 48A Avenue
Hydro & Gas Account #21-3432-99491

RCMP Sub office

Electricity	1	0.0	39	699
Subtotal	1	0.0	39	699

8850 Walnut Grove Drive
Hydro Account #21-3832-03191

Shop / Hall 22200 Fraser

Electricity	31	0.7	1,804	32,027
Subtotal	31	0.7	1,804	32,027

4914 221st Street
Hydro Account #21-3432-49001

Walnut Grove Rec. Centre

Electricity	36	0.8	2,153	38,217
Natural Gas	59	1.4	1,185	6,184
Subtotal	95	2.2	3,338	44,402

8889 Walnut Grove Drive
Hydro & Gas Account #21-3822-00061

Williams Park

Electricity	4	0.1	211	3,747

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Natural Gas	6	0.1	119	~~734~~
Subtotal	9	0.2	330	~~4,481~~
6595 238th Street Hydro & Gas Account #21-3651-35961				
Willoughby Park				
Electricity	3	0.1	162	~~2,878~~
Natural Gas	1	0.0	24	~~258~~
Subtotal	4	0.1	186	~~3,136~~
20542 84th Avenue Hydro Account #21-3721-50201 - 42,600 kWh's Hydro Account #21-3721-50221 - 2,443 kWh's Gas Account #21-3721-50201 - 23.8 GJ's				
Subtotal Buildings	1,749	40.6	54,674	~~576,140~~
Vehicle Fleet				
Private Vehicle Usage For Work				
Gasoline	17	0.4	243	~~21,821~~
Subtotal	17	0.4	243	~~21,821~~
Township of Langley Fleet				
Gasoline	196	4.6	2,880	0
Diesel	595	13.8	8,422	0
Propane	733	17.0	12,226	0
Subtotal	1,523	35.4	23,528	0

1995 Fleet data for the Township of Langley.
Vehicle fleet data was not readily available for 1995. Although consumption increased from 1995 until 1999, overall fuel efficiency also increased. With this in mind, we are assuming the 1995 fuel consumption values to be approximately the same as the fig
Clear Diesel : 177,470 litres
Marked Diesel : 18,965 litres
Gasoline : 83,097 litres
Propane : 478,873 litres

The following fuel prices where determined and used to calculate the cost of fueling the Township of Langley's vehicle fleet for 1995:
Clear Diesel: $0.432/litre
Marked Diesel: $0.332/litre
Gasoline: $0.489/litre
Propane: $0.299/litre

The Township of Langley's Fleet was comprised of the following in 1999 and is assumed to have been quite similiar in 1995:
Dump Trucks: 11 full size diesel, 3 gas and 3 propane.
Flat Deck Trucks: 3 full size diesel, 1 gas mid size and 6 propane mid range.
Pick up trucks: 12 gas, 35 propane and 8 duel fuel.

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Vans: 12 gas and 9 propane. Forklifts: 1 diesel and 1 propane. Cars: 21 gasoline Graders: 2 diesel Loaders: 3 Diesel Backhoes: 4 Diesel Brushcutters: 3 Diesel RCMP: 40 Gasoline and 20 Propane Parks gang mowers: 3 Diesel Fire Dept: 22 Diesel and 11 Gas				
Subtotal Vehicle Fleet	1,540	35.8	23,771	~~21,821~~
Streetlights				
Ornamental Street Lighting				
Electricity	114	2.6	6,719	0
Subtotal	114	2.6	6,719	0
Ornamental Street Lighting				
Overhead Street Lighting				
Electricity	50	1.2	2,937	0
Subtotal	50	1.2	2,937	0
Overheadl Street Lighting				
Traffic General				
Electricity	14	0.3	836	0
Subtotal	14	0.3	836	0
Traffic Signals				
Electricity	5	0.1	301	0
Subtotal	5	0.1	301	0
Rate 1704				
Subtotal Streetlights	183	4.2	10,793	0
Water/Sewage				
20461 102B Avenue				
Electricity	1	0.0	66	0

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	1	0.0	66	0
20461 102B Avenue Hydro Account #1824444				
27540 28th Avenue				
Electricity	53	1.2	3,128	~~55,516~~
Subtotal	53	1.2	3,128	~~55,516~~
27540 28th Avenue Hydro Account #88955				
62nd Avenue Lift Station				
Electricity	0	0.0	9	~~158~~
Subtotal	0	0.0	9	~~158~~
20555 - 62nd Avenue Hydro Account #21-3611-00281				
9800 208th Street				
Electricity	0	0.0	12	~~222~~
Subtotal	0	0.0	12	~~222~~
9800 208th Street Hydro Account #21-3921-00011				
Acadia Water				
Electricity	1	0.0	37	~~656~~
Subtotal	1	0.0	37	~~656~~
4745 - 242A Street Hydro Account #21-3452-60401				
Aldergrove Pump #3				
Electricity	6	0.1	381	~~6,754~~
Subtotal	6	0.1	381	~~6,754~~
2800 - 272nd Street Hydro Account #22-3013-31101				
Aldergrove Pump #7				
Electricity	5	0.1	273	~~4,846~~
Subtotal	5	0.1	273	~~4,846~~
2520 - 272nd Street Hydro Account #22-3153-09632				

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Aldergrove Reservoir E				
Electricity	0	0.0	25	~~444~~
Subtotal	0	0.0	25	~~444~~
Quinton Rd W/O Hydro Account #22-3134-28301				
Aldergrove Sewage Treat. Plant				
Electricity	5	0.1	291	~~5,165~~
Subtotal	5	0.1	291	~~5,165~~
27540 28th Avenue Hydro Account #22-3033-03411				
Aldergrove Well Pump #4				
Electricity	1	0.0	73	~~1,294~~
Subtotal	1	0.0	73	~~1,294~~
3201 - 272nd Street Hydro Account #22-3203-40001				
Aldergrove Well Water #7				
Electricity	12	0.3	720	~~12,779~~
Subtotal	12	0.3	720	~~12,779~~
27190 - 25th Avenue Hydro Account #22-3153-20201				
Aldergrove Well Water #8				
Electricity	18	0.4	1,055	~~18,733~~
Subtotal	18	0.4	1,055	~~18,733~~
2623 - 272nd Street Hydro Account #22-3034-87652				
Aldergrove Well Water res.				
Electricity	4	0.1	226	~~4,008~~
Subtotal	4	0.1	226	~~4,008~~
3170 - 262B Street Hydro Account #22-3083-53701				
Brookswood #9 Well				
Electricity	4	0.1	231	~~4,102~~
Subtotal	4	0.1	231	~~4,102~~
20701 - 32nd Avenue				

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Hydro Account #21-3121-02731				
Brookswood Water #10 Well				
Electricity	13	0.3	745	~~13,230~~
Subtotal	13	0.3	745	~~13,230~~
19820 - 36th Avenue Hydro Account #21-3202-03201				
Brookswood Water well #4				
Electricity	5	0.1	316	~~5,601~~
Subtotal	5	0.1	316	~~5,601~~
3482 - 197th Street Hydro Account #21-3204-00511				
Brookswood Water well #8				
Electricity	0	0.0	10	~~184~~
Subtotal	0	0.0	10	~~184~~
3458 - 200th Street Hydro Account #21-3204-49291				
Brookswood water PRV				
Electricity	3	0.1	175	~~3,106~~
Subtotal	3	0.1	175	~~3,106~~
19620 - 36th Avenue PRV [Pressure Reducing Valve] Hydro Account #21-3202-01251				
Drainage Pump Station				
Electricity	0	0.0	7	~~126~~
Subtotal	0	0.0	7	~~126~~
19698 - 33A Avenue Hydro Account #21-3204-00371				
Dyke Pump Station				
Electricity	4	0.1	245	~~4,348~~
Subtotal	4	0.1	245	~~4,348~~
Salmon Rv W Langley Hydro Account #21-3844-51511				
Glocester S.T.P.				
Electricity	18	0.4	1,048	0

