AGRICULTURE WATER DEMAND MODEL

Squamish-Lillooet Regional District (Pemberton Valley)

September 2020

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Report for Squamish-Lillooet Regional District (Pemberton Valley)

September 2020

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  Retired Research Scientist
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1. Background

The Agriculture Water Demand Model (AWDM or "Model") was first developed in the Okanagan Watershed in 2006. It was initiated in response to rapid population growth, drought conditions from climate change, and the overall increased demand for water. Many of the watersheds in British Columbia (B.C.) are fully allocated already or may be in the next 15 to 20 years. The AWDM helps to understand current agricultural water use and to fulfil the Province's commitment under the "*Living Water Smart – BC's Water Plan*" to reserve water for agricultural lands. The Model can be used to establish agricultural water reserves throughout the various watersheds in B.C. by providing current and future agricultural water use data.

Climate change scenarios developed by the University of British Columbia (UBC) and the Summerland Research and Development Centre predict an increase in agricultural water demand due to warmer and longer summers and lower precipitation during summer months in the future.

1.1 Model Overview

The Model provides current and future agricultural water demands. It calculates water use on a property-by-property basis, and sums each property to obtain a total water demand for the entire basin or each subbasin. Data on crop type, irrigation system type, soil texture and climate are used to calculate the water demand. Climate data from year 2003 was used to represent the highest water demands in one of the hottest and driest years on record, and year 1997 climate data was used to represent the water demand in a wet year. Lands within the Agriculture Land Reserve (ALR) in Squamish-Lillooet Regional District (SLRD) are shown in green in Figure 1.

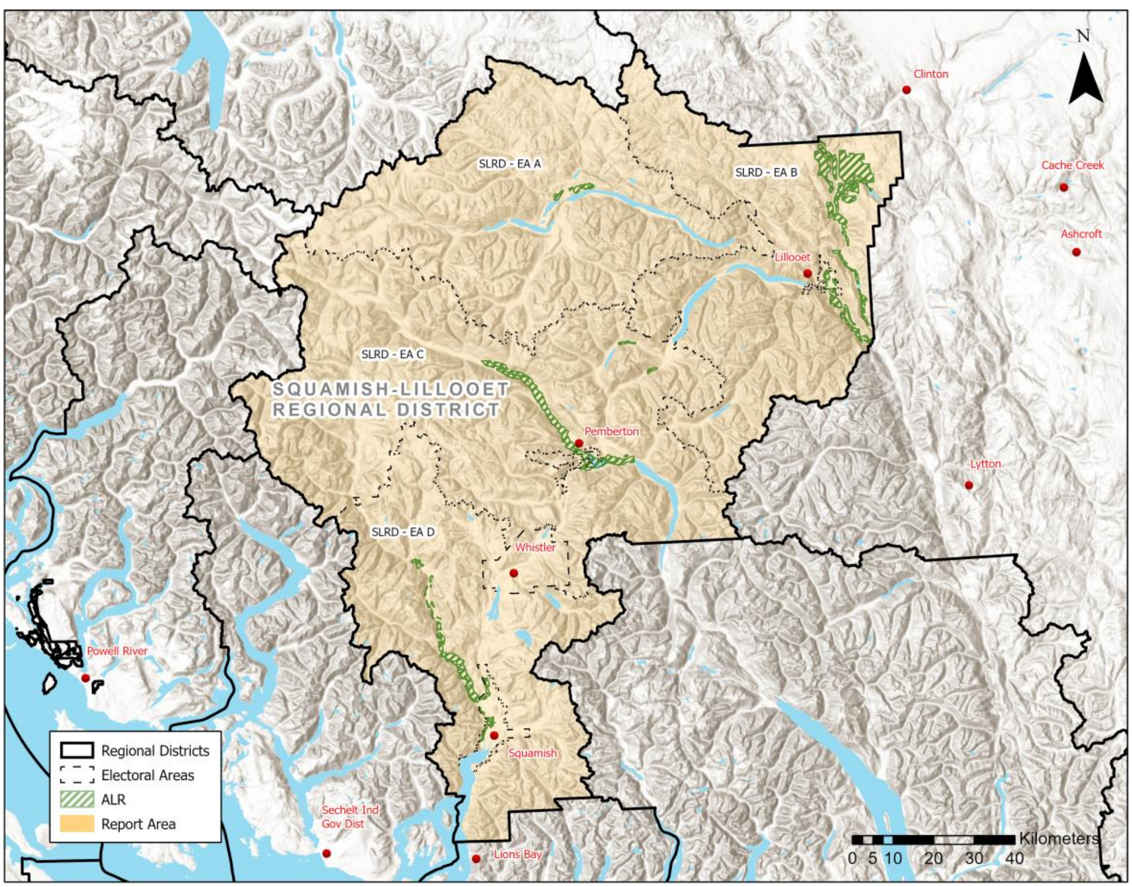

Figure 1 Map of the Project Area

1.2 Model Applications

Since the AWDM was developed in the Okanagan, the model has been expanded to over 20 additional regions. The AWDM results have been widely used by many local governments for water management and planning purposes, and by the Province to guide the development of future water policies.

1.2.1 Watershed Plans

The Province has made groundwater and surface water management a priority in the Living Water Smart: BC's Water Plan, which is the over-arching provincial policy framework for the *Water Sustainability Ac*t (WSA). The WSA and the BC's Water Plan also committed to establish dedicated agriculture water. The recognition of watershed planning for allocation in regular and drought/flood conditions has led communities to initiate planning processes to ensure agriculture has access to a fair and equitable amount of water among all users within the community or watershed. If local governments choose to develop watershed plans that support agriculture and food security, the AWDM results will serve as a baseline for demand, and thus needed supply.

1.2.2 BC Agriculture Water Calculator

In 2016, upon the request from the agricultural industry, the BC Ministry of Agriculture (AGRI) partnered with the BC Ministry of Environment and Climate Change Strategy (ENV), Partnership for Water Sustainability in BC (PWSBC), and the Okanagan Basin Water Board (OBWB) to develop an online tool called the BC Agriculture Water Calculator to assist with water license applications. This calculator has been built with information provided by the AWDM, most specifically the climate dataset that has been developed.

This tool calculates irrigation and livestock water requirements to assist agricultural producers in determining the volume of water to apply for in their water license applications, for both surface water and groundwater. Since there are about 20,000 non-domestic wells that will be required to be licensed for their existing uses by March 1, 2022 under the WSA, the Ministry of Forests, Lands, Natural Resource Operations and Rural Development (FLNRORD) also uses this tool to assess water license applications more efficiently.

The AWDM calculates water demand using downscaled climate data on a 500 m by 500 m grid. The climate data uses existing climate station information along with a Digital Elevation Model (DEM) that takes into account a number of parameters, such as, elevation, latitude and longitude, slope and other factors to calculate evapotranspiration data on a daily basis for each grid cell. Combined with irrigation efficiency and soil texture information, water demand can be calculated for each grid cell using forage as a base crop, sprinkler as a base irrigation system, and sandy loam as a base soil texture.

For this calculator, the AWDM was run for ten years (2001 to 2010) to produce an averaged climate dataset for each 500 m grid cell. The Model then determined the annual irrigation water demands for the base crop, base irrigation system and soil type. The AWDM was run for other crops, irrigation systems and soil types to develop factors to adjust water demand for other scenarios. These factors are all stored in the calculator. For peak evapotranspiration data in this calculator, the maximum 10-day value averaged over the 10-year period was used.

In addition to the BC Agriculture Water Calculator, a BC Landscape Water Calculator has also been developed using the same principles. The landscape calculator may form the basis of a water conservation plan for municipal governments as a prerequisite for obtaining municipal infrastructure grants in the future.

2. Methodology

The Model is based on a Geographic Information System (GIS) database that contains data on crop type, irrigation system type, soil texture and climate. An explanation of how the data is compiled for each variable is provided in this section. Figure 2 shows the surveyed area including all properties within the ALR and areas that were zoned for agriculture by the local governments. The survey was conducted by the Ministry of Agriculture (AGRI) staff, and professional contractors and summer students hired by the Ministry of Agriculture.

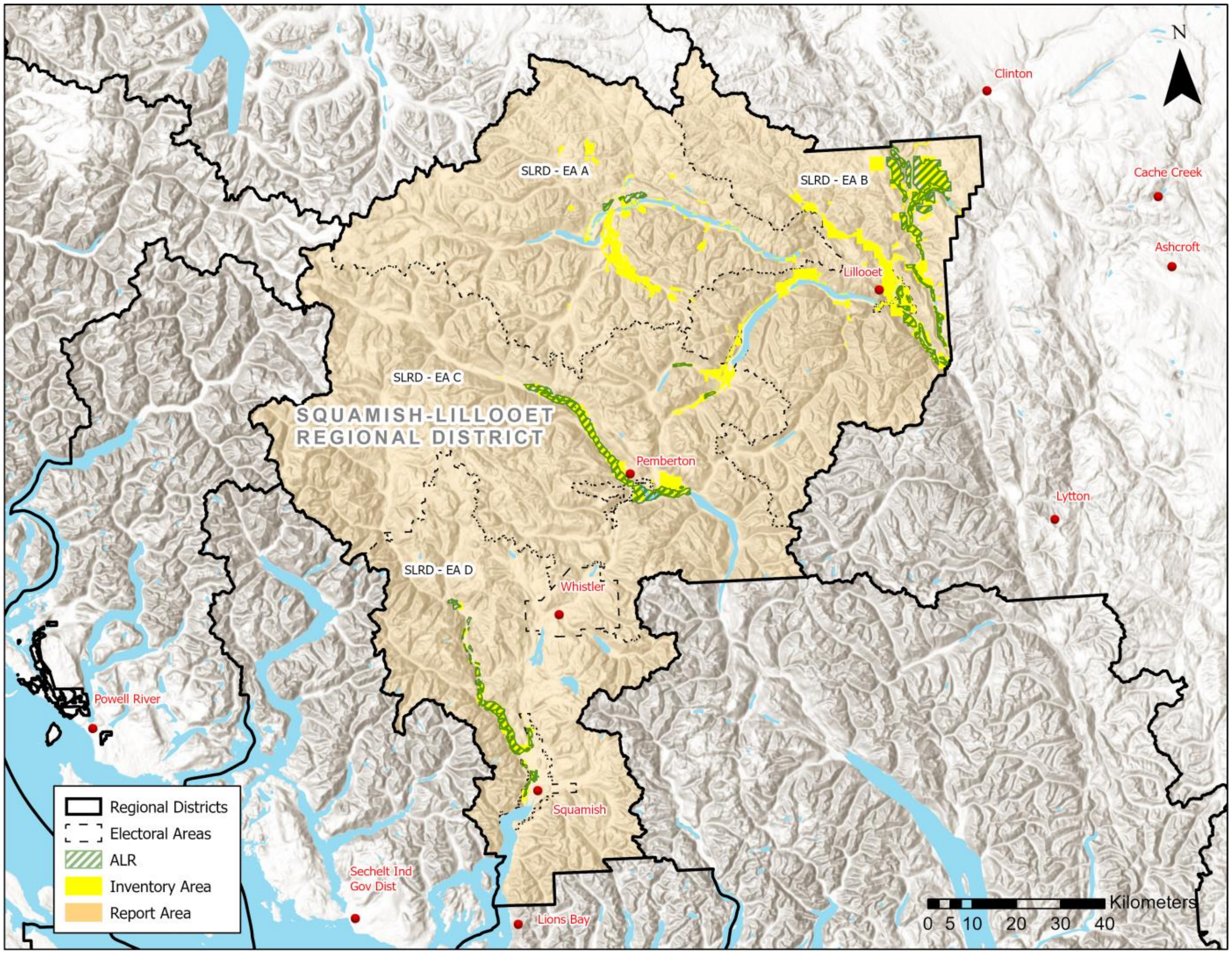

Figure 2 Map of the Surveyed Area

2.1. Cadastre and Polygon

Cadastre data was provided by the Integrated Cadastral Information Society (ICIS). All of the cadastre data was unified into one seamless cover for the entire project area. This process allows the Model to calculate water demand for each parcel and to report out on subbasins, local governments, water purveyors or aquifers by summing the data for those areas. Aerial photographs were used to conduct an initial review of crop type by cadastre. Within each cadastre, permanent physical structures (e.g., farmstead and driveways) were separated from cropping areas by creating new polygons, and excluded from the calculation of water demand. If the difference in crop type could be identified on the aerial photographs, the polygon would be split so each new polygon would contain a unique crop type. This data was entered in the GIS land use database that was used by the field crew to conduct and complete the Agricultural Land Use Inventory (ALUI).

