Green Energy Study for British Columbia

Phase 2: Mainland

Small Hydro

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BC Hydro

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- DISCLAIMER

This report has been written for BC Hydro for the purpose of documenting potential hydropower sites in British Columbia. Any reliance on the information contained herein is at the risk of the user. Anyone considering a hydro development is urged to make independent inquiry of the site, hydrology and regulatory conditions affecting such a development before proceeding. BC Hydro will not be responsible for any costs by any person howsoever incurred in the potential development of a hydro project or in an attempt by such person to obtain rights, contracts or other requirements necessary for a development. The mention in the report of any site, technique, product, or company is for information purposes only and shall not be considered an endorsement by BC Hydro.

EXECUTIVE SUMMARY

British Columbia provides many opportunities for small hydro development. Projects in the Inventory range in size from 500 kW to about 47 MW and they are located in most geographical regions of the province. Because of differing terrain, capacities and different hydrology, the projects also have a range of unit energy costs. Approximately 40% of the project sites are developable at less than 7 c/kWh which comprises about 67% of the total developable energy. This observation combined with the shape of the cumulative energy curve is indicative of the larger projects being generally more economic.

It is likely that the first projects to be developed will be the more economical projects, since these have less financial risk associated with them.

The inventory is based on sizing each project to the mean annual flow and operating on a run-of-river basis. This may not be the optimal configuration of the project but it may be a requirement for a green classification. It is likely that when any project is examined in detail the hydrology, terrain and component costing aspects will be reviewed to optimize the project.

The inventory treats each project separately and includes transmission costs to the nearest location on the BC Hydro (BCH) grid. The relative density of projects in British Columbia combined with the relative sparseness of transmission and distribution lines makes it sensible to consider clustered projects that can share infrastructure. Roads, transmission lines and sub-stations can potentially be shared by more than one project. A future review of the identified cluster projects would further optimize the resources and potentially include other renewable energy projects in a region.

1. SITE LOCATIONS

The inventory of potential hydro sites in British Columbia is based on the inventory that was part of the publication **Small Hydro Technology and Resource Assessment,** which was produced for the BC Ministry of Energy in 1983. The sites previously identified were reviewed and updated and some sites were added, based on a review of the existing mapping as well as additional map coverage (see Figure 1). The original inventory was based on individual projects connecting to existing transmission lines. This inventory notes that there are economies made possible by larger projects, clustered projects and future transmission line extensions. A list of the selected sites with their coordinates is shown in Table 1. Note that some of the listed sites may have been licenced for existing or proposed developments, hence the current licence status should be checked on the Water Management website:
(http://srmwww.gov.bc.ca:8000/pls/wtrwhse/water_licences.input)

The inventory was developed from map and regional hydrology studies. Typically 1:50,000 scale maps were reviewed to find stream basins that seemed to have development potential. Stream basin areas were determined and the steepest section of creek that was over 10%(±) slope was selected as the best location for an intake, penstock and powerhouse. **The projects are assumed to be run-of-river** (no significant water storage). Below is a short description of the main characteristics of run-of-river technology.

General

Run-of-river hydropower implies that there is no (or minimal) storage reservoir. The instantaneous flows that are passed through the powerhouse are essentially the flows that occur in the stream at the intake and flows downstream of the powerhouse are virtually identical to pre-development flows. Most of the technology used in the development of such projects can be found in other hydropower projects, but there are some differences as indicated below.

Intake

The most significant characteristic of run-of-river projects will be found in the intake. The dam, if there is one, will be relatively small and provision may need to be made for instream flow releases and sediment control if the river is silty. The intake dam may include moveable crest gates (i.e. a rubber dam) or other devices to control both normal water levels and flood conditions. Operationally, the main difference between a run-of-river project and a storage project will be the presence of a head level controller. This is a water level monitor located at the intake, wired into the plant controller at the powerhouse. The changes in water level signal the turbine gates to open or close to maintain a constant water level and in doing so respond to changes in the inflowing water. The power output will change accordingly.

Water Conduit

Most run-of-river projects use a penstock (a pipe made of wood, plastic or steel) to convey the water from the intake to the powerhouse. In doing so the water pressure in the pipe increases until it reaches the powerhouse. The choice of conveyance of the water is a matter of economics and topography. In some situations, tunnels or canals may replace a penstock for a portion of the route, but at the powerhouse the water must be contained within a pipe capable of withstanding the static and dynamic pressures in the column of water that leads back to the intake.

Powerhouse

The water pressure is converted by a turbine to mechanical energy in the form of a rotating shaft, and that is in turn converted to electrical energy through the generator. The powerhouse may be a wood frame, concrete or steel building or it may be located underground if a tunnel is used. The configuration and style of the powerhouse is independent of whether or not the project is run-of-river. The water output from the powerhouse enters the tailrace while the electrical output goes to the substation and powerlines.

Tailrace

The discharge of water from the turbine (relieved of its high pressure) is conveyed back to the watercourse by the tailrace. Usually the tailrace is a short open channel, but it could also be a pipe or a tunnel, depending on the configuration of the project. Sometimes the tailrace may be designed as a fish habitat since fish may utilize the tailrace for spawning and rearing. The flows in the tailrace will follow the natural flows in the river except that they cannot exceed the turbine capacity.

Substation and Powerlines

The other output of the powerhouse is the electrical energy. This passes from the generator through controls and switchgear that are designed to provide electrical protection to both the power plant and the powerlines. Information is also collected for the routine operation and maintenance of the power plant. There may be a nearby substation (or simply a transformer) that raises the voltage to a level compatible with the electrical system and an interconnecting powerline to the nearest point of the utility capable of accepting the power. The electrical output for the run-of-river plant follows the pattern of river flows, compared with a plant with storage, which may be block loaded or may follow variations in electrical demand.

The proximity of a site to an existing transmission line was noted (see Table 1). The available maps show only 69kV lines and higher. Distances to 25kV lines were based on local knowledge and reasonable assumptions about probable areas of service. There were areas where clusters of 3 or more sites could share the same transmission line, thus achieving some economy of scale. Further discussion about such clusters of sites is in Section 6.

Sites where the intake, penstock or powerhouse are located in a Park are not included in this study. In recent years BC's Parks system has been expanded and some new parks may not be shown on mapping, thus a land status check of any potential site is worth doing if the site appears developable.

2. ENERGY OUTPUT

The determination of the **power P** (see Table 1) available in kilowatts (kW) is a function of the design flow and the available gross head at an assumed 80% efficiency which includes headloss, as shown in the following equation:

$P = Q\ H \times 7.83$ where Q and H are in m^3/s and metres respectively.

The **design flow Q** is related to regional runoff patterns and is set as the mean annual flow, which provides a reasonable estimate of an economic plant size. The choice of mean annual flow is only an indicator, because other considerations apply, including:

- a relatively high electricity value, which will encourage a larger project and higher design flow;
- peaky runoff in a run-of-river situation, which will result in smaller design flows being optimal;
- amount and timing of fish flow releases;
- site specific considerations, such as project layout; penstock and turbine availability; storage or flow regulation; values of electricity by time of day and seasonally; and operational and lending costs.

In a complete analysis the preceding parameters and resulting costs and benefits will all combine to derive an optimal project size that may be higher or lower than the size based on the mean annual flow.

In order to provide a flow estimate for new sites added to the 1983 database, the unit runoff of nearby sites was used where possible. Where the new sites were too far from previous sites, nearby Water Survey of Canada (WSC) gauges were selected that had long term flow records. From the mean annual flow of each gauge, average runoffs on a unit area basis were determined. The design flow at a given site was based on the mean unit flow times the basin area of the site.

The investigation to determine **head H** was hampered by the fact that the contours were usually of 100 ft (30m) intervals which does not permit accurate estimates of the available head if the actual head over the steep section of creek was more or less than a multiple of 100 ft. In addition, sometimes the location of the contour on the map (especially on lower head sites) may be in error, resulting in an incorrect estimate of the length of penstock. Waterfalls are often shown on the maps but the head at the falls is often not indicated. These are shown as potential sites because the presence of a waterfall would usually provide a head drop over a short distance that would be suitable for a project, however the project output is indeterminate.

The annual **'green' energy generation** (see Table 1) is taken as the total number of gigawatt hours (GWh) of energy, which could be generated in a year. It is assumed that the plant will generate at a rate equivalent to the energy available in the water, up to the installed capacity. For run-of-river plants with no storage, this is taken as the theoretical annual energy (based on full generation at the installed capacity) multiplied by the **capacity factor** (which accounts for the periods when there is insufficient flow to meet the installed capacity) and by a **fish flow factor** (which accounts for the required fish flow, that cannot be used for generation).

The capacity factor (see Table 1) accounts for seasonal variations in flow. Higher energy outputs originate from streams that are coastal (60-70% of the theoretical maximum based on design flow being available all the time) or have lakes providing storage. Low outputs tend to result from areas where there is a pronounced spring runoff coupled with dry summers and cold winters (25-40% of the theoretical maximum).

This inventory has been adjusted to provide for flow releases based on generic 'green' energy criteria. The effect of a 10% of Mean Annual Flow fish flow requirement on the total flow was studied in a number of creeks. The amount of energy reduction, expressed by the fish flow factor, can be viewed on the flow duration curve (Figure 2). The energy is reduced by about 10% since during days with high flows, when there is maximum generation, the fish flow does not affect the generation. In the calculations an energy reduction of 10% is used for all streams which is a reasonable approximation of the average diversion of water to fish flow based on the 10% of Mean Annual Flow criteria. The actual fish flow or stream maintenance flow is very site specific. It depends on life cycles, species presence and the quality of the affected habitat. The flow release may be higher or lower than 10% of Mean Annual Flow. In order to be classified as 'green' energy the project must meet the criteria specified in Appendix A. (Note that green criteria may change to reflect evolving industry standards. The most recent version of the green criteria used by Hydro can be found at www.bchydro.com/greenipp.)

Sometimes very low flows will require the plant to be shut down because some turbines cannot operate well at low flows. This will be a site-specific determination and no allowance has been made because most of the sites are smaller high head sites, which use impulse turbines that can operate over a wide flow range.

The **average monthly energy generation** (see Table 2) at each site is based on the development of monthly flow duration curves at representative WSC gauges. British Columbia was divided in 17 hydrologic zones following the *BC Streamflow Inventory*, Ministry of Environment, Lands and Parks (MELP), March 1998 (see Figure 3). A WSC gauge for each site was selected, representative of the monthly flow distribution in each zone. Each site was linked to the appropriate gauge and used the monthly energy capacity factor of that gauge. To illustrate the development of a monthly capacity factor an example is provided in Figure 4. Figure 4 shows the flow duration curves for May and December for WSC 08DC006. The area below the design flow line and each duration curve indicates the average generation produced in each month. The ratio of this generation to the maximum possible generation in that month (represented by the rectangular area below the design flow) indicates the monthly capacity factor. In the example shown in Figure 4, May has a capacity factor of 77% while December has a capacity factor of 20%. The sites linked to this gauge use these capacity factors in combination with the installed capacity of the site to calculate the monthly energy generation. Table 2 shows the hydrologic zones and monthly capacity factors for all the sites. Note that the average monthly energy is not 'green' energy, since it is difficult to determine any required reduction for fish flow on a monthly basis. Also note that the monthly capacity factors for a particular site are based on the above described hydrologic zones, whereas the annual capacity factor used in the calculation of the annual 'green' energy is based mostly on more detailed analysis performed in the 1983 report for the BC Ministry of Energy, as mentioned in Section 1.

The **monthly firm generation** (see Table 2) is estimated in a similar way as the average monthly energy, using the same 17 WSC gauges, but instead of using monthly flow duration curves derived from all the months of record (e.g. all Mays), the third lowest average month was used (e.g. the third lowest May). The use of the third lowest month was selected, instead of the lowest, to avoid potentially unreliable extreme data. It should be emphasized that these low months do not necessarily occur in sequence.

Experience with the independent power industry has shown that there may be other developable projects not included in this inventory. Developers have (in the past) taken a creative approach to developing head (by using tunnels and diversions) that shortens what may otherwise have been a long penstock. The present inventory is limited to a map study and thus cannot duplicate the in-depth study that eventually should be done with any project site.

3. COSTS

The information derived from the map and hydrology studies on flows, penstock length, head and road access distance was used to estimate the principal costs of the development.

In summary, the Total Project Cost (see Table 1) is calculated in the following way:

Penstock Cost
Intake Cost
Powerhouse Cost
Subtotal 1

(Site Factor) x **Subtotal 1**
Generating Equipment Cost
Access Road Cost
Switchyard Cost

Subtotal 2

Engineering (20% of Subtotal 2)
Contingency (30% of Subtotal 2)
Capital Cost

Transmission Line Cost
Total Capital Cost

The Site Factor was applied to the standard unit costs to account for the higher construction cost that a contractor will face on isolated sites. It ranges from 1.0 for a site near a large city, to 1.5 for an isolated site as shown below.

Typical BC Site Factors

Within 1/2 hour drive of City > 50,000 population	1.0
Within 1 hour drive of City > 50,000 population	1.1
Within 1/2 hour drive of Town < 50,000 population	1.2
Within 1 hour drive of Town < 50,000 population	1.3
Fly or barge in	1.4
Fly in only from anywhere	1.5

Engineering includes all the engineering work such as site visits, preliminary and final design, permitting and approvals, tendering, engineering during construction, inspection and commissioning. Contingency accounts for weather related events or probable increase in material or labour costs that could affect the estimated cost of the project, as well as potential design changes during construction.

The switchyard cost for 25kV lines was assumed at $300,000 for sites with less than 2 MW, and $600,000 for sites over 2 MW. No adjustment was made for the switchyard costs of higher voltage lines as this requires additional site specific information.

The transmission line cost is based on the estimated transmission line distance as follows:

Transmission Line Distance	Transmission Line	Cost ($/km)
Up to 50 km	25 kV	70,000
From 50 to 100 km	69 kV	140,000
More than 100 km	138 kV	220,000

Since the optimization of the transmission line system (and by extension the switchyard) is to be performed by BC Hydro, by consideration of all the potential 'green' energy projects, the costs of the required switchyard and transmission line should be considered as initial approximations.

The **unit cost** of power is estimated by dividing the annual cost of the project by the average 'green' energy generated each year (see Table 1). The annual cost of the project reflects the levelized capital costs at an 8% real discount rate, assuming a 40 year project life and adding 2% of the original capital cost for annual **maintenance and operating** expenses. No interest-during-construction costs were included, but these are likely to be relatively small given the short construction time for most projects.

Taxes include property taxes and water rent. Property taxes (including school taxes) were based on $30 per $1000 of the assessed property value (which is estimated at 80% of the capital cost less the equipment cost). Water rents were based on $1.036 per MWh for sites generating less than 160,000 MWh per year, and $4.835 per MWh for sites with greater generation (the new rate that takes effect in January 2003) and $3.453 per kW installed. The point of sale is considered to be the grid, so wheeling charges were not included.

The resulting cost of power ($/kWh) is a means of comparing different sites with a common parameter, and relating the cost to current rates payable for power. Once a project has been studied further, the actual unit cost of power must be determined by a more detailed financial analysis.

The **annual cashflow during construction** (see Table 1) is estimated by dividing the construction cost (i.e. total cost less equipment cost, but including adjusted contingency and engineering) by the expected construction period in years. It is assumed that projects with a capacity of less than 1 MW would take 1 year to build, projects with 1 to 10 MW capacity would take 2 years and bigger projects 3 years. The **number of jobs** annually during construction was estimated by dividing the annual labour cost by an assumed annual amount of $50,000. It is assumed that the annual labour cost is 50% of the construction cost as described above (the remaining 50% is material and equipment cost). Note that the preceding estimates are intended to be overall averages and individual projects may have different cost allocations and durations.

4. ASSOCIATED ISSUES AND CHALLENGES

There are a number of potential issues associated with small hydropower development and this section will briefly describe the main ones. It is not possible to outline the final path to project development, because each project is unique and some of these issues and challenges have not been worked through at either the permitting or the contracting/ financing level since there are no recent precedents, although at the time of writing there are numerous projects poised for development. This section is therefore intended to provide an awareness of the potential issues so that steps can be taken to address them early in the project development process.

Environmental

The most significant issues with hydroelectric projects are likely to be the environmental aspects. The following list highlights some of the key environmental issues that are present with many projects and beside each item is an approach to dealing with the issue.

Permitting Every hydropower project needs a water licence as well as related permits and approvals. Water licence officials must consider all aspects of a project before granting a water licence. These officials do not have to achieve consensus on all issues, but are ultimately governed by the Water Act and what is in the public interest. At the present time, guidelines for 'green' energy are not included in the water licence process, so it may be possible to licence a project even though it is not considered to meet all of the potential requirements for designation as a 'green' energy project. However, recent Electricity Purchase Agreements have required compliance with the criteria noted in Appendix A, independent of the Water Licence process. The most recent water licence guidelines are available at the water management website www.bc-land-assets.com/water/general/apply.html.

Fish Usually the biggest concern with a hydropower project is its impact on fish and fish habitat. Factors to consider include the pre and post diversion flows; the species present and their habitat utilization; and project operating plans. The approach is to review the required scope of biological studies in the early permitting stages so that no seasonal data collection will be delayed. The findings of these studies and resulting mitigation plans will help ensure that a water licence can be issued that will permit hydropower development and maintenance of existing fish resources.

Table 3 indicates the presence of fish and obstructions near the selected sites. The information on this table is taken from the FishWizard website which is a co-operative presentation of BC Fisheries and Fisheries and Oceans Canada. Table 3 is intended as a starting point for further investigation and environmental studies and has not been used to screen sites in this study. The presence of fish in a stream does not preclude a project from being licenced, but the project design must accommodate the habitat requirements of the fish. A project on a stream with fish present may or may not be considered 'green' energy, depending on the manner in which the project is adapted to the applicable 'green' energy criteria.

Flow releases The use of flow releases is one technique to ensure that fish habitats are preserved in the area downstream of a hydropower diversion. The amount of flow release is subject to either a predetermined definition established to try to ensure that the project attracts a green classification (for example, 10% of the mean annual flow shall be maintained down the watercourse at all times) or the timing and amount of flow release is determined by biological studies that recommend amounts of water to suit the needs of the fish. Note that in a run-of-river project, the flows downstream of the powerhouse are essentially unchanged from predevelopment flows.

Wildlife Run-of-river hydro projects generally have minimal impacts on wildlife. Local impacts for project structures can generally be easily mitigated. The most significant effect is the fact that some linear elements of the project (the penstock/water conduit and transmission line) may disrupt a migration corridor. In the case of surface disruptions caused by an above ground penstock or canal, the migration routes can be maintained with periodic passageways designed for the prevalent species. Transmission lines, which may be a hazard to birds, have a number of design techniques that can be utilized to minimize the impacts. In both cases the biological studies would cover off issues, either directly or in response to agency concerns and terms would be incorporated in the water licence.

Vegetation The impacts of the projects on vegetation are also limited to linear corridors. The project elements need enough clearing for working space and safety for tree falls. Since most projects are remote and in forested areas, vegetation concerns are usually minimal and can be easily mitigated.

Dams Every hydro project needs an intake that may or may not need to be included in a dam structure. Technically, any blockage of a watercourse could be considered to be a dam, but not every dam would exclude a project from being classified as green. The green rating relates to the amount of water stored and whether there is a significant impoundment of water. If any significant flooding occurred, whether or not the project was green, the impacts on wildlife and vegetation would be more significant and would require further study.

'Green' Energy There will likely be some debate about whether some hydro projects are classified as 'green' energy. While there is no debate that the water utilized is a renewable resource, there is much discussion about hydropower and its impacts on fish. Some agencies have set standards for green small hydro projects based on the amount of flow release or the presence of a significant dam. As indicated above, licencing of a project is not a guarantee that the project will meet the desired green classification. Since all of these programs are relatively new, it will take some time for the market to adjust so that the standards are well understood with respect to their applicability to different project configurations. (In Canada the official classifier of 'green' energy is the EcoLogo program administered by Terra Choice, but individual governments and utilities may have separate programs and there are several programs in the United States.) The criteria adopted by BC Hydro, shown in Appendix A, have considered most other criteria and have generally followed the more conservative of the criteria where there are differences. Thus a project meeting BC Hydro's criteria should be capable of meeting most other criteria. Latest developments in BC Hydro's Green Energy Program and green criteria may be obtained from: www.bchydro.com/greenipp.

Noise Small hydro projects are considered to be relatively quiet but they are not noise free. Very high noise levels exist in many powerhouses due to the size and rotation frequency of the generating equipment. Very few noise issues have been reported, principally because projects are often in isolated locations, but developers should pay some attention to the design of the powerhouse to ensure that external noise levels are acceptable.

Construction Construction of small hydro projects and other projects have undergone many changes over the years to meet higher environmental standards. Project construction impacts, particularly around watercourses, can be minimized by utilizing proper construction techniques intended to minimize spillages and providing proper cleanup response if spills do occur. Most project licences, and all projects to be developed under the green criteria in Appendix A, carry terms requiring environmental plans to be produced that will be followed by all contractors as well as provide for the appointment of an independent environmental monitor to review procedures and report on incidents. The environmental monitor has the power to recommend changes to procedures if problems are encountered.

Summary The independent power industry in British Columbia began before the concept of 'green' energy evolved. Thus the projects upon which the industry was established may or may not be green under the prevailing definitions of 'green' energy. While such projects are not affected directly by such a finding, the experience of the industry is not based directly on the current green power market. Similarly, the experience of regulators and utilities in actually licencing projects is based on the past rules, but not the new set of definitions. As projects go through licencing, there will be a mix of new and old techniques that will be required to achieve acceptable projects.

Development Challenge

The other main issue is likely to be the development challenge (see also attached Development Chart). The issues associated with project development include:

Technology Small hydropower is a mature technology, although innovations are continually occurring, especially in the field of electronics and controls. It is for this reason that there is a relatively minor challenge in winning acceptance of the technology for suitability of long term power supply. The uncertainty with all small hydro projects is the hydrology, which can best be dealt with by utilizing conservative runoff assumptions and providing gauging during the investigative period. Some examples of the latest hydropower technology are shown in Section 5.