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	18	0.4	1,048	0
5676 272nd Street Hydro Account #22-3143-87002				
Lift Station at 6656 Glover Rd				
Electricity	1	0.0	58	~~1,036~~
Subtotal	1	0.0	58	~~1,036~~
6656 Glover Road Hydro Account #21-3613-98151				
Lift Station at 8395 216th St.				
Electricity	0	0.0	21	~~364~~
Subtotal	0	0.0	21	~~364~~
8395 - 216th Street Hydro Account #21-3732-00311				
Lift Station at 9001 216th St				
Electricity	1	0.0	54	~~955~~
Subtotal	1	0.0	54	~~955~~
9001 - 216th Street Hydro Account #21-3828-00451				
Lift Station at 9046 - 214B St				
Electricity	0	0.0	24	~~419~~
Subtotal	0	0.0	24	~~419~~
9046 - 214B Street Hydro Account #21-3826-99231				
Murrayville Well #1				
Electricity	9	0.2	554	~~9,840~~
Subtotal	9	0.2	554	~~9,840~~
Murrayville Well #1 4451 224th Street Hydro Account #21-3232-80021				
Murrayville Well #2				
Electricity	6	0.1	365	~~6,487~~
Subtotal	6	0.1	365	~~6,487~~
22566 Old Yale Road Hydro Account #21-3351-50251				

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
NW Langley Sewage Treat.				
Electricity	158	3.7	9,342	0
Subtotal	158	3.7	9,342	0
North West Langley Sewage Treatment Plant Note: This was taken over by the GVRD in 1996				
NW Sewer Lift Station				
Electricity	0	0.0	4	~~79~~
Subtotal	0	0.0	4	~~79~~
20513 - 95A Avenue Hydro Account #21-3813-14211				
NWL Reservoir Station				
Electricity	21	0.5	1,213	~~21,532~~
Subtotal	21	0.5	1,213	~~21,532~~
21212 - 85th Avenue Hydro Account #21-3734-00241				
NWL Well at 22709 88th Ave				
Electricity	49	1.1	2,869	~~50,931~~
Subtotal	49	1.1	2,869	~~50,931~~
22709 - 88th Avenue Hydro Account #21-3732-15001				
P.R.V. at 9620 201st Street				
Electricity	1	0.0	36	~~641~~
Subtotal	1	0.0	36	~~641~~
PRV [Pressure Reducing Valve] at 9620 - 201st Street Hydro Account #21-3910-00551				
Sewage Lift Station - 200A St				
Electricity	0	0.0	7	~~119~~
Subtotal	0	0.0	7	~~119~~
Sewage lift station located at 4353 - 200A Street Hydro Account #21-3318-00011				
Sewage Pump Station				
Electricity	0	0.0	1	~~15~~

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	0	0.0	1	~~15~~
23750 Fraser Hwy Hydro Account #21-3351-36501				
Sewage Pump Station - Old Yale				
Electricity	0	0.0	1	~~12~~
Subtotal	0	0.0	1	~~12~~
21341 Old Yale Rd Hydro Account #21-3422-60131				
Sewer Lift St @ 203rd st/62Ave				
Electricity	6	0.1	327	~~5,797~~
Subtotal	6	0.1	327	~~5,797~~
Located at 203rd Street and 62nd Avenue Hydro Account #21-3611-04001				
Sewer Lift Station at 24th Ave				
Electricity	0	0.0	14	~~252~~
Subtotal	0	0.0	14	~~252~~
26827 - 24th Avenue Hydro Account #22-3153-09941				
Sewer Lift Station at 272nd St				
Electricity	0	0.0	10	~~180~~
Subtotal	0	0.0	10	~~180~~
2502 - 272nd Street Hydro Account #22-3153-10101				
Sewer Lift Station at 28B Ave				
Electricity	0	0.0	17	~~307~~
Subtotal	0	0.0	17	~~307~~
27170 - 28B Avenue Hydro Account #22-3013-13701				
Sewer Lift Station at 28th Ave				
Electricity	1	0.0	33	~~588~~
Subtotal	1	0.0	33	~~588~~
26600 - 28th Avenue Hydro Account #22-3194-54321				

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Sewer Lift Station at 98th Ave				
Electricity	1	0.0	60	~~1,068~~
Subtotal	1	0.0	60	~~1,068~~
20452 - 98th Avenue Hydro Account #21-3921-21002				
Tall Timbers Water				
Electricity	4	0.1	227	~~4,035~~
Subtotal	4	0.1	227	~~4,035~~
23990 58A Avenue Hydro Account #21-3454-22452				
Valve				
Electricity	0	0.0	1	~~20~~
Subtotal	0	0.0	1	~~20~~
19603 - 96th Avenue Hydro Account #21-3910-00131				
W L Dyke Pump Stn				
Electricity	4	0.1	221	~~3,931~~
Subtotal	4	0.1	221	~~3,931~~
20461 - 102B Avenue Hydro Account #21-3921-47611				
WG Sewer Lift Station				
Electricity	9	0.2	543	~~9,631~~
Subtotal	9	0.2	543	~~9,631~~
21212 - 85th Avenue Hydro Account #21-3912-50181				
WL Sewer Lift Station				
Electricity	7	0.2	389	~~6,896~~
Subtotal	7	0.2	389	~~6,896~~
21150 - 56th Avenue Hydro Account #21-3521-75501				
Water Bkswd Reservoir				
Electricity	1	0.0	49	~~865~~
Subtotal	1	0.0	49	~~865~~
2077 - 32nd Avenue				

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Hydro Account #21-3121-02711				
Water Bkswd to #7 well				
Electricity	1	0.0	67	~~10,186~~
Subtotal	1	0.0	67	~~10,186~~
20650 - 32nd Avenue Hydro Account #21-3113-15501				
Water Pump SRU #1				
Electricity	26	0.6	1,538	~~27,306~~
Subtotal	26	0.6	1,538	~~27,306~~
5800 - 245A Street Hydro Account #22-3104-69502				
Water Pump SRU #3				
Electricity	1	0.0	68	~~1,212~~
Subtotal	1	0.0	68	~~1,212~~
5945 - 252nd Street Hydro Account #22-3103-00011				
Water Pump at 206th Street				
Electricity	9	0.2	524	~~9,305~~
Subtotal	9	0.2	524	~~9,305~~
6795 - 206th Street Hydro Account #21-3612-99011				
Willoughby Booster Station				
Electricity	5	0.1	310	~~5,498~~
Subtotal	5	0.1	310	~~5,498~~
20400 - 73A Avenue Hydro Account #21-3712-00311				
Willoughby Res Water				
Electricity	0	0.0	15	~~268~~
Subtotal	0	0.0	15	~~268~~
20450 - 73A Avenue Hydro Account #21-3712-12251				
Subtotal Water/Sewage	475	11.0	28,036	~~321,046~~
Waste				