2.2 Agricultural Land Use Inventory (ALUI)

The survey crew uses the land use database created to verify data about each property. Surveys were done in the summer of 2017, and a resurvey of Pemberton Valley in the summer of 2019. The survey crew drove by each property and checked the database for accuracy using visual observation and the aerial photographs on the survey maps. A Professional Agrologist with local knowledge verified what was on the site, and a GIS technician altered the codes in the database as necessary. When the survey was completed for the entire project area, post-survey data quality control was conducted to ensure the additional polygons were accurately entered into the database.

The smallest unit for which water use is calculated are the polygons within each cadastre. A polygon is determined by a change in crop type or irrigation system type within a cadastre. Polygons are designated as blue lines within each cadastre as shown in Figure 3 which provides an enhanced view of a cadastre containing three polygons. Each cadastre has a unique identifier as does each polygon. The polygon identifier is acknowledged by PolygonID. This allows the survey team to call up the cadastre in the database, review the number of polygons within the cadastre and ensure the land use is coded accurately for each polygon.

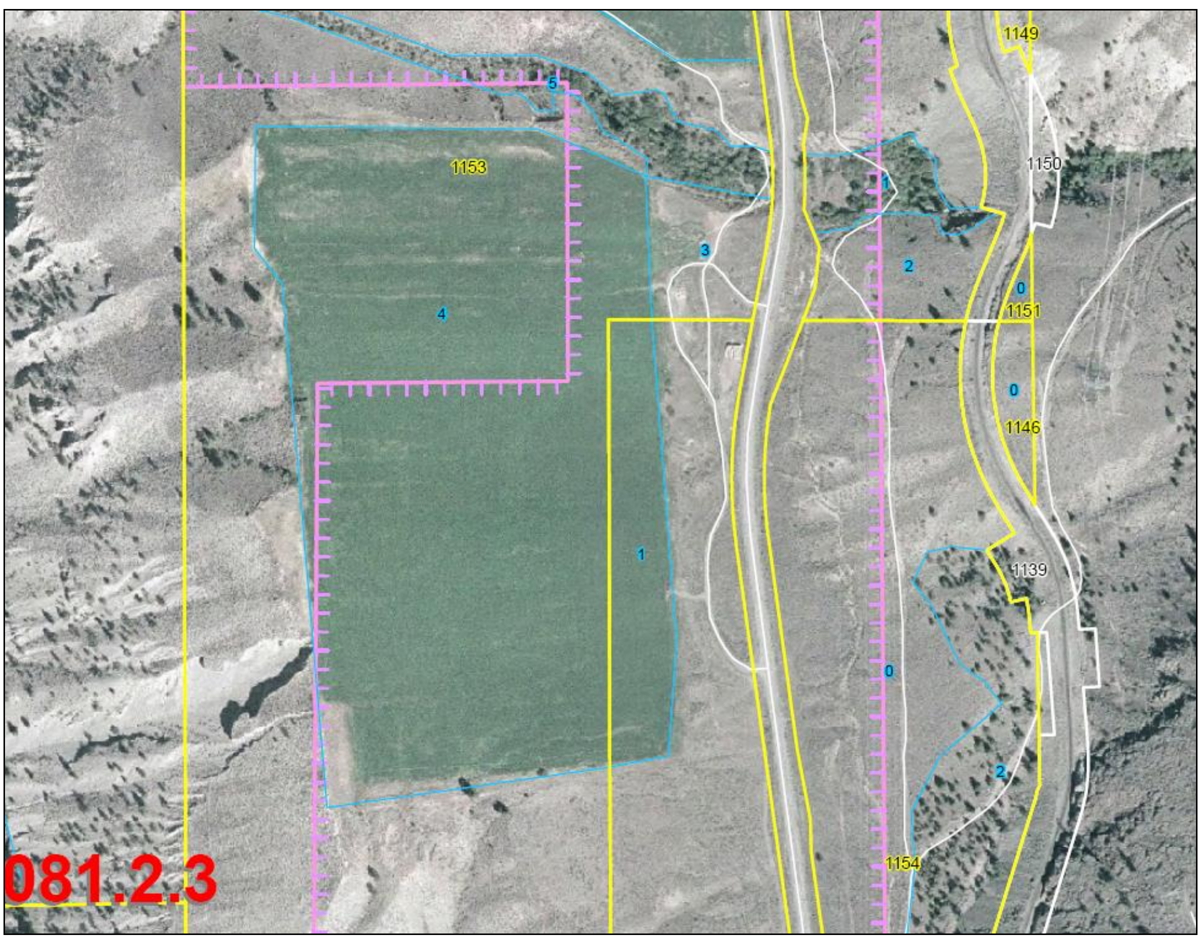

Figure 3 Cadastre with Polygons

2.3 Soil Information

Soil data was obtained digitally from the British Columbia Ministry of Environment. Soil attributes required for this project was the soil texture, the available water storage capacity, and the peak infiltration rate for each texture type.

The intersection of soil boundaries with the cadastre and land use polygons creates additional polygons that the Model uses to calculate water demand. Figure 4 shows how the land use information is divided into additional polygons using the soil boundaries. The Model calculates water demand using every different combination of crop, soil and irrigation system as identified by each polygon.

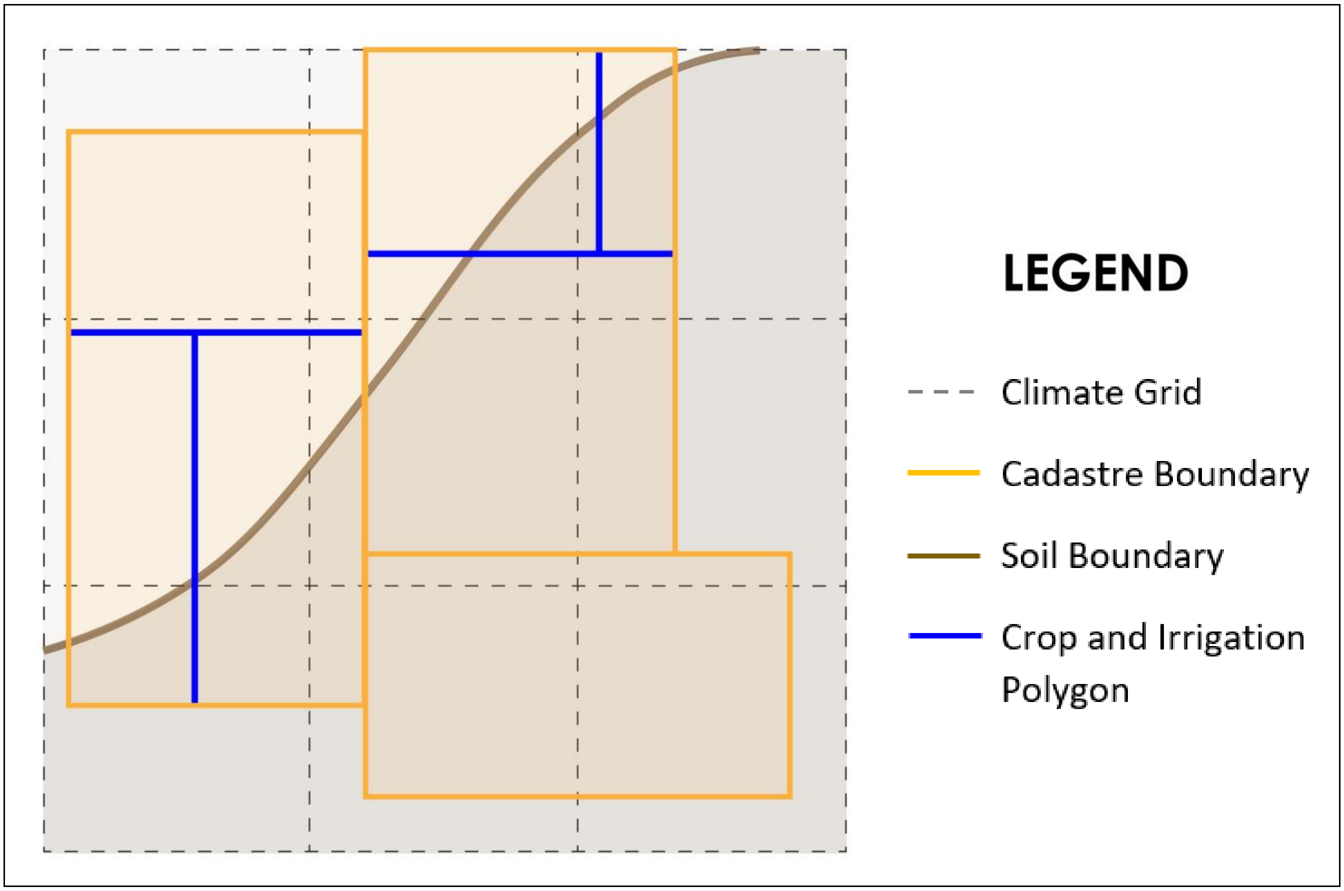

Figure 4 Polygon Attributes

2.4 Climate Information

The agricultural water demand is calculated using climate data, crop type, irrigation system type and soil texture. The climate generally gets cooler and wetter from south to north and as elevation increases. To incorporate the climatic diversity, climate layers were developed for the entire Province on a 500 metre by 500 metre grid. Each grid cell contains daily climate data, minimum and maximum temperature (T_{min} and T_{max}), and precipitation all of which allow the Model to calculate a daily reference evapotranspiration rate (ET_o) value. A range of agro-climatic indices such as growing degree days (GDD), corn heat units (CHU), frost free days and temperature sum (T-sum) can also be calculated for each grid cell based on temperature data. These values are used to determine seeding dates and the length of the growing season in the Model.

The climate dataset has been developed by using data collected from climate stations across the Province from 1961 to 2010. This climate dataset was then interpolated to provide a climate data layer for the entire Province on the 500 metre by 500 metre grid. The climate grid cell that is prominent for a cadastre boundary is assigned to that cadastre. Additional polygons are not generated with the climate grid.

The attributes attached to each climate grid cell include:

- Latitude
- Longitude
- Elevation
- Aspect
- Slope
- Daily Precipitation
- Daily T_{min} and T_{max}

A climate database contains T_{min}, T_{max}, T_{mean} and Precipitation for each day of the year from 1961 until 2010. The parameters that need to be selected, calculated and stored within the Model are evapotranspiration (ET_o), T-sum, effective precipitation (EP), frost free days, first frost date, GDD with base temperatures of 5 ^oC and 10 ^oC, and CHU. These climate and crop parameters are used to determine the growing season length as well as the beginning and end of the growing season in Julian day.