'Green' Energy At the time of writing, two forms of 'green' energy market have emerged. Existing and some potential projects have the option to be certified green by an independent organization and sell the green credits from their generation on the Greenhouse Gas (GHG) reduction market separately from their electricity production. Values vary depending on the jurisdiction, but are usually less than 1 c/kWh.

The second 'green' energy market involves purchases of green electricity complete with GHG and green credits. This form of purchase requires the electricity buyer to be satisfied that the generation is green by subjecting the project to pre-contract, pre-construction and operational screening processes. The value of electricity is a blend of a market value for the electricity together with an add-on for the green component.

This form of contract is being applied by BC Hydro to a number of projects in 2001-2002.

Electricity Markets There was a time when utilities offered a purchase price (per kWh) and projects that could be built for that price would attempt to secure a contract. Some regions now have a market mechanism which allows the price to float based on various external influences, such as the price of natural gas or seasonal supply/demand variations in the distribution system. Each market place has its own conditions that result in a unique set of circumstances determining the price. In British Columbia such circumstances include the cost of internal project development, natural gas costs, the Alberta market and the various US markets. The local market price at any time depends on the preceding factors, as well as the ability to transmit the power to the location. At the present time most market indices are relatively short term (hourly to one year) while hydropower projects (with their large capital costs and low operating costs) require longer term contracts to support financing. The benefit to the purchaser of such generation is long term stability immune from market swings.

The market mechanism has allowed the development of merchant plants that are built without a guaranteed customer. To date, most merchant plants constructed in other jurisdictions have been thermal as opposed to hydroelectric. Hydropower projects, especially smaller developments, are likely to continue to require long term stable priced contracts to support their development. Such projects are capital intensive and rely on long term financing that is paid back from future electricity revenues. Suitable financing is not obtainable without the strength of some contractual guarantees through the Electricity Purchase Agreement or other security.

Financing Raising project financing has always been challenging and it may become more challenging under evolving electricity markets. Lenders have traditionally been risk averse and they slowly adapted to the idea of relatively small developers taking on significant projects on the strength of a long term utility contract. Now that it is considered routine to finance worthy projects on the basis of the utility contract, some utility contracts have changed to transfer more risk (market swings) to the developer. Only time will tell whether such risks actually materialize. In an environment of rising prices, the developer may be better off, but the risk of a downside will deter lenders. The developers will adapt either by the small developers selling their interests or partnering with larger developers better able to absorb the risks or finding more equity to support reduced levels of available financing. The financial strength and diversity of large developers may make it easier for them to raise project financing, while smaller developers may have difficulty. However, long term contracts with predetermined prices are still available and will appeal to a wide range of developers.

Power Contracts Despite the open access that is available and the feasibility of water licencing without a utility contract, most projects will still require a contract in order for the developer (even a large one) to commit to construction. These contracts may be with BC Hydro or they may be with another utility or a power aggregator. At the present time wholesale wheeling is permissible in BC, which allows power sales to certain entities other than BC Hydro. BC Hydro would usually be involved to provide interconnection, wheeling and other services on a market basis. Typical power contracts have many clauses but the most significant issues involve the quantity of power delivered, the duration of the contract and the price of the power. A contract itself is only as good as the credit worthiness of the purchaser. Most utilities have strong reputations and contracts with them are considered bankable (as long as the terms are favourable to the development of the project, in the eyes of the Lender).

Interconnection One of the newer aspects of project development is that the electrical interconnection issues are dealt with directly with the Transmission and Distribution department of BC Hydro, rather than through power contracts. These requirements are primarily technical in nature and involve the developer incorporating electrical devices that provide protection for both the development and the BC Hydro system. Sometimes a fee is necessary to support system studies and upgrades that may be necessary for BC Hydro’s system. The technical terms will be incorporated into a formal agreement. Once the interconnection issues are agreed to, the developer may sell through the system to BC Hydro and other qualified purchasers.

Summary The preceding development issues are general to the emerging power markets and to all technologies. In the context of renewable energy supply in British Columbia the development challenge originates with the electricity purchase contract. If the contract leaves project risks with the developer and market risks with the utility, then the ability to obtain project financing will be high.

Social Issues

A number of other issues may be associated with hydropower developments. Not all of these will be associated with every project and each of the issues may have a different manner of resolution.

Land Use Small hydro developments are linear corridor projects. The land they occupy alienates some other land uses, which may or may not be an issue depending on the surroundings. The overall land area occupied (not including storage reservoirs) is relatively small compared with other forms of generation.

Community Values A few of the small hydro projects will be located close enough to communities that local issues will need consideration. These are all site specific, but there are examples of projects that have been built near communities with no adverse results.

First Nations It is important that local First Nations be consulted in the development of a project. Developers must allow sufficient time for meaningful consultation to occur, be flexible toward local concerns and introduce the project at an early stage in order to bring the First Nations comments into project decision making. These comments apply whether or not the project impinges on a designated reserve boundary.

Operating Regimes Since most of the small hydro projects are run-of-river in nature, the issue of operating regimes is likely to be insignificant. Headpond levels will be relatively constant while plant outflows will vary with the stream flows. The main operating issue is ensuring adequate flows for fish and this will be covered by the environmental permits.

Summary Project development involves dealing with many issues from a technical, environmental, financial and social point of view. The preceding social issues represent some of the areas that may need to be considered in addition to the technical and financial issues. Communities and organizations are very active when there is a potential project in their area of interest and they need to be informed about project plans and listened to. It is a goal, but not always possible, to achieve consensus among all of the interested parties. The developer must prove that the project impacts are manageable in order to secure the required approvals.

5. LATEST TECHNOLOGY FOR SMALL HYDRO SYSTEMS

This section contains material previously included in the **Handbook of Micro Hydro Development in British Columbia**, prepared for BC Hydro by Sigma Engineering Ltd, August 2000. This section contains the following:

INNOVATIVE MICRO SYSTEMS DEVELOPMENTS
- Packaged Plant Developments
- Water Supply System Developments
- Special Environmental Issues
- Operation in tandem with a diesel plant
- Restoration Projects
- Underground Powerhouse

INNOVATIVE MICRO SYSTEMS PRODUCTS
- Belt Drives
- Breaker Failure Protection Unit
- Cavitation Repair
- Control Systems
- Generators
- Ice Prevention
- Packaged Plants
- Pumps used as Turbines
- Rubber Dams
- Software
- Spillway Gates
- Turbines

- Oil and grease free turbine (Alstom Power) (NEW)
- S-Type Turbine (Ossberger-Turbinenfabrik)
- Submerged Turbine Generator Assemblies (Obermeyer HYDROMATRIX)
- Turbines to order (Canadian Hydro Components)
- Turbine seals (John Crane Italia)

Tables with additional information on the above developments and products are included in Appendix B.

6. OPPORTUNITIES AND OUTLOOK FOR DEVELOPMENT

Overview

British Columbia provides many opportunities for small hydro development. Projects in the Inventory range in size from 500 kW to about 47 MW and they are located in most geographical regions of the province. Because of differing terrain, capacities and different hydrology, the projects also have a range of unit energy costs. Figure 5 summarizes the project sizes and costs. Approximately 40% of the project sites are developable at less than 7 c/kWh which comprises about 66% of the total developable energy. This observation combined with the shape of the cumulative energy curve is indicative of the larger projects being generally more economic.

It is likely that the first projects to be developed will be the more economical projects, since these have less financial risk associated with them. The following table indicates the numbers of projects that are available in different price categories. This table is representative of the immediate and longer term outlooks for small hydropower generation in the province.

Unit Cost ($/kWh)	# of sites	'Green' Energy (GWh)	Capacity (MW)
More than 0.09	342	2456	601
0.07 to 0.09	107	1162	270
0.05 to 0.07	169	2698	639
0.04 to 0.05	84	2284	497
Less than 0.04	54	2112	447
TOTAL	756	10712	2454

Note: the costs are based on the index costs described in Section 3.

The Inventory is based on sizing each project to the mean annual flow and operating on a run-of-river basis. This may not be the optimal configuration of the project but it may be a requirement for a green classification. It is likely that when any project is examined in detail the hydrology, terrain and component costing aspects will be reviewed to optimize the project.

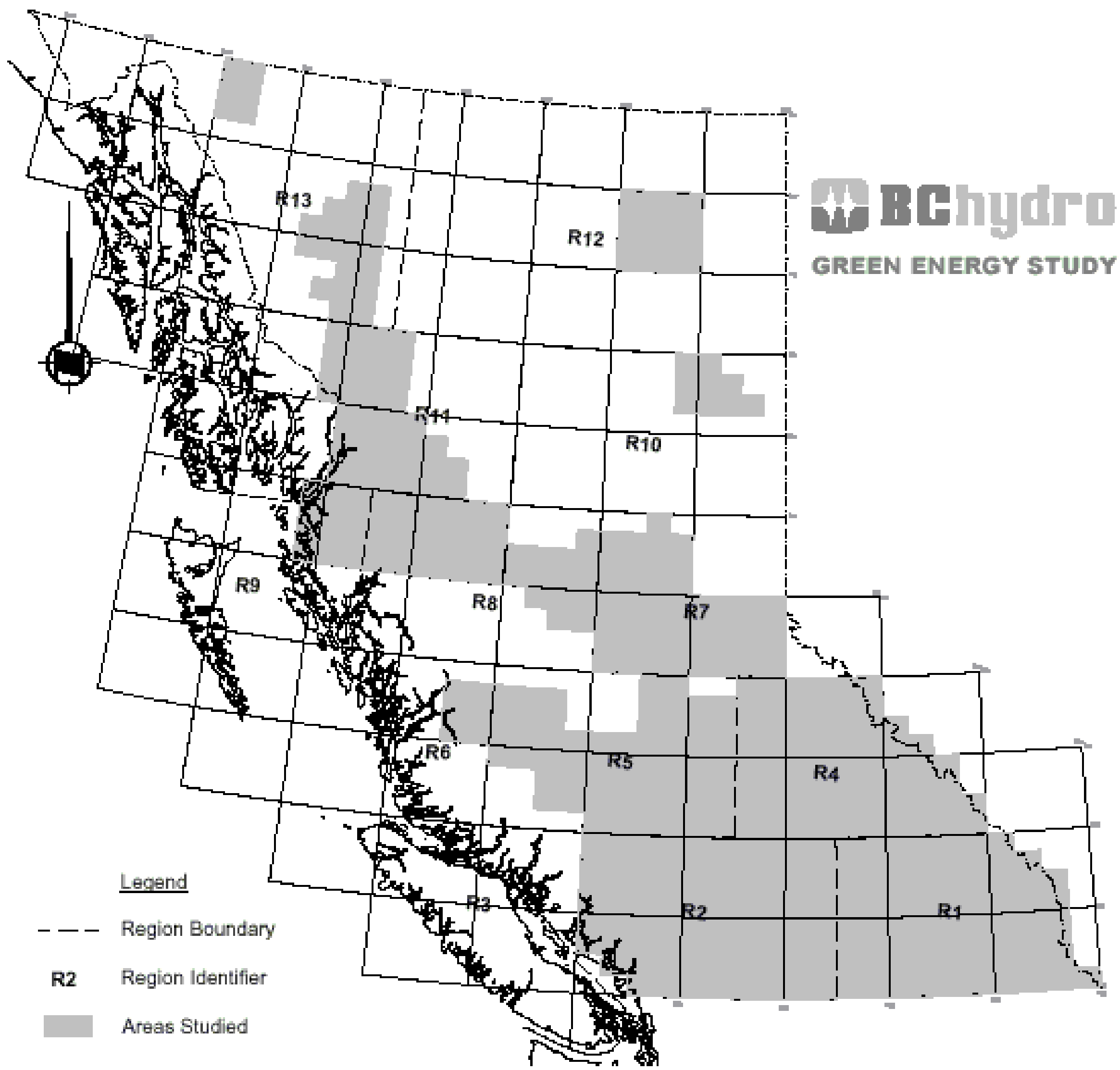
Hydropower Clusters

The Inventory treats each project separately and includes transmission costs to the nearest location on the BCH grid. BC Hydro could review transmission issues and consider aggregation of projects within the hydropower sector as well as other renewable energy sectors that may have nearby sites. Projects that appear to have cluster potential are shown with a 'Y' in the appropriate column in Table 1.

The relative density of projects in British Columbia combined with the relative sparseness of transmission and distribution lines makes it sensible to consider clustered projects that can share infrastructure. Roads, transmission lines and sub-stations can potentially be shared by more than one project.

Many of the project sites shown in Table 1 were not shown in previous inventories and they have much higher unit costs than would be considered economic, despite the use of the 10% slope criteria which should result in more economic sites. The reason for this anomaly is that in most cases the projects required a long transmission line which boosted the unit cost. These projects, if they could connect with other projects along the transmission route, could benefit from being clustered.

FIGURES



BRITISH COLUMBIA HYDRO PROJECTS
LOCATION MAP FOR REGIONS

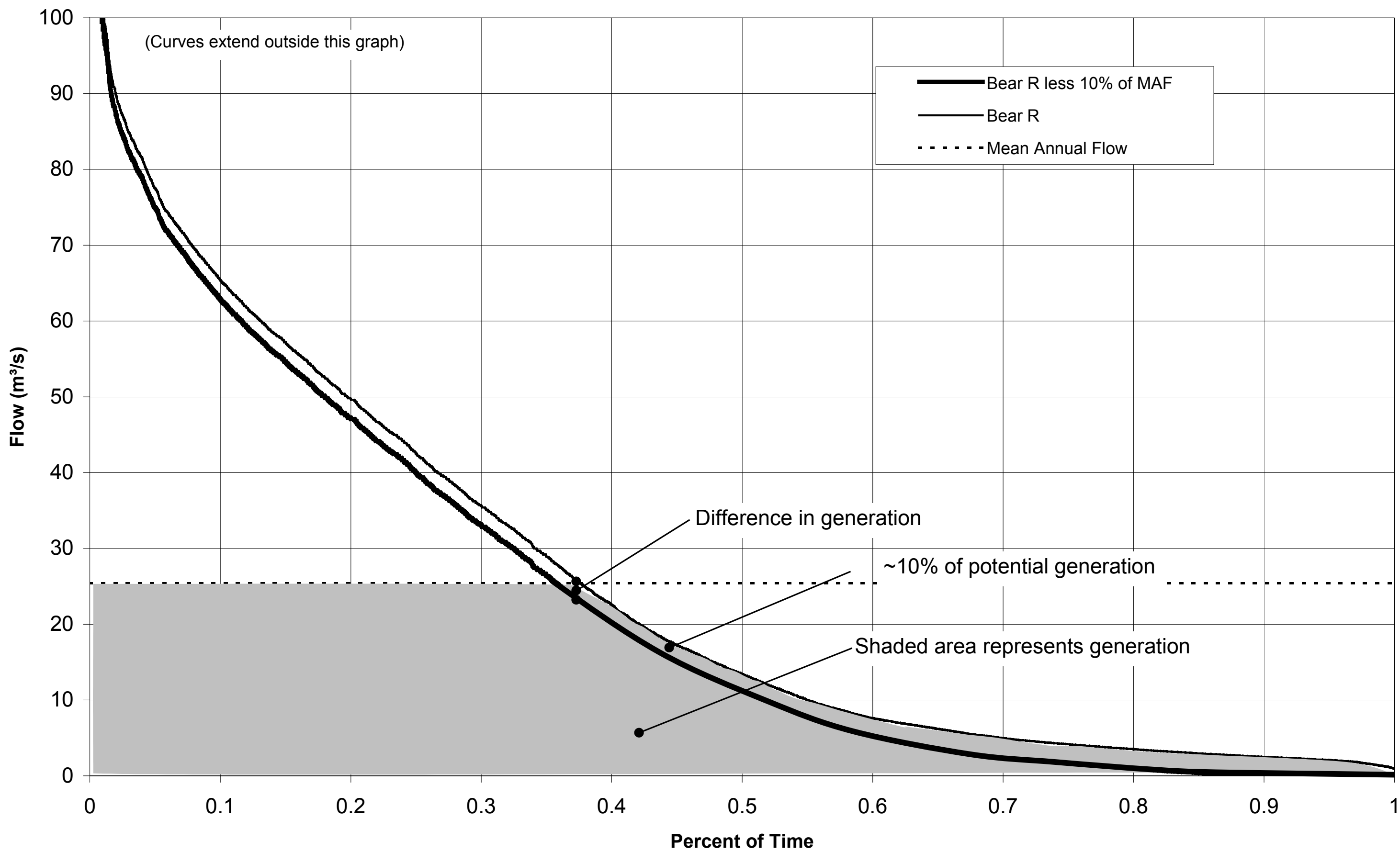
FIGURE 1

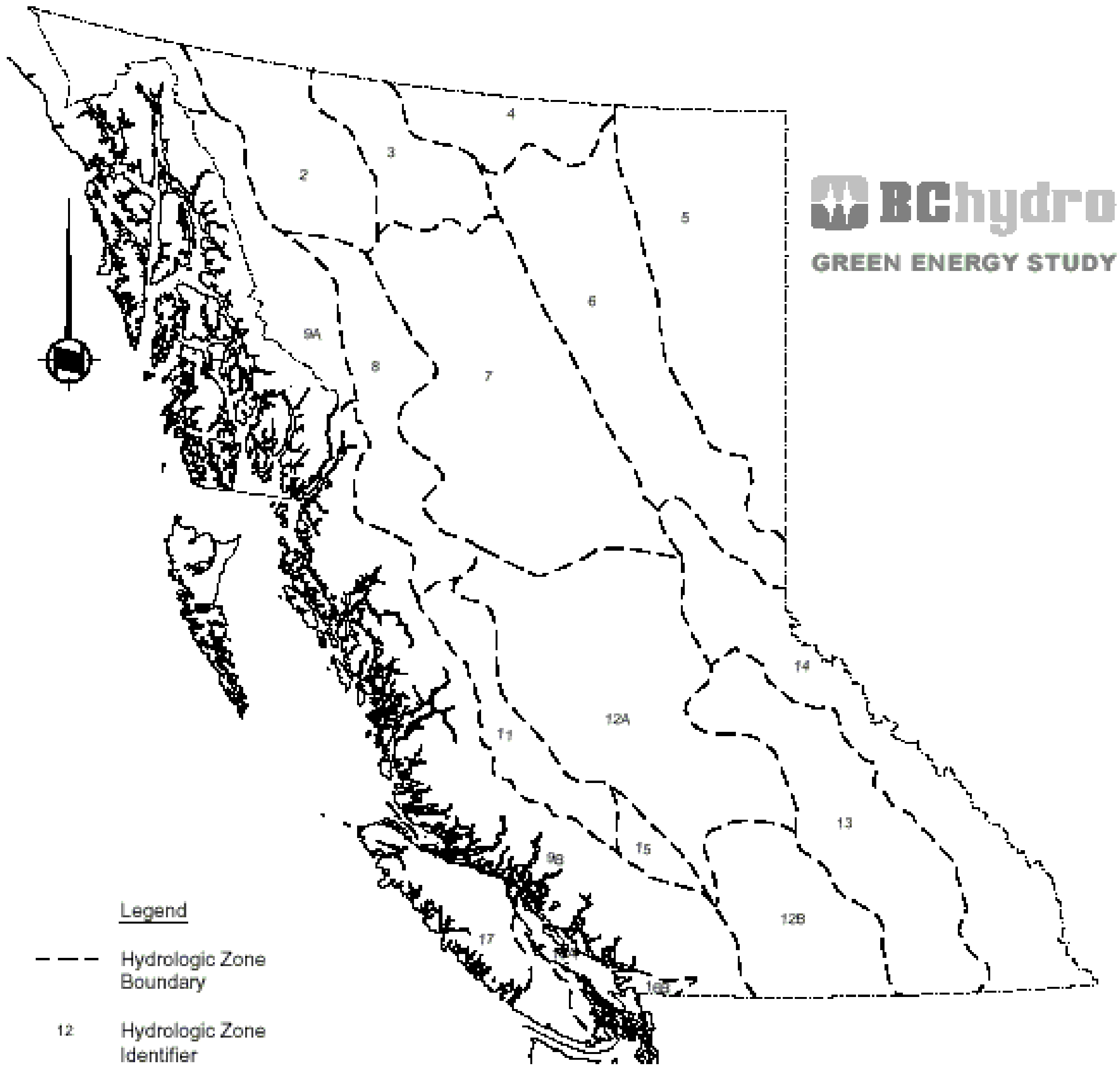
SIGMA ENGINEERING LTD

DECEMBER 2001

Figure 2 - Green Generation Reduction

Flow Duration Curve (WSC08DC006 Bear River above Bitter Creek)





BRITISH COLUMBIA HYDRO PROJECTS
HYDROLOGIC ZONES

FIGURE 3

SIGMA ENGINEERING LTD

JUNE 2002

Figure 4 - Monthly Capacity Factor

WSC08DC006 Bear River above Bitter Creek - Flow duration curves for May and December