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Untitled				
Paper Products	282	6.6		0
Food Waste	90	2.1		0
Plant Debris	-9	-0.2		0
Wood/Textiles	-5	-0.1		0
Subtotal	358	8.3		0
743				
Subtotal Waste	358	8.3		0
Other				
No Other Known Emission Source				
Subtotal	0	0.0	0	0
No other known sources of emissions existed within the Township of Langley in 1995.				
Subtotal Other	0	0.0	0	0
Total	4,305	100.0	117,274	919,007

Township of Langley

Corporate Greenhouse Gas Emissions in 1995

Base Year Report by Source

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Electricity	1,155	26.8	68,153	830,803
Natural Gas	1,252	29.1	25,351	66,383
Gasoline	213	4.9	3,123	21,821
Diesel	595	13.8	8,422	0
Propane	733	17.0	12,226	0
Paper Products	282	6.6		0
Food Waste	90	2.1		0
Plant Debris	-9	-0.2		0
Wood/Textiles	-5	-0.1		0
Total	4,305	100.0	117,274	919,007

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Buildings				
City Hall				
4914 221st Street	6	0.1	362	0
Subtotal	6	0.1	362	0
Cultural Centre/Library				
Brookswood Library	11	0.3	290	2,900
Museum	24	0.5	686	5,221
Subtotal	35	0.8	976	8,121
Maintenance Yard/Garage				
Operations Centre	25	0.6	1,503	26,686
Subtotal	25	0.6	1,503	26,686
Other				
21447 51B Avenue	0	0.0	17	296
21860 Old Yale Road B	0	0.0	7	122
22259 48th Avenue	2	0.0	97	1,722
22313 48th Avenue	2	0.0	119	2,108
4061 200th Street (102)	2	0.0	107	1,900
9308 208th Street	1	0.0	75	1,338
9580 208th Street	4	0.1	264	4,695
Airport	1	0.0	68	1,212
Aldergrove are (elec)	200	4.6	6,515	79,524
Aldergrove RCMP Sub Office	2	0.0	94	1,660
Brookswood Park	1	0.0	43	769
Fire Hall #5	5	0.1	272	4,821
Fl Cemetary	4	0.1	83	739
Hall #2	12	0.3	302	2,912
Hall #3	2	0.0	97	1,723
Hall #4	2	0.0	99	1,764
Hall #7	18	0.4	408	3,078
Heli Pad	0	0.0	1	16
Langley Lawns cemetary	1	0.0	30	527
Methane Burner	1	0.0	37	649
Murrayville Cemetary	3	0.1	74	618

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
RCMP	197	4.6	6,486	80,015
RCMP Sub office	1	0.0	39	699
Shop / Hall 22200 Fraser	31	0.7	1,804	32,027
Williams Park	9	0.2	330	4,481
Subtotal	498	11.6	17,469	229,414
Recreation				
Aldergrove Community Centre	42	1.0	1,235	13,604
Aldergrove South Park	1	0.0	59	1,048
Ball Park 271 St.	31	0.7	651	3,662
Bell Park	0	0.0	10	178
Blair Pool	677	15.7	17,703	107,889
Brown Park	0	0.0	18	0
Civic Centre	315	7.3	10,640	134,148
Fl Community Pool	1	0.0	68	1,200
Noel Booth Park	1	0.0	26	271
Park at 5745 216th Street	0	0.0	29	510
Park at 6860 Glover Road	0	0.0	14	257
Park at 8937 Walnut Grove Dr	16	0.4	388	1,615
Walnut Grove Rec. Centre	95	2.2	3,338	44,402
Willoughby Park	4	0.1	186	3,136
Subtotal	1,185	27.5	34,365	311,920
Subtotal Buildings	1,749	40.6	54,674	576,140
Vehicle Fleet				
Automobile				
Private Vehicle Usage For Work	17	0.4	243	21,821
Township of Langley Fleet	1,523	35.4	23,528	0
Subtotal	1,540	35.8	23,771	21,821
Subtotal Vehicle Fleet	1,540	35.8	23,771	21,821
Streetlights				
Traffic General	14	0.3	836	0
Subtotal	14	0.3	836	0

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Street Lights				
Ornamental Street Lighting	114	2.6	6,719	0
Overhead Street Lighting	50	1.2	2,937	0
Subtotal	164	3.8	9,656	0
Traffic Signals				
Traffic Signals	5	0.1	301	0
Subtotal	5	0.1	301	0
Subtotal Streetlights	183	4.2	10,793	0
Water/Sewage				
Other				
Acadia Water	1	0.0	37	656
Aldergrove Reservoir E	0	0.0	25	444
Aldergrove Well Water res.	4	0.1	226	4,008
Brookswood water PRV	3	0.1	175	3,106
NWL Reservoir Station	21	0.5	1,213	21,532
P.R.V. at 9620 201st Street	1	0.0	36	641
Valve	0	0.0	1	20
Water Bkswd Reservoir	1	0.0	49	865
Willoughby Res Water	0	0.0	15	268
Subtotal	30	0.7	1,777	31,539
Sewage Lift Station				
27540 28th Avenue	53	1.2	3,128	55,516
62nd Avenue Lift Station	0	0.0	9	158
9800 208th Street	0	0.0	12	222
Lift Station at 6656 Glover Rd	1	0.0	58	1,036
Lift Station at 8395 216th St.	0	0.0	21	364
Lift Station at 9001 216th St	1	0.0	54	955
Lift Station at 9046 - 214B St	0	0.0	24	419
NW Sewer Lift Station	0	0.0	4	79
Sewage Lift Station - 200A St	0	0.0	7	119
Sewer Lift St @ 203rd st/62Ave	6	0.1	327	5,797
Sewer Lift Station at 24th Ave	0	0.0	14	252
Sewer Lift Station at 272nd St	0	0.0	10	180

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Sewer Lift Station at 28B Ave	0	0.0	17	307
Sewer Lift Station at 28th Ave	1	0.0	33	588
Sewer Lift Station at 98th Ave	1	0.0	60	1,068
WG Sewer Lift Station	9	0.2	543	9,631
Willoughby Booster Station	5	0.1	310	5,498
WL Sewer Lift Station	7	0.2	389	6,896
Subtotal	85	2.0	5,019	89,085
Sewage Treatment				
Aldergrove Sewage Treat. Plant	5	0.1	291	5,165
Glocester S.T.P.	18	0.4	1,048	0
NW Langley Sewage Treat.	158	3.7	9,342	0
Subtotal	181	4.2	10,681	5,165
Water Pumping				
20461 102B Avenue	1	0.0	66	0
Aldergrove Pump #3	6	0.1	381	6,754
Aldergrove Pump #7	5	0.1	273	4,846
Aldergrove Well Pump #4	1	0.0	73	1,294
Aldergrove Well Water #7	12	0.3	720	12,779
Aldergrove Well Water #8	18	0.4	1,055	18,733
Brookswood #9 Well	4	0.1	231	4,102
Brookswood Water #10 Well	13	0.3	745	13,230
Brookswood Water well #4	5	0.1	316	5,601
Brookswood Water well #8	0	0.0	10	184
Drainage Pump Station	0	0.0	7	126
Dyke Pump Station	4	0.1	245	4,348
Murrayville Well #1	9	0.2	554	9,840
Murrayville Well #2	6	0.1	365	6,487
NWL Well at 22709 88th Ave	49	1.1	2,869	50,931
Sewage Pump Station	0	0.0	1	15
Sewage Pump Station - Old Yale	0	0.0	1	12
W L Dyke Pump Stn	4	0.1	221	3,931
Water Bkswd to #7 well	1	0.0	67	10,186
Water Pump at 206th Street	9	0.2	524	9,305
Water Pump SRU #1	26	0.6	1,538	27,306