3. Model Calculations

The Model calculates the water demand for each polygon by using crop type, irrigation system type, soil texture and climate data as explained below. Each polygon was assigned an ID number as mentioned previously.

3.1 Crop

The CropID is an attribute of the PolygonID as each polygon contains a single crop. The crop information is collected (as observed during the land use survey) and stored with the PolygonID. CropID provides cropping attributes to the Model for calculating water use for each polygon. CropID along with the climate data is also used to calculate the growing season length and the beginning and end of the growing season. The attributes for CropID include rooting depth, availability coefficient, crop coefficient and a drip factor.

- Rooting depth is the rooting depth for a mature crop in a deep soil.
- An availability coefficient is assigned to each crop. The availability coefficient is used with the IrrigID to determine the soil moisture available to the crop for each PolygonID.
- The crop coefficient adjusts the calculated ET_o for the stages of crop growth during the growing season. Crop coefficient curves have been developed for every crop. The crop coefficient curve allows the Model to calculate water demand with an adjusted daily ET_o value throughout the growing season.
- The drip factor is used in the water use calculation for polygons where drip irrigation systems are used. Since the Model calculates water use by area, the drip factor adjusts the percentage of area irrigated by the drip system for that crop.

3.2 Irrigation

The IrrigID is an attribute of the PolygonID as each polygon has a single irrigation system type operating. The irrigation system type is collected (as observed during the land use survey) and stored with the PolygonID. The land use survey determines if a polygon has an irrigation system operating, what the system type is, and if the system is being used. The IrrigID contains an irrigation efficiency listed as an attribute.

Two of the IrrigID, Overtreedrip and Overtreemicro are polygons that have two systems in place. Two irrigation IDs occur when an overhead irrigation system has been retained to provide crop cooling or frost protection. In this case, the efficiency factors for drip and microsprinkler are used in the Model.

3.3 Soil

The digitized soil database came from the British Columbia Ministry of Environment. In addition, soil data provided by Agriculture and Agri-Food Canada (AAFC) was also used to generate multiple soil layers within each polygon. Each parcel was assigned the most predominant soil polygon, and then for each crop field within that soil polygon, the most predominant texture within the crop's rooting depth was determined and assigned to the crop field.

Note that textures could repeat at different depths. The combined total of the thicknesses determined the most predominant texture. For example, a layer of 20 cm sand, followed by 40 cm clay and then 30 cm of sand would have sand be designated at the predominant soil texture.

The attributes attached to the SoilID is the Available Water Storage Capacity (AWSC) which is calculated using the soil texture and crop rooting depth.

The Maximum Soil Water Deficit (MSWD) is calculated to decide the parameters for the algorithm that is used to determine the Irrigation Requirement (IR). The Soil Moisture Deficit (SMD) at the beginning of the season is calculated using the same terms as the MSWD.

3.4 Climate

The climate data in the Model is used to calculate a daily reference evapotranspiration rate (ET_o) for each climate grid cell. The data that is required to calculate this value are:

- Elevation, metres (m)
- Latitude, degrees (^{o})
- Minimum Temperature, degree Celsius (^{o}C)
- Maximum Temperature, degree Celsius (^{o}C)
- Classification as Coastal or Interior
- Classification as Arid or Humid
- Julian Day

Data that is assumed or are constants in this calculation are:

• Wind speed	2 m/s
• Albedo or canopy reflection coefficient,	0.23
• Solar constant, G_{sc}	0.082 $MJ^{-2}min^{-1}$
• Interior and Coastal coefficients, K_{Rs}	0.16 for interior locations 0.19 for coastal locations
• Humid and arid region coefficients, K_o	0 °C for humid/sub-humid climates 2 °C for arid/semi-arid climates

4. Livestock Water Use

Livestock type was observed and recorded during the land use survey as listed in Table 1. Livestock scale was also observed and entered into the database: very small, small, medium, large, very large, and very very large. The Model calculates an estimated livestock water demand using the livestock scale observed. Water use for each animal type is calculated differently depending on requirements. For example, for a dairy milking cow, the water demand for each animal includes, drinking, preparation for milking, pen and barn cleaning, milking system washout, bulk tank washout and milking parlor washing. However, for a dry dairy cow, the demand only includes drinking and pen and barn cleaning.

The water use is estimated on a daily basis per animal even though the facility is not cleaned daily. For example, for a broiler operation, the water use for cleaning a barn is calculated as 4 hours of pressure washing per cycle at a flow rate of 10 gallons per minute (gpm), multiplied by 6 cycles per barn with each barn holding 50,000 birds. On a daily basis, this is quite small with a value of 0.01 Litres per day per bird applied.

For all cases, the daily livestock water demand is applied to the farm location. However, in the case of beef, the livestock spend parts of the year on the range. Since the actual location of the animals cannot be ascertained, the water demand is applied to the home farm location, even though most of the demand will not be from this location. Therefore, the animal water demand on a watershed scale will work well, but not when the demand is segregated into sub-watersheds or groundwater areas.

The estimates used for each livestock are shown in Table 1.

Table 1 Livestock Water Demand (Litres/day)

Animal Type	Drinking	Milking Preparation	Barn Component	Total
Milking Dairy Cow	65	5	15	85
Dry Cow	45		5	50
Swine	12		0.5	12.5
Poultry – Broiler	0.16		0.01	0.17
Poultry – Layer	0.08		0.01	0.09
Turkeys	0.35		0.01	0.36
Goats	8			8
Sheep	8			8
Beef – range, steer, bull, heifer	50			50
Horses	50			50

5. Report Area

The Squamish-Lillooet Regional District (SLRD) is a local government federation consisting of four member municipalities (Figure 5):

- District of Lillooet
- Village of Pemberton
- Resort Municipality of Whistler
- District of Squamish

and four unincorporated rural Electoral Areas:

- Electoral Area A
- Electoral Area B
- Electoral Area C (also commonly known as Pemberton Valley)
- Electoral Area D

This report discussed results for Electoral Area C, i.e., Pemberton Valley, with some comparative data that relates it to the entire SLRD. For simplicity, Electoral Area C is referred to as Pemberton Valley from this point forward.

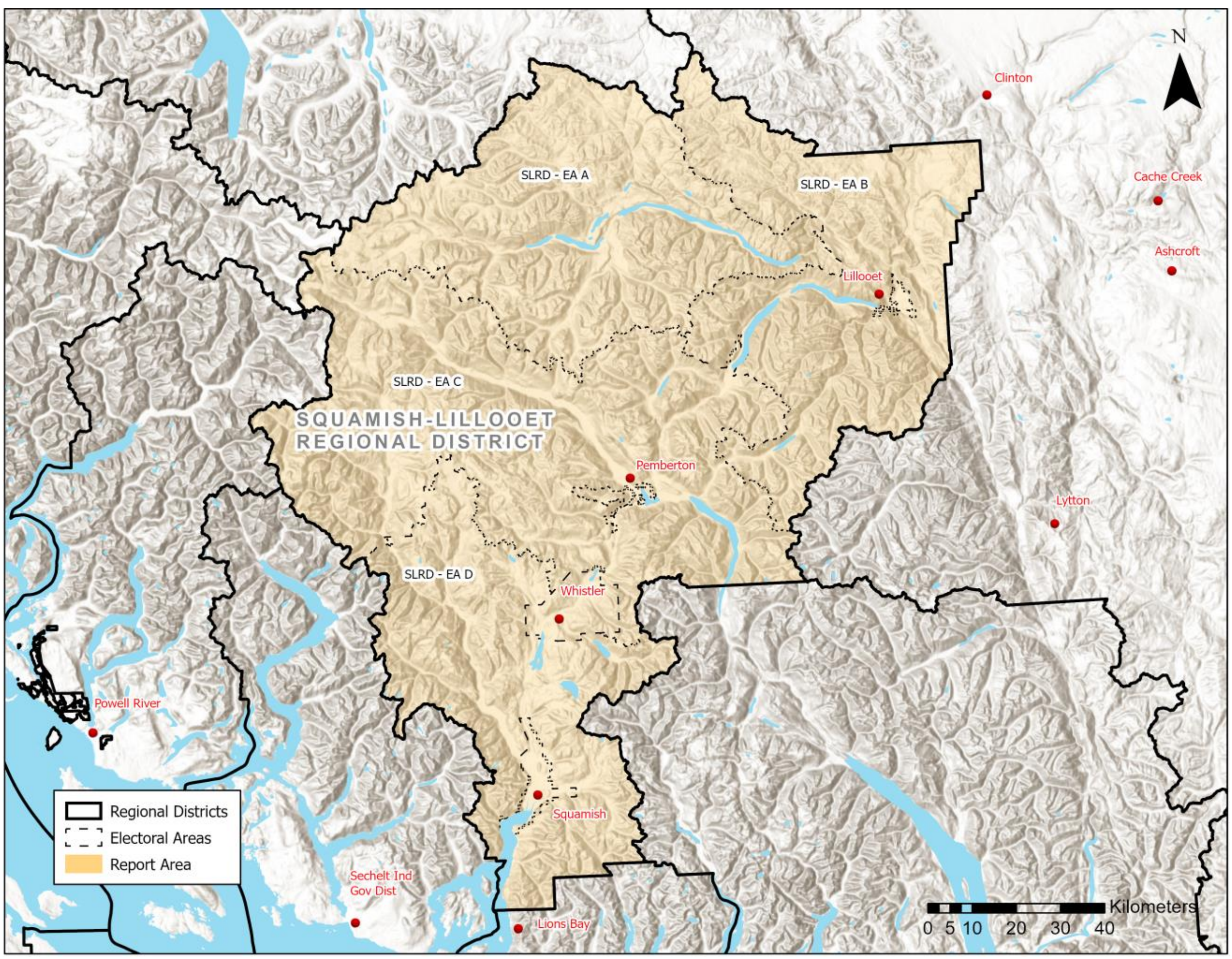

Figure 5 Administrative Areas in the Project Area

6. Agricultural Water Demand Results

The Agriculture Water Demand Model (AWDM or "Model") can generate modelled results using a series of pre-developed scenarios. The Appendix in this report includes summary tables of the modelled results. Climate data from years 1997 and 2003 were chosen as they represent a relatively wet year and dry year respectively. Most results in this report are based on climate data from year 2003 which represents the maximum water demand. Results using climate change scenarios in years 2053, 2056 and 2059 are also presented. The results presented are focused on Pemberton Valley with some comparative data that relates it to the entire SLRD.

6.1 Annual Crop Water Demand – Tables A-1, A-2, B-1 and B-2

The Model offers a selection of three irrigation management factors: good, average and poor. Unless otherwise noted, average management was used in the tables. Appendix Tables A-1 (SLRD) and A-2 (Pemberton) provide the annual irrigation water demand based on the crop and irrigation systems observed in the survey year, year 2003 climate data, and average irrigation management. Tables B-1 and B-2 provide the same data for year 1997 climate data.

The total irrigated acreage in SLRD is 2,098 hectares (ha), including 1,797 ha of forage, and 193 ha of vegetable. In SLRD, 1,881 ha is supplied by licensed surface water sources, and 217 ha is irrigated with groundwater. The total irrigated acreage in Pemberton is 716 ha, including 449 ha of forage, and 174 ha of vegetable. In Pemberton, 715 ha is supplied by licensed surface water sources, and 0.9 ha is irrigated with groundwater. Although groundwater licensing is required under the *Water Sustainability Act* (WSA) as of February 29, 2016, no or minimal groundwater licences were issued since then in the project area. Parcels that were observed to have irrigation were assumed to obtain water from aquifers if surface water licences do not exist and that the parcel is not purveyed by the local government.