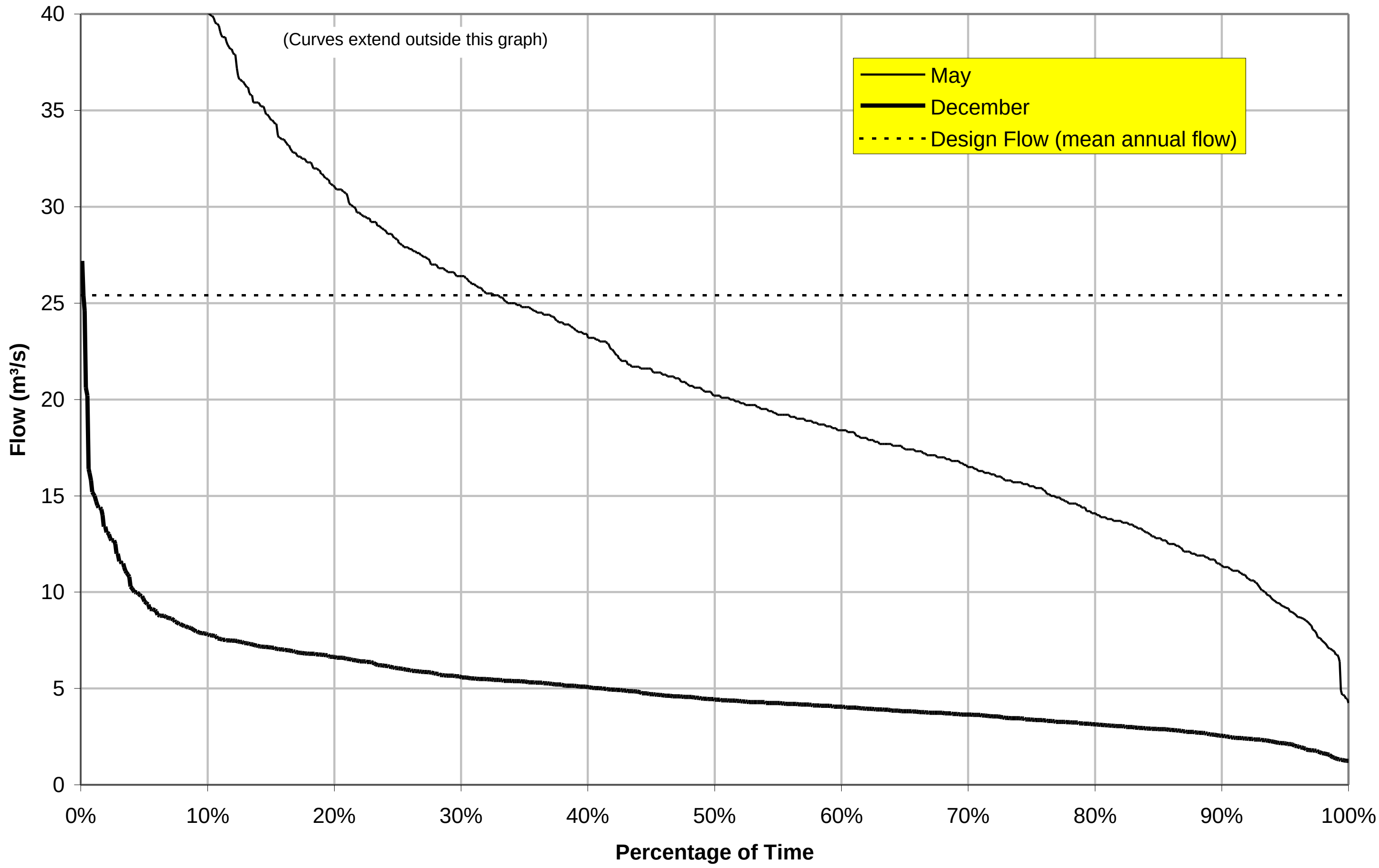
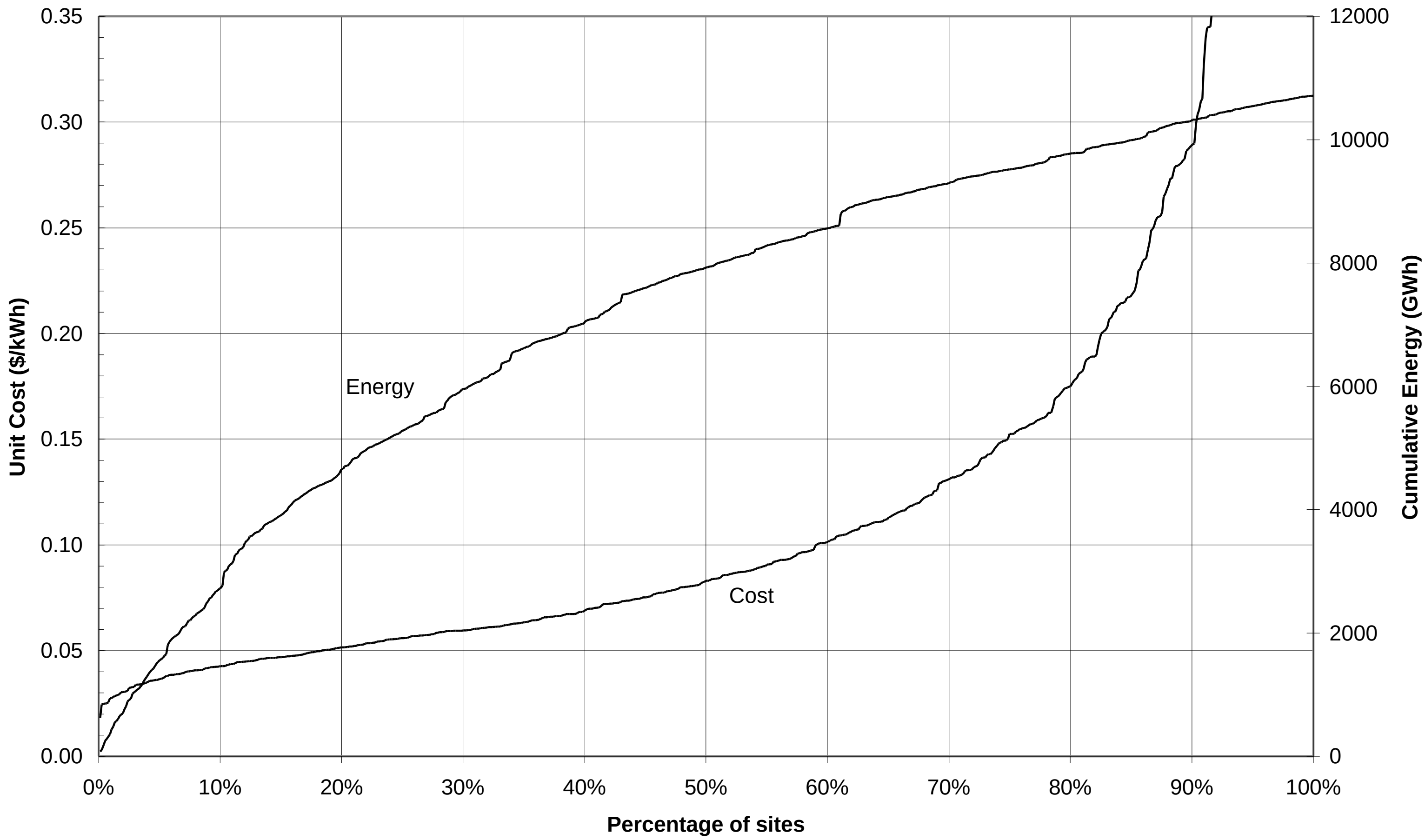


Figure 5 Cost Distribution and Cumulative 'Green' Energy
All Sites



TABLES

Table 1. Site Information

Ref No	Stream Name	Lat.	Long.	D.A. (km²)	Flow (m³/s)	Head (m)	Penstock L(m)	T.L. (kv)	T.L. Dist. (km)	Cluster potential	Power (kW)	Capacity Factor	'Green' Energy (GWh)	Unit Cost $/kWh	Cost inl. TL ($1000)	Annual Cashflow dur.Constr.	# of Jobs annually	Annual O&M	Annual Taxes
1001	ARROW PARK CR	5008	11757	265	4.50	61	1600	25	20		2100	45%	7.5	0.116	8,341	2,987,470	30	166,820	138,689
1002	ARTHURS CR	4941	11843	33	0.40	280	2000	25	50	Y	900	40%	2.8	0.281	7,674	6,600,445	66	153,480	141,937
1003	ASHER CR	5036	11729	113	3.40	150	2100	69	54		4000	53%	16.7	0.110	17,721	7,470,001	75	354,420	338,856
1004	ASSINIBOINE CR	5048	11540	22	0.53	240	1500	25	47	Y	1000	50%	3.9	0.279	10,596	4,691,647	47	211,920	201,393
1005	BANNOCK CR	4942	11736	57	1.71	90	800	25	16		1200	45%	4.3	0.104	4,273	1,486,301	15	85,460	69,936
1006	BEATRICE CR	4950	11728	138	4.10	150	700	25	7	Y	4800	45%	17.0	0.056	9,181	3,228,509	32	183,620	168,327
1007	BEATTON CR	5044	11744	99	2.80	150	2000	25	50		3300	63%	16.4	0.067	10,495	4,044,272	40	209,900	195,218
1008	BEHRMAN CR	5030	11652	20	0.70	240	850	25	34		1300	50%	5.1	0.129	6,371	2,595,372	26	127,420	116,813
1009	BEN ABLE CR	5016	11609	42	0.63	180	1400	25	33		900	50%	3.5	0.190	6,483	5,377,582	54	129,660	117,713
1010	BERNARD CR	4952	11651	55	1.70	180	1200	25	20	Y	2400	45%	8.5	0.081	6,624	2,308,759	23	132,480	112,593
1011	BLANKET CR FALLS	5050	11805	75	3.40	60	200	25	21	Y	1600	45%	5.7	0.083	4,540	1,467,738	15	90,800	71,876
1012	BOYD CR	5053	11734	58	2.20	250	1800	69	64	Y	4300	53%	18.0	0.107	18,481	7,921,774	79	369,620	359,424
1013	BREMNER CR	5013	11730	77	3.50	120	1900	25	26		3300	47%	12.2	0.086	10,095	3,801,295	38	201,900	181,469
1014	BRUCE CR	5034	11615	79	2.40	50	400	25	12		900	52%	3.7	0.153	5,419	4,078,590	41	108,380	91,429
1015	CAMPBELL CR	4957	11651	88	2.70	240	2400	25	28	Y	5100	45%	18.1	0.073	12,640	4,951,789	50	252,800	241,566
1016	CARIBOU CR	4959	11750	202	6.10	100	1350	25	2.5		4800	45%	17.0	0.053	8,681	2,865,862	29	173,620	153,367
1017	CASCADE CR	5025	11707	70	1.90	180	1800	25	14.5	Y	2700	57%	12.1	0.054	6,254	2,092,623	21	125,080	108,540
1018	CHAMPION CR	4914	11735	73	0.95	92	500	25	4		700	40%	2.2	0.134	2,841	1,809,115	18	56,820	42,222
1019	CLINT CR	5013	11654	69	2.40	243	2000	25	45		4600	50%	18.1	0.061	10,689	4,102,782	41	213,780	204,086
1020	CLUTE CR	5001	11653	23	0.81	609	3200	25	8		3900	50%	15.4	0.060	8,924	3,472,112	35	178,480	173,610
1021	COCHRANE CR	4940	11844	44	0.53	500	2600	25	45	Y	2100	40%	6.6	0.130	8,310	3,292,581	33	166,200	149,824
1022	COFFEE CR	4942	11656	70	1.61	150	1500	25	0.2		1900	55%	8.2	0.050	3,979	1,289,960	13	79,580	68,753
1023	COOKE CR	5037	11850	64	1.90	200	2100	25	0.5		3000	45%	10.6	0.057	5,881	1,895,345	19	117,620	100,218
1024	COOPER CR	5012	11659	4.6	4.60	183	5100	25	1.5	Y	6600	47%	24.5	0.077	18,204	7,390,021	74	364,080	355,509
1025	CORN CR	4904	11640	100	2.30	60	800	25	4		1100	55%	4.8	0.087	4,009	1,326,650	13	80,180	63,816
1026	COUGAR CR	4938	11747	19	0.51	240	1100	25	0.1	Y	1000	45%	3.5	0.066	2,246	638,669	6	44,920	33,694
1027	CRAWFORD CR	5045	11759	27	1.10	250	1300	25	21		2200	53%	9.2	0.063	5,566	1,867,937	19	111,320	94,238
1028	CREIGHTON CR	5012	11846	32	0.30	200	1800	25	2		500	47%	1.9	0.139	2,478	1,650,506	17	49,560	37,920
1029	CULTUS CR	4920	11647	168	3.90	123	1800	25	27	Y	3800	55%	16.5	0.061	9,750	3,576,011	36	195,000	178,198
1030	DAVIS CR	5008	11657	39	0.80	122	500	25	0.5	Y	800	47%	3.0	0.074	2,101	1,096,110	11	42,020	28,619
1031	DENNIS CR	5002	11722	17	0.71	182	1250	25	2		1000	45%	3.5	0.094	3,200	1,078,497	11	64,000	51,938
1032	DERRY CR	5046	11833	44	1.30	300	2350	25	22		3100	45%	11.0	0.066	6,983	2,488,828	25	139,660	125,018
1033	DIORITE CR	4958	11540	56	1.30	490	4100	25	2		5000	40%	15.8	0.073	11,031	4,375,173	44	220,620	215,552
1034	DOG CR	4924	11807	129	1.30	50	400	25	35		500	40%	1.6	0.352	5,348	4,244,382	42	106,960	90,663
1035	DRIMMIE CR	5052	11805	28	1.30	150	700	25	7	Y	1500	45%	5.3	0.063	3,242	994,913	10	64,840	51,885
1036	DUNBAR CR FALLS	5047	11621	69	2.40	60	600	25	7		1100	52%	4.5	0.075	3,240	953,357	10	64,800	47,934
1037	EAST CR	5042	11653	73	2.90	50	500	25	25	Y	1100	53%	4.6	0.189	8,356	3,410,803	34	167,120	149,750
1038	EAST CR #1	5039	11701	175	7.00	100	1150	25	45	Y	5500	53%	23.0	0.061	13,513	5,046,997	50	270,260	251,496
1039	ENTERPRISE CR (TUNNEL)	4951	11722	87	2.60	244	2500	25	14	Y	5000	45%	17.7	0.055	9,455	3,462,453	35	189,100	179,289
1040	FALL CR	5036	11853	15	0.45	500	1000	25	1.5		1800	45%	6.4	0.040	2,477	714,703	7	49,540	42,521
1041	FARNHAM FALLS	5030	11633	78	3.10	120	600	25	25		2900	52%	11.9	0.064	7,369	2,530,523	25	147,380	126,901
1042	FENNELL CR	4955	11714	21	0.63	210	1500	25	34	Y	1000	45%	3.5	0.146	4,980	1,954,901	20	99,600	87,500
1043	FENWICK CR	5028	11537	102	2.00	50	650	25	40		800	50%	3.2	0.209	6,340	5,029,188	50	126,800	109,517
1044	FERRY CR	5015	11839	NA	1.10	150	3100	25	1		1300	51%	5.2	0.090	4,527	1,651,853	17	90,540	78,593
1045	FITZSTUBBS CR	5009	11722	251	11.00	60	2000	25	13	Y	5200	47%	19.3	0.079	14,594	5,419,790	54	291,880	263,017
1046	FORSTER CR FALLS	5039	11626	79	3.20	40	500	25	25	Y	1000	52%	4.1	0.170	6,700	2,601,520	26	134,000	115,224
1047	FORSTER FALLS	5040	11630	35	1.40	180	1200	25	30	Y	2000	52%	8.2	0.109	8,619	3,554,617	36	172,380	162,433
1048	FOSTHALL CR #1	5022	11757	222	8.80	91	700	25	34	Y	6300	47%	23.3	0.051	11,428	3,870,199	39	228,560	205,987
1049	FOSTHALL CR #2	5025	11801	52	2.10	240	1900	25	40	Y	3900	47%	14.5	0.073	10,088	3,878,364	39	201,760	188,658
1050	GIEGERICH CR	5043	11707	116	4.60	100	1100	69	55	Y	3600	53%	15.0	0.106	15,327	6,257,212	63	306,540	285,235
1051	GOATSKIN CR	4943	11839	100	1.20	100	1000	69	60	Y	900	50%	3.5	0.382	13,062	11,658,232	117	261,240	245,914
1052	GRIZZLY CR	4938	11751	105	2.80	45	500	25	0.2	Y	1000	45%	3.5	0.095	3,230	934,142	9	64,600	45,983
1053	GWILLIM CR (TUNNEL)	4945	11728	80	2.40	213	1500	25	1	Y	4000	45%	14.2	0.045	6,137	1,925,423	19	122,740	108,584
1054	HADOW CR	5040	11748	36	1.40	400	1200	25	25	Y	4400	53%	18.4	0.047	8,401	3,111,343	31	168,020	162,972
1055	HALFWAY HOTSPRINGS	5029	11751	290	13.00	60	1300	25	22		6100	47%	22.6	0.063	13,720	4,825,989	48	274,400	244,626
1056	HALL CR	5041	11706	44	1.80	100	850	69	51	Y	1400	53%	5.8	0.188	10,596	4,528,991	45	211,920	196,445
1057	HELLROARER CR	4935	11845	59	0.71	400	1750	25	30	Y	2200	40%	6.9	0.107	7,167	2,703,399	27	143,340	126,406
1058	HOPE CR	5028	11711	23	0.76	240	1250	25	24	Y	1400	47%	5.2	0.097	4,827	1,831,512	18	96,540	85,728
1059	HORSETHIEF FALLS	5029	11636	52	1.30	100	300	25	45		1000	55%	4.3	0.143	5,966	2,362,334	24	119,320	104,958
1060	HOUGHTON CR	4944	11647	20	0.46	305	2600	25	5		1100	55%	4.8	0.074	3,385	1,195,604	12	67,700	58,337
1061	HUNTERS CR	5041	11847	43	1.30	150	1900	25	10		1500	45%	5.3	0.101	5,172	1,931,209	19	103,440	90,751
1062	INCOMAPPLEUX R	5046	11741	1020	55.80	30.5	1600	25	12	Y	13300	53%	55.6	0.089	47,418	12,844,380	128	948,360	904,653
1063	IRON CR	5043	11836	10	0.22	550	2000	25	22		900	47%	3.3	0.113	3,634	2,762,864	28	72,680	63,414
1064	JOFFRE CR	5034	11518	36	0.86	200	1300	69	79	Y	1300	50%	5.1	0.310	15,285	6,905,107	69	305,700	292,626
1065	JOHN CR	5016	11701	23	0.62	180	1200	25	4.5	Y	900	47%	3.3	0.080	2,567	1,575,021	16	51,340	39,197
1066	KAIN CR	5051	11635	34	0.95	250	1100	25	16		1900	52%	7.8	0.062	4,614	1,667,045	17	92,280	83,532
1067	KELLIE CR	5055	11734	46	1.80	250	1150	69	65	Y	3500	53%	14.6	0.123	17,328	7,440,292	74	346,560	333,113
1068	KUSHANAX CR	5016	11746	330	15.00	60	900	25	5	Y	7000	47%	25.9	0.048	12,082	3,866,936	39	241,640	211,768
1069	LADYBIRD CR	4925	11740	156	2.00	120	600	25	2.5		1900	40%	6.0	0.061	3,527	1,036,448	10	70,540	55,814
1070	LAIDLAW CR	5052	11714	49	2.20	150	1400	69	73		2600	53%	10.9	0.156	16,282	6,940,407	69	325,640	304,866
1071	LASCA CR	4936	11709	64	1.50	300	2100	25	1		3500	45%	12.4	0.047	5,592	1,775,733	18	111,840	98,792
1072	LATEWHOS CR	5027	11843	43	0.65	450	2600	25	8		2300	45%	8.2	0.065	5,074	1,691,558	17	101,480	86,540
1073	LEGERWOOD CR	5058	11846	12	0.53	250	1300	25	1.5		1000	45%	3.5	0.078	2,648	837,069	8	52,960	41,909
1074	LEXINGTON CR	5050	11737	15	0.55	450	1700	69	58	Y	1900	53%	7.9	0.163	12,423	5,522,707	55	248,460	241,282
1075	LILLIAN CR	5009	11638	23	0.46	240	1000	25	21		900	50%	3.5	0.135	4,624	3,617,406	36	92,480	81,437
1076	LITTLE GLACIER CR	5026	11655	36	1.30	60	600	25	26		600	50%	2.4	0.189	4,307	3,207,983	32	86,140	70,520
1077	LOFTUS CR	5056	11849	17	0.75	250	1000	25	0.5		1500	45%	5.3	0.054	2,780	828,748	8	55,600	45,155
1078	LOKI CR	4950	11651	28	0.87	430	2400	25	14	Y	2900	45%	10.3	0.067	6,623	2,384,265	24	132,460	119,466
1079	LOST LEDGE CR	5006	11656	14	0.28	430	1700	25	0.5	Y	900	47%	3.3	0.058	1,875	1,026,504	10	37,500	27,900
1080	LUXOR CR	5046	11610	81	0.97	100	1400	25	3	Y	800	52%	3.3	0.108	3,426	2,346,845	23	68,520	54,891
1081	MAURIER CR	4956	11516	19	0.55	330	2000	25	30	Y	1400	45%	5.0	0.116	5,555	2,215,780	22	111,100	101,316
1082	MCDONALD CR	5034	11625	50	1.80	250	1100	25	36		3500	52%	14.3	0.060	8,277	3,046,593	30	165,540	152,681
1083	MCDOUGAL CR	5058	11737	85	3.40	150	850	69	80	Y	4000	53%	16.7	0.132	21,293	9,204,096	92	425,860	409,538
1084	MEADOW CR	5018	11703	23	0.62	180	1300	25	4	Y	900	47%	3.3	0.087	2,802	1,803,591	18	56,040	43,965
1085	MENHINICK CR	5049	11739	17	0.60	200	900	69	53	Y	900	53%	3.8	0.276	10,007	8,816,668	88	200,140	187,422
1086	MIDGE CR	4922	11652	243	5.60	30	1000	25	33	Y	1300	55%	5.6	0.170	9,233	3,691,758	37	184,660	162,982
1087	MITCHELL R FALLS	5048	11542	74	1.80	40	600	25	45	Y	600	50%	2.4	0.439	9,999	8,654,062	87	199,980	183,267
1088	MOHAWK CR	5047	11736	20	0.60	270	1000	69	51	Y	1300	53%	5.4	0.194	10,124	4,428,600	44	202,480	191,490