Township of Langley

Corporate Greenhouse Gas Emissions in 1995
Base Year Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Water Pump SRU #3	1	0.0	68	1,212
Subtotal	175	4.1	10,332	191,222
Water Treatment				
Tall Timbers Water	4	0.1	227	4,035
Subtotal	4	0.1	227	4,035
Subtotal Water/Sewage	475	11.0	28,036	321,046
Waste				
Untitled	358	8.3		0
Subtotal Waste	358	8.3		0
Other				
Subtotal Other	0	0.0		
Total	4,305	100.0	117,274	919,007

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Summary Report

	Equiv CO_2 (tonnes)	Equiv CO_2 Equiv CO	Energy GJ)	Cost ($)
Buildings	2,033	47.8	67,476	0
Vehicle Fleet	1,541	36.2	23,792	0
Streetlights	107	2.5	15,452	0
Water/Sewage	184	4.3	19,275	0
Waste	390	9.2		0
Other	0	0.0		
Total	4,256	100.0	125,995	0

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Buildings				
4061 200 Street				
Electricity	3	0.1	374	0
Subtotal	3	0.1	374	0
Acct.# 80635				
4914 222 St				
Electricity	0	0.0	35	0
Natural Gas	80	1.9	1,611	0
Subtotal	80	1.9	1,646	0
7017 202B Street				
Electricity	0	0.0	53	0
Subtotal	0	0.0	53	0
Airport				
Electricity	2	0.1	345	0
Subtotal	2	0.1	345	0
6 hydro accounts...total kWh's = 95,918				
Aldergrove Arena				
Electricity	25	0.6	3,628	0
Natural Gas	169	4.0	3,413	0
Subtotal	194	4.6	7,041	0
2882 272 Street				
Aldergrove Kinsemen				
Electricity	4	0.1	576	0
Natural Gas	35	0.8	718	0
Subtotal	39	0.9	1,294	0
26770 29 Ave				
Aldergrove RCMP Sub Office				
Electricity	1	0.0	87	0

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	1	0.0	87	0
3085 271 Street 2 Hydro Accounts				
Aldergrove South Park				
Subtotal	0	0.0	0	0
W of 27A Ave 269 St				
Ball Park				
Electricity	0	0.0	55	0
Natural Gas	33	0.8	664	0
Subtotal	33	0.8	719	0
27155 32 Ave 2 accounts				
Bell Park				
Electricity	0	0.0	8	0
Subtotal	0	0.0	8	0
3800 205A St				
Brookswood Library				
Electricity	1	0.0	82	0
Natural Gas	10	0.2	200	0
Subtotal	10	0.2	282	0
20045 40 Ave				
Brookswood Park				
Electricity	1	0.0	122	0
Subtotal	1	0.0	122	0
This used to be the Old Fire Hall				
Brookswood RCMP Sub-Office				
Electricity	1	0.0	90	0
Subtotal	1	0.0	90	0
4061 200 St (112)				
Brown Park (Irrigation)				
Electricity	0	0.0	6	0

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	0	0.0	6	0
5022 240 St				
Cemetary Fort Langley				
Electricity	0	0.0	19	0
Natural Gas	4	0.1	86	0
Subtotal	4	0.1	105	0
23105 St. Andrews				
Civic Centre				
Electricity	33	0.8	4,696	0
Natural Gas	222	5.2	4,493	0
Subtotal	255	6.0	9,189	0
20699 42 Ave				
Fire Hall No.2				
Electricity	1	0.0	100	0
Natural Gas	11	0.3	224	0
Subtotal	12	0.3	324	0
23191 93 Ave				
Fire Hall No.3				
Electricity	1	0.0	103	0
Natural Gas	34	0.8	682	0
Subtotal	34	0.8	785	0
2900 272 Street				
Fire Hall No.4				
Electricity	1	0.0	102	0
Natural Gas	22	0.5	444	0
Subtotal	23	0.5	546	0
20409 80 Ave 2 hydro accounts 28,309 kWh				
Fire Hall No.5				
Electricity	1	0.0	195	0

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	1	0.0	195	0
20355 32 Ave				
Fire Hall No.6				
Electricity	9	0.2	1,327	0
Subtotal	9	0.2	1,327	0
22170 50 Ave				
Fire Hall No.7				
Electricity	1	0.0	93	0
Natural Gas	27	0.6	549	0
Subtotal	28	0.7	642	0
3876 248 St				
Fire Hall No.8				
Electricity	1	0.0	197	0
Natural Gas	8	0.2	153	0
Subtotal	9	0.2	350	0
9580 208 Street				
Fort Langley Comm. Pool				
Electricity	0	0.0	57	0
Subtotal	0	0.0	57	0
23055 St. Andrews Ave				
James Kennedy Park				
Electricity	0	0.0	48	0
Subtotal	0	0.0	48	0
8995 213 St				
LEPS Trailer				
Electricity	0	0.0	0	0
Subtotal	0	0.0	0	0
4700 224 St				
Langley Lawns Cemetary				
Electricity	0	0.0	54	0
Natural Gas	5	0.1	110	0

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	6	0.1	164	0
4393 208 St				
McCleod Athletic Park				
Electricity	0	0.0	65	0
Subtotal	0	0.0	65	0
5745 216 St				
McClughan Park				
Electricity	0	0.0	6	0
Subtotal	0	0.0	6	0
9035 206 St				
Methane Burner				
Electricity	0	0.0	20	0
Subtotal	0	0.0	20	0
1099 272 St				
Municipal Hall				
Electricity	7	0.2	1,063	0
Subtotal	7	0.2	1,063	0
4914 221 St				
Municipal Hall (A)				
Electricity	0	0.0	4	0
Subtotal	0	0.0	4	0
4914 221 St				
Municipal Hall (B)				
Electricity	0	0.0	15	0
Subtotal	0	0.0	15	0
4914 221 St				
Murrayville Cemetary				
Electricity	0	0.0	15	0
Natural Gas	3	0.1	70	0
Subtotal	4	0.1	85	0
21405 44 Ave				

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Museum				
Electricity	2	0.1	332	0
Natural Gas	67	1.6	1,356	0
Subtotal	69	1.6	1,688	0
23398 Mavis Ave 2 Hydro Accounts				
Noel Booth Park				
Natural Gas	2	0.0	40	0
Subtotal	2	0.0	40	0
20244 36 Ave				
Operations Centre				
Electricity	19	0.5	2,805	0
Subtotal	19	0.5	2,805	0
4700 224 St				
RCMP				
Electricity	1	0.0	157	0
Subtotal	1	0.0	157	0
22323 48 Ave				
RCMP Murrayville				
Electricity	25	0.6	3,528	0
Natural Gas	131	3.1	2,656	0
Subtotal	156	3.7	6,184	0
22180 48A Ave				
RCMP Sub. Office Walnut				
Electricity	0	0.0	69	0
Natural Gas	3	0.1	53	0
Subtotal	3	0.1	122	0
8850 Walnut Grove Drive				
WC Blair Rec. Centre				
Electricity	35	0.8	4,993	0
Natural Gas	586	13.8	11,867	0