For SLRD, the total annual irrigation demand was 19,447,960 m^3 in 2003, and dropped to 12,991,069 m^3 in 1997. During a wet year like 1997, the demand was only 66% of a hot dry year like 2003. For Pemberton, the total annual irrigation demand was 4,640,378 m^3 in 2003, and dropped to 3,290,689 m^3 in 1997. During a wet year like 1997, the demand was only 70% of a hot dry year like 2003.

6.2 Annual Water Demand by Irrigation System – Tables C-1 and C-2

The irrigation demand can also be summarized by irrigation system type as shown in Tables C-1 (SLRD) and C-2 (Pemberton). The more efficient irrigation system for horticultural crops is drip (including overtreedrip) which irrigates 65 ha in SLRD and 48 ha in Pemberton, and for forage is low-pressure pivot which irrigates 160 ha in SLRD and 20 in Pemberton. There is also a large portion of the forage irrigated by less efficient sprinkler systems. Sprinkler systems irrigate 1,538 ha (73%) of the agricultural crops in SLRD and 581 ha (81%) in Pemberton.

6.3 Annual Water Demand by Soil Texture – Tables D-1 and D-2

The Model calculates water demand on a property by property basis and can summarize the data for each soil texture as shown in Tables D-1 (SLRD) and D-2 (Pemberton). Where soil texture data is missing, the soil texture has been defaulted to sandy loam, i.e., "Sandy Loam (defaulted)".

6.4 Annual Water Demand by Subbasin – Table E-1

The Model calculates water demand on a property by property basis and can summarize the data for each subbasin in SLRD as shown in Table E-1.

6.5 Annual Water Demand by Water Purveyor – Tables F-1 and F-2

The Model calculates water demand on a property by property basis and can summarize the data for each water purveyor as shown in Tables F-1 (SLRD) and F-2 (Pemberton). Naming convention for water purveyors follows the approved version published by GeoBC.

6.6 Annual Water Demand by Local Government – Tables G-1 and G-2

The Model calculates water demand on a property by property basis and can summarize the data for irrigated area within each local government as shown in Tables G-1 (SLRD) and G-2 (Pemberton).

6.7 Annual Water Demand by Electoral Area – Table H-1

The Model calculates water demand on a property by property basis and can summarize the data for irrigated area within each electoral area as shown in Table H-1.

6.8 Improved Irrigation Efficiency and Good Management – Tables I-1 and I-2

There is an opportunity to reduce water use by converting irrigation systems to a higher efficiency for some crops. For example, drip systems could be used for all fruit crops, vegetable crops and some of the other horticultural crops, but not forage crops. In addition, using better management such as irrigation scheduling techniques will also reduce water use, especially for forage where drip conversion is not possible. Tables I-1 (SLRD) and I-2 (Pemberton) provide a scenario of water demand if all sprinkler systems are converted to drip systems for horticultural crops in the project area, as well as converting irrigation systems to low-pressure pivot systems for forage fields over 10 ha, using good irrigation management. In this case, the water demand for 2003 would reduce from 19,447,960 m^3 to 14,867,717 m^3 (24% reduction) in SLRD, and from 4,640,378 m^3 to 3,972,675 m^3 (14% reduction) in Pemberton.

6.9 Livestock Water Use – Tables J-1 and J-2

The Model provides an estimate of water use for livestock. The estimate is based on the number of animals in the project area as determined by the latest census, the drinking water required for each animal per day and the barn or milking parlour wash water. Values used are shown in Tables J-1 (SLRD) and J-2 (Pemberton). The amount of livestock water is estimated at 363,935 m^3 in SLRD and 303,919 m^3 in Pemberton.

6.10 Crop Water Demand with Climate Change (Year 2050s Climate) for High Demand Years Using Surveyed Crops and Irrigation Systems and Good Management – Tables K-1 and K-2

The Model also has access to climate change information until the year 2100. While data can be run for each year, three driest years in the 2050s were selected to give a representation of climate change. Figure 6 shows the climate change results which indicate 2053, 2056, and 2059 generate the highest annual ET_o and lowest annual precipitation. Therefore, these three years were used in this report. Tables K-1 (SLRD) and K-2 (Pemberton) provide the results of climate change on irrigation demand for the three years selected using crop types and irrigation system types captured in the land use survey. Surveyed crop and irrigation system types were used to show the increase due to climate change alone, with no other changes taking place.

Figure 7 shows all of the climate change scenario runs for the Okanagan using 12 climate change models from year 1960 to 2100. This work was compiled by Denise Neilsen, a retired research scientist at the Agriculture and Agri-Food Canada – Summerland Research and Development Centre. There is a lot of scatter in this figure, but it is obvious that there is a trend of increasing water demand.

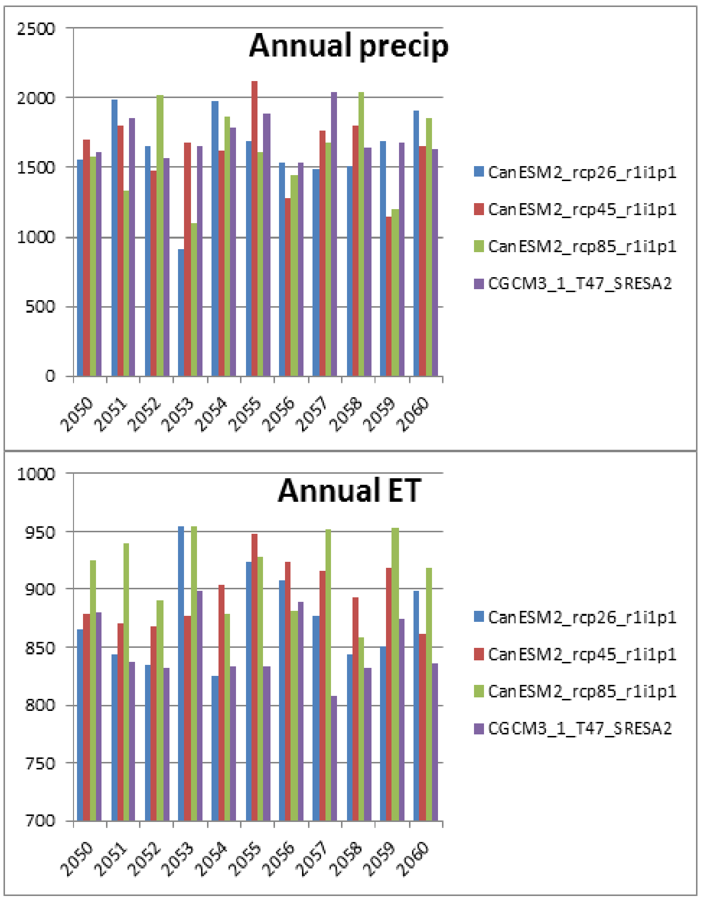

Figure 6 Annual ET and Effective Precipitation in Year 2050s

The three climate change models used in this report are access1 rcp85, canESM2 rcp85 and cnrm-cm5 rcp85. Running only three climate change models on three selected future years in the project area is not sufficient to provide a trend like in Figure 7. What the results do show is that in an extreme climate scenario, it is possible to have an annual water demand that is 29% (SLRD) and 35% (Pemberton) higher than what was experienced in year 2003 based on canESM2 rcp85 climate model in year 2053. More runs of the climate change models will be required to better estimate a climate change trend for the region.

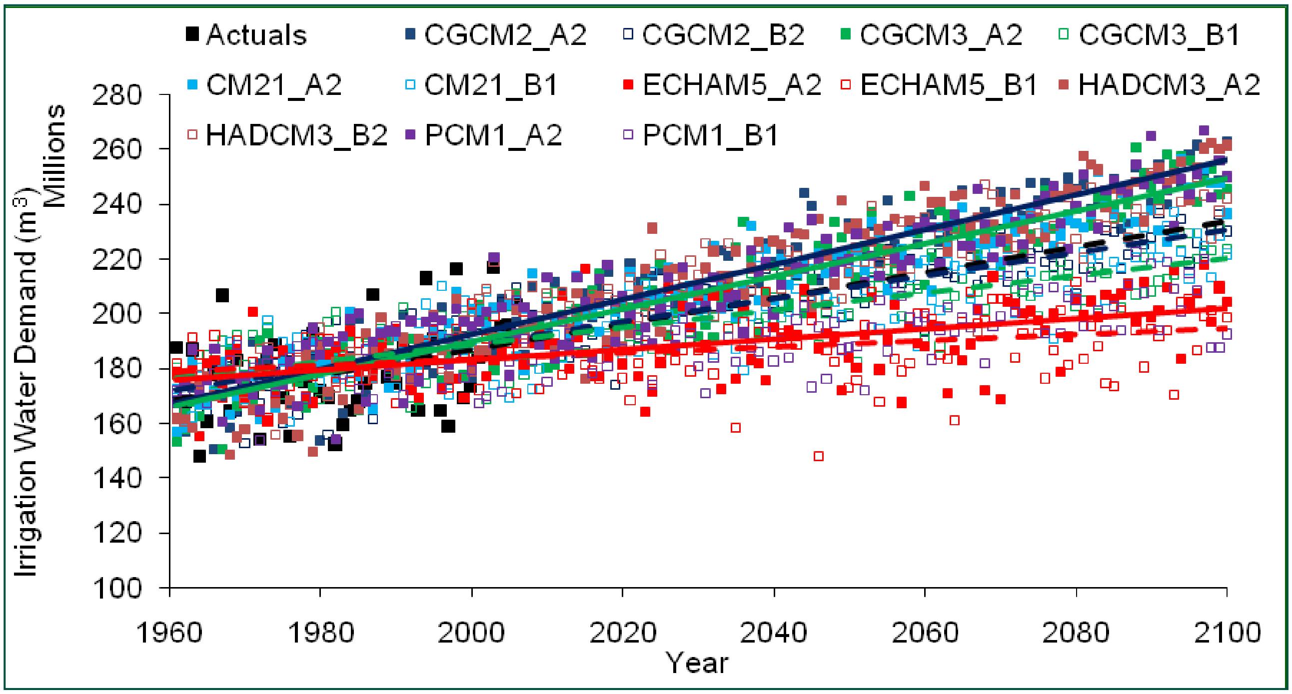

Figure 7 Future Irrigation Demand for All Outdoor Uses in the Okanagan in Response to Observed Climate Data (Actuals) and Future Climate Data Projected from a Range of Global Climate Models

6.11 Water Demand by Crop with Buildout, Year 2003 Climate, and Good Management – Tables L-1 and L-2

An agricultural irrigated buildout scenario was developed that looked at potential agricultural lands that could be irrigated in the future. The rules used to establish where potential additional agricultural lands were located are as follows:

- within 1,000 m of water supply (lake)
- within 1,000 m of water supply (water course)
- within 1,000 m of water supply (wetland)
- within 1,000 m of high productivity aquifer
- within 1,000 m of water purveyor
- within 125 m elevation from the surface water source to the property
- with Ag Capability class 1-4 only where available
- must be within the ALR
- below 750 m average elevation
- must be private ownership

Permanent physical structure (e.g., farmstead, houses, driveways) are not considered to be available for the buildout scenario. For the areas that are determined to be eligible for future buildout, a crop type and irrigation system type need to be applied. Where a crop already exists in the land use inventory, that crop would remain and an irrigation system type assigned. If no crop exists, then a crop type and an irrigation system type would be assigned as per the criteria below:

- 50% Vegetable – 80% sprinkler, 20% travelling gun
- 50% Forage – 90% drip, 10% sprinkler

For Pemberton Valley where cropping is quite different from the rest of SLRD, the following buildout rules were applied:

- 30% forage (15% sprinkler, 15 % low pressure pivot)
- 20% pasture (10% sprinkler and 10% low pressure pivot
- 20% potato with low pressure pivot
- 15% vegetable with drip
- 10% berry with drip
- 5 % cranberry with sprinkler

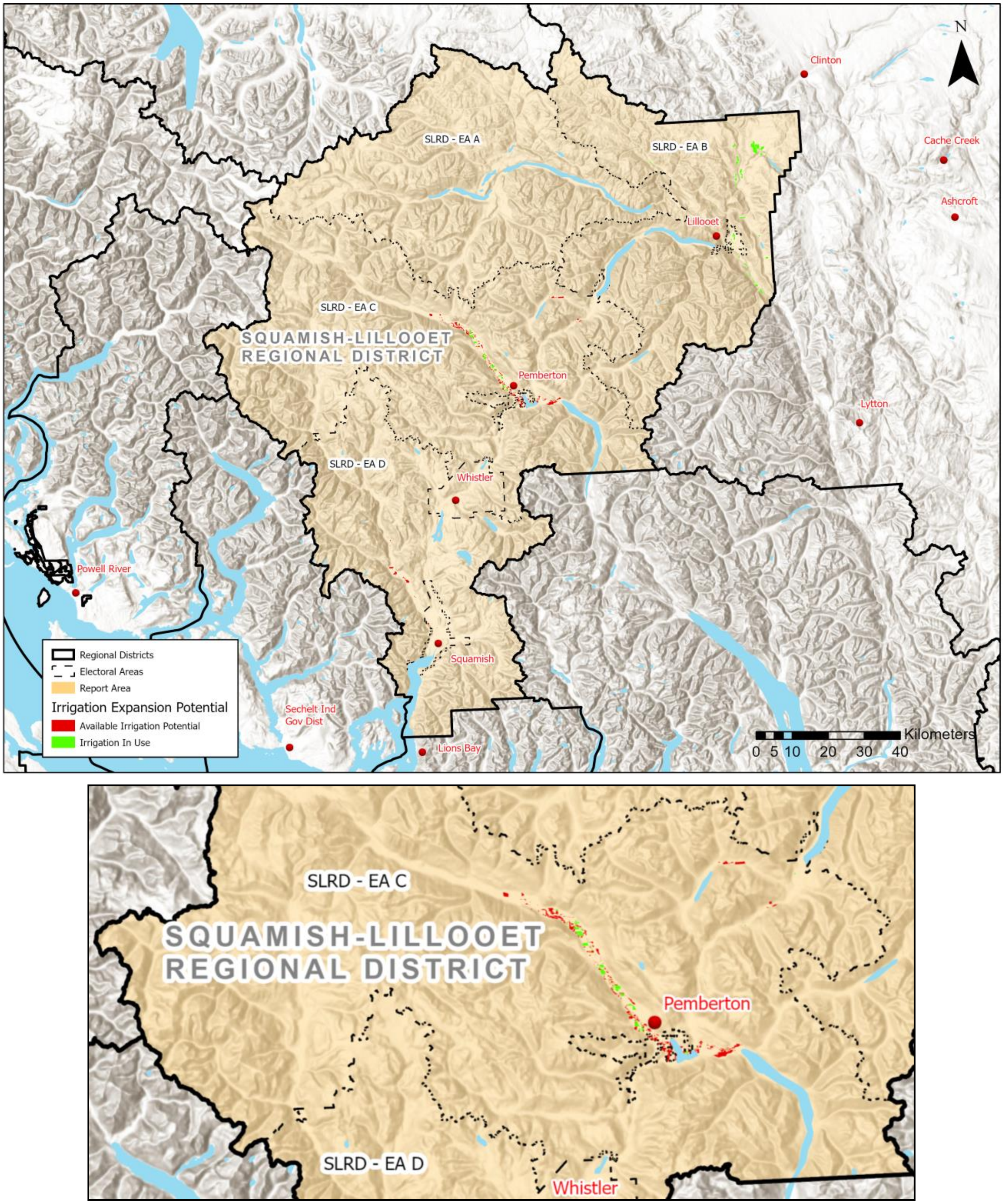

Figure 8 Irrigation Expansion Potential for the Project Area (top) and Pemberton Valley (bottom)

Figure 8 indicates the location of agricultural land that is currently irrigated (green) and the land that can be potentially irrigated (red). Based on the scenarios provided for SLRD and Pemberton, the additional agricultural land that could be irrigated is 2,526 ha (SLRD) which is an increase in irrigated acreage of 120%, and 2,094 ha (Pemberton) which is an increase in irrigated acreage of 292%. The water demand for a year like 2003 would then be about 33 million m^3 for SLRD and 16 million m^3 for Pemberton assuming efficient irrigation systems and good management.

6.12 Crop Water Demand with Buildout, Climate Change (Year 2050s Climate for High Demand Years), and Good Management – Tables M-1 and M-2

The same irrigation expansion and cropping scenario used to generate the values in Tables K-1 (SLRD) and K-2 (Pemberton) were used to generate the water demand with climate change as shown in Tables M-1 (SLRD) and M-2 (Pemberton). See discussion under Tables L-1 and L-2 section. When climate change is added to the buildout scenario, the water demand increases from 25 million m^3 to 45 million m^3 (a further 82% increase for SLRD), and from 6 million m^3 to 22 million m^3 (a further 266% increase for Pemberton) based on climate change model canESM2 rcp85 in Year 2053 using the highest potential scenario.

6.13 Water Demand by Irrigation System with Buildout, Year 2003 Climate, and Good Management – Tables N-1 and N-2

Tables N-1 (SLRD) and N-2 (Pemberton) provide an account of the irrigation systems used by area for the buildout scenario in the previous two examples. Note that pivot irrigation (especially low-pressure type) is expected to be used for forage field over 10 ha in size to be economically feasible.

6.14 Water Demand by Soil Texture with Buildout, Year 2003 Climate, and Good Management – Tables O-1 and O-2

Tables O-1 (SLRD) and O-2 (Pemberton) provide the water demand by soil type for the buildout scenario used in this report. Comparing these values with the result in Tables D-1 (SLRD) and D-2 (Pemberton) will provide information on the possible increased water demand by soil type for the projected irrigated areas.

6.15 Water Demand by Subbasin with Buildout, Year 2003 Climate, and Good Management – Table P-1

Table P-1 (SLRD) provides the water demand by subbasin for the buildout scenario used in this report. Comparing these values with the result in Table E-1 will provide information on the possible increased water demand in each subbasin for the projected irrigated areas.

6.16 Water Demand by Water Purveyor with Buildout, Year 2003 Climate, and Good Management – Tables Q-1 and Q-2

Tables Q-1 (SLRD) and Q-2 (Pemberton) provide the water demand by water purveyor for the buildout scenario used in this report. Comparing these values with the result in Tables F-1 (SLRD) and F-2 (Pemberton) will provide information on the possible increased water demand by each water purveyor for the projected irrigated areas. Naming convention for water purveyors follows the approved version published by GeoBC.

6.17 Water Demand by Local Government with Buildout, Year 2003 Climate, and Good Management – Tables R-1 and R-2

Tables R-1 and R-2 provide the water demand by local government for the buildout scenario used in this report. Comparing these values with the result in Tables G-1 and G-2 will provide information on the possible increased water demand in each local government for the projected irrigated areas.

6.18 Water Demand by Electoral Area with Buildout, Year 2003 Climate, and Good Management – Table S-1

Table S-1 provides the water demand by electoral area for the buildout scenario used in this report. Comparing these values with the result in Table H-1 will provide information on the possible increased water demand in each electoral area for the projected irrigated areas.

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Appendix Tables

Appendix Table A-1. SLRD - Water Demand by Crop Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Apple	4.5	41,816	926	0	0	0	2.8	31,603	1,132	7.3	**73,419**	1,005
Berry	35.3	127,890	363	0	0	0	0	0	0	35.3	**127,890**	363
Cranberry	44.2	368,823	835	0	0	0	0	0	0	44.2	**368,823**	835
Forage	1,606.6	16,028,405	998	0	0	0	190.5	1,592,554	836	1,797.1	**17,620,959**	981
Fruit	0.5	2,100	426	0	0	0	0	0	0	0.5	**2,100**	426
Grape	1.1	5,197	484	0	0	0	8.8	49,322	564	9.8	**54,519**	555
Nursery	8.8	70,935	805	0	0	0	0	0	0	8.8	**70,935**	805
Nursery Floriculture	0	197	409	0	0	0	0	0	0	0	**197**	409
Vegetable	178.7	1,043,094	584	0	0	0	14.5	70,811	488	193.2	**1,113,905**	576
	1,881.2	**17,697,695**	941	0	**0**	0	217.2	**1,750,265**	806	2,098.4	**19,447,960**	927

Appendix Table A-2. Pemberton - Water Demand by Crop Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Apple	1.1	8,808	788	0	0	0	0	0	0	1.1	**8,808**	788
Berry	35.1	127,113	362	0	0	0	0	0	0	35.1	**127,113**	362
Cranberry	44.2	368,823	835	0	0	0	0	0	0	44.2	**368,823**	835
Forage	449.7	3,038,962	676	0	0	0	0	0	0	449.7	**3,038,962**	676
Fruit	0.5	2,100	426	0	0	0	0	0	0	0.5	**2,100**	426
Grape	0.2	733	383	0	0	0	0	0	0	0.2	**733**	383
Nursery	8.8	70,935	805	0	0	0	0	0	0	8.8	**70,935**	805
Nursery Floriculture	0	197	409	0	0	0	0	0	0	0	**197**	409
Vegetable	174.4	1,008,278	578	0	0	0	0.4	3,174	749	174.8	**1,011,452**	579
	715.3	**4,633,591**	648	0	**0**	0	0.9	**6,787**	758	716.2	**4,640,378**	648

Appendix Table B-1. SLRD - Water Demand by Crop Using Year 1997 Climate and Average Management

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Apple	4.5	25,878	573	0	0	0	2.8	21,837	782	7.3	**47,715**	653
Berry	35.3	81,996	232	0	0	0	0	0	0	35.3	**81,996**	232
Cranberry	44.2	289,515	656	0	0	0	0	0	0	44.2	**289,515**	656
Forage	1,606.6	10,673,258	664	0	0	0	190.5	990,683	520	1,797.1	**11,663,941**	649
Fruit	0.5	1,155	234	0	0	0	0	0	0	0.5	**1,155**	234
Grape	1.1	2,875	268	0	0	0	8.8	30,910	353	9.8	**33,786**	344
Nursery	8.8	44,205	501	0	0	0	0	0	0	8.8	**44,205**	501
Nursery Floriculture	0	135	280	0	0	0	0	0	0	0	**135**	280
Vegetable	178.7	767,112	429	0	0	0	14.5	52,580	362	193.2	**819,692**	424
	1,881.2	**11,891,335**	632	0	**0**	0	217.2	**1,099,724**	506	2,098.4	**12,991,059**	619

Appendix Table B-2. Pemberton - Water Demand by Crop Using Year 1997 Climate and Average Management