Table 1. Site Information

Ref No	Stream Name	Lat.	Long.	D.A. (km^2)	Flow (m^3/s)	Head (m)	Penstock L(m)	T.L. (kv)	T.L. Dist. (km)	Cluster potential	Power (kW)	Capacity Factor	'Green' Energy (GWh)	Unit Cost $/kWh	Cost inl. TL ($1000)	Annual Cashflow dur.Constr.	# of Jobs annually	Annual O&M	Annual Taxes
1089	MORRISSEY CR	4923	11455	28	0.56	240	2100	25	6		1100	50%	4.3	0.079	3,293	1,131,458	11	65,860	55,191
1090	MULVEHILL CR	5051	11807	42	1.90	150	550	25	17	Y	2200	45%	7.8	0.066	4,942	1,489,631	15	98,840	77,175
1091	NEMO CR	4955	11725	68	2.00	490	3300	25	3		7700	45%	27.3	0.045	11,764	4,461,602	45	235,280	240,408
1092	NEXT CR	4918	11645	155	3.60	120	1100	25	25	Y	3400	55%	14.7	0.056	7,895	2,720,216	27	157,900	139,475
1093	OCTOPUS CR	4945	11806	45	0.68	150	650	25	6		800	40%	2.5	0.110	2,683	1,695,411	17	53,660	40,473
1094	OUTLET CR	5020	11830	40	0.60	150	1400	25	3		700	45%	2.5	0.123	2,953	1,996,986	20	59,060	46,443
1095	PALLISER FALLS #1	5032	11536	358	8.60	10	300	69	53	Y	700	50%	2.8	0.517	13,736	11,797,154	118	274,720	247,689
1096	PALLISER FALLS #2	5032	11528	277	6.70	30	300	69	63	Y	1600	50%	6.3	0.249	15,140	6,471,881	65	302,800	277,761
1097	PAYNE CR	5037	11751	54	1.60	100	400	25	45		1300	53%	5.4	0.111	5,810	2,225,242	22	116,200	101,427
1098	POOL CR	5047	11738	65	2.50	350	3000	69	51	Y	6900	53%	28.8	0.072	19,990	8,431,369	84	399,800	401,584
1099	POPLAR CR	5024	11708	128	4.20	120	2700	25	17	Y	3900	47%	14.5	0.078	10,891	4,111,356	41	217,820	198,995
1100	POWDER CR	4953	11651	45	1.40	370	2500	25	23	Y	4100	45%	14.5	0.063	8,798	3,315,572	33	175,960	166,511
1101	QUARRIE CR	5016	11459	59	1.20	50	550	25	12		500	50%	2.0	0.178	3,375	2,329,601	23	67,500	51,888
1102	RAPID CR	5027	11710	35	1.20	300	2400	25	21	Y	2800	47%	10.4	0.070	7,020	2,535,718	25	140,400	125,315
1103	RIOULX CR	5017	11805	53	0.90	200	2000	25	30		1400	45%	5.0	0.152	7,293	3,010,073	30	145,860	134,359
1104	RUSSEL CR	4937	11746	39	1.05	210	1600	25	0.1	Y	1700	45%	6.0	0.061	3,525	1,142,947	11	70,500	59,662
1105	SANCA CR	4923	11643	100	2.30	120	1000	25	5		2200	55%	9.5	0.057	5,230	1,591,639	16	104,600	83,552
1106	SCHROEDER CR	5002	11653	32	0.64	300	2300	25	0.5	Y	1500	47%	5.6	0.061	3,257	1,078,388	11	65,140	55,785
1107	SEPTET CR	5048	11641	40	1.40	150	950	25	34		1600	52%	6.6	0.093	5,895	2,266,333	23	117,900	105,648
1108	SHANNON CR	5005	11729	33	1.50	180	1700	25	2		2100	47%	7.8	0.059	4,447	1,290,680	13	88,940	68,949
1109	SHAW CR	4915	11643	48	1.10	240	1000	25	21	Y	2100	55%	9.1	0.061	5,307	1,748,346	17	106,140	88,828
1110	SHUSWAP R BRENDA F	5021	11832	NA	39.00	20	700	25	0		6100	45%	21.6	0.095	19,747	7,098,514	71	394,940	338,782
1111	SICAMOUS CR	5048	11858	64	1.60	200	1400	25	0		2500	45%	8.9	0.054	4,597	1,329,494	13	91,940	73,128
1112	SKOOKUMCHUCK F	4958	11608	133	2.40	70	1300	25	42	Y	1300	40%	4.1	0.183	7,237	2,868,594	29	144,740	126,894
1113	SLEWISKIN CR	5008	11747	76	3.40	60	1200	25	2		1600	45%	5.7	0.088	4,822	1,604,910	16	96,440	78,114
1114	SMYTH CR	5032	11843	16	0.29	600	2000	25	15	Y	1400	45%	5.0	0.070	3,342	1,190,271	12	66,840	59,075
1115	SNOW CR	4957	11750	109	3.16	45	500	25	6	Y	1100	45%	3.9	0.101	3,798	1,181,854	12	75,960	56,839
1116	SOUTH CRANBERRY CR	5046	11806	59	2.70	200	900	25	29	Y	4200	52%	17.2	0.048	7,936	2,764,411	28	158,720	146,529
1117	SOWSAP CR	5026	11846	52	0.42	200	2100	25	3.5		700	45%	2.5	0.131	3,125	2,204,338	22	62,500	50,742
1118	SPECTRUM CR FALLS	5029	11827	NA	2.00	65	500	25	18		1000	50%	3.9	0.120	4,558	1,628,474	16	91,160	74,777
1119	ST.LEON CR	5026	11752	108	4.90	213	2500	25	26	Y	8200	47%	30.4	0.051	15,016	5,712,483	57	300,320	296,705
1120	STOCKDALE CR	5035	11635	66	2.60	240	1100	25	38		4900	52%	20.1	0.059	11,470	4,447,500	44	229,400	221,683
1121	SUNDOWN CR	4914	11552	46	1.10	120	1800	25	7		1000	50%	3.9	0.107	4,072	1,461,945	15	81,440	68,158
1122	TAM O'SHANTER CR	4948	11651	31	0.96	490	3000	25	10	Y	3700	45%	13.1	0.058	7,302	2,667,550	27	146,040	137,066
1123	TEA CR	5033	11647	61	2.44	60	400	25	44		1100	50%	4.3	0.154	6,419	2,496,419	25	128,380	110,910
1124	TEMPLETON CR	5048	11629	29	1.00	250	2300	25	21		2000	52%	8.2	0.081	6,381	2,512,546	25	127,620	119,334
1125	TENDERFOOT CR	5028	11713	45	1.50	240	2500	25	28	Y	2800	47%	10.4	0.078	7,800	2,879,675	29	156,000	139,428
1126	TOWN CR	5046	11745	14	0.49	400	1400	25	44		1500	53%	6.3	0.104	6,304	2,584,268	26	126,080	117,946
1127	TSUIUS CR	5037	11840	208	5.00	150	1650	25	27	Y	5900	47%	21.9	0.055	11,631	4,220,312	42	232,620	217,831
1128	UNNAMED CR	4959	11603	40	0.75	300	1100	25	37	Y	1800	40%	5.7	0.118	6,470	2,601,266	26	129,400	119,273
1129	UNNAMED CR	4959	11600	8.2	0.16	560	1550	25	33	Y	700	40%	2.2	0.214	4,557	3,709,827	37	91,140	80,944
1130	UNNAMED CR	5006	11646	9	0.18	550	1650	25	8		800	50%	3.2	0.082	2,487	1,674,755	17	49,740	40,640
1131	UNNAMED CR	5007	11644	11	0.22	490	1400	25	13		800	50%	3.2	0.096	2,918	2,080,307	21	58,360	48,936
1132	UNNAMED CR	5019	11736	50	2.25	60	500	25	15		1100	50%	4.3	0.101	4,231	1,434,477	14	84,620	67,545
1133	UNNAMED CR	5020	11651	14	0.28	300	1150	25	14		700	50%	2.8	0.122	3,251	2,376,945	24	65,020	54,324
1134	UNNAMED CR	5021	11651	16	0.32	430	2000	25	15		1100	55%	4.8	0.077	3,531	1,291,582	13	70,620	62,050
1135	UNNAMED CR	5021	11648	15	0.30	240	900	25	19		600	50%	2.4	0.150	3,406	2,535,327	25	68,120	56,725
1136	UNNAMED CR	5036	11822	55	1.40	90	600	25	10		1000	50%	3.9	0.111	4,197	1,492,085	15	83,940	69,328
1137	UNNAMED CR	5055	11807	19	0.85	250	1150	25	1	Y	1700	45%	6.0	0.054	3,122	968,043	10	62,440	52,361
1138	UNNAMED CR	5057	11824	24	1.20	300	1100	25	6	Y	2800	45%	9.9	0.048	4,568	1,345,317	13	91,360	75,757
1139	UNNAMED CR	5058	11836	10	0.50	300	700	25	7		1200	45%	4.3	0.063	2,580	789,821	8	51,600	41,215
1140	UNNAMED CR	5059	11645	24	0.72	400	1100	25	34		2300	52%	9.4	0.074	6,731	2,482,132	25	134,620	120,015
1141	VAN HOUTEN CR	4940	11807	38	0.57	150	700	25	16		700	40%	2.2	0.182	3,858	2,876,229	29	77,160	64,082
1142	VICTOR CR	5057	11824	10	0.50	300	550	25	6	Y	1200	45%	4.3	0.060	2,445	723,972	7	48,900	38,503
1143	VOWELL CR	5053	11652	132	5.90	50	800	25	50		2300	52%	9.4	0.126	11,429	4,401,211	44	228,580	199,401
1144	WAP CR FALLS	5054	11829	66	3.30	40	400	25	14		1000	45%	3.5	0.119	4,077	1,328,012	13	81,540	61,982
1145	WARREN CR	5058	11642	47	1.40	550	3400	25	30		6000	52%	24.6	0.056	13,324	5,392,088	54	266,480	269,672
1146	WEE SANDY CR	5000	11725	59	1.80	180	900	25	10		2500	47%	9.3	0.061	5,458	1,730,167	17	109,160	89,925
1147	WHATSHAN L DAM & F	4954	11807	590	7.00	30	1500	25	1		1600	40%	5.0	0.160	7,774	2,896,732	29	155,480	131,228
1148	WILSON CR	4935	11652	25	0.58	609	2700	25	12		2800	55%	12.1	0.049	5,750	2,012,410	20	115,000	105,627
1149	WILSON CR FALLS	5008	11720	205	9.20	60	550	25	11	Y	4300	47%	15.9	0.061	9,410	3,126,662	31	188,200	161,116
1150	WODEN CR	4955	11753	70	2.07	150	1800	25	6	Y	2400	45%	8.5	0.087	7,116	2,517,546	25	142,320	121,670
1151	WOODBURY CR	4948	11657	83	1.90	300	3900	25	6		4500	55%	19.5	0.055	10,296	3,966,927	40	205,920	200,610
1152	WRAGGE CR	5004	11728	25	1.10	244	1800	25	2		2100	45%	7.5	0.075	5,346	1,769,562	18	106,920	88,528
1153	YARD CR	5054	11848	122	3.10	150	1550	25	0		3600	45%	12.8	0.050	6,191	1,919,619	19	123,820	105,519
2001	ADAMS R RAPIDS	5056	11939		71.00	15	1000	25	0		8300	60%	39.3	0.097	36,601	14,422,514	144	732,020	669,312
2002	AIRPLANE CR	4908	12137	16	0.90	300	1400	25	7	Y	2100	63%	10.4	0.054	5,461	1,851,692	19	109,220	94,892
2003	ANDERSON CR	4911	12143	4	0.21	850	1500	25	5		1400	63%	7.0	0.047	3,123	1,107,686	11	62,460	57,978
2004	ASHLU CR (TUNNEL)	4955	12320	310	24.00	230	5500	25	5		43200	62%	211.2	0.043	86,946	7,907,613	79	1,738,920	1,663,448
2005	BASTION CR	5051	11905	12	0.24	300	1000	25	17		600	45%	2.1	0.133	2,723	1,897,179	19	54,460	43,262
2006	BEAR CR	4928	12146	29	1.60	365	2100	25	20		4600	60%	21.8	0.039	8,090	2,925,637	29	161,800	159,574
2007	BIG SILVER CR	4942	12151	295	13.00	100	1600	25	0	Y	10200	55%	44.2	0.040	17,099	4,064,296	41	341,980	334,654
2008	BILLYGOAT CR	5003	12233	200	11.50	110	3000	25	10	Y	9900	62%	48.4	0.045	21,002	8,089,166	81	420,040	420,548
2009	BIRKENHEAD R	5027	12241	380	15.60	122	1600	25	17		14900	63%	74.0	0.031	22,134	5,378,757	54	442,680	463,280
2010	BLACKCOMB & HORSTMAN CR	5007	12256	14	0.70	274	2500	25	1	Y	1500	65%	7.7	0.050	3,687	1,278,627	13	73,740	66,306
2011	BLOWDOWN CR	5026	12215	50	0.80	180	1800	25	40		1100	55%	4.8	0.138	6,320	2,574,805	26	126,400	114,732
2012	BLURTON CR	5041	11902	19	0.48	400	1600	25	1		1500	45%	5.3	0.057	2,938	950,158	10	58,760	50,191
2013	BOBB CR	5051	12233	40	0.80	300	1400	25	22	Y	1900	52%	7.8	0.094	7,070	2,880,799	29	141,400	133,856
2014	BOISE CR	4937	12241	59	4.70	275	2200	25	50	Y	10100	55%	43.8	0.043	18,010	4,715,894	47	360,200	373,119
2015	BOX CANYON CR	4935	12324	6	0.76	400	1400	25	2		2400	55%	10.4	0.042	4,220	1,253,489	13	84,400	71,158
2016	BRANDYWINE CR	5004	12309	36	2.90	298	4500	25	2	Y	6800	66%	35.4	0.045	15,299	6,116,441	61	305,980	314,526
2017	BREMNER CR	4940	12201	39	3.10	60	200	25	7		1500	55%	6.5	0.056	3,503	986,345	10	70,060	52,754
2018	BROHM R #1	4953	12308	53	3.90	244	2000	25	10	Y	7500	55%	32.5	0.039	12,081	4,414,992	44	241,620	242,973
2019	BROHM R #2 (TUNNEL/PEN)	4952	12310	54	4.00	263	6600	25	0.5	Y	8200	70%	45.3	0.053	23,028	9,682,171	97	460,560	477,962
2020	BUCKLIN CR	4943	12243	33	2.60	365	2200	69	57	Y	7400	55%	32.1	0.060	18,445	7,645,825	76	368,900	373,670
2021	CADWALLADER CR	5046	12248	172	4.80	50	600	25	0.5		1900	52%	7.8	0.065	4,882	1,532,002	15	97,640	78,348
2022	CALLAGHAN CR	5004	12306	200	16.00	60	1400	25	2		7500	60%	35.5	0.040	13,824	4,623,152	46	276,480	254,920
2023	CANTELON/YOLA CR	4913	12123	66	3.00	105	2000	25	22	Y	2500	63%	12.4	0.072	8,605	3,159,893	32	172,100	152,332