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	621	14.6	16,860	0
22200 Fraser Hwy				
Walnut Grove Park				
Electricity	1	0.0	136	0
Natural Gas	9	0.2	176	0
Subtotal	10	0.2	312	0
8937 Walnut Grove Park				
Walnut Grove Rec. Centre				
Electricity	32	0.8	4,633	0
Natural Gas	344	8.1	6,963	0
Subtotal	376	8.8	11,596	0
8889 Walnut Grove Drive				
West Langley Hall				
Electricity	1	0.0	94	0
Natural Gas	8	0.2	155	0
Subtotal	8	0.2	249	0
9400 208 St				
Williams Park (wash)				
Electricity	1	0.0	118	0
Natural Gas	6	0.2	130	0
Subtotal	7	0.2	248	0
6595 238 St				
Willoughby Park				
Electricity	1	0.0	124	0
Natural Gas	2	0.0	35	0
Subtotal	3	0.1	159	0
20542 84 Ave (A) 2 Hydro Accounts				
Subtotal Buildings	2,033	47.8	67,476	0
Vehicle Fleet				
Private Vehicle Usage				
Gasoline	18	0.4	264	0

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	18	0.4	264	0

For the year 1999, their where 71,877 km's reimbursed to staff for usage of their private vehicles at work.
Each kilometer is reimbursed at $0.33 so therefore in 1999 their was $23,719.40 paidout to civic employees for the use of their private vehicles at work.
Valerie Glowacki (533-6026) with the Township of Langley provided this data.
Given that 71,877km where driven and assuming that the average fleet vehicle gets a fuel efficiency of 10.6 litres per 100 km, then in 1999 aproximately 7,619 litres of fuel was consumed by employees while using their personal vehicles at work.
We are assuming that all of this fuel is gasoline.

Township of Langley Fleet Data

Gasoline	196	4.6	2,880	0
Diesel	595	14.0	8,422	0
Propane	733	17.2	12,226	0
Subtotal	1,523	35.8	23,528	0

Township of Langley fleet fuel use was as follows for 1999:
Clear Diesel : 177,470 litres
Marked Diesel : 18,965 litres
Gasoline : 184,659 litres
Propane : 563,381 litres

The following are the average fuel prices that where calculated for the Township of Langley in 1999:
Clear Diesel: $0.443/litre
Marked Diesel: $0.332/litre
Gasolne: $0.467/litre
Propane: $0.311/litre

The Township of Langley's Fleet is comprised of the following:
Dump Trucks: 11 full size diesel, 3 gas and 3 propane.
Flat Deck Trucks: 3 full size diesel, 1 gas mid size and 6 propane mid range.
Pick up trucks: 12 gas, 35 propane and 8 duel fuel.
Vans: 12 gas and 9 propane.
Forklifts: 1 diesel and 1 propane.
Cars: 21 gasoline
Graders: 2 diesel
Loaders: 3 Diesel
Backhoes: 4 Diesel
Brushcutters: 3 Diesel
RCMP: 40 Gasoline and 20 Propane
Parks gang mowers: 3 Diesel
Fire Dept: 22 Diesel and 11 Gas

Note: From 1995 until 1999 the volume of propane used increased every year.

Subtotal Vehicle Fleet	1,541	36.2	23,792	0

Streetlights

Ornamental Street Lighting

Electricity	62	1.5	8,990	0

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	62	1.5	8,990	0
Rate 1701				
For details on each individual account please refer to the excel spreadsheet.				
Overhead Street Lighting				
Electricity	20	0.5	2,939	0
Subtotal	20	0.5	2,939	0
Rate 1702				
For details on each individual account please refer to the excel spreadsheet.				
Traffic General				
Electricity	10	0.2	1,397	0
Subtotal	10	0.2	1,397	0
Rate 1220				
For details on each individual account please refer to the excel spreadsheet.				
Traffic Signals				
Electricity	15	0.3	2,126	0
Subtotal	15	0.3	2,126	0
Rate 1704				
For details on each individual account please refer to the excel spreadsheet.				
Subtotal Streetlights	107	2.5	15,452	0
Water/Sewage				
All Water/Sewage Accounts				
Electricity	126	3.0	18,090	0
Natural Gas	59	1.4	1,185	0
Subtotal	184	4.3	19,275	0
For details on each individual account please refer to the excel spreadsheet.				
Subtotal Water/Sewage	184	4.3	19,275	0
Waste				
Untitled				
Paper Products	307	7.2		0
Food Waste	98	2.3		0

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Plant Debris	-10	-0.2		0
Wood/Textiles	-6	-0.1		0
Subtotal	390	9.2		0
809				
Subtotal Waste	390	9.2		0
Other				
No Other Known Emissions				
Subtotal	0	0.0	0	0
Their where no other known emissions sources associated with the Township of Langley in 1999.				
Subtotal Other	0	0.0	0	0
Total	4,256	100.0	125,995	0

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Report by Source

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Electricity	446	10.5	64,170	0
Natural Gas	1,879	44.1	38,033	0
Gasoline	214	5.0	3,144	0
Diesel	595	14.0	8,422	0
Propane	733	17.2	12,226	0
Paper Products	307	7.2		0
Food Waste	98	2.3		0
Plant Debris	-10	-0.2		0
Wood/Textiles	-6	-0.1		0
Total	4,256	100.0	125,995	0

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Buildings				
4061 200 Street	3	0.1	374	0
4914 222 St	80	1.9	1,646	0
7017 202B Street	0	0.0	53	0
Airport	2	0.1	345	0
Aldergrove Arena	194	4.6	7,041	0
Aldergrove Kinsemen	39	0.9	1,294	0
Aldergrove RCMP Sub Office	1	0.0	87	0
Ball Park	33	0.8	719	0
Bell Park	0	0.0	8	0
Brookswood Library	10	0.2	282	0
Brookswood Park	1	0.0	122	0
Brookswood RCMP Sub-Office	1	0.0	90	0
Brown Park (Irrigation)	0	0.0	6	0
Cemetary Fort Langley	4	0.1	105	0
Civic Centre	255	6.0	9,189	0
Fire Hall No.2	12	0.3	324	0
Fire Hall No.3	34	0.8	785	0
Fire Hall No.4	23	0.5	546	0
Fire Hall No.5	1	0.0	195	0
Fire Hall No.6	9	0.2	1,327	0
Fire Hall No.7	28	0.7	642	0
Fire Hall No.8	9	0.2	350	0
Fort Langley Comm. Pool	0	0.0	57	0
James Kennedy Park	0	0.0	48	0
Langley Lawns Cemetary	6	0.1	164	0
LEPS Trailer	0	0.0	0	0
McCleod Athletic Park	0	0.0	65	0
McClughan Park	0	0.0	6	0
Methane Burner	0	0.0	20	0
Municipal Hall	7	0.2	1,063	0
Municipal Hall (A)	0	0.0	4	0
Municipal Hall (B)	0	0.0	15	0
Murrayville Cemetary	4	0.1	85	0