Year: 1997	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Apple	1.1	5,501	492	0	0	0	0	0	0	1.1	**5,501**	492
Berry	35.1	81,598	233	0	0	0	0	0	0	35.1	**81,598**	233
Cranberry	44.2	289,515	656	0	0	0	0	0	0	44.2	**289,515**	656
Forage	449.7	2,115,943	471	0	0	0	0	0	0	449.7	**2,115,943**	471
Fruit	0.5	1,155	234	0	0	0	0	0	0	0.5	**1,155**	234
Grape	0.2	372	194	0	0	0	0	0	0	0.2	**372**	194
Nursery	8.8	44,205	501	0	0	0	0	0	0	8.8	**44,205**	501
Nursery Floriculture	0	135	280	0	0	0	0	0	0	0	**135**	280
Vegetable	174.4	743,773	426	0	0	0	0.4	2,240	528	174.8	**746,012**	427
	715.3	**3,286,489**	459	0	**0**	0	0.9	**4,100**	458	716.2	**3,290,589**	459

Appendix Table C-1. SLRD - Water Demand by Irrigation System Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Irrigation System	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Drip	7.6	24,034	317	0	0	0	6.8	27,347	404	14.3	**51,381**	358
Flood	394.2	4,364,520	1,107	0	0	0	0	0	0	394.2	**4,364,520**	1,107
Gun	27.1	372,743	1,376	0	0	0	0	0	0	27.1	**372,743**	1,376
Handline	333.8	3,602,680	1,079	0	0	0	87.8	866,995	987	421.6	**4,469,675**	1,060
Landscapesprinkler	1.2	11,127	919	0	0	0	0.1	457	851	1.3	**11,584**	916
Microsprinkler	1.5	9,238	623	0	0	0	0.6	4,854	792	2.1	**14,092**	673
Overtreedrip	41.7	172,609	414	0	0	0	9.5	51,928	549	51.2	**224,537**	439
Pivot	25.1	310,862	1,240	0	0	0	0	0	0	25.1	**310,862**	1,240
PivotLP	160.4	1,491,656	930	0	0	0	0.2	1,941	1,006	160.6	**1,493,597**	930
SDI	0	0	0	0	0	0	3.6	21,417	589	3.6	**21,417**	589
Sprinkler	115.3	765,013	663	0	0	0	11.2	75,382	673	126.5	**840,395**	664
Ssovertree	77.5	614,349	792	0	0	0	0	0	0	77.5	**614,349**	792
Sssprinkler	8.8	51,344	583	0	0	0	6.3	63,146	1,001	15.1	**114,489**	758
Ssundertree	1	9,113	887	0	0	0	0	0	0	1	**9,113**	887
Travgun	287.7	1,969,289	685	0	0	0	0	0	0	287.7	**1,969,289**	685
Wheelline	398.4	3,929,117	986	0	0	0	91.2	636,798	699	489.5	**4,565,915**	933
	1,881.2	**17,697,695**	941	0	**0**	0	217.2	**1,750,265**	806	2,098.4	**19,447,960**	927

Appendix Table C-2. Pemberton - Water Demand by Irrigation System Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Irrigation System	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Drip	7.5	23,546	315	0	0	0	0	0	0	7.5	**23,546**	315
Gun	7.1	50,335	712	0	0	0	0	0	0	7.1	**50,335**	712
Handline	22.1	95,736	433	0	0	0	0	0	0	22.1	**95,736**	433
Microsprinkler	1.3	7,641	597	0	0	0	0.5	3,614	767	1.8	**11,254**	643
Overtreedrip	40.8	168,146	412	0	0	0	0	0	0	40.8	**168,146**	412
PivotLP	20.2	119,565	591	0	0	0	0	0	0	20.2	**119,565**	591
Sprinkler	97.1	582,183	600	0	0	0	0.4	3,174	749	97.5	**585,357**	600
Ssovertree	77.5	614,349	792	0	0	0	0	0	0	77.5	**614,349**	792
Sssprinkler	7.5	38,069	508	0	0	0	0	0	0	7.5	**38,069**	508
Travgun	283.6	1,917,823	676	0	0	0	0	0	0	283.6	**1,917,823**	676
Wheelline	150.6	1,016,197	675	0	0	0	0	0	0	150.6	**1,016,197**	675
	715.3	**4,633,591**	648	0	**0**	0	0.9	**6,787**	758	716.2	**4,640,378**	648

Appendix Table D-1. SLRD - Water Demand by Soil Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Soil Texture	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Cultured Medium	1.5	9,238	623	0	0	0	0.7	5,974	852	2.2	**15,212**	697
Loam	515.3	5,140,090	997	0	0	0	80.3	499,204	622	595.6	**5,639,294**	947
Loamy Sand	180	1,881,123	1,045	0	0	0	3.2	39,711	1,239	183.2	**1,920,834**	1,049
Organic	4	22,360	558	0	0	0	0	0	0	4	**22,360**	558
Sand	518.2	6,215,315	1,200	0	0	0	86.8	926,227	1,067	605	**7,141,541**	1,180
Sandy Loam	152.6	1,256,155	823	0	0	0	10	52,573	523	162.6	**1,308,728**	805
Sandy Loam (defaulted)	5.4	44,848	830	0	0	0	2.8	14,440	515	8.2	**59,288**	722
Silt Loam	249.5	1,814,123	727	0	0	0	33.3	212,136	636	282.8	**2,026,259**	716
Silty Clay Loam	254.8	1,314,443	516	0	0	0	0	0	0	254.8	**1,314,443**	516
	1,881.2	**17,697,695**	941	0	**0**	0	217.2	**1,750,265**	806	2,098.4	**19,447,960**	927

Appendix Table D-2. Pemberton - Water Demand by Soil Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Soil Texture	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Cultured Medium	1.3	7,641	597	0	0	0	0.5	3,614	767	1.8	**11,254**	643
Loam	152.2	1,163,599	765	0	0	0	0	0	0	152.2	**1,163,599**	765
Loamy Sand	9.6	83,353	867	0	0	0	0	0	0	9.6	**83,353**	867
Organic	4	22,360	558	0	0	0	0	0	0	4	**22,360**	558
Sand	5.1	40,728	802	0	0	0	0.2	1,230	765	5.2	**41,957**	801
Sandy Loam	100.3	818,878	816	0	0	0	0.3	1,944	739	100.6	**820,822**	816
Sandy Loam (defaulted)	4.9	42,438	864	0	0	0	0	0	0	4.9	**42,438**	864
Silt Loam	183.1	1,140,152	623	0	0	0	0	0	0	183.1	**1,140,152**	623
Silty Clay Loam	254.8	1,314,443	516	0	0	0	0	0	0	254.8	**1,314,443**	516
	715.3	**4,633,591**	648	0	**0**	0	0.9	**6,787**	758	716.2	**4,640,378**	648

Appendix Table E-1. SLRD - Water Demand by Subbasin Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Subbasin	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Unknown	715.3	4,633,591	648	0	0	0	0.9	6,787	758	716.2	**4,640,378**	648
Fraser River	1,165.40	13,061,694	1,121	0	0	0	204.2	1,681,317	823	1,369.60	**14,743,011**	1,076
Cheakamus River	0.5	2,410	490	0	0	0	1.5	8,103	536	2	**10,513**	525
Pillchuck Creek	0	0	0	0	0	0	4.4	15,538	351	4.4	**15,538**	351
Squamish River	0	0	0	0	0	0	6.2	38,519	622	6.2	**38,519**	622
	1,881.20	**17,697,695**	941	0	**0**	0	217.2	**1,750,265**	806	2,098.4	**19,447,960**	927

Appendix Table F-1. SLRD - Water Demand by Water Purveyor Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Water Purveyor	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Pemberton Valley	674.9	4,355,043	645	0	0	0	0	0	0	674.9	**4,355,043**	645
	674.9	**4,355,043**	645	0	**0**	0	0	**0**	0	674.9	**4,355,043**	645
Bridge River First Nation	16.2	160,581	993	0	0	0	0.2	1,779	907	16.4	**162,360**	992
Lil'Wat First Nation	5.1	30,068	594	0	0	0	0	0	0	5.1	**30,068**	594
N'Quatqua First Nation	4.1	41,265	1,012	0	0	0	0	0	0	4.1	**41,265**	1,012
Titqet First Nation	0	0	0	0	0	0	5.7	65,908	1,148	5.7	**65,908**	1,148
Xaxlip First Nation	16.5	147,462	894	0	0	0	44	545,487	1,239	60.5	**692,949**	1,145
	41.8	**379,376**	907	0	**0**	0	50	**613,174**	1,227	91.8	**992,550**	1,081
Private	1,164.5	12,963,277	1,113	0	0	0	167.2	1,137,090	680	1,331.8	**14,100,367**	1,059
	1,164.5	**12,963,277**	1,113	0	**0**	0	167.2	**1,137,090**	680	1,331.8	**14,100,367**	1,059
	1,881.2	**17,697,695**	941	0	**0**	0	217.2	**1,750,265**	806	2,098.4	**19,447,960**	927

Appendix Table F-2. Pemberton - Water Demand by Water Purveyor Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Water Purveyor	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)
Pemberton Valley	674.9	4,355,043	645	0	0	0	0	0	0	674.9	**4,355,043**	645
	674.9	**4,355,043**	645	0	**0**	0	0	**0**	0	674.9	**4,355,043**	645
Lil'Wat First Nation	5.1	30,068	594	0	0	0	0	0	0	5.1	**30,068**	594
N'Quatqua First Nation	4.1	41,265	1,012	0	0	0	0	0	0	4.1	**41,265**	1,012
	9.1	**71,333**	780	0	**0**	0	0	**0**	0	9.1	**71,333**	780
Private	31.3	207,215	662	0	0	0	0.9	6,787	758	32.2	**214,002**	665
	31.3	**207,215**	662	0	**0**	0	0.9	**6,787**	758	32.2	**214,002**	665
	715.3	**4,633,591**	648	0	**0**	0	0.9	**6,787**	758	716.2	**4,640,378**	648

Appendix Table G-1. SLRD - Water Demand by Local Government Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Local Government	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)
Bridge River First Nation	16.2	160,581	993	0	0	0	0.2	1,779	907	16.4	**162,360**	992
District Of Squamish	0.5	2,410	490	0	0	0	7.6	46,264	606	8.1	**48,675**	599
Lillooet	84	1,058,934	1,260	0	0	0	31.8	262,284	824	115.9	**1,321,218**	1,140
Lil'Wat First Nation	5.1	30,068	594	0	0	0	0	0	0	5.1	**30,068**	594
N'Quatqua First Nation	4.1	41,265	1,012	0	0	0	0	0	0	4.1	**41,265**	1,012
Squamish-Lillooet Regional District	1,752.9	16,246,391	1,761	0	0	0	127.8	828,543	1,079	1,880.7	**17,074,933**	1,712
Titqet First Nation	0	0	0	0	0	0	5.7	65,908	1,148	5.7	**65,908**	1,148
Village Of Pemberton	2.0	10,584	538	0	0	0	0	0	0	2.0	**10,584**	538
Xaxlip First Nation	16.5	147,462	894	0	0	0	44	545,487	1,239	60.5	**692,949**	1,145
	1,881.2	**17,697,695**	941	0	**0**	0	217.2	**1,750,265**	806	2,098.4	**19,447,960**	927

Appendix Table G-2. Pemberton - Water Demand by Local Government Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Local Government	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Lil'Wat First Nation	5.1	30,068	594	0	0	0	0	0	0	5.1	**30,068**	594
N'Quatqua First Nation	4.1	41,265	1,012	0	0	0	0	0	0	4.1	**41,265**	1,012
Squamish-Lillooet Regional District	704.2	4,551,674	646	0	0	0	0.9	6,787	758	705.1	**4,558,461**	647
Village Of Pemberton	2.0	10,584	538	0	0	0	0	0	0	2.0	**10,584**	538
	715.3	**4,633,591**	648	0	**0**	0	0.9	**6,787**	758	716.2	**4,640,378**	648