Table 1. Site Information

Ref No	Stream Name	Lat.	Long.	D.A. (km²)	Flow (m³/s)	Head (m)	Penstock L(m)	T.L. (kv)	T.L. Dist. (km)	Cluster potential	Power (kW)	Capacity Factor	'Green' Energy (GWh)	Unit Cost $/kWh	Cost inl. TL ($1000)	Annual Cashflow dur.Constr.	# of Jobs annually	Annual O&M	Annual Taxes
2024	CAPILANO R DAM	4921	12306	NA	22.00	87	100	25	0.5		15000	65%	76.9	0.018	13,492	2,385,313	24	269,840	280,261
2025	CASCADE CR	4916	12212	15	1.05	150	1300	25	0	Y	1200	55%	5.2	0.059	2,949	902,769	9	58,980	47,090
2026	CAYOOSH CR #1	5039	12201	835	20.00	50	900	25	7	Y	7800	53%	32.6	0.048	14,938	4,999,409	50	298,760	268,479
2027	CAYOOSH CR #2	5039	12159	887	21.00	30	800	25	4	Y	4900	53%	20.5	0.064	12,651	4,297,583	43	253,020	216,799
2028	CAYOOSH CR #3 (TUNNEL)	5039	12200	800	13.20	152	4100	25	4	Y	15700	53%	65.6	0.051	32,498	8,782,004	88	649,960	670,062
2029	CHAPMAN CR FALLS	4932	12338	33	2.40	60	500	25	11		1100	55%	4.8	0.084	3,844	1,246,300	12	76,880	60,278
2030	CHASE CR	5049	11941	20	0.99	100	500	25	0		800	45%	2.8	0.077	2,097	1,056,220	11	41,940	27,672
2031	CHEEKYE R	4948	12306	24	1.70	120	1200	25	7		1600	55%	6.9	0.075	5,007	1,804,811	18	100,140	87,597
2032	CHICKWAT CR	4949	12343	46	3.70	180	1050	25	22	Y	5200	55%	22.5	0.041	8,885	3,037,533	30	177,700	167,061
2033	CHIPMUNK CR	4906	12139	37	2.00	400	3100	25	26	Y	6300	63%	31.3	0.042	12,585	4,929,994	49	251,700	258,532
2034	CINNAMON CR	5037	12207	35	0.80	300	1000	25	14	Y	1900	53%	7.9	0.059	4,493	1,629,847	16	89,860	82,195
2035	CINQUEFOIL CR	5032	12147	70	1.05	240	2100	25	2		2000	50%	7.9	0.060	4,533	1,609,931	16	90,660	81,991
2036	CLEAR CR	4938	12150	54	2.40	90	1100	25	39	Y	1700	60%	8.0	0.088	6,847	2,636,817	26	136,940	122,801
2037	CLOWHOM R	4949	12323	104	7.80	60	400	25	19	Y	3700	55%	16.0	0.059	9,075	3,061,514	31	181,500	156,225
2038	CLOWHOM R	4950	12329	22	1.70	320	600	25	27	Y	4300	55%	18.6	0.059	10,642	4,166,024	42	212,840	206,715
2039	CLOWHOM R	4951	12327	48	3.60	120	1000	25	25	Y	3400	55%	14.7	0.075	10,586	4,026,670	40	211,720	193,823
2040	COGBURN CR	4933	12145	130	5.90	100	1050	25	35	Y	4600	60%	21.8	0.047	9,777	3,426,609	34	195,540	179,994
2041	CONNEL CR	5039	12225	50	0.65	950	3800	25	0.5	Y	4800	52%	19.7	0.046	8,786	3,408,210	34	175,720	178,729
2042	CORBOLD CR	4937	12238	92	7.30	120	700	25	46	Y	6900	55%	29.9	0.042	12,239	4,292,410	43	244,780	232,099
2043	CRAWFORD CR	4941	12254	30	2.30	90	700	25	20		1600	55%	6.9	0.074	4,931	1,725,083	17	98,620	83,916
2044	CULLITON CR	4953	12309	53	3.90	244	2000	25	10	Y	7500	55%	32.5	0.039	12,081	4,414,992	44	241,620	242,973
2045	DE BECK	4930	12237	47	3.70	213	1050	25	33	Y	6200	55%	26.9	0.048	12,451	4,695,961	47	249,020	243,689
2046	DEMPSTER CR	4945	12327	11	0.88	550	1100	25	11		3800	55%	16.5	0.037	5,856	1,975,166	20	117,120	112,051
2047	DOUGLAS CR	4946	12209	90	5.10	290	3800	25	4	Y	11600	60%	54.9	0.042	22,239	6,005,183	60	444,780	471,514
2048	DOWNTON CR	5035	12207	78	1.80	335	3300	25	16	Y	4700	53%	19.6	0.060	11,252	4,434,253	44	225,040	220,592
2049	DURUISEAU CR	4905	12021	36	0.29	250	1600	25	24		600	45%	2.1	0.210	4,310	3,417,153	34	86,200	74,682
2050	DUTEAU CR	5011	11902	161	0.80	260	2600	25	6.5		1600	45%	5.7	0.101	5,513	2,145,943	21	110,260	100,495
2051	EATON CR	4915	12123	7	0.30	850	2150	25	16	Y	2000	63%	9.9	0.049	4,653	1,799,142	18	93,060	91,594
2052	ELAHO CR	5007	12326	1200	108.00	30	650	25	27		25400	60%	120.2	0.063	72,365	14,558,873	146	1,447,300	1,119,901
2053	FIRE CR	4947	12214	90	5.10	275	3200	25	17	Y	11000	60%	52.0	0.038	19,271	5,066,193	51	385,420	407,545
2054	FISH HATCHERY CR	4936	12238	13.5	1.10	670	1600	25	50	Y	5800	55%	25.1	0.044	10,564	4,109,810	41	211,280	215,651
2055	FITZSIMMONS CR	5006	12257	64	3.20	244	2700	25	4	Y	6100	65%	31.3	0.036	10,794	3,945,371	39	215,880	217,464
2056	FOLEY CR	4908	12133	17	0.85	240	2800	25	14	Y	1600	60%	7.6	0.089	6,520	2,626,352	26	130,400	122,230
2057	FRIES CR	4945	12309	23	1.60	180	1100	25	3		2300	55%	10.0	0.054	5,229	1,644,379	16	104,580	86,596
2058	FURRY CR	4935	12313	52	3.60	230	1600	25	6		6500	57%	29.2	0.034	9,639	3,320,718	33	192,780	190,680
2059	GRAVELL CR	5018	12241	27	1.54	640	2200	25	8	Y	7700	62%	37.6	0.026	9,258	3,316,898	33	185,160	203,340
2060	GRAY CR	4932	12345	52	3.60	95	700	25	8		2700	55%	11.7	0.052	5,889	1,790,300	18	117,780	95,705
2061	HAYLMORE CR	5032	12228	110	2.20	215	2700	25	2.3		3700	52%	15.2	0.057	8,352	3,034,261	30	167,040	154,652
2062	HICKS CR	4911	12121	18	0.81	120	900	25	25	Y	800	63%	4.0	0.117	4,493	3,414,956	34	89,860	77,210
2063	HIGH CR	4955	12352	31	2.20	210	1000	25	21	Y	3600	55%	15.6	0.047	7,115	2,439,207	24	142,300	129,486
2064	HIGH FALLS CR	4956	12318	27	2.00	520	1700	25	5	Y	8100	55%	35.1	0.027	9,285	3,242,691	32	185,700	199,113
2065	HILLS CR	5043	11904	34	0.68	250	1250	25	3		1300	45%	4.6	0.066	2,945	936,321	9	58,900	48,134
2066	HIXON CR	4931	12253	32	2.40	90	800	25	0.5		1700	55%	7.4	0.050	3,572	1,047,146	10	71,440	57,054
2067	HORNET CR (TUNNEL)	4938	12145	39	1.70	341	4100	25	5		4500	55%	19.5	0.056	10,503	4,092,997	41	210,060	205,883
2068	HUMMING BIRD CR	5046	11900	15	0.30	250	750	25	1	Y	600	45%	2.1	0.089	1,831	1,011,137	10	36,620	25,281
2069	HURLEY R (TUNNEL)	5047	12251	378	18.50	180	3800	25	3		26100	52%	107.0	0.062	63,556	15,360,987	154	1,271,120	1,159,419
2070	JOFFRE CR	5018	12235	63	2.50	400	2800	25	16	Y	7800	62%	38.1	0.035	12,958	4,973,498	50	259,160	272,883
2071	KAKILA CR	5007	12232	72	4.10	210	2000	25	10	Y	6700	62%	32.8	0.034	10,747	3,805,890	38	214,940	215,109
2072	KEARY CR	5049	12225	41	0.60	400	2800	25	12		1900	52%	7.8	0.087	6,507	2,638,687	26	130,140	124,064
2073	KOOKIPI CR	4959	12138	120	6.00	335	2700	25	12	Y	15700	60%	74.3	0.031	21,810	5,671,571	57	436,200	484,723
2074	KWOIEK CR	5007	12135	247	7.40	350	3500	25	7		20300	60%	96.0	0.044	40,780	10,815,093	108	815,600	844,246
2075	LAFORGUE CR	4914	12109	14	0.62	300	1200	25	27		1500	60%	7.1	0.076	5,160	2,002,267	20	103,200	95,069
2076	LAKE LOVELY WATER	4948	12313	15	1.10	569	950	25	0.1	Y	4900	60%	23.2	0.025	5,481	1,715,382	17	109,620	112,290
2077	LAKEVIEW CR	4909	12010	40	0.32	550	2900	25	20		1400	45%	5.0	0.110	5,248	2,108,919	21	104,960	97,151
2078	LIVINGSTON & GOWAN CR	4956	12221	116	6.60	250	3600	25	2	Y	12900	60%	61.0	0.039	23,013	6,123,472	61	460,260	489,811
2079	LIZZIE CR	5012	12228	70	4.00	230	2000	25	32	Y	7200	57%	32.4	0.041	12,663	4,709,742	47	253,260	253,412
2080	LOG CR	5001	12138	60	3.00	360	4200	25	13	Y	8500	65%	43.6	0.042	17,716	7,185,423	72	354,320	373,027
2081	LOST CR	4920	12216	30	2.10	90	1000	25	7	Y	1500	55%	6.5	0.068	4,246	1,411,809	14	84,920	70,453
2082	LOST VALLEY CR	5040	12218	94	0.94	350	1050	25	6		2600	52%	10.7	0.049	5,063	1,626,809	16	101,260	87,528
2083	LYNN CR	4921	12301	40	4.00	75	1800	25	0		2300	55%	10.0	0.059	5,711	1,718,411	17	114,220	89,760
2084	MAIMEN CR	4917	12124	9	0.39	610	3150	25	11	Y	1900	60%	9.0	0.055	4,774	1,838,412	18	95,480	92,042
2085	MAMQUAM R	4943	12304	258	22.00	190	825	25	6		32700	57%	146.9	0.038	53,800	7,788,125	78	1,076,000	750,964
2086	MANATEE CR	5042	12338	85	5.50	210	2100	69	78		9000	60%	42.6	0.071	28,959	12,386,732	124	579,180	586,103
2087	MARA CR	5046	11900	23	0.46	250	1000	25	1	Y	900	45%	3.2	0.067	2,073	1,147,311	11	41,460	30,252
2088	MARSHALL CR (TUNNEL)	5051	12230	86	1.10	340	2000	25	0		2900	52%	11.9	0.045	5,172	1,646,836	16	103,440	90,839
2089	MASELPANIK CR	4907	12115	52	2.30	300	2500	25	37	Y	5400	63%	26.8	0.047	12,118	4,721,308	47	242,360	241,804
2090	MAWBY CR	4953	12318	9	0.65	580	1150	25	2		3000	55%	13.0	0.041	5,094	1,672,789	17	101,880	93,368
2091	MCGILLIVARY CR	5037	12226	77	1.20	350	1300	25	1	Y	3300	52%	13.5	0.039	5,132	1,595,984	16	102,640	91,776
2092	MCNAIR CR	4931	12330	18	2.10	180	1600	25	1		3000	55%	13.0	0.048	5,990	1,929,178	19	119,800	104,062
2093	MCNULTY CR	4925	12005	200	1.30	250	1900	25	10		2500	40%	7.9	0.086	6,558	2,315,655	23	131,160	112,852
2094	MEHATL CR	4956	12158	287	14.20	171	1150	25	10	Y	19000	60%	89.9	0.025	21,652	5,081,783	51	433,040	475,543
2095	MISERY CR FALLS	4940	12335	52	4.20	305	4000	25	30	Y	10000	55%	43.4	0.052	21,730	5,955,081	60	434,600	450,210
2096	MONMOUTH CR	4943	12311	8	0.59	470	1000	25	3		2200	55%	9.5	0.055	5,069	1,702,802	17	101,380	88,232
2097	MOWHOKAM CR	5002	12131	118	1.40	100	1000	25	3		1100	50%	4.3	0.088	3,658	1,220,752	12	73,160	58,990
2098	NICOAMEN CR	5016	12124	153	1.50	200	600	25	10		2300	50%	9.1	0.054	4,741	1,423,509	14	94,820	76,273
2099	NOEL CR	5046	12248	98	3.20	50	400	25	2		1300	52%	5.3	0.077	3,935	1,212,658	12	78,700	60,401
2100	NORTH CR	5034	12311	77	4.50	244	2400	25	30	Y	8600	60%	40.7	0.039	15,370	5,894,493	59	307,400	316,213
2101	NORTH SLOQUET CR	4943	12221	32	2.50	213	1300	25	8	Y	4200	60%	19.9	0.034	6,496	2,079,381	21	129,920	121,364
2102	OWL CR	5022	12244	55	3.10	180	1300	25	5	Y	4400	62%	21.5	0.037	7,620	2,564,641	26	152,400	144,024
2103	PAUL CR	4915	12001	106	0.67	120	400	25	1		600	40%	1.9	0.141	2,560	1,625,115	16	51,200	37,806
2104	PEBBLE CR	5038	12324	125	7.10	180	1700	25	36	Y	10000	63%	49.7	0.035	16,688	4,165,106	42	333,760	344,882
2105	PERKETTS CR	4953	12352	27	1.90	340	1000	25	15	Y	5100	55%	22.1	0.036	7,662	2,619,987	26	153,240	149,093
2106	PHAIR CR	5038	12202	45	1.03	300	1700	25	5	Y	2400	53%	10.0	0.056	5,394	1,787,088	18	107,880	92,880
2107	PHELIX CR	5034	12239	40	0.64	330	2000	25	14		1700	55%	7.4	0.070	4,962	1,890,960	19	99,240	91,779
2108	PINECONE CR	4940	12244	20	1.60	700	3000	69	54	Y	8800	55%	38.2	0.052	19,116	8,044,637	80	382,320	401,552
2109	PLACER CR	4911	12034	69	0.69	250	1900	25	25		1400	45%	5.0	0.105	5,013	1,926,151	19	100,260	89,408
2110	POST CR	4905	12128	22	1.10	125	500	25	17		1100	60%	5.2	0.080	4,029	1,426,143	14	80,580	68,041
2111	POTLATCH CR	4935	12319	4	0.43	150	1300	25	1		500	55%	2.2	0.113	2,366	1,508,983	15	47,320	35,331

Table 1. Site Information

Ref No	Stream Name	Lat.	Long.	D.A. (km^2)	Flow (m^3/s)	Head (m)	Penstock L(m)	T.L. (kv)	T.L. Dist. (km)	Cluster potential	Power (kW)	Capacity Factor	'Green' Energy (GWh)	Unit Cost $/kWh	Cost inl. TL ($1000)	Annual Cashflow dur.Constr.	# of Jobs annually	Annual O&M	Annual Taxes
2112	RAFFUSE CR	4943	12303	34.5	2.90	335	3500	25	0.5	Y	7600	57%	34.2	0.037	12,323	4,628,588	46	246,460	254,161
2113	RAINY R	4932	12330	56	7.00	122	1750	25	1.5		6700	55%	29.1	0.042	11,626	4,029,950	40	232,520	220,837
2114	RED CR	4931	12023	110	0.28	260	1250	25	4		600	40%	1.9	0.179	3,264	2,406,062	24	65,280	53,966
2115	RED TUSK CR	4947	12325	33	2.70	213	1800	25	15	Y	4500	62%	22.0	0.039	8,241	2,894,524	29	164,820	158,319
2116	REINECKER CR	5047	11913	48	0.96	100	500	25	4		800	45%	2.8	0.093	2,539	1,485,010	15	50,780	36,479
2117	ROARING CR	4927	12213	20	1.40	200	900	25	25		2200	55%	9.5	0.066	6,070	2,080,946	21	121,400	103,347
2118	ROGERS CR	4959	12227	148	10.00	120	1200	25	7	Y	9400	62%	45.9	0.029	13,040	4,340,083	43	260,800	260,412
2119	RUBBLE CR	4957	12307	56	2.80	730	3000	25	4		16000	60%	75.7	0.028	20,147	5,380,559	54	402,940	469,294
2120	RUTHERFORD CR	5016	12252	122	8.00	400	9000	25	7	Y	25100	62%	122.7	0.073	86,739	24,438,803	244	1,734,780	1,738,563
2121	RYAN CR	5027	12257	240	13.70	90	2500	25	15	Y	9700	62%	47.4	0.045	20,418	7,713,949	77	408,360	403,096
2122	SCUZZZY CR	4949	12128	226	7.90	70	1100	25	3		4300	47%	15.9	0.059	9,114	3,035,687	30	182,280	157,556
2123	SECHELT CR	4940	12333	75	6.00	153	1200	25	0.5	Y	7200	55%	31.2	0.032	9,726	3,132,005	31	194,520	187,484
2124	SHALE CR	4943	12243	18	1.40	425	2100	69	57	Y	4700	55%	20.4	0.078	15,209	6,402,018	64	304,180	300,475
2125	SHULAPS CR	5056	12217	58	0.58	200	1550	25	30		900	52%	3.7	0.153	5,418	4,360,539	44	108,360	96,789
2126	SIGURD CR FALLS	4954	12320	22	1.70	366	800	25	1	Y	4900	55%	21.2	0.029	5,879	1,825,821	18	117,580	114,858
2127	SIWASH CR	4934	12124	66	3.00	200	600	25	30		4700	50%	18.5	0.064	11,338	4,361,584	44	226,760	216,025
2128	SLOQUET CR	4945	12215	176	13.70	61	1600	25	6	Y	6500	60%	30.7	0.047	14,020	4,907,058	49	280,400	258,265
2129	SNOWCAP CR	4956	12225	185	10.50	150	3500	25	7	Y	12300	60%	58.2	0.043	24,266	6,373,804	64	485,320	500,280
2130	SOUTH SLOQUET CR	4944	12219	20	1.60	305	1500	25	2	Y	3800	60%	18.0	0.033	5,633	1,771,198	18	112,660	105,370
2131	SOWERBY CR	4919	12126	30	1.40	425	3400	25	7	Y	4700	63%	23.3	0.043	9,635	3,696,038	37	192,700	193,973
2132	SPUZZUM CR	4939	12126	209	7.30	152	3500	25	1.5		8700	60%	41.2	0.044	17,340	6,636,135	66	346,800	348,698
2133	SQUAKUM CR	5000	12147	36	1.80	640	2900	25	20	Y	9000	60%	42.6	0.031	12,587	4,835,032	48	251,740	275,761
2134	SQUAMISH R	5010	12324	290	26.00	60	1400	25	30	Y	12200	60%	57.7	0.046	25,701	6,399,981	64	514,020	500,434
2135	STAWAMUS CR	4942	12307	33	2.80	223	2650	25	5	Y	4900	55%	21.2	0.047	9,613	3,528,204	35	192,260	185,565
2136	STEVE CR	4941	12243	15	1.20	240	1200	69	53	Y	2300	55%	10.0	0.123	11,769	4,861,773	49	235,380	217,556
2137	STOKKE CR	4943	12202	63	3.60	90	300	25	10	Y	2500	60%	11.8	0.062	7,063	2,379,866	24	141,260	119,607
2138	SWANEE CR	4915	12123	5	0.23	460	1900	25	17	Y	800	60%	3.8	0.093	3,392	2,533,655	25	67,840	58,907
2139	TACHEWANA CR	4957	12150	32	1.60	366	2250	25	0.5	Y	4600	60%	21.8	0.034	7,095	2,443,292	24	141,900	140,054
2140	TANTALUS CR	4951	12315	14	1.10	569	1700	25	10	Y	4900	55%	21.2	0.033	6,738	2,326,037	23	134,760	135,415
2141	TAQUAT CR	4945	12325	38	3.10	305	2000	25	11	Y	7400	62%	36.2	0.036	12,435	4,672,613	47	248,700	257,099
2142	TATLOW & FALK	4958	12330	68	5.10	152	2200	25	16	Y	6100	55%	26.5	0.054	13,713	5,209,094	52	274,260	264,717
2143	TEREPOCKI CR	4923	12216	22	1.50	125	500	25	11	Y	1500	55%	6.5	0.056	3,486	1,089,116	11	69,720	56,917
2144	TEXAS CR	5031	12150	153	2.30	100	800	25	23	Y	1800	50%	7.1	0.091	6,222	2,332,757	23	124,440	109,965
2145	TEXAS CR	5034	12149	170	2.60	150	900	25	18	Y	3100	50%	12.2	0.051	5,965	1,869,247	19	119,300	100,621
2146	THORNHILL CR	4940	12336	15	1.20	459	1250	25	0	Y	4300	55%	18.6	0.034	6,098	2,025,794	20	121,960	118,438
2147	TIPELLA CR	4945	12210	61	3.50	90	300	25	9	Y	2500	60%	11.8	0.045	5,176	1,463,695	15	103,520	81,522
2148	TOMMY CR	5050	12231	68	1.20	300	1800	25	20	Y	2800	52%	11.5	0.055	6,111	2,094,167	21	122,220	108,118
2149	TRETHEWAY CR	4942	12205	83	4.70	213	3100	25	8	Y	7800	60%	36.9	0.048	16,876	6,659,555	67	337,520	341,972
2150	TRUAX CR	5053	12238	50	1.00	200	700	25	18	Y	1600	52%	6.6	0.062	3,936	1,350,685	14	78,720	68,005
2151	TSILEUH CR	4946	12126	29	0.87	700	3900	25	5	Y	4800	47%	17.8	0.047	7,969	2,965,459	30	159,380	158,224
2152	TUWASUS CR	5000	12230	180	10.30	110	4300	25	13		8900	60%	42.1	0.059	24,037	9,699,136	97	480,740	477,468
2153	TWENTYONE MILE CR	5007	12259	57	3.20	370	4000	25	10	Y	9300	60%	44.0	0.042	17,949	7,235,513	72	358,980	378,407
2154	TWIN ONE CR	5015	12230	57	2.30	430	4100	25	1		7700	56%	34.0	0.046	15,110	6,048,413	60	302,200	313,394
2155	TYAUGHTON CR (TUNNEL)	5055	12242	757	9.80	195	2800	25	0		15000	52%	61.5	0.042	24,672	6,418,945	64	493,440	516,046
2156	TZOONIE CR	4947	12343	159	11.00	30	320	25	23	Y	2600	55%	11.3	0.083	9,008	3,018,384	30	180,160	145,579
2157	UNNAMED CR	4935	12220	46	3.20	335	1550	25	14	Y	8400	70%	46.4	0.028	12,550	4,662,015	47	251,000	270,580
2158	UNNAMED CR	4938	12237	28	2.24	300	1400	69	53	Y	5300	55%	23.0	0.067	14,901	6,083,189	61	298,020	292,203
2159	UNNAMED CR	4957	12143	26	1.30	396	2700	25	7	Y	4000	60%	18.9	0.049	8,941	3,405,229	34	178,820	174,876
2160	UNNAMED CR	5049	12303	80	5.00	335	1600	25	19		13100	52%	53.7	0.034	17,793	4,522,858	45	355,860	382,568
2161	UNNAMED CR	4908	12119	20	0.90	245	1500	25	30	Y	1700	63%	8.4	0.075	6,114	2,418,286	24	122,280	114,379
2162	UNNAMED CR	4909	12120	26	1.20	243	2100	25	30	Y	2300	63%	11.4	0.073	8,031	3,049,177	30	160,620	145,783
2163	UNNAMED CR	4912	12120	5.8	0.26	670	2050	25	24	Y	1400	63%	7.0	0.073	4,919	1,963,787	20	98,380	93,060
2164	UNNAMED CR	4915	12115	21	0.93	180	1300	25	25		1300	60%	6.1	0.087	5,180	1,988,594	20	103,600	92,885
2165	UNNAMED CR	4929	12125	11	0.45	425	2600	25	3		1500	60%	7.1	0.057	3,874	1,409,716	14	77,480	71,091
2166	UNNAMED CR	4939	12335	2.3	0.18	793	1800	25	0		1100	57%	4.9	0.051	2,449	804,872	8	48,980	42,402
2167	UNNAMED CR	4940	12151	13	0.65	540	2000	69	55		2700	60%	12.8	0.107	13,135	5,590,549	56	262,700	252,042
2168	UNNAMED CR	4940	12335	1.9	0.15	1037	2400	25	0		1200	60%	5.7	0.052	2,831	996,008	10	56,620	51,458
2169	UNNAMED CR	4941	12316	4.1	0.41	580	1700	25	2.5		1900	55%	8.2	0.046	3,667	1,296,286	13	73,340	68,952
2170	UNNAMED CR	4943	12345	13	1.00	427	1200	25	17		3300	55%	14.3	0.041	5,653	1,878,780	19	113,060	103,901
2171	UNNAMED CR	4944	12332	5.5	0.44	397	700	25	5		1400	55%	6.1	0.050	2,894	940,157	9	57,880	50,094
2172	UNNAMED CR	4945	12331	69	5.50	122	350	25	6	Y	5300	55%	23.0	0.030	6,701	1,841,922	18	134,020	118,566
2173	UNNAMED CR	4945	12343	9	0.72	510	1000	25	18	Y	2900	55%	12.6	0.045	5,466	1,844,984	18	109,320	99,289
2174	UNNAMED CR	4946	12326	7.8	0.62	458	1100	25	14		2200	55%	9.5	0.058	5,307	1,815,823	18	106,140	92,626
2175	UNNAMED CR	4947	12334	19	1.40	457	1200	25	28	Y	5000	55%	21.7	0.051	10,645	4,174,109	42	212,900	212,585
2176	UNNAMED CR	4948	12324	9.4	0.80	793	2700	25	15		5000	55%	21.7	0.043	9,033	3,487,603	35	180,660	184,391
2177	UNNAMED CR	4949	12323	4.7	0.38	793	1150	25	17		2400	55%	10.4	0.053	5,271	1,837,324	18	105,420	95,025
2178	UNNAMED CR	4950	12131	58	2.00	300	2200	25	9	Y	4700	47%	17.4	0.053	8,863	3,252,226	33	177,260	169,312
2179	UNNAMED CR	4955	12348	13	0.88	579	3000	25	25		4000	55%	17.3	0.050	8,305	3,157,082	32	166,100	162,416
2180	UNNAMED CR	4957	12150	58	2.30	366	2400	25	18	Y	6600	47%	24.5	0.049	11,599	4,399,444	44	231,980	230,639
2181	UNNAMED CR	4957	12155	21	1.01	420	2200	25	24	Y	3300	60%	15.6	0.057	8,548	3,281,547	33	170,960	163,408
2182	UNNAMED CR	5001	12321	22	1.80	275	700	25	15		3900	55%	16.9	0.050	8,190	2,983,591	30	163,800	154,684
2183	UNNAMED CR FALLS	4950	12314	14	1.10	240	1200	25	8	Y	2100	55%	9.1	0.060	5,289	1,739,763	17	105,780	88,835
2184	UPPER CHEAKAMUS	5003	12302	263	17.90	61	2600	25	5	Y	8500	63%	42.2	0.051	20,918	7,902,998	79	418,360	401,714
2185	UPPER LILLOOET R	5040	12328	510	30.10	60	220	25	6		14100	60%	66.7	0.025	16,084	3,085,401	31	321,680	310,148
2186	UPPER MAMQUAM R	4943	12301	238	20.30	120	1700	25	8	Y	19100	55%	82.8	0.033	26,163	6,317,346	63	523,260	545,734
2187	UPPER STAVE R	4934	12222	215	15.10	61	750	25	14	Y	7200	70%	39.7	0.036	13,866	4,706,362	47	277,320	261,420
2188	URE CR	5016	12235	119	6.80	275	2050	25	5	Y	14600	60%	69.1	0.029	18,984	4,747,372	47	379,680	418,060
2189	UZTLIUS CR	4947	12122	140	4.80	90	1500	25	17		3400	47%	12.6	0.072	8,744	3,062,038	31	174,880	151,697
2190	VANCOUVER CR	4956	12348	108	7.60	91	1300	25	25	Y	5400	55%	23.4	0.056	12,601	4,584,833	46	252,020	232,934
2191	VICKERS CR	4931	12234	30	2.40	120	1500	25	43	Y	2300	55%	10.0	0.097	9,322	3,563,052	36	186,440	165,293
2192	WHITECAP CR	5043	12218	73	0.73	200	950	25	1		1100	52%	4.5	0.067	2,924	936,326	9	58,480	47,393
2193	WILLIS CR	4925	12025	120	0.60	150	1200	25	9		700	45%	2.5	0.143	3,411	2,441,961	24	68,220	55,531
2194	WRAY CR	4920	12118	18	0.83	305	2000	25	12		2000	60%	9.5	0.057	5,180	1,953,878	20	103,600	97,653
2195	ZENITH CR	4952	12316	1.5	0.11	1159	2800	25	15	Y	1000	60%	4.7	0.096	4,390	1,775,717	18	87,800	81,804
4001	ADOLPH CR #1	5231	11923	80	2.80	213	3400	25	29		4700	50%	18.5	0.084	14,983	6,146,325	61	299,660	290,299
4002	ADOLPH CR #2	5231	11924	78	2.70	61	700	25	29		1300	50%	5.1	0.144	7,086	2,774,688	28	141,720	124,413
4003	ALLAN CR	5232	11907	122	4.30	91	1900	25	12		3100	50%	12.2	0.074	8,715	3,093,464	31	174,300	151,717
4004	ARCHIE CR	5226	12047	25	0.80	210	2200	138	115	Y	1300	44%	4.5	0.701	30,419	14,256,359	143	608,380	592,105