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Museum	69	1.6	1,688	0
Noel Booth Park	2	0.0	40	0
Operations Centre	19	0.5	2,805	0
RCMP	1	0.0	157	0
RCMP Murrayville	156	3.7	6,184	0
RCMP Sub. Office Walnut	3	0.1	122	0
Walnut Grove Park	10	0.2	312	0
Walnut Grove Rec. Centre	376	8.8	11,596	0
WC Blair Rec. Centre	621	14.6	16,860	0
West Langley Hall	8	0.2	249	0
Williams Park (wash)	7	0.2	248	0
Willoughby Park	3	0.1	159	0
Subtotal	2,033	47.8	67,476	0
Subtotal Buildings	2,033	47.8	67,476	0
Vehicle Fleet				
Automobile				
Private Vehicle Usage	18	0.4	264	0
Township of Langley Fleet Data	1,523	35.8	23,528	0
Subtotal	1,541	36.2	23,792	0
Subtotal Vehicle Fleet	1,541	36.2	23,792	0
Streetlights				
Traffic General	10	0.2	1,397	0
Traffic Signals	15	0.3	2,126	0
Subtotal	24	0.6	3,523	0
Street Lights				
Ornamental Street Lighting	62	1.5	8,990	0
Overhead Street Lighting	20	0.5	2,939	0
Subtotal	83	1.9	11,929	0
Subtotal Streetlights	107	2.5	15,452	0
Water/Sewage				

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 1999

Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
All Water/Sewage Accounts	184	4.3	19,275	0
Subtotal	184	4.3	19,275	0
Subtotal Water/Sewage	184	4.3	19,275	0
Waste				
Untitled	390	9.2		0
Subtotal Waste	390	9.2		0
Other				
Subtotal Other	0	0.0		
Total	4,256	100.0	125,995	0

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Summary Report

	Equiv CO_2 (tonnes)	Equiv CO_2 Equiv CO	Energy GJ)	Cost ($)
Buildings	2,898	58.4	91,688	0
Vehicle Fleet	1,342	27.1	19,963	0
Streetlights	105	2.1	15,797	0
Water/Sewage	192	3.9	21,241	0
Waste	423	8.5		0
Other	0	0.0		
Total	4,961	100.0	148,690	0

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Buildings				
Airport (1)				
Electricity	1	0.0	111	0
Subtotal	1	0.0	111	0
5385 216 Street BC Hydro Acct. # 21343400041				
Airport (2)				
Electricity	1	0.0	96	0
Subtotal	1	0.0	96	0
5333 216th Street (Pole) BC Hydro Acct.# 21343400111				
Airport (3)				
Electricity	1	0.0	79	0
Subtotal	1	0.0	79	0
5385 216th Street BC Hydro Acct.# 21343400281				
Airport (4)				
Electricity	0	0.0	14	0
Subtotal	0	0.0	14	0
5385 216th Street BC Hydro Acct.# 21343400381				
Airport (Heli)				
Electricity	0	0.0	3	0
Subtotal	0	0.0	3	0
5225 216th Street BC Hydro Acct.# 21343400451				
Aldergrove (COP)				
Electricity	2	0.0	229	0
Natural Gas	3	0.1	55	0
Subtotal	4	0.1	283	0
Aldergrove Community Policing Office BC Hydro Acct.# 00001715684 Terasen Acct.# 909385 (Consolidated)				
Aldergrove Arena				

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Electricity	15	0.3	2,253	0
Natural Gas	166	3.4	3,369	0
Subtotal	181	3.7	5,622	0

2882 272 Street
BC Hydro Acct.# 22301331201
Terasen Acct.# 909385

Aldergrove Ball Park

Electricity	0	0.0	74	0
Natural Gas	28	0.6	564	0
Subtotal	28	0.6	639	0

27155 32 Avenue
BC Hydro Acct.#'s 22320330011, 22320330611 (2 Accounts)
Terasen Acct.# 909385

Aldergrove Kinsemen Centre

Electricity	4	0.1	665	0
Natural Gas	26	0.5	520	0
Subtotal	30	0.6	1,184	0

26770 29 Avenue
BC Hydro Acct.# 22319460101
Terasen Acct.# 909385

Aldergrove RCMP Sub Office

Electricity	0	0.0	0	0
Subtotal	0	0.0	0	0

3085 271 Street
BC Hydro Acct.# 22301417903

Note: This account was closed on March 31, 2003.

Aldergrove South Park

Electricity	1	0.0	130	0
Subtotal	1	0.0	130	0

West of 27A Avenue and 269 Street
BC Hydro Acct.# 22303409201

Bell Park

Electricity	0	0.0	10	0
Subtotal	0	0.0	10	0

3800 205A Street
BC Hydro Acct.# 21321100191

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Brookswood Library (1)				
Electricity	0	0.0	15	0
Natural Gas	6	0.1	132	0
Subtotal	7	0.1	146	0

20049 40 Avenue
BC Hydro Acct.# 00002590894
Terasen Acct.# 909385 (Consolidated)

Brookswood Library (2)				
Electricity	1	0.0	91	0
Subtotal	1	0.0	91	0

20045 40 Avenue
BC Hydro Acct.# 21331480031
Terasen Acct.# 909385 (Consolidated)

Note: Brookswood Library has two hydro accounts and one gas account.

Brookswood Park				
Electricity	1	0.0	103	0
Subtotal	1	0.0	103	0

4035 200 Street
BC Hydro Acct.# 21330300081

Note: This used to be a Fire Hall but has now been turned into a park, Brookswood. This park also contains a water spray park.

Brown Park				
Electricity	0	0.0	16	0
Subtotal	0	0.0	16	0

5022 240 Street
BC Hydro Acct.# 33142104201
soccer and ball lights.

Cemetary				
Electricity	0	0.0	42	0
Natural Gas	4	0.1	87	0
Subtotal	5	0.1	129	0

4393 208 Street
BC Hydro Acct.# 23122171981
Terasen Acct.# 909385 (Consolidated)

Cemetary (Fort Langley)				
Electricity	0	0.0	16	0
Natural Gas	2	0.0	49	0

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	3	0.1	65	0

23105 St. Andrews
BC Hydro Acct.# 21385235601
Terasen Acct.# 909385

Denny Ross Memorial Park

Electricity	0	0.0	66	0
Natural Gas	2	0.0	50	0
Subtotal	3	0.1	116	0

Park Washrooms
21900 Old Yale Road
BC Hydro Acct.# 00002840464
Terasen Acct.# 909385 (Consolidated)

Fire Hall No.2

Electricity	1	0.0	89	0
Natural Gas	13	0.3	265	0
Subtotal	14	0.3	354	0

23191 96 Avenue
BC Hydro Acct.# 21384451231
Terasen Acct.# 909385□□□

Fire Hall No.3

Electricity	2	0.0	330	0
Natural Gas	20	0.4	405	0
Subtotal	22	0.4	735	0

26316 30A Avenue
BC Hydro Acct.# 00001695144
Terasen Acct.# 909385 (Consolidated)

Fire Hall No.4

Electricity	3	0.1	375	0
Natural Gas	37	0.7	741	0
Subtotal	39	0.8	1,116	0

20253 72 Avenue
BC Hydro Acct.# 00003089164
Terasen Acct.# 909385 (Consolidated)

Fire Hall No.4 (2)

Electricity	0	0.0	49	0
Subtotal	0	0.0	49	0

20409 80 Avenue

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
BC Hydro Acct. # 21373100281				
Note: This account was closed on May 21, 2003.				
Fire Hall No.5				
Electricity	1	0.0	163	0
Natural Gas	26	0.5	516	0
Subtotal	27	0.5	679	0
20355 32 Avenue BC Hydro Acct.# 21311300421 Terasen Acct.# 909385 (Consolidated)				
Fire Hall No.6				
Electricity	10	0.2	1,501	0
Natural Gas	40	0.8	803	0
Subtotal	50	1.0	2,304	0
22170 50 Avenue BC Hydro Acct. #21343200181 Terasen Acct.# 909385				
Fire Hall No.7				
Electricity	1	0.0	78	0
Natural Gas	25	0.5	506	0
Subtotal	26	0.5	584	0
3876 248 Street BC Hydro Acct.# 22307350501 Terasen Acct.# 909385				
Fire Hall No.8				
Electricity	1	0.0	221	0
Natural Gas	9	0.2	173	0
Subtotal	10	0.2	394	0
9580 208 Street BC Hydro Acct. # 21381507531 Terasen Acct.# 909385				
Fort Langley Community Pool				
Electricity	0	0.0	69	0
Natural Gas	19	0.4	389	0
Subtotal	20	0.4	458	0
23055 St. Andrews BC Hydro Acct.# 21385235591 Terasen Acct.# 909385				

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
James Kennedy Park				
Electricity	0	0.0	56	0
Subtotal	0	0.0	56	0

8995 213 Street
BC Hydro Acct.# 21382601121

Note: This is for the security lights.