Appendix Table H-1. SLRD - Water Demand by Electoral Area Using Year 2003 Climate and Average Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Electoral Area	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
SLRD Electoral Area B	1,165.4	13,061,694	1,121	0	0	0	204.2	1,681,317	823	1,369.6	**14,743,011**	1,076
SLRD Electoral Area C	715.8	4,636,001	648	0	0	0	8.5	53,052	622	724.3	**4,689,053**	647
SLRD Electoral Area D	0	0	0	0	0	0	4.5	15,896	354	4.5	**15,896**	354
	4.2	**20,536**	486	0	**0**	0	47.2	**209,464**	444	51.4	**230,000**	448

Appendix Table I-1. SLRD - Water Demand by Crop Using Improved Irrigation System Efficiency, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)
Apple	4.5	23,475	520	0	0	0	2.8	17,379	623	7.3	**40,853**	559
Berry	35.3	125,281	355	0	0	0	0	0	0	35.3	**125,281**	355
Cranberry	44.2	352,360	798	0	0	0	0	0	0	44.2	**352,360**	798
Forage	1,606.6	12,116,196	754	0	0	0	190.5	1,472,818	773	1,797.1	**13,589,014**	756
Fruit	0.5	1,252	254	0	0	0	0	0	0	0.5	**1,252**	254
Grape	1.1	5,051	470	0	0	0	8.8	47,266	540	9.8	**52,317**	532
Nursery	8.8	69,227	785	0	0	0	0	0	0	8.8	**69,227**	785
Nursery Floriculture	0	189	391	0	0	0	0	0	0	0	**189**	391
Vegetable	178.7	568,300	318	0	0	0	14.5	54,335	375	193.2	**622,635**	322
	1,881.2	**13,270,152**	705	0	**0**	0	217.2	**1,597,565**	736	2,098.4	**14,867,717**	709

Appendix Table I-2. Pemberton - Water Demand by Crop Using Improved Irrigation System Efficiency, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)
Apple	1.1	5,057	452	0	0	0	0	0	0	1.1	**5,057**	452
Berry	35.1	124,521	355	0	0	0	0	0	0	35.1	**124,521**	355
Cranberry	44.2	352,360	798	0	0	0	0	0	0	44.2	**352,360**	798
Forage	449.7	2,856,480	635	0	0	0	0	0	0	449.7	**2,856,480**	635
Fruit	0.5	1,252	254	0	0	0	0	0	0	0.5	**1,252**	254
Grape	0.2	704	368	0	0	0	0	0	0	0.2	**704**	368
Nursery	8.8	69,227	785	0	0	0	0	0	0	8.8	**69,227**	785
Nursery Floriculture	0	189	391	0	0	0	0	0	0	0	**189**	391
Vegetable	174.4	550,505	316	0	0	0	0.4	1,627	384	174.8	**552,132**	316
	715.3	**3,967,589**	555	0	**0**	0	0.9	**5,086**	568	716.2	**3,972,675**	555

Appendix Table J-1. SLRD - Water Demand by Animal Type Using Year 2003 Climate

Year: 2003 Animal Type	Water Demand (m^3)
Beef	200,549
Dairy - dry	26,727
Dairy - milking	69,491
Goats	1,153
Horses	58,327
Poultry - broiler	448
Poultry - laying	237
Sheep	5,224
Swine	1,779
	363,935

Appendix Table J-2. Pemberton - Water Demand by Animal Type Using Year 2003 Climate

Year: 2003 Animal Type	Water Demand (m^3)
Beef	159,396
Dairy - dry	25,550
Dairy - milking	66,430
Goats	394
Horses	46,501
Poultry - broiler	332
Poultry - laying	176
Sheep	4,059
Swine	1,081
	303,919

Appendix Table K-1. SLRD - Crop Water Demand with Climate Change (Year 2050s Climate for High Demand Years) Using Surveyed Crops and Irrigation Systems and Good Management

	Climate Model									Average Crop Irrigation		
	Access1 rcp85			CanESM2 rcp85			cnrm-cm5 rcp85					
Year	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
2053	2,098.4	**22,206,971**	1,058	2,098.4	**25,171,116**	1,200	2,098.4	**20,033,266**	955	2098.4	**22,470,451**	1071
2056	2,098.4	**19,830,971**	945	2,098.4	**16,118,201**	768	2,098.4	**11,585,172**	552	2098.4	**15,844,781**	755
2059	2,098.4	**15,449,904**	736	2,098.4	**22,455,614**	1,070	2,098.4	**14,874,818**	709	2098.4	**17,593,445**	838

Appendix Table K-2. Pemberton - Crop Water Demand with Climate Change (Year 2050s Climate for High Demand Years) Using Surveyed Crops and Irrigation Systems and Good Management

	Climate Model									Average Crop Irrigation		
	Access1 rcp85			CanESM2 rcp85			cnrm-cm5 rcp85					
Year	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
2053	716.2	**4,466,882**	624	716.2	**6,287,472**	878	716.2	**4,051,657**	566	716.2	**4,935,337**	689
2056	716.2	**4,613,260**	644	716.2	**3,368,635**	470	716.2	**2,280,422**	318	716.2	**3,420,772**	477
2059	716.2	**3,383,361**	472	716.2	**4,784,746**	668	716.2	**2,728,003**	381	716.2	**3,632,037**	507

Appendix Table L-1. SLRD Water Demand by Crop with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Apple	4.5	40,659	900	0	0	0	2.8	31,001	1,111	7.3	**71,660**	980
Berry	165.9	433,545	261	0	0	0	0	0	0	165.9	**433,545**	261
Cranberry	136.5	1,144,639	839	0	0	0	0	0	0	136.5	**1,144,639**	839
Domestic Outdoor	0.3	2,295	687	0	0	0	0	0	0	0.3	**2,295**	687
Forage	3,136.5	26,108,720	832	0	0	0	230.8	1,931,852	837	3,367.3	**28,040,572**	833
Fruit	0.5	2,057	417	0	0	0	0	0	0	0.5	**2,057**	417
Grape	1.1	5,051	470	0	0	0	8.8	47,266	540	9.8	**52,317**	532
Nursery	12.5	86,487	693	0	0	0	0	0	0	12.5	**86,487**	693
Nursery Floriculture	0	189	391	0	0	0	0	0	0	0.0	**189**	391
Recreational Turf	1	9,793	938	0	0	0	0	0	0	1	**9,793**	938
Vegetable	906.5	3,862,727	426	0	0	0	14.5	68,196	470	921	**3,930,923**	427
	4,366.8	**31,704,983**	726	0	**0**	0	257.6	**2,084,082**	809	4,624.3	**33,789,065**	731

Appendix Table L-2. Pemberton - Water Demand by Crop with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Crop Group	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Apple	1.1	8,462	757	0	0	0	0	0	0	1.1	**8,462**	757
Berry	165.7	432,786	261	0	0	0	0	0	0	165.7	**432,786**	261
Cranberry	136.5	1,144,639	839	0	0	0	0	0	0	136.5	**1,144,639**	839
Domestic Outdoor	0.3	2,295	687	0	0	0	0	0	0	0.3	**2,295**	687
Forage	1,714.9	11,222,562	654	0	0	0	0	0	0	1,714.9	**11,222,562**	654
Fruit	0.5	2,057	417	0	0	0	0	0	0	0.5	**2,057**	417
Grape	0.2	704	368	0	0	0	0	0	0	0.2	**704**	368
Nursery	12.5	86,487	693	0	0	0	0	0	0	12.5	**86,487**	693
Nursery Floriculture	0	189	391	0	0	0	0	0	0	0.0	**189**	391
Vegetable	776.5	3,510,927	452	0	0	0	0.4	3,150	743	776.9	**3,514,077**	452
	2,809.5	**16,418,401**	584	0	**0**	0	0.9	**6,609**	738	2,810.4	**16,425,010**	584

Appendix Table M-1. SLRD - Crop Water Demand with Buildout, Climate Change (Year 2050s Climate for High Demand Years), and Good Management

	Climate Model									Average Crop Irrigation		
	Access1 rcp85			CanESM2 rcp85			cnrm-cm5 rcp85					
Year	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
2053	4,624.3	**37,952,562**	821	4,624.3	**45,847,053**	991	4,624.3	**34,356,733**	743	4,624.3	**39,385,449**	852
2056	4,624.3	**35,752,948**	773	4,624.3	**28,529,471**	617	4,624.3	**20,372,010**	441	4,624.3	**28,218,143**	610
2059	4,624.3	**27,692,977**	599	4,624.3	**39,839,155**	862	4,624.3	**25,562,132**	553	4,624.3	**31,031,421**	671

Appendix Table M-2. Pemberton - Crop Water Demand with Buildout, Climate Change (Year 2050s Climate for High Demand Years), and Good Management

	Climate Model									Average Crop Irrigation		
	Access1 rcp85			CanESM2 rcp85			cnrm-cm5 rcp85					
Year	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
2053	2,810.4	**16,846,339**	599	2,810.4	**22,989,000**	818	2,810.4	**15,377,284**	547	2,810.4	**18,404,208**	655
2056	2,810.4	**17,299,906**	616	2,810.4	**13,152,455**	468	2,810.4	**9,094,172**	324	2,810.4	**13,182,178**	469
2059	2,810.4	**13,026,078**	463	2,810.4	**18,607,881**	662	2,810.4	**10,820,411**	385	2,810.4	**14,151,457**	503

Appendix Table N-1. SLRD - Water Demand by Irrigation System with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Irrigation System	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m³)	Avg.Req. (mm)
Drip	599.2	1,793,819	299	0	0	0	6.8	26,227	388	606.0	**1,820,046**	300
Flood	394.2	4,364,520	1,107	0	0	0	0	0	0	394.2	**4,364,520**	1,107
Gun	27.1	353,265	1,304	0	0	0	0	0	0	27.1	**353,265**	1,304
Handline	479.5	4,699,549	980	0	0	0	117.8	1,129,750	959	597.3	**5,829,299**	976
Landscapesprinkler	1.2	10,912	901	0	0	0	0.1	448	835	1.3	**11,360**	898
Microsprinkler	1.5	8,822	595	0	0	0	0.6	4,646	758	2.1	**13,468**	643
Overtreedrip	41.7	168,048	403	0	0	0	9.5	49,754	526	51.2	**217,803**	426
Pivot	72.4	610,557	843	0	0	0	0	0	0	72.4	**610,557**	843
PivotLP	862	5,522,058	641	0	0	0	0.2	1,859	964	862.2	**5,523,917**	641
SDI	3.7	17,260	471	0	0	0	3.6	20,513	564	7.3	**37,773**	517
Sprinkler	908.9	6,218,173	684	0	0	0	11.2	74,649	667	920.1	**6,292,823**	684
Ssovertree	157.9	1,127,080	714	0	0	0	0	0	0	157.9	**1,127,080**	714
Sssprinkler	9.9	55,077	554	0	0	0	6.3	61,630	977	16.3	**116,707**	718
Ssundertree	1	8,931	869	0	0	0	0	0	0	1	**8,931**	869
Travgun	344.1	2,303,121	669	0	0	0	0	0	0	344.1	**2,303,121**	669
Wheelline	462.5	4,443,791	961	0	0	0	101.5	714,604	704	564	**5,158,395**	915
	4,366.8	**31,704,983**	726	0	**0**	0	257.6	**2,084,082**	809	4,624.3	**33,789,065**	731