Table 1. Site Information

Ref No	Stream Name	Lat.	Long.	D.A. (km^2)	Flow (m^3/s)	Head (m)	Penstock L(m)	T.L. (kv)	T.L. Dist. (km)	Cluster potential	Power (kW)	Capacity Factor	'Green' Energy (GWh)	Unit Cost $/kWh	Cost inl. TL ($1000)	Annual Cashflow dur.Constr.	# of Jobs annually	Annual O&M	Annual Taxes
4005	BILL MINER CR	5234	12034	47	2.02	360	1800	138	140	Y	5700	44%	19.8	0.234	44,599	20,502,987	205	891,980	880,771
4006	BLUE R	5204	11926	42	1.47	60	400	25	8	Y	700	50%	2.8	0.175	4,651	3,486,597	35	93,020	77,573
4007	BOBBIE BURNS CR	5101	11652	170	3.54	60	900	25	30		1700	52%	7.0	0.098	6,559	2,426,294	24	131,180	113,184
4008	BOULDERY CR	5231	12039	130	5.58	300	1800	138	125	Y	13100	44%	45.4	0.105	45,785	13,544,532	135	915,700	926,492
4009	BULLDOG CR	5239	11859	104	3.60	152	875	25	26		4300	50%	17.0	0.076	12,351	4,830,752	48	247,020	232,640
4010	CAMP CR	5239	11911	74	2.60	91	1100	25	2		1900	50%	7.5	0.065	4,662	1,541,588	15	93,240	78,394
4011	CARIBOU CR	5110	11711	43	1.72	122	1400	69	70		1600	52%	6.6	0.230	14,536	6,433,187	64	290,720	276,021
4012	CHUA CHUA CR	5121	12007	104	0.50	450	1900	25	2		1800	43%	6.1	0.064	3,740	1,317,744	13	74,800	67,299
4013	CLEARWATER RAPID-2	5141	12002		225.00	10	1800	25	3		17600	44%	61.1	0.240	140,850	41,159,169	412	2,817,000	2,692,273
4014	CLEARWATER RAPID-3	5139	12004		227.00	5	1000	25	1		8900	44%	30.9	0.345	102,524	44,810,103	448	2,050,480	1,926,789
4015	CLEMINA CR	5234	11905	70	2.50	152	1300	25	10		3000	50%	11.8	0.056	6,381	2,086,074	21	127,620	109,111
4016	CUPOLA CR	5130	11731	70	1.46	150	1000	25	45		1700	52%	7.0	0.107	7,153	2,861,543	29	143,060	130,871
4017	DAVE HENRY CR #1	5246	11904	92	3.20	61	850	25	15	Y	1500	50%	5.9	0.100	5,674	2,043,578	20	113,480	95,898
4018	DAVE HENRY CR #2	5245	11905	99	3.50	91	550	25	11	Y	2500	50%	9.9	0.068	6,493	2,105,600	21	129,860	106,127
4019	DEADMAN R @ FALLS	5109	12051		0.60	120	500	25	24		600	43%	2.0	0.182	3,564	2,599,974	26	71,280	57,587
4020	DECEPTION CR	5206	12029	39	1.20	60	500	25	42	Y	600	44%	2.1	0.539	10,802	9,512,962	95	216,040	200,922
4021	DOMINION CR	5227	11907	60	2.10	180	1500	25	1	Y	3000	50%	11.8	0.053	6,078	1,971,578	20	121,560	104,600
4022	DOUBLE EDDY CR	5150	11750	35	0.73	150	1100	138	113	Y	900	52%	3.7	0.794	28,216	26,446,714	264	564,320	547,078
4023	FINN CR	5156	11919	107	3.75	120	1000	25	1		3500	50%	13.8	0.047	6,182	1,875,854	19	123,640	104,387
4024	FROTH CR	5201	11920	38	1.33	150	400	25	0.5	Y	1600	50%	6.3	0.045	2,718	724,284	7	54,360	42,175
4025	GHITA CR	5251	11839	76	2.70	306	2750	25	31	Y	6500	50%	25.6	0.058	14,415	5,725,790	57	288,300	286,315
4026	GLENOGLE CR	5117	11649	98	2.04	30	300	25	11		500	52%	2.0	0.157	3,091	1,956,201	20	61,820	44,231
4027	GRANT BROOK	5254	11845	111	3.90	152	1500	25	21	Y	4600	50%	18.1	0.057	9,973	3,640,797	36	199,460	185,539
4028	HELLROAR CR	5212	11913	65	2.28	90	700	25	1.5	Y	1600	50%	6.3	0.064	3,877	1,213,665	12	77,540	62,506
4029	HOLT CR	5120	11710	42	0.80	92	1100	25	3		600	52%	2.5	0.147	3,478	2,476,155	25	69,560	56,040
4030	HOWARD CR	5222	11845	55	1.93	90	700	69	100		1400	50%	5.5	0.670	35,600	16,652,199	167	712,000	697,683
4031	ISAIAH CR	5249	12056	43	1.85	180	2300	138	172	Y	2600	44%	9.0	0.532	46,222	21,506,304	215	924,440	897,848
4032	JUMPING CR	5111	11745	50	2.00	150	1300	25	40		2300	52%	9.4	0.086	7,837	2,881,206	29	156,740	136,449
4033	KIMMEL CR	5243	11925	47.5	1.70	91	820	25	10		1200	50%	4.7	0.130	5,927	2,290,216	23	118,540	104,037
4034	KIRBYVILLE CR	5139	11839	80	2.80	60	1000	25	27	Y	1300	50%	5.1	0.235	11,604	4,965,204	50	232,080	215,594
4035	LIBERTY CR	5134	11835	39	1.37	150	1300	25	17	Y	1600	50%	6.3	0.137	8,328	3,447,191	34	166,560	154,986
4036	LYNEX CR	5236	12040	60	2.58	120	1300	138	150	Y	2400	44%	8.3	0.550	44,108	20,434,942	204	882,160	853,806
4037	MAMMOTH CR	5147	11908	40	1.40	90	1200	25	30	Y	1000	50%	3.9	0.153	5,797	2,268,847	23	115,940	101,081
4038	MCLENNAN R	5250	11920	139	4.90	30	800	25	4	Y	1200	50%	4.7	0.124	5,625	1,970,613	20	112,500	90,910
4039	MCLENNAN R @ N.ARM	5251	11921	95	3.30	61	1250	25	5.5	Y	1600	50%	6.3	0.104	6,313	2,331,019	23	126,260	108,875
4040	MCLENNAN R @ S.ARM	5251	11921	40	1.40	244	1450	25	6	Y	2700	50%	10.6	0.059	6,021	2,029,635	20	120,420	104,614
4041	MILEDGE CR	5217	11911	65	2.28	120	900	25	1.5	Y	2100	50%	8.3	0.061	4,865	1,429,373	14	97,300	75,247
4042	MOLSON CR	5210	11825	50	1.75	180	2200	69	70	Y	2500	50%	9.9	0.217	20,635	9,097,575	91	412,700	393,381
4045	MOLYBDENITE	5211	12056	37	0.89	180	2800	25	2.5		1300	44%	4.5	0.132	5,729	2,255,150	23	114,580	102,905
4046	MOONBEAM CR	5227	11907	46	1.61	90	900	25	1	Y	1100	50%	4.3	0.080	3,356	1,061,848	11	67,120	52,435
4047	MOOSE R	5255	11848	464	16.00	61	550	25	15	Y	7600	50%	30.0	0.047	13,581	4,496,946	45	271,620	243,934
4048	NORTH BLUE R	5204	11926	100	3.50	60	900	25	8	Y	1600	50%	6.3	0.081	4,912	1,648,418	16	98,240	80,409
4049	OLDMAN CR	5129	11715	24	0.50	123	1200	25	5		500	52%	2.0	0.171	3,373	2,463,276	25	67,460	54,946
4050	PACKSADDLE CR	5248	11908	46	1.60	122	1250	25	7.5		1500	50%	5.9	0.088	5,001	1,821,423	18	100,020	86,867
4051	PALMER CR	5141	11743	112	2.33	90	1000	69	80	Y	1600	52%	6.6	0.249	15,710	6,957,795	70	314,200	297,285
4052	PTARMIGAN CR	5235	11850	272	9.50	61	1600	25	40		4500	50%	17.7	0.088	15,008	5,817,497	58	300,160	274,804
4053	ROARING R	5241	12051	148	6.35	240	4000	138	170	Y	11900	44%	41.3	0.163	64,597	19,632,355	196	1,291,940	1,293,956
4054	SERPENTINE CR	5223	11909	58	2.03	240	1800	25	1	Y	3800	50%	15.0	0.050	7,236	2,503,767	25	144,720	132,769
4055	SOARDS CR	5202	11836	152	5.32	60	800	25	5	Y	2500	50%	9.9	0.066	6,297	1,916,375	19	125,940	98,423
4056	SUNSET CR	5139	11909	60	2.10	90	1000	25	30		1500	50%	5.9	0.174	9,900	4,157,176	42	198,000	183,404
4057	SWAN CR	5150	11749	40	0.83	152	1500	69	93	Y	1000	52%	4.1	0.417	16,461	7,499,956	75	329,220	314,490
4058	SWIFT CR #1	5252	11913	110	3.30	91	1325	25	5	Y	2400	50%	9.5	0.080	7,283	2,504,976	25	145,660	122,156
4059	SWIFT CR #2	5251	11916	126	3.70	61	1425	25	0.9	Y	1800	50%	7.1	0.085	5,777	2,028,702	20	115,540	97,935
4060	UNNAMED CR	5203	12027	6	0.19	360	1900	25	38	Y	500	44%	1.7	0.567	9,467	8,493,185	85	189,340	179,118
4061	UNNAMED CR	5205	12027	7	0.22	300	1000	25	41	Y	500	44%	1.7	0.551	9,196	8,213,747	82	183,920	173,221
4062	UNNAMED CR	5234	12058	26	1.12	240	1800	138	180	Y	2100	44%	7.3	0.673	47,237	22,102,997	221	944,740	918,443
4063	UNNAMED CR	5254	11846	71	2.50	152	520	25	24	Y	3000	50%	11.8	0.058	6,551	2,168,571	22	131,020	112,151
4064	UNNAMED CR	5256	11853	75	2.60	366	1420	25	11	Y	7500	50%	29.6	0.036	10,327	3,696,319	37	206,540	209,986
4065	WATT CR	5244	12046	62	2.66	270	2400	138	180	Y	5600	44%	19.4	0.289	54,093	25,048,074	250	1,081,860	1,065,622
4066	WOOD R	5220	11757	200	6.00	170	1300	138	140		8000	50%	31.5	0.188	57,018	26,032,818	260	1,140,360	1,130,941
4067	YELLOWJACKET CR	5243	11903	94	3.30	61	400	25	17		1600	50%	6.3	0.078	4,757	1,575,727	16	95,140	77,133
5001	ABBOTT CR	5234	12111	46	1.97	300	2100	138	110		4600	45%	16.3	0.217	34,061	15,493,479	155	681,220	667,640
5002	BEAVER CR @ FALLS	5241	12206	1200	3.00	30	500	25	18		700	43%	2.4	0.211	4,811	3,481,767	35	96,220	76,792
5003	BLACKBEAR CR	5237	12128	26	1.12	150	1600	69	75		1300	45%	4.6	0.340	15,088	6,778,773	68	301,760	287,064
5004	CHAPMAN CR	5102	12335	23	0.69	180	600	138	150	Y	1000	45%	3.5	1.102	37,632	17,792,148	178	752,640	734,082
5005	CHESHI CR	5128	12422	40	0.80	90	450	25	22		600	45%	2.1	0.220	4,517	3,481,303	35	90,340	76,072
5006	COLWELL CR	5150	12525	233	4.50	80	900	25	27	Y	2800	50%	11.0	0.131	13,934	5,641,616	56	278,680	255,039
5007	FALLS R	5108	12334	102	3.06	180	1000	138	135	Y	4300	45%	15.3	0.255	37,464	17,063,221	171	749,280	728,603
5008	GILMAN CR	5118	12450	9	0.35	570	1500	69	60	Y	1600	50%	6.3	0.257	15,634	7,133,140	71	312,680	305,438
5009	GRAIN CR	5237	12106	95	4.08	120	1900	138	120	Y	3800	45%	13.5	0.279	36,222	16,420,497	164	724,440	699,621
5010	GUN CR (TUNNEL)	5151	12230	480	11.50	290	4600	25	0		26100	52%	107.0	0.059	60,953	15,276,861	153	1,219,060	1,154,253
5011	HELL RAVING CR	5140	12458	100	1.00	120	800	25	18	Y	900	45%	3.2	0.243	7,461	6,255,687	63	149,220	136,030
5012	JAMISON CR	5132	12426	63	0.60	390	3400	25	15		1800	45%	6.4	0.149	9,171	3,940,001	39	183,420	176,315
5013	KLINAKLINI CR	5152	12456	98	2.50	60	650	25	11		1200	45%	4.3	0.160	6,549	2,534,863	25	130,980	113,697
5014	MACKIN CR	5222	12223	480	0.50	330	2800	25	2		1300	45%	4.6	0.074	3,271	1,119,895	11	65,420	55,799
5015	MAYDOE CR	5208	12516	45	0.63	210	3300	25	35		1000	60%	4.7	0.149	6,793	2,834,796	28	135,860	125,301
5016	MCCLINCHY CR	5207	12510	208	3.10	30	800	25	33		700	60%	3.3	0.251	7,999	6,576,174	66	159,980	141,708
5017	MOREHEAD CR	5239	12148	140	6.01	90	1000	69	55		4200	45%	14.9	0.111	15,949	6,446,926	64	318,980	295,052
5018	MOSLEY CR	5119	12451	1650	66.00	91	2000	138	310		47000	50%	185.3	0.104	186,349	50,556,981	506	3,726,980	4,185,566
5019	NUDE CR FALLS	5123	12445	186	7.40	61	1400	69	71		3500	50%	13.8	0.266	35,371	15,864,366	159	707,420	682,361
5020	PUNTZI CR	5212	12405	495	4.10	90	2000	25	1		2900	50%	11.4	0.081	8,916	3,217,764	32	178,320	155,688
5021	QUARTZ CR	5136	12458	28.5	0.29	300	1700	25	25	Y	700	45%	2.5	0.370	8,857	7,820,049	78	177,140	166,947
5022	RASMUSSEN CR	5116	12455	18	0.72	180	600	69	65	Y	1000	50%	3.9	0.455	17,260	7,902,666	79	345,200	332,648
5023	RAZOR CR	5142	12445	76	0.76	210	1800	25	11	Y	1200	45%	4.3	0.160	6,542	2,680,997	27	130,840	119,776
5024	RELIANCE CR	5123	12441	42	1.70	90	350	25	50		1200	50%	4.7	0.213	9,719	4,129,688	41	194,380	179,439
5025	SELLER CR	5241	12125	77	3.30	60	1200	69	81		1600	45%	5.7	0.311	16,994	7,513,417	75	339,880	319,428