LEPS Trailer				
Electricity	0	0.0	28	0
Natural Gas	2	0.0	33	0
Subtotal	2	0.0	61	0

4700 224th Street
BC Hydro Acct.# 00001045384
Terasen Acct.# 909385 (Consolidated)

Langley Civic Centre				
Electricity	36	0.7	5,365	0
Natural Gas	183	3.7	3,703	0
Subtotal	219	4.4	9,069	0

20699 42 Avenue
BC Hydro Acct.# 21331855741
Terasen Acct.# 909385

Langley Meadows Park				
Electricity	0	0.0	0	0
Subtotal	0	0.0	0	0

19907 64 Avenue
BC Hydro Acct.# 21350701171

Note: This is for the irrigation controller.

McCleod Athletic Park (3)				
Electricity	0	0.0	71	0
Subtotal	0	0.0	71	0

5745 216 Street
BC Hydro Acct.# 21352100172

Methane Burner				
Electricity	0	0.0	14	0

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	0	0.0	14	0

1099 272 Street
BC Hydro Acct.# 22304443401

Municipal Hall

Electricity	9	0.2	1,287	0
Natural Gas	50	1.0	1,003	0
Subtotal	58	1.2	2,290	0

4914 221 Street
BC Hydro Acct. #21343249001
Terasen Acct.# 909385

Murrayville Cemetary

Electricity	0	0.0	42	0
Natural Gas	3	0.1	57	0
Subtotal	3	0.1	99	0

21405 44 Avenue
BC Hydro Acct.# 21332304051
Terasen Acct.# 909385

Murrayville Library

Electricity	3	0.1	438	0
Natural Gas	4	0.1	76	0
Subtotal	7	0.1	513	0

22071 48 Avenue
BC Hydro Acct.# 00003501164
Terasen Acct.# 909385 (Consolidated)

Museum (1)

Electricity	1	0.0	135	0
Natural Gas	17	0.3	335	0
Subtotal	17	0.4	470	0

23398 Mavis Avenue
BC Hydro Acct. # 21384445091
Terasen Acct.# 909385

Note: The Museum has two hydro accounts and one gas account.

Museum (2)

Electricity	1	0.0	187	0
Subtotal	1	0.0	187	0

23398 Mavis Avenue

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
BC Hydro Acct. # 21384445231				
Noel Booth				
Natural Gas	2	0.0	35	0
Subtotal	2	0.0	35	0
Gas Account				
Operations Centre				
Electricity	19	0.4	2,829	0
Natural Gas	152	3.1	3,075	0
Subtotal	171	3.4	5,904	0
4700 224th Street BC Hydro Acct. # 21333500091 Terasen Acct.# 909385				
RCMP				
Electricity	21	0.4	3,151	0
Natural Gas	173	3.5	3,497	0
Subtotal	194	3.9	6,647	0
22180 48A Avenue BC Hydro Acct. # 21343299491 Terasen Acct.# 909385				
RCMP Green HQ				
Electricity	2	0.0	271	0
Natural Gas	5	0.1	98	0
Subtotal	7	0.1	369	0
22323 48 Avenue Hydro Acct.# 00000278394 Terasen Acct.# 909385 (Consolidated)				
RCMP Sub Office				
Electricity	0	0.0	74	0
Natural Gas	1	0.0	27	0
Subtotal	2	0.0	101	0
4061 200th Street (109) BC Hydro Acct.# 00003200674 Terasen Acct.# 909385 (Consolidated)				
RCMP Sub Office (Walnut)				
Electricity	0	0.0	72	0
Natural Gas	3	0.1	66	0

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	4	0.1	138	0

8850 Walnut Grove Drive (108)
BC Hydro Acct. #21383203191
Terasen Acct.# 909385

South Aldergrove Park

Electricity	0	0.0	9	0
Subtotal	0	0.0	9	0

26817 27 Avenue
BC Hydro Acct.# 00003453204

WC Blair Recreation Centre

Electricity	35	0.7	5,294	0
Natural Gas	483	9.7	9,773	0
Subtotal	518	10.4	15,067	0

22200 Fraser Highway
BC Hydro Acct. # 21343297003
Terasen Acct.# 8215001891 (Industrial)

Walnut Grove Park (1)

Electricity	1	0.0	183	0
Natural Gas	11	0.2	225	0
Subtotal	12	0.2	408	0

8937 Walnut Grove Drive
BC Hydro Acct.# 21382299191
Terasen Acct.# 909385

Note: This is for the water park and the restrooms.

Walnut Grove Recreation Centre

Electricity	77	1.5	11,519	0
Natural Gas	1,114	22.5	22,548	0
Subtotal	1,191	24.0	34,066	0

8889 Walnut Grove Drive
BC Hydro Acct. # 21382200061
Terasen Acct.# 8215011211 (Industrial)

West Langley Hall

Electricity	1	0.0	93	0
Natural Gas	8	0.2	156	0
Subtotal	8	0.2	248	0

9400 208 Street

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
BC Hydro Acct. #21381507031 Terasen Acct.# 909385				
Williams Park (Restrooms)				
Electricity	1	0.0	76	0
Subtotal	1	0.0	76	0
6595 238 Street (Restrooms) BC Hydro Acct. #21365135961				
Williams Park (Shelter)				
Electricity	0	0.0	1	0
Natural Gas	6	0.1	116	0
Subtotal	6	0.1	117	0
6595 238 Street BC Hydro Acct.# 00002756004 Terasen Acct.# 909385 (Consolidated)				
Willoughby Park (Restrooms)				
Electricity	1	0.0	78	0
Natural Gas	4	0.1	77	0
Subtotal	4	0.1	155	0
20542 84 Avenue BC Hydro Acct. # 21372150201 Terasen Acct.# 909385 (Two meters: 43.8 GJ and 33.3 GJ)				
Willoughby Park (Sec. Lights)				
Electricity	0	0.0	6	0
Subtotal	0	0.0	6	0
20542 84 Avenue (A) BC Hydro Acct.# 21372150221				
Subtotal Buildings	2,898	58.4	91,688	0
Vehicle Fleet				
Private Vehicle Usage				
Gasoline	11	0.2	168	0
Subtotal	11	0.2	168	0
Total km's 45,843 Fuel efficency = 10.6 lites/km				
Township Fleet				
Gasoline	516	10.4	7,567	0

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Diesel	543	10.9	7,690	0
Propane	272	5.5	4,538	0
Subtotal	1,330	26.8	19,795	0

This is for the entire Township vehicle fleet. For more detailed information please refer to the excel spreadsheet.