Appendix Table N-2. Pemberton - Water Demand by Irrigation System with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Irrigation System	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Drip	473.7	1,477,291	312	0	0	0	0	0	0	473.7	**1,477,291**	312
Gun	7.1	48,147	681	0	0	0	0	0	0	7.1	**48,147**	681
Handline	78.9	471,946	598	0	0	0	0	0	0	78.9	**471,946**	598
Microsprinkler	1.3	7,293	570	0	0	0	0.5	3,459	734	1.8	**10,752**	614
Overtreedrip	40.8	163,702	401	0	0	0	0	0	0	40.8	**163,702**	401
Pivot	47.3	306,437	647	0	0	0	0	0	0	47.3	**306,437**	647
PivotLP	721.8	4,199,695	582	0	0	0	0	0	0	721.8	**4,199,695**	582
SDI	3.7	17,260	471	0	0	0	0	0	0	3.7	**17,260**	471
Sprinkler	768.8	5,233,534	681	0	0	0	0.4	3,150	743	769.3	**5,236,684**	681
Ssovertree	157.9	1,127,080	714	0	0	0	0	0	0	157.9	**1,127,080**	714
Sssprinkler	8.4	40,394	480	0	0	0	0	0	0	8.4	**40,394**	480
Travgun	324	2,148,338	663	0	0	0	0	0	0	324	**2,148,338**	663
Wheelline	175.8	1,177,284	670	0	0	0	0	0	0	175.8	**1,177,284**	670
	2,809.5	**16,418,401**	584	0	**0**	0	0.9	**6,609**	738	2,810.4	**16,425,010**	584

Appendix Table O-1. SLRD - Water Demand by Soil with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Soil Texture	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Unkonwn	3.4	30,920	912	0	0	0	0	0	0	3.4	**30,920**	912
Cultured Medium	1.5	8,822	595	0	0	0	0.7	5,766	822	2.2	**14,588**	668
Loam	892.5	7,364,166	825	0	0	0	80.6	481,405	597	973.1	**7,845,571**	806
Loamy Sand	354.1	3,284,331	927	0	0	0	9.6	99,572	1,035	363.8	**3,383,903**	930
Organic	72.7	371,884	511	0	0	0	0	0	0	72.7	**371,884**	511
Sand	716.8	7,424,353	1,036	0	0	0	120.4	1,223,368	1,016	837.2	**8,647,721**	1,033
Sandy Loam	766.1	5,068,990	662	0	0	0	10	52,152	519	776.1	**5,121,142**	660
Sandy Loam (defaulted)	115.7	439,273	380	0	0	0	2.8	14,133	504	118.5	**453,406**	383
Silt Loam	588.5	3,520,077	598	0	0	0	33.3	207,685	623	621.9	**3,727,762**	599
Silty Clay Loam	855.4	4,192,168	490	0	0	0	0	0	0	855.4	**4,192,168**	490
	4,366.8	**31,704,983**	726	0	**0**	0	257.6	**2,084,082**	809	4,624.3	**33,789,065**	731

Appendix Table O-2. Pemberton - Water Demand by Soil with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Soil Texture	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Unkonwn	0.8	6,954	848	0	0	0	0	0	0	0.8	**6,954**	848
Cultured Medium	1.3	7,293	570	0	0	0	0.5	3,459	734	1.8	**10,752**	614
Loam	529.4	3,397,974	642	0	0	0	0	0	0	529.4	**3,397,974**	642
Loamy Sand	106.2	792,868	747	0	0	0	0	0	0	106.2	**792,868**	747
Organic	72.7	371,884	511	0	0	0	0	0	0	72.7	**371,884**	511
Sand	142.6	844,054	592	0	0	0	0.2	1,206	750	142.7	**845,260**	592
Sandy Loam	549.3	3,768,351	686	0	0	0	0.3	1,944	739	549.6	**3,770,295**	686
Sandy Loam (defaulted)	30.0	193,184	644	0	0	0	0	0	0	30.0	**193,184**	644
Silt Loam	521.8	2,843,671	545	0	0	0	0	0	0	521.8	**2,843,671**	545
Silty Clay Loam	855.4	4,192,168	490	0	0	0	0	0	0	855.4	**4,192,168**	490
	2,809.5	**16,418,401**	584	0	**0**	0	0.9	**6,609**	738	2,810.4	**16,425,010**	584

Appendix Table P. SLRD - Water Demand by Subbasin with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Subbasin	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Unkonwn	2,816.2	16,448,380	584	0	0	0	0.9	6,609	738	2,817.1	**16,454,988**	584
Fraser River	1,310.3	14,216,307	1,085	0	0	0	244.5	2,016,040	824	1,554.8	**16,232,347**	1,044
Ashlu Creek	47.5	292,199	615	0	0	0	0	0	0	47.5	**292,199**	615
Cheakamus River	3.1	16,058	515	0	0	0	1.5	7,930	525	4.6	**23,988**	518
Lillooet River	6.2	42,150	681	0	0	0	0	0	0	6.2	**42,150**	681
Pillchuck Creek	8.6	35,023	408	0	0	0	4.4	14,991	339	13	**50,014**	385
Squamish River	174.9	654,867	374	0	0	0	6.2	38,511	622	181.1	**693,378**	383
	4,366.8	**31,704,983**	726	0	**0**	0	257.6	**2,084,082**	809	4,624.3	**33,789,065**	731

Appendix Table Q-1. SLRD - Water Demand by Water Purveyor with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Water Purveyor	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Pemberton Valley	1,999.4	11,838,296	592	0	0	0	0	0	0	1,999.4	**11,838,296**	592
	1,999.4	**11,838,296**	592	0	**0**	0	0	**0**	0	1,999.4	**11,838,296**	592
Bridge River First Nation	16.2	156,970	971	0	0	0	18.3	178,520	978	34.4	**335,490**	974
Cayoose Creek First Nation	3.9	40,495	1,032	0	0	0	0	0	0	3.9	**40,495**	1,032
Lil'Wat First Nation	366.3	2,114,554	577	0	0	0	0	0	0	366.3	**2,114,554**	577
N'Quatqua First Nation	8.7	66,198	765	0	0	0	0	0	0	8.7	**66,198**	765
Seton Lake First Nation	0.2	1,858	840	0	0	0	0	0	0	0.2	**1,858**	840
Titqet First Nation	4.9	65,279	1,324	0	0	0	5.7	62,925	1,096	10.7	**128,204**	1,201
Xaxlip First Nation	94.5	901,485	954	0	0	0	61.2	678,846	1,110	155.7	**1,580,332**	1,015
	494.7	**3,346,840**	676	0	**0**	0	85.2	**920,291**	1,081	579.9	**4,267,131**	736
Private	1,872.7	16,519,848	882	0	0	0	172.4	1,163,791	675	2,045.1	**17,683,638**	865
	1,872.7	**16,519,848**	882	0	**0**	0	172.4	**1,163,791**	675	2,045.1	**17,683,638**	865
	4,366.8	**31,704,983**	726	0	**0**	0	257.6	**2,084,082**	809	4,624.3	**33,789,065**	731

Appendix Table Q-2. Pemberton - Water Demand by Water Purveyor with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Water Purveyor	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Pemberton Valley	1,999.4	11,838,296	592	0	0	0	0	0	0	1,999.4	**11,838,296**	592
	1,999.4	**11,838,296**	592	0	**0**	0	0	**0**	0	1,999.4	**11,838,296**	592
Lil'Wat First Nation	366.3	2,114,554	577	0	0	0	0	0	0	366.3	**2,114,554**	577
N'Quatqua First Nation	8.7	66,198	765	0	0	0	0	0	0	8.7	**66,198**	765
	375	**2,180,753**	582	0	**0**	0	0	**0**	0	375	**2,180,753**	582
Private	435.2	2,399,352	551	0	0	0	0.9	6,609	738	436.1	**2,405,961**	552
	435.2	**2,399,352**	551	0	**0**	0	0.9	**6,609**	738	436.1	**2,405,961**	552
	2,809.5	**16,418,401**	584	0	**0**	0	0.9	**6,609**	738	2,810.4	**16,425,010**	584

Appendix Table R-1. SLRD - Water Demand by Local Government with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Local Government	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Bridge River First Nation	16.2	156,970	971	0	0	0	18.3	178,520	978	34.4	**335,490**	974
Cayoose Creek First Nation	3.9	40,495	1,032	0	0	0	0	0	0	3.9	**40,495**	1,032
District Of Squamish	18.1	105,475	582	0	0	0	7.6	46,092	604	25.8	**151,567**	588
Lillooet	84	1,021,455	1,215	0	0	0	31.8	253,146	795	115.9	**1,274,601**	1,100
Lil'Wat First Nation	366.3	2,114,554	577	0	0	0	0	0	0	366.3	**2,114,554**	577
N'Quatqua First Nation	8.7	66,198	765	0	0	0	0	0	0	8.7	**66,198**	765
Seton Lake First Nation	0.2	1,858	840	0	0	0	0	0	0	0.2	**1,858**	840
Squamish-Lillooet Regional District	3,635.3	26,537,835	1,659	0	0	0	133.0	864,553	1,068	3,768.1	**27,402,388**	1,614
Titqet First Nation	4.9	65,279	1,324	0	0	0	5.7	62,925	1,096	10.7	**128,204**	1,201
Village Of Pemberton	134.6	693,379	515	0	0	0	0	0	0	134.6	**693,379**	515
Xaxlip First Nation	94.5	901,485	954	0	0	0	61.2	678,846	1,110	155.7	**1,580,332**	1,015
	4,366.8	**31,704,983**	726	0	**0**	0	257.6	**2,084,082**	809	4,624.3	**33,789,065**	731

Appendix Table R-2. Pemberton - Water Demand by Local Government with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Local Government	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
Lil'Wat First Nation	366.3	2,114,554	577	0	0	0	0	0	0	366.3	**2,114,554**	577
N'Quatqua First Nation	8.7	66,198	765	0	0	0	0	0	0	8.7	**66,198**	765
Squamish-Lillooet Regional District	2,299.9	13,544,270	589	0	0	0	0.9	6,609	738	2,300.8	**13,550,878**	589
Village Of Pemberton	134.6	693,379	515	0	0	0	0	0	0	134.6	**693,379**	515
	2,809.5	**16,418,401**	584	0	**0**	0	0.9	**6,609**	738	2,810.4	**16,425,010**	584

Appendix Table S-1. SLRD - Water Demand by Electoral Area with Buildout, Year 2003 Climate, and Good Management

Year: 2003	Water Source									Total		
	Surface Water			Reclaimed Water			Groundwater					
Electoral Area	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)	Irrigated Area (ha)	Irrigation Demand (m^3)	Avg.Req. (mm)
SLRD Electoral Area A	1	7,528	729	0	0	0	0	0	0	1	**7,528**	729
SLRD Electoral Area B	1,293.6	14,056,054	1,087	0	0	0	244.5	2,016,040	824	1,538.1	**16,072,095**	1,045
SLRD Electoral Area C	21.9	194,874	891	0	0	0	0	0	0	21.9	**194,874**	891
SLRD Electoral Area D	222.6	922,650	414	0	0	0	4.5	15,341	341	227.1	**937,991**	413
Other	2,827.7	16,523,876	584	0	0	0	8.5	52,700	618	2,836.2	**16,576,577**	584
	4,366.8	**31,704,983**	726	0	**0**	0	257.6	**2,084,082**	809	4,624.3	**33,789,065**	731