Table 1. Site Information

Ref No	Stream Name	Lat.	Long.	D.A. (km²)	Flow (m³/s)	Head (m)	Penstock L(m)	T.L. (kv)	T.L. Dist. (km)	Cluster potential	Power (kW)	Capacity Factor	'Green' Energy (GWh)	Unit Cost $/kWh	Cost inl. TL ($1000)	Annual Cashflow dur.Constr.	# of Jobs annually	Annual O&M	Annual Taxes
5026	STIKELAN CR #1	5128	12424	190	4.80	30	450	25	22		1100	45%	3.9	0.166	6,221	2,291,382	23	124,420	102,547
5027	STIKELAN CR #2	5127	12422	107	2.70	90	900	25	25		1900	45%	6.7	0.112	7,271	2,805,899	28	145,420	129,570
5028	UNNAMED CR	5119	12449	9.5	0.37	180	700	69	62		500	50%	2.0	0.795	15,080	13,873,852	139	301,600	288,873
5029	UNNAMED CR	5126	12357	29	0.58	120	1500	69	75		500	45%	1.8	0.816	13,936	12,715,123	127	278,720	263,839
5030	UNNAMED CR	5126	12445	27	1.10	330	1400	69	60		2800	50%	11.0	0.189	20,091	8,894,631	89	401,820	387,760
5031	UNNAMED CR	5144	12427	43	0.40	450	3900	25	1		1400	45%	5.0	0.093	4,447	1,704,284	17	88,940	80,850
5032	UNNAMED CR	5151	12521	67	1.67	140	1100	25	27	Y	1800	50%	7.1	0.169	11,537	4,964,102	50	230,740	219,317
5033	UNNAMED CR	5241	12138	45	1.93	90	1400	69	71	Y	1400	45%	5.0	0.327	15,662	6,973,540	70	313,240	296,103
5034	UNNAMED CR	5241	12145	90	3.86	75	1200	69	60	Y	2300	45%	8.2	0.269	21,113	9,194,996	92	422,260	395,547
5035	VALLEAU CR	5144	12443	120	1.20	90	1050	25	1.5		800	45%	2.8	0.114	3,124	2,033,860	20	62,480	47,965
6001	CACOOHTIN CR	5226	12620	45	1.70	210	1200	25	2		2800	65%	14.3	0.041	5,614	1,796,310	18	112,280	99,204
6002	CHRISTENSON CR	5228	12641	40	2.80	90	1400	25	12		2000	65%	10.2	0.092	9,117	3,684,541	37	182,340	170,465
6003	CLAYTON FALLS CR	5222	12649	83	6.60	60	700	25	0	Y	3100	65%	15.9	0.047	7,141	2,221,070	22	142,820	119,559
6004	CRAG CR	5244	12626	87	6.09	90	1500	138	145		4300	65%	22.0	0.356	75,463	35,322,951	353	1,509,260	1,494,352
6005	GYLLENSPETZ CR	5212	12602	142	4.26	120	1000	69	65		4000	65%	20.5	0.132	26,049	11,456,555	115	520,980	508,001
6006	HUMPBACK CR	5245	12655	44	3.08	60	700	69	90	Y	1400	65%	7.2	0.507	34,993	16,295,841	163	699,860	685,134
6007	JUMP ACROSS CR #1	5232	12655	73	5.11	120	1450	69	94	Y	4800	65%	24.6	0.186	44,109	20,119,715	201	882,180	873,774
6008	JUMP ACROSS CR #2	5237	12657	103	7.21	90	1050	69	84	Y	5100	65%	26.1	0.161	40,553	18,199,434	182	811,060	797,079
6009	KALONE CR	5243	12642	34	2.38	90	1100	138	130	Y	1700	65%	8.7	0.721	60,438	28,651,698	287	1,208,760	1,195,366
6010	MILL CR (UNNAMED)	5224	12634	13	1.10	638	2200	25	1.5		5500	65%	28.2	0.025	6,805	2,299,804	23	136,100	143,821
6011	NECLEETSCONNAY R	5235	12625	19	1.21	210	1500	25	32	Y	2000	65%	10.2	0.133	13,109	5,755,590	58	262,180	256,061
6012	NIEUMIAMUS CR	5225	12651	42	3.60	60	1450	25	10		1700	65%	8.7	0.087	7,324	2,797,644	28	146,480	130,998
6013	NOEICK R	5206	12634	232	14.00	120	1600	69	56		13200	65%	67.6	0.045	29,227	7,807,544	78	584,540	599,714
6014	NOOKLIKONNIK CR	5222	12634	31	1.70	360	2500	25	2		4800	65%	24.6	0.037	8,657	3,180,311	32	173,140	174,303
6015	NOOMST CR #1	5223	12615	53	1.30	420	2950	25	7		4300	65%	22.0	0.041	8,603	3,226,393	32	172,060	171,699
6016	NOOSESECK R	5227	12658	50	4.00	150	800	25	35		4700	65%	24.1	0.105	24,393	10,625,502	106	487,860	482,223
6017	NOOSGULCH CR	5227	12623	135	8.40	30	700	25	1		2000	65%	10.2	0.068	6,731	2,282,801	23	134,620	112,461
6018	NORDSCHOW CR	5218	12603	96	2.90	183	1500	25	20		4200	65%	21.5	0.052	10,770	4,119,588	41	215,400	207,616
6019	SALLOOMT CR	5227	12634	130	8.60	30	850	25	7		2000	65%	10.2	0.082	8,140	2,967,026	30	162,800	140,756
6020	SMITELY R #1	5208	12638	213	15.00	60	400	69	61	Y	7000	65%	35.9	0.060	20,571	7,987,810	80	411,420	390,212
6021	SMITELY R #2	5215	12634	18	1.26	150	800	69	86	Y	1500	65%	7.7	0.286	21,192	9,708,220	97	423,840	412,189
6022	SMITELY R @ FALLS	5205	12636	265	18.60	30	400	69	56	Y	4400	65%	22.5	0.084	18,228	7,112,778	71	364,560	331,309
6023	SNOOTLI CR	5223	12636	34	2.20	150	1300	25	1	Y	2600	65%	13.3	0.042	5,438	1,676,386	17	108,760	92,491
6024	SWALLOP CR	5240	12658	170	11.90	30	700	69	80	Y	2800	65%	14.3	0.273	37,756	16,928,401	169	755,120	724,275
6025	TASTSQUAN CR	5222	12645	26	1.90	90	250	25	0.5		1300	65%	6.7	0.043	2,735	718,691	7	54,700	41,274
6026	THORSEN CR	5222	12642	80	6.10	80	1300	25	1	Y	3800	65%	19.5	0.044	8,186	2,701,653	27	163,720	145,657
6027	TSEAPSEAHOOLZ CR	5227	12625	25	1.30	270	1900	25	0.5		2700	65%	13.8	0.046	6,075	2,070,869	21	121,500	109,792
6028	TSINI-TSINI CR	5222	12606	39	1.20	213	1450	25	12		2000	65%	10.2	0.055	5,475	2,052,125	21	109,500	102,557
6029	UNNAMED CR	5202	12623	24	1.44	60	600	69	71		700	65%	3.6	0.506	17,471	15,932,683	159	349,420	333,557
6030	UNNAMED CR	5203	12632	78	4.70	210	1300	25	16		7700	65%	39.5	0.069	26,244	11,213,912	112	524,880	533,519
6031	UNNAMED CR	5206	12648	14	0.98	150	1200	69	63		1200	65%	6.1	0.213	12,611	5,593,619	56	252,220	239,681
6032	UNNAMED CR	5209	12653	25	1.72	210	1400	69	77		2800	65%	14.3	0.173	23,888	10,667,358	107	477,760	463,984
6033	UNNAMED CR	5210	12650	46	3.20	180	1000	25	31		4500	65%	23.1	0.041	9,068	3,256,358	33	181,360	174,026
6034	UNNAMED CR	5211	12649	42	2.90	390	3200	25	31		8900	65%	45.6	0.040	17,642	7,141,004	71	352,840	374,180
6035	UNNAMED CR	5221	12627	20	1.15	120	1200	25	5		1100	65%	5.6	0.067	3,657	1,240,771	12	73,140	61,114
6036	UNNAMED CR	5221	12639	9	0.68	240	1200	25	1		1300	65%	6.7	0.046	2,957	938,337	9	59,140	50,398
6037	UNNAMED CR	5232	12656	27	1.87	90	800	69	94	Y	1300	65%	6.7	0.556	35,654	16,699,048	167	713,080	700,807
6038	UNNAMED CR	5232	12641	42	2.94	90	900	25	23	Y	2100	65%	10.8	0.116	12,000	4,841,922	48	240,000	219,180
6039	UNNAMED CR	5237	12656	37	2.59	180	1000	69	84	Y	3700	65%	19.0	0.200	36,512	16,667,413	167	730,240	721,080
6040	UNNAMED CR	5243	12640	37	2.59	150	1600	138	140	Y	3000	65%	15.4	0.463	68,489	32,232,909	322	1,369,780	1,354,855
6041	UNNAMED CR	5245	12641	21	1.47	120	1300	138	135	Y	1400	65%	7.2	0.888	61,350	29,191,143	292	1,227,000	1,214,738
7001	BERNICE CR	5309	12009	18	0.70	305	1100	25	15		1700	50%	6.7	0.063	4,061	1,445,752	14	81,220	72,536
7002	BOUNDING CR	5328	12039	16	0.50	153	1200	25	15		600	50%	2.4	0.175	3,974	3,031,023	30	79,480	67,147
7003	CARROLE FALLS	5358	12351	264	1.70	60	400	25	1.5		800	40%	2.5	0.122	2,956	1,786,034	18	59,120	42,484
7004	CENTENNIAL CR	5340	12030	44	1.50	60	400	25	25		700	50%	2.8	0.290	7,702	6,448,898	64	154,040	138,713
7005	CLYDE CR #1	5323	12022	30	1.10	183	2250	25	8		1600	50%	6.3	0.086	5,211	1,959,413	20	104,220	93,347
7006	CLYDE CR #2	5323	12022	30	1.10	91	900	25	8		800	50%	3.2	0.118	3,593	2,490,884	25	71,860	57,616
7007	DORE CR #1	5316	12017	178	6.80	92	1600	25	7	Y	4900	50%	19.3	0.053	9,810	3,372,512	34	196,200	177,031
7008	DORE CR #2	5313	12017	137	5.20	91	1500	25	17	Y	3700	50%	14.6	0.072	10,133	3,697,062	37	202,660	181,208
7009	DORE CR #3	5312	12027	23	0.90	183	1400	25	20	Y	1300	50%	5.1	0.135	6,645	2,701,259	27	132,900	121,610
7010	EAST TWIN CR	5328	12023	112	3.90	61	300	25	15		1900	50%	7.5	0.072	5,198	1,726,915	17	103,960	85,740
7011	EDDY CR	5314	12007	20	0.70	274	1500	25	6		1500	50%	5.9	0.063	3,606	1,238,751	12	72,120	62,669
7012	FLEET CR	5330	12027	58	2.00	91	1500	25	25		1400	50%	5.5	0.115	6,096	2,331,344	23	121,920	106,836
7013	FORGETMENOT CR	5342	12025	360	14.40	30	250	25	25		3400	50%	13.4	0.116	15,013	5,759,505	58	300,260	264,521
7014	HELLROARING CR	5340	12034	55	2.10	263	2700	25	13		4300	50%	17.0	0.070	11,405	4,497,260	45	228,100	219,131
7015	HIXON CR	5327	12234	63	0.40	151	2900	25	1		500	50%	2.0	0.149	2,819	1,950,050	20	56,380	44,301
7016	HOLLIDAY CR	5311	11953	52	1.80	91	1400	25	28		1300	50%	5.1	0.130	6,415	2,506,721	25	128,300	113,294
7017	HORSEY CR	5308	11941	168	5.90	122	2050	25	14		5600	50%	22.1	0.061	12,978	4,844,558	48	259,560	243,348
7018	LEGRAND	5325	12023	13	0.50	152	1100	25	11		600	50%	2.4	0.136	3,097	2,179,133	22	61,940	49,540
7019	MCINTOSH CR	5321	12020	33	1.20	92	800	25	5		900	50%	3.5	0.097	3,301	2,163,527	22	66,020	51,645
7020	PANTAGE CR	5317	12307	396	1.25	120	1050	25	38		1200	50%	4.7	0.132	6,007	2,362,622	24	120,140	106,265
7021	ROBSON R	5303	11913	175	6.10	61	1050	25	2.5		2900	50%	11.4	0.066	7,297	2,334,986	23	145,940	118,922
7022	SMALL CR	5304	11935	261	9.10	61	1400	25	7		4300	50%	17.0	0.072	11,774	4,280,159	43	235,480	210,267
7023	SNOWSHOE CR	5332	12046	32	1.30	152	1400	25	8		1500	50%	5.9	0.087	4,953	1,827,164	18	99,060	87,091
7024	SWIFTCURRENT CR	5301	11917	165	5.80	61	800	25	0.5		2800	50%	11.0	0.063	6,680	2,052,830	21	133,600	106,487
7025	UNNAMED CR	5306	12011	155	6.00	120	1500	25	20		5600	50%	22.1	0.051	10,903	3,831,148	38	218,060	201,022
7026	UNNAMED CR	5327	12012	31	1.10	213	1800	25	15		1800	50%	7.1	0.109	7,458	3,040,525	30	149,160	139,632
7027	UNNAMED CR	5307	12001	27	0.90	366	1200	25	16		2600	50%	10.2	0.090	8,856	3,473,737	35	177,120	163,655
7028	UNNAMED CR	5310	12001	13	0.50	549	1700	25	11		2100	50%	8.3	0.083	6,616	2,479,257	25	132,320	118,657
7029	UNNAMED CR	5321	11951	36	1.30	274	2000	25	32		2800	50%	11.0	0.143	15,183	6,484,644	65	303,660	289,969
7030	WALLOP CR	5343	12025	30	1.20	335	2250	25	25		3100	50%	12.2	0.109	12,868	5,362,065	54	257,360	245,726
8001	ALICE CR	5440	12847	36	1.90	92	1200	25	1		1400	60%	6.6	0.062	3,963	1,298,064	13	79,260	65,667
8002	ANDERSON CR	5402	12843	31	2.60	61	900	25	1.5		1200	60%	5.7	0.070	3,805	1,205,386	12	76,100	60,126
8003	ATLIN CR	5403	12557	135	2.03	30	500	25	1		500	43%	1.7	0.178	2,912	1,781,414	18	58,240	40,508
8004	ATNA LAKE	5401	12746	63	2.39	35	200	25	45	Y	700	55%	3.0	0.355	10,372	8,919,004	89	207,440	189,817
8005	AUGIER/BABINE LAKE	5427	12536	800	12.00	180	4100	25	35		16900	43%	57.3	0.067	37,116	4,536,890	45	742,320	399,833
8006	BOLTON CR	5413	12826	62	4.80	61	1050	25	18		2300	60%	10.9	0.091	9,501	3,512,327	35	190,020	164,822
8007	BOWBYES CR	5409	12842	18	1.40	122	800	25	8		1300	60%	6.1	0.070	4,170	1,454,648	15	83,400	71,149

Table 1. Site Information

Ref No	Stream Name	Lat.	Long.	D.A. (km^2)	Flow (m^3/s)	Head (m)	Penstock L(m)	T.L. (kv)	T.L. Dist. (km)	Cluster potential	Power (kW)	Capacity Factor	'Green' Energy (GWh)	Unit Cost $/kWh	Cost inl. TL ($1000)	Annual Cashflow dur.Constr.	# of Jobs annually	Annual O&M	Annual Taxes
8008	BUCK CR	5420	12637	160	3.70	50	900	25	2.3		1400	50%	5.5	0.089	4,742	1,580,038	16	94,840	76,217
8009	CHIMDEMASH CR	5440	12822	80	4.50	30	300	25	0		1100	60%	5.2	0.077	3,877	1,153,354	12	77,540	57,169
8010	CHIST CR #1	5419	12824	64	3.40	31	700	25	13	Y	800	60%	3.8	0.202	7,355	5,891,165	59	147,100	128,855
8011	CHIST CR #2	5419	12818	49	2.70	61	975	25	16	Y	1300	60%	6.1	0.145	8,562	3,491,086	35	171,240	155,641
8012	COLDWATER CR	5420	12840	49	2.80	91	1825	25	7.5		2000	60%	9.5	0.084	7,647	2,972,911	30	152,940	140,170
8013	DAHL CR	5409	12843	33	2.40	91	600	25	10		1700	60%	8.0	0.058	4,483	1,490,941	15	89,660	75,944
8014	DASQUE CR	5423	12855	70	3.70	61	920	25	16		1800	60%	8.5	0.100	8,219	3,214,021	32	164,380	148,292
8015	DOCKRILL CR	5428	12650	86	1.99	30	300	25	6.5		500	50%	2.0	0.155	2,937	1,806,195	18	58,740	41,155
8016	DOUGLAS CR	5450	12845	39	2.34	90	1300	25	5	Y	1600	60%	7.6	0.064	4,689	1,607,918	16	93,780	80,115
8017	EIGHT MILE CR	5430	12821	33	1.85	90	500	25	1		1300	60%	6.1	0.050	2,986	840,603	8	59,720	45,801
8018	ERLANDSEN CR	5436	12844	60	4.00	61	1500	25	9		1900	60%	9.0	0.074	6,443	2,331,121	23	128,860	112,595
8019	EXISTING DAMS @ FULTON R	5449	12613	1370	27.40	50	2000	25	3		10700	50%	42.2	0.061	24,662	6,130,291	61	493,240	463,091
8020	FLINT CR	5457	12823	20	1.20	120	500	25	1		1100	60%	5.2	0.052	2,618	737,051	7	52,360	39,822
8021	GOAT CR	5443	12846	31	1.70	91	675	25	4		1200	60%	5.7	0.060	3,256	993,532	10	65,120	51,243
8022	HADENSCHILD CR	5457	12855	20	1.20	90	700	25	0.5		800	60%	3.8	0.070	2,551	1,476,893	15	51,020	37,388
8023	HAMPSON CR	5448	12829	47	2.82	90	750	25	12		2000	60%	9.5	0.066	6,051	2,196,399	22	121,020	107,742
8024	HANKIN CR	5435	12826	17	1.00	91	950	25	1		700	60%	3.3	0.125	4,001	2,933,942	29	80,020	66,846
8025	HARDSCRABBLE CR	5442	12820	55	2.90	61	350	25	8		1400	60%	6.6	0.081	5,135	1,804,132	18	102,700	86,523
8026	HATCHERY CR	5422	12832	30	1.65	60	450	25	0.5		800	60%	3.8	0.070	2,559	1,400,380	14	51,180	35,797
8027	HOULT CR	5411	12808	50	4.05	30	300	25	25		1000	60%	4.7	0.217	9,892	4,105,447	41	197,840	178,440
8028	HOUSTON TOMMY CR	5417	12653	230	5.32	21	1150	25	1		900	50%	3.5	0.232	7,924	1,793,850	18	158,480	44,067
8029	HOWSON CR	5433	12721	202	2.00	50	700	25	28		800	50%	3.2	0.219	6,661	5,341,373	53	133,220	116,346
8030	HUMPHRYS CR	5411	12830	15	1.40	122	1900	25	13		1300	60%	6.1	0.091	5,375	2,039,038	20	107,500	95,320
8031	HUNTER CR	5413	12811	64	5.19	30	300	25	22		1200	60%	5.7	0.176	9,645	3,922,220	39	192,900	172,573
8032	KLEANZA CR	5436	12822	180	9.20	92	1200	25	2		6600	60%	31.2	0.035	10,505	3,380,013	34	210,100	195,687
8033	LITTLE OLIVER CR	5448	12816	72	4.32	60	400	25	1		2000	60%	9.5	0.047	4,278	1,256,283	13	85,560	68,941
8034	LORNE CR	5453	12825	100	6.00	60	700	25	1		2800	60%	13.2	0.050	6,344	1,885,426	19	126,880	101,796
8035	LOWRIE CR	5439	12825	19	1.05	90	1300	25	1.5		700	60%	3.3	0.092	2,937	1,898,120	19	58,740	45,286
8036	MAROON CR	5446	12845	60	3.60	120	1250	25	10	Y	3400	60%	16.1	0.045	6,894	2,234,518	22	137,880	121,079
8037	MCKAY CR	5413	12825	61	4.90	152	2750	25	18		5800	60%	27.4	0.053	14,109	5,441,267	54	282,180	274,304
8038	MOLYBDENUM CR	5434	12845	18	1.00	152	1100	25	8.5		1200	60%	5.7	0.066	3,607	1,224,126	12	72,140	60,710
8039	MORAINE CR	5423	12802	14	0.79	150	1400	25	8	Y	900	60%	4.3	0.086	3,514	2,464,672	25	70,280	58,559
8040	NABEELAH CR	5408	12832	19	1.40	92	900	25	6		1000	60%	4.7	0.078	3,530	1,170,661	12	70,600	56,885
8041	OLIVER CR	5449	12818	142	8.52	45	1050	25	1		3000	60%	14.2	0.060	8,228	2,682,573	27	164,560	136,628
8042	PINE CR	5439	12714	130	1.29	60	600	25	3		600	50%	2.4	0.116	2,632	1,581,071	16	52,640	37,324
8043	PINKUT CR FALLS #1	5427	12527	400	6.00	31	400	25	30	Y	1500	43%	5.1	0.141	6,912	2,513,374	25	138,240	114,164
8044	PINKUT CR FALLS #2	5426	12525	400	6.00	30	400	25	30	Y	1400	43%	4.7	0.150	6,865	2,512,607	25	137,300	113,436
8045	QUILL CR	5456	12825	126	7.56	60	650	25	2		3600	60%	17.0	0.047	7,716	2,417,803	24	154,320	130,598
8046	RALEY CR	5412	12842	20	1.50	91	1250	25	15		1100	60%	5.2	0.103	5,140	1,929,391	19	102,800	89,032
8047	REISETER CR	5455	12710	156	2.52	120	3000	25	0.5		2400	60%	11.4	0.119	13,061	1,051,366	11	261,220	63,772
8048	SCHULBUCKHAND CR	5420	12832	26	1.43	90	750	25	0.5		1000	60%	4.7	0.066	2,996	909,157	9	59,920	46,161
8049	SHAMES R	5425	12845	80	4.30	61	1320	25	15		2100	60%	9.9	0.073	6,953	2,313,574	23	139,060	113,367
8050	SHANNON CR	5440	12730	27	1.50	122	1200	25	17		1400	60%	6.6	0.091	5,786	2,220,535	22	115,720	103,593
8051	SINCLAIR CR	5437	12730	56	0.70	100	1500	25	17		500	50%	2.0	0.197	3,735	2,786,153	28	74,700	61,244
8052	STAR CR	5441	12855	33	1.89	90	900	25	9		1300	60%	6.1	0.093	5,499	2,060,536	21	109,980	96,326
8053	STE CROIX	5442	12819	29	1.70	122	1400	25	6		1600	60%	7.6	0.061	4,434	1,529,451	15	88,680	76,823
8054	STEWARD CR	5427	12754	34	1.29	60	600	25	2		600	60%	2.8	0.097	2,663	1,611,167	16	53,260	38,468
8055	THOMAS CR #1	5420	12802	22	1.24	92	750	25	20	Y	900	60%	4.3	0.118	4,826	3,643,563	36	96,520	82,744
8056	THOMAS CR #2	5420	12802	31	1.74	60	350	25	20	Y	800	60%	3.8	0.129	4,708	3,487,018	35	94,160	78,653
8057	TRAPLINE CR	5425	12804	35	1.97	90	1150	25	5	Y	1400	60%	6.6	0.066	4,212	1,415,393	14	84,240	70,436
8058	TROUT CR	5451	12719	99	1.60	50	500	25	0		600	60%	2.8	0.084	2,292	1,217,120	12	45,840	30,328
8059	TSHESINK/FRANCOIS LAKES	5401	12535	400	6.00	30	3800	25	10		1400	43%	4.7	0.304	13,878	5,917,124	59	277,560	255,624
8060	UNNAMED CR	5405	12820	35	2.60	91	900	25	22		1900	60%	9.0	0.102	8,851	3,575,108	36	177,020	163,981
8061	UNNAMED CR	5405	12830	12.5	1.00	61	950	25	5		500	60%	2.4	0.148	3,366	2,354,869	24	67,320	53,018
8062	UNNAMED CR	5415	12846	8	0.70	122	800	25	21		700	60%	3.3	0.160	5,112	4,061,855	41	102,240	89,746
8063	UNNAMED CR	5419	12824	20	1.20	91	850	25	10	Y	900	60%	4.3	0.121	4,964	3,775,508	38	99,280	85,769
8064	UNNAMED CR	5422	12854	40	2.20	122	2100	25	15	Y	2100	60%	9.9	0.097	9,234	3,553,226	36	184,680	164,937
8065	UNNAMED CR	5423	12853	24	1.40	183	1250	25	15	Y	2000	60%	9.5	0.078	7,091	2,814,887	28	141,820	133,387
8066	UNNAMED CR INTO MORICE L	5404	12735	20	0.76	120	1300	25	50	Y	700	55%	3.0	0.280	8,187	7,044,563	70	163,740	150,689
8067	UNNAMED INTO CLEAR CR	5455	12847	33	1.98	90	800	25	6		1400	60%	6.6	0.067	4,269	1,443,228	14	85,380	71,565
8068	UNNAMED INTO CLORE R	5411	12756	37	1.41	90	700	25	37	Y	1000	55%	4.3	0.300	12,506	5,525,655	55	250,120	236,777
8069	UNNAMED INTO CLORE R	5412	12755	10	0.38	330	700	25	37	Y	1000	55%	4.3	0.288	12,018	5,406,515	54	240,360	231,820
8070	UNNAMED INTO CLORE R	5414	12757	4	0.15	450	1200	25	33	Y	500	55%	2.2	0.472	9,856	8,889,894	89	197,120	187,958
8071	UNNAMED INTO CLORE R	5418	12755	31	1.18	90	600	25	25	Y	800	55%	3.5	0.265	8,837	7,580,103	76	176,740	163,322
8072	UNNAMED INTO LEGATE CR	5444	12813	22	1.22	92	750	25	4		900	60%	4.3	0.069	2,817	1,693,811	17	56,340	42,638
8073	UNNAMED INTO ZYMOETE R.	5427	12813	25	1.40	90	500	25	1		1000	60%	4.7	0.057	2,595	714,163	7	51,900	38,035
8074	WESACH CR	5448	12845	31	1.86	122	1600	25	6	Y	1800	60%	8.5	0.061	4,964	1,752,700	18	99,280	87,781
8075	WHITE CR	5424	12841	25	1.30	90	700	25	8		900	60%	4.3	0.101	4,149	2,982,767	30	82,980	69,336
8076	WILLIAMS CR	5424	12825	133	7.50	61	1100	25	6		3600	60%	17.0	0.054	8,920	3,007,390	30	178,400	155,013
8077	ZYMOETZ R	5447	12749		8.40	20	1500	25	38		1300	50%	5.1	0.289	14,250	6,040,600	60	285,000	260,023
9001	ARDEN CR	5419	12941	14	1.20	336	750	25	16		3200	70%	17.7	0.053	9,096	3,522,846	35	181,920	175,448
9002	AYTON CR	5411	12943	43	4.50	31	400	25	6		1100	70%	6.1	0.086	4,998	1,703,586	17	99,960	80,789
9003	COLONEL JOHNSON CR	5413	13009	3	0.30	276	800	25	5		600	70%	3.3	0.082	2,627	1,793,865	18	52,540	42,675
9004	CUTHBERT CR	5405	12851	19	2.63	90	600	25	0		1900	70%	10.5	0.039	3,928	1,183,416	12	78,560	66,654
9005	KHTADA CR	5411	12936	144	15.00	62	900	25	0.5		7300	70%	40.3	0.036	13,999	4,762,121	48	279,980	265,035
9006	MARION CR	5422	13003	8	1.00	122	1600	25	20		1000	70%	5.5	0.102	5,424	2,120,421	21	108,480	96,820
9007	MATHISON CR	5458	13000	8	0.65	210	1100	69	60		1100	65%	5.6	0.420	22,782	10,579,978	106	455,640	446,405
9008	MCDONALD CR	5407	12954	11	1.20	315	1900	25	0.5		3000	70%	16.6	0.039	6,201	2,125,611	21	124,020	115,923
9009	TALA HAAT CR	5446	13004	38	3.10	30	300	25	5		700	65%	3.6	0.124	4,279	2,964,858	30	85,580	67,662
9010	UNION CR	5440	13015	53	6.49	122	1200	25	45		6200	70%	34.2	0.072	23,769	9,995,992	100	475,380	471,430
9011	UNNAMED CR	5405	12956	29	3.80	30	400	25	12	Y	900	70%	5.0	0.109	5,213	3,734,700	37	104,260	85,599
9012	UNNAMED CR	5406	12955	17.5	5.60	31	600	25	12	Y	1400	70%	7.7	0.087	6,489	2,336,866	23	129,780	109,716
9013	UNNAMED CR	5410	12956	1	0.10	650	2000	25	0.5		500	70%	2.8	0.080	2,133	1,418,954	14	42,660	34,085
9014	UNNAMED CR	5411	12945	15	1.50	122	1300	25	10		1400	70%	7.7	0.067	5,005	1,841,127	18	100,100	89,150
9015	UNNAMED CR	5420	12946	7	0.70	397	800	25	16		2200	70%	12.1	0.067	7,890	3,053,527	31	157,800	146,754
9016	UNNAMED CR	5427	13004	5	0.60	274	1100	25	30		1300	70%	7.2	0.075	5,192	2,035,795	20	103,840	95,771
9017	UNNAMED INTO EXCHAMSIKS R	5429	12930	60	5.40	90	550	25	25		3800	70%	21.0	0.059	11,976	4,574,385	46	239,520	224,442
9018	UNNAMED INTO EXCHAMSIKS R	5432	12938	22	1.98	90	800	25	33		1400	70%	7.7	0.155	11,556	4,980,357	50	231,120	219,098