Subtotal Vehicle Fleet	1,342	27.1	19,963	0

Streetlights

Ornamental Street Lighting

Electricity	59	1.2	8,906	0
Subtotal	59	1.2	8,906	0

Rate 1701

Note: As defined by BCHydro...for lighting of public highways, streets and lanes in cases where B.C. Hydro owns, installs and maintains the fixtures, conductors, controls and poles.

Overhead Street Lighting

Electricity	17	0.3	2,581	0
Subtotal	17	0.3	2,581	0

Rate 1702

Note: As defined by BC Hydro...for lighting of public highways, streets and lanes in those cases where the Customer owns, installs and maintains the standards, fixtures, conductors and controls.

Traffic General

Electricity	12	0.2	1,854	0
Subtotal	12	0.2	1,854	0

Rate 1220

Traffic Signals and Signs

Electricity	16	0.3	2,456	0
Subtotal	16	0.3	2,456	0

Rate 1704 Account - Traffic Signals, Traffic Signs & Traffic Warning Devices

Note: This is the sum of the individual accounts. For more detailed information please refer to the excel spreadsheet.

Subtotal Streetlights	105	2.1	15,797	0

Water/Sewage

Water/Sewage

Electricity	134	2.7	20,056	0
Natural Gas	59	1.2	1,185	0

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Detailed Report

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal	192	3.9	21,241	0
This is the combined amount for the individual accounts. For details of the individual accounts please refer to the excel spreadsheet.				
The only gas account for Water/Sewage is the Aldergrove Water Treatment Plant. Account # 909385. Total consumption for 2003 was 1184.6 GJ.				
Subtotal Water/Sewage	192	3.9	21,241	0
Waste				
Untitled				
Paper Products	334	6.7		0
Food Waste	106	2.1		0
Plant Debris	-11	-0.2		0
Wood/Textiles	-6	-0.1		0
Subtotal	423	8.5		0
878 tonnes				
Subtotal Waste	423	8.5		0
Other				
Untitled				
Subtotal	0	0.0	0	0
Subtotal Other	0	0.0	0	0
Total	4,961	100.0	148,690	0

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Report by Source

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Electricity	494	9.9	74,020	0
Natural Gas	2,702	54.5	54,707	0
Gasoline	527	10.6	7,735	0
Diesel	543	10.9	7,690	0
Propane	272	5.5	4,538	0
Paper Products	334	6.7		0
Food Waste	106	2.1		0
Plant Debris	-11	-0.2		0
Wood/Textiles	-6	-0.1		0
Total	4,961	100.0	148,690	0

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Buildings				
Airport (2)	1	0.0	96	0
Airport (3)	1	0.0	79	0
Airport (4)	0	0.0	14	0
Airport (Heli)	0	0.0	3	0
Aldergrove (COP)	4	0.1	283	0
Aldergrove Ball Park	28	0.6	639	0
Aldergrove South Park	1	0.0	130	0
Bell Park	0	0.0	10	0
Brown Park	0	0.0	16	0
Fire Hall No.7	26	0.5	584	0
James Kennedy Park	0	0.0	56	0
Langley Meadows Park	0	0.0	0	0
McCleod Athletic Park (3)	0	0.0	71	0
Methane Burner	0	0.0	14	0
Noel Booth	2	0.0	35	0
Walnut Grove Park (1)	12	0.2	408	0
Willoughby Park (Sec. Lights)	0	0.0	6	0
Subtotal	75	1.5	2,445	0
City Hall				
Municipal Hall	58	1.2	2,290	0
Operations Centre	171	3.4	5,904	0
Subtotal	229	4.6	8,195	0
Cultural Centre/Library				
Brookswood Library (1)	7	0.1	146	0
Brookswood Library (2)	1	0.0	91	0
Murrayville Library	7	0.1	513	0
Subtotal	14	0.3	750	0
Other				
Airport (1)	1	0.0	111	0
Aldergrove RCMP Sub Office	0	0.0	0	0
Cemetary	5	0.1	129	0

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Cemetary (Fort Langley)	3	0.1	65	0
Denny Ross Memorial Park	3	0.1	116	0
Fire Hall No.2	14	0.3	354	0
Fire Hall No.3	22	0.4	735	0
Fire Hall No.4	39	0.8	1,116	0
Fire Hall No.4 (2)	0	0.0	49	0
Fire Hall No.5	27	0.5	679	0
Fire Hall No.6	50	1.0	2,304	0
Fire Hall No.8	10	0.2	394	0
LEPS Trailer	2	0.0	61	0
Murrayville Cemetary	3	0.1	99	0
Museum (1)	17	0.4	470	0
Museum (2)	1	0.0	187	0
RCMP	194	3.9	6,647	0
RCMP Green HQ	7	0.1	369	0
RCMP Sub Office	2	0.0	101	0
RCMP Sub Office (Walnut)	4	0.1	138	0
West Langley Hall	8	0.2	248	0
Williams Park (Restrooms)	1	0.0	76	0
Williams Park (Shelter)	6	0.1	117	0
Willoughby Park (Restrooms)	4	0.1	155	0
Subtotal	421	8.5	14,721	0
Recreation				
Aldergrove Arena	181	3.7	5,622	0
Aldergrove Kinsemen Centre	30	0.6	1,184	0
Brookswood Park	1	0.0	103	0
Fort Langley Community Pool	20	0.4	458	0
Langley Civic Centre	219	4.4	9,069	0
South Aldergrove Park	0	0.0	9	0
Walnut Grove Recreation Centre	1,191	24.0	34,066	0
WC Blair Recreation Centre	518	10.4	15,067	0
Subtotal	2,159	43.5	65,578	0
Subtotal Buildings	2,898	58.4	91,688	0

Vehicle Fleet

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Automobile				
Private Vehicle Usage	11	0.2	168	0
Subtotal	11	0.2	168	0
Other				
Township Fleet	1,330	26.8	19,795	0
Subtotal	1,330	26.8	19,795	0
Subtotal Vehicle Fleet	1,342	27.1	19,963	0
Streetlights				
Traffic General	12	0.2	1,854	0
Subtotal	12	0.2	1,854	0
Other Lights				
Overhead Street Lighting	17	0.3	2,581	0
Subtotal	17	0.3	2,581	0
Street Lights				
Ornamental Street Lighting	59	1.2	8,906	0
Subtotal	59	1.2	8,906	0
Traffic Signals				
Traffic Signals and Signs	16	0.3	2,456	0
Subtotal	16	0.3	2,456	0
Subtotal Streetlights	105	2.1	15,797	0
Water/Sewage				
Water/Sewage	192	3.9	21,241	0
Subtotal	192	3.9	21,241	0
Subtotal Water/Sewage	192	3.9	21,241	0
Waste				
Untitled	423	8.5		0

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.

Township of Langley

Corporate Greenhouse Gas Emissions in 2003

Report by Subsector

	Equiv CO_2 (tonnes)	Equiv CO_2 (%)	Energy GJ)	Cost ($)
Subtotal Waste	423	8.5		0
Other				
Subtotal Other	0	0.0		
Total	4,961	100.0	148,690	0

This report has been generated for Township of Langley, British Columbia with software created by Torrie Smith Associates for the Cities for Climate Protection Campaign of The International Council for Local Environmental Initiatives.
Default emissions coefficients were used.