Table 1. Site Information

Ref No	Stream Name	Lat.	Long.	D.A. (km^2)	Flow (m^3/s)	Head (m)	Penstock L(m)	T.L. (kv)	T.L. Dist. (km)	Cluster potential	Power (kW)	Capacity Factor	'Green' Energy (GWh)	Unit Cost $/kWh	Cost inl. TL ($1000)	Annual Cashflow dur.Constr.	# of Jobs annually	Annual O&M	Annual Taxes
9019	UNNAMED INTO EXSTEW R	5428	12910	19	1.71	150	350	25	15	Y	2000	70%	11.0	0.048	5,121	1,829,797	18	102,420	94,041
9020	UNNAMED INTO EXSTEW R #1	5430	12912	15	1.35	300	700	25	17	Y	3200	70%	17.7	0.042	7,184	2,576,723	26	143,680	136,061
9021	UNNAMED INTO EXSTEW R #2	5432	12911	23	2.07	270	550	25	20	Y	4400	70%	24.3	0.038	8,886	3,269,865	33	177,720	175,816
9022	UNNAMED INTO EXSTEW R #3	5433	12914	15	1.35	300	550	25	22	Y	3200	70%	17.7	0.051	8,704	3,314,215	33	174,080	166,601
9023	UNNAMED INTO EXSTEW R #4	5435	12916	85	7.65	90	300	25	27	Y	5400	70%	29.8	0.045	12,865	4,708,835	47	257,300	244,652
9024	UNNAMED INTO ISHKHEENICKH R #1	5454	12934	35	3.15	90	600	69	55		2200	65%	11.3	0.119	12,903	5,263,470	53	258,060	235,157
9025	UNNAMED INTO ISHKHEENICKH R #2	5456	12935	17	1.53	120	450	69	55		1400	65%	7.2	0.158	10,890	4,696,253	47	217,800	204,551
9026	UNNAMED INTO KASIKS R	5423	12933	32	2.97	60	750	25	18		1400	70%	7.7	0.081	5,996	2,219,313	22	119,920	104,658
9027	UNNAMED INTO KHTADA LAKE	5406	12924	18	1.62	120	600	25	16	Y	1500	70%	8.3	0.101	8,013	3,281,844	33	160,260	149,832
9028	UNNAMED INTO KHTADA LAKE	5406	12927	32	2.88	120	1500	25	14	Y	2700	70%	14.9	0.076	10,876	4,260,331	43	217,520	201,598
9029	UNNAMED INTO KHYEX R	5422	12950	18	1.67	120	550	25	19		1600	70%	8.8	0.075	6,392	2,477,668	25	127,840	117,212
9030	UNNAMED INTO SKEENA R	5416	12921	30	2.70	180	900	25	1		3800	70%	21.0	0.030	6,152	1,918,528	19	123,040	114,631
9031	UNNAMED INTO SKEENA R	5417	12918	11	0.99	180	450	25	1		1400	70%	7.7	0.040	2,969	899,847	9	59,380	50,244
9032	UNNAMED INTO SKEENA R	5421	12906	15	1.35	120	1100	25	1		1300	70%	7.2	0.052	3,576	1,164,146	12	71,520	60,322
9033	UNNAMED LAKE INTO EXCHAMSIKS	5424	12926	9	0.81	300	900	25	15		1900	70%	10.5	0.062	6,279	2,496,890	25	125,580	120,875
9034	VOSHELL CR	5456	12934	73	6.57	30	300	25	40		1500	65%	7.7	0.106	7,852	2,962,228	30	157,040	135,252
11001	AMERICAN CR	5608	12954	99	6.55	90	1300	25	6		4600	55%	19.9	0.057	10,967	3,971,572	40	219,340	201,598
11002	ANSEDAGAN CR	5506	12920	20	1.20	150	1700	25	20		1400	60%	6.6	0.093	5,943	2,322,088	23	118,860	107,734
11003	ANTHONY CR	5647	12839	34	2.25	60	1500	138	135	Y	1100	55%	4.8	1.094	50,256	23,776,307	238	1,005,120	985,954
11004	BARNEY GULCH	5557	12958	8	0.50	457	2000	25	2		1800	55%	7.8	0.046	3,486	1,195,703	12	69,720	63,987
11005	BEAR R	5607	12946	82	5.10	30	500	25	6		1200	55%	5.2	0.101	5,052	1,692,686	17	101,040	79,782
11006	BLACKSTOCK CR	5540	12745	40	0.80	92	550	25	20	Y	600	50%	2.4	0.172	3,914	2,899,529	29	78,280	64,272
11007	BURDICK CR	5511	12746	88	1.17	90	1050	25	3		800	60%	3.8	0.086	3,125	2,034,413	20	62,500	48,915
11008	CARRIGAN CR	5538	12745	38	0.72	91	650	25	16	Y	500	50%	2.0	0.181	3,430	2,477,677	25	68,600	54,856
11009	CASCADE CR	5522	12951	18	1.15	90	1100	69	70		800	60%	3.8	0.737	26,867	25,084,151	251	537,340	524,513
11010	CAUSQUA CR	5502	12716	50	1.00	91	550	25	4.5		700	50%	2.8	0.111	2,947	1,909,997	19	58,940	44,878
11011	CLARY CR	5528	12926	33	2.00	480	2050	25	3		7500	60%	35.5	0.029	9,951	3,592,981	36	199,020	212,037
11012	CORYA CR	5502	12723	57	1.14	95	1400	25	3.5		800	50%	3.2	0.207	6,283	1,360,529	14	125,660	34,231
11013	DAK R	5531	12927	100	4.50	60	600	25	5		2100	65%	10.8	0.057	5,908	1,803,150	18	118,160	93,271
11014	GINGIETL CR	5513	12916	11	0.66	210	1300	25	27	Y	1100	60%	5.2	0.203	10,178	4,462,032	45	203,560	194,054
11015	GINMILTKUN CR	5532	12838	91	3.64	30	300	25	35		900	50%	3.5	0.201	6,872	5,345,661	53	137,440	116,993
11016	GISWATZ CR	5511	12921	10.5	0.63	360	1100	25	33	Y	1800	60%	8.5	0.135	11,093	4,865,161	49	221,860	216,503
11017	GLACIER CR	5559	12956	49	2.90	61	600	25	7		1400	55%	6.1	0.080	4,679	1,582,770	16	93,580	76,771
11019	GWUNYA CR	5531	12929	25	1.13	95	600	25	5		800	65%	4.1	0.079	3,126	2,046,186	20	62,520	49,430
11020	INSECT CR	5503	12829	32	1.30	150	2550	25	13	Y	1500	60%	7.1	0.133	9,099	3,837,837	38	181,980	171,821
11021	JADE LAKE INTO WHITE R.	5546	12920	49	2.70	90	600	25	20		1900	55%	8.2	0.126	9,971	4,117,084	41	199,420	185,807
11022	JUNIPER CR	5507	12742	90	1.20	91	1550	25	8		900	60%	4.3	0.137	5,609	4,403,048	44	112,180	98,878
11023	KELSKIIST CR	5521	12941	52	3.40	180	1600	25	28	Y	4800	60%	22.7	0.080	17,468	7,299,341	73	349,360	342,966
11024	KINSHUCH LAKE	5543	12919	57	2.57	240	140	25	25		4800	60%	22.7	0.049	10,701	4,084,429	41	214,020	209,310
11025	KSHADIN CR	5527	12903	58	3.00	90	1150	25	6		2100	60%	9.9	0.097	9,305	3,533,787	35	186,100	164,380
11026	KWINATAHL R	5525	12908	110	6.80	120	1300	25	1		6400	60%	30.3	0.045	13,175	4,817,922	48	263,500	253,861
11027	LUND CR	5510	12720	27	0.54	153	1000	25	16		600	50%	2.4	0.174	3,967	3,023,958	30	79,340	66,972
11029	MARMOT R	5553	13000	94	5.60	61	650	25	7		2700	55%	11.7	0.062	6,975	2,213,406	22	139,500	113,334
11030	MAY CR	5501	12902	80	4.40	90	1500	25	16		3100	60%	14.7	0.087	12,231	4,798,043	48	244,620	225,047
11031	MIKE CR	5613	12839	13.5	0.89	180	900	69	60		1300	55%	5.6	0.401	21,787	10,050,334	101	435,740	425,063
11032	MILL CR	5506	12807	86	3.40	60	1150	25	4		1600	60%	7.6	0.071	5,187	1,781,959	18	103,740	87,383
11033	PANORAMA CR	5646	12837	39	2.58	60	1600	138	128	Y	1200	55%	5.2	0.966	48,397	22,849,558	228	967,940	948,812
11034	RITCHIE CR	5629	12918	23	1.45	150	2000	25	50		1700	55%	7.4	0.131	9,323	3,914,498	39	186,460	174,950
11035	ROSEVELT CR	5603	12948	23.5	1.41	270	1900	69	53		3000	55%	13.0	0.120	14,981	6,364,101	64	299,620	285,614
11036	SANSKISOOT CR	5610	12839	50	1.00	120	2300	25	40	Y	900	55%	3.9	0.253	9,521	8,255,570	83	190,420	177,747
11037	SANYAM CR	5617	12848	52	3.44	60	1800	69	56		1600	55%	6.9	0.353	23,611	10,725,439	107	472,220	455,755
11038	SCOTT CR	5627	12947	44.5	2.95	60	1000	69	80		1400	55%	6.1	0.345	20,169	9,099,982	91	403,380	385,203
11039	SEASKINNISH CR	5516	12859	34	2.40	136	1800	25	2		2600	60%	12.3	0.059	7,034	2,433,021	24	140,680	122,877
11040	SEDAN CR	5505	12812	116	4.60	60	900	25	8		2200	60%	10.4	0.065	6,551	2,095,650	21	131,020	105,333
11041	SHANALOPE	5604	12843	65	1.30	90	2200	25	35	Y	900	55%	3.9	0.207	7,785	6,512,362	65	155,700	141,628
11042	SHEGISIC CR	5442	12740	88	1.71	60	600	25	26	Y	800	50%	3.2	0.159	4,827	3,601,823	36	96,540	80,219
11043	SHEWILILBA CR	5535	12744	36	0.70	150	1000	25	10	Y	800	50%	3.2	0.112	3,399	2,391,156	24	67,980	55,486
11044	SKOWILL CR	5638	12938	77	4.85	90	1400	69	81		3400	55%	14.7	0.141	20,078	8,563,607	86	401,560	378,724
11045	STEEP CANYON CR	5537	12815	24	0.36	180	1800	25	30		500	50%	2.0	0.283	5,362	4,438,889	44	107,240	95,257
11046	SUPLHURETS CR	5629	13028	129	8.12	90	1000	138	170		5700	55%	24.7	0.255	60,735	27,897,783	279	1,214,700	1,190,876
11047	SWEETIN R	5546	12820	200	3.00	30	300	25	25		700	50%	2.8	0.214	5,697	4,341,462	43	113,940	94,878
11048	TODD CR	5617	12946	33	2.07	120	1000	69	75	Y	1900	55%	8.2	0.256	20,275	9,166,527	92	405,500	392,224
11049	TONY CR	5643	12835	17	1.12	210	2400	69	95		1800	55%	7.8	0.476	35,751	16,773,397	168	715,020	706,755
11050	UNNAMED CR	5502	12825	68	2.72	60	700	25	19	Y	1300	60%	6.1	0.155	9,186	3,791,160	38	183,720	168,040
11051	UNNAMED CR	5503	12807	69	2.60	60	1000	25	3.3		1200	60%	5.7	0.092	5,037	1,801,108	18	100,740	84,858
11052	UNNAMED CR	5505	12839	32	1.28	60	750	25	30	Y	600	60%	2.8	0.382	10,452	9,174,533	92	209,040	195,002
11053	UNNAMED CR	5507	12901	12	0.78	330	2500	25	10		2000	60%	9.5	0.079	7,160	2,923,822	29	143,200	138,058
11054	UNNAMED CR	5508	12853	30	1.65	60	800	25	9		800	60%	3.8	0.154	5,605	4,357,753	44	112,100	97,072
11055	UNNAMED CR	5517	12911	8	0.56	270	1300	25	7		1200	60%	5.7	0.084	4,604	1,763,246	18	92,080	83,179
11056	UNNAMED CR	5518	12855	10	0.70	300	2000	25	1	Y	1600	60%	7.6	0.060	4,347	1,595,009	16	86,940	79,690
11057	UNNAMED CR	5518	12844	41	1.60	150	1200	25	45	Y	1900	50%	7.5	0.157	11,335	4,861,021	49	226,700	215,279
11058	UNNAMED CR	5519	12910	7.5	0.52	390	2100	25	9		1600	60%	7.6	0.068	4,970	1,922,725	19	99,400	93,099
11059	UNNAMED CR	5519	12836	11	0.44	450	2800	25	25	Y	1600	50%	6.3	0.093	5,643	2,262,687	23	112,860	105,487
11060	UNNAMED CR	5520	12838	42	1.70	180	1700	25	35	Y	2400	50%	9.5	0.135	12,323	5,075,385	51	246,460	228,245
11061	UNNAMED CR	5521	12854	6.5	0.32	420	1600	25	5	Y	1100	50%	4.3	0.079	3,312	1,184,103	12	66,240	57,409
11062	UNNAMED CR	5522	12940	34	2.17	210	1500	25	26	Y	3600	60%	17.0	0.090	14,772	6,156,101	62	295,440	285,439
11063	UNNAMED CR	5523	12844	46	1.38	120	1400	25	28	Y	1300	50%	5.1	0.175	8,632	3,618,623	36	172,640	159,549
11064	UNNAMED CR	5525	12844	20	0.60	180	1200	25	25		800	50%	3.2	0.156	4,742	3,722,834	37	94,840	82,764
11065	UNNAMED CR	5526	12846	20	0.40	150	1050	25	16		500	50%	2.0	0.218	4,146	3,236,898	32	82,920	70,648
11066	UNNAMED CR	5604	12921	10	0.66	270	1700	25	26		1400	55%	6.1	0.112	6,562	2,685,723	27	131,240	122,121
11067	UNNAMED CR	5608	12902	9.5	0.63	270	2200	25	20		1300	55%	5.6	0.163	8,822	3,796,721	38	176,440	167,712
11068	UNNAMED CR	5609	12904	22	1.46	180	1200	25	18		2100	55%	9.1	0.103	9,000	3,501,378	35	180,000	161,838
11069	UNNAMED CR	5610	12906	6.5	0.38	210	700	25	16		600	55%	2.6	0.215	5,387	4,442,922	44	107,740	96,732
11070	UNNAMED CR	5610	12857	15.5	1.02	330	2400	25	23	Y	2600	55%	11.3	0.105	11,384	4,686,901	47	227,680	214,989
11071	UNNAMED CR	5620	12948	18	1.13	180	1300	69	70	Y	1600	55%	6.9	0.270	18,055	8,192,434	82	361,100	349,598
11072	UNNAMED CR	5625	13027	21	1.27	150	1200	138	179		1500	55%	6.5	0.910	56,983	27,082,214	271	1,139,660	1,122,786

Table 1. Site Information

Ref No	Stream Name	Lat.	Long.	D.A. (km²)	Flow (m³/s)	Head (m)	Penstock L(m)	T.L. (kv)	T.L. Dist. (km)	Cluster potential	Power (kW)	Capacity Factor	'Green' Energy (GWh)	Unit Cost $/kWh	Cost inl. TL ($1000)	Annual Cashflow dur.Constr.	# of Jobs annually	Annual O&M	Annual Taxes
11073	UNNAMED CR	5625	12955	31	1.95	240	700	69	85		3700	55%	16.0	0.158	24,432	10,861,035	109	488,640	476,457
11074	UNNAMED CR	5632	12923	12	0.71	180	1200	69	61	Y	1000	55%	4.3	0.306	12,761	5,718,724	57	255,220	242,428
11075	UNNAMED CR	5633	12920	14	0.83	180	900	69	63	Y	1200	55%	5.2	0.273	13,687	6,134,523	61	273,740	261,203
11076	UNNAMED CR	5635	12916	45	2.98	90	1500	69	70	Y	2100	55%	9.1	0.224	19,626	8,543,562	85	392,520	368,177
11077	UNNAMED CR	5637	12914	10	0.66	180	1500	69	86	Y	900	55%	3.9	0.502	18,874	17,407,050	174	377,480	364,401
11078	UNNAMED CR	5644	12953	4	0.26	240	1000	69	96		500	55%	2.2	0.771	16,093	14,887,282	149	321,860	308,252
11079	UNNAMED CR	5648	12846	27.5	1.82	120	1300	138	156	Y	1700	55%	7.4	0.744	52,799	24,988,099	250	1,055,980	1,039,284
11080	UNNAMED CR	5649	12937	26	1.72	60	1000	138	104	Y	800	55%	3.5	0.885	29,565	27,620,476	276	591,300	571,710
11081	UNNAMED CR	5649	12955	11	0.69	210	1700	138	102	Y	1100	55%	4.8	0.587	26,968	12,612,862	126	539,360	524,459
11082	UNNAMED CR	5649	13020	44	2.77	90	1300	138	130		2000	55%	8.7	0.464	38,762	18,075,515	181	775,240	756,392
11083	UNNAMED CR	5650	12932	17.5	1.10	150	1300	138	115		1300	55%	5.6	0.640	34,731	16,313,690	163	694,620	678,858
11084	UNNAMED CR	5651	12851	17	1.26	120	1200	138	146	Y	1200	55%	5.2	0.937	46,922	22,224,300	222	938,440	921,217
11085	UNNAMED CR	5652	12958	8	0.50	180	1100	138	108	Y	700	55%	3.0	0.925	27,019	25,388,240	254	540,380	524,133
11086	UNNAMED CR	5652	12925	14	0.88	210	1700	138	121		1400	55%	6.1	0.633	37,026	17,448,990	174	740,520	726,353
11087	UNNAMED CR	5652	12845	15	0.99	210	1800	138	177	Y	1600	55%	6.9	0.918	61,313	29,209,366	292	1,226,260	1,212,246
11088	UNNAMED CR	5654	12906	9	0.57	240	1500	138	150	Y	1100	55%	4.8	1.044	47,926	22,797,643	228	958,520	943,922
11089	UNNAMED CR	5654	12850	59	3.90	60	1900	138	166	Y	1800	55%	7.8	0.807	60,626	28,651,034	287	1,212,520	1,191,577
11090	UNNAMED CR	5655	12951	11	0.69	90	700	138	110	Y	500	55%	2.2	1.463	30,534	28,790,991	288	610,680	593,145
11091	UNNAMED CR	5655	13029	11	0.69	210	1500	138	145		1100	55%	4.8	0.859	39,443	18,668,271	187	788,860	772,580
11092	UNNAMED CR	5655	12858	27	1.79	90	1300	138	170	Y	1300	55%	5.6	1.070	58,093	27,591,605	276	1,161,860	1,143,180
11093	UNNAMED CR	5655	12934	26.5	1.66	120	1100	138	130		1600	55%	6.9	0.614	40,999	19,277,122	193	819,980	803,201
11094	UNNAMED CR	5657	12913	7.5	0.47	180	900	138	160	Y	700	55%	3.0	1.633	47,726	45,492,331	455	954,520	937,722
11095	UNNAMED CR	5658	12959	8	0.50	270	1900	138	110		1100	55%	4.8	0.627	28,800	13,523,393	135	576,000	561,633
11096	UNNAMED CR	5702	13024	9.5	0.60	240	800	138	145		1100	55%	4.8	0.800	36,756	17,375,121	174	735,120	718,785
11097	UNNAMED CR	5706	13023	18	0.25	270	1700	138	150		500	55%	2.2	1.792	37,398	35,583,926	356	747,960	730,918
11098	UNNAMED CR	5710	13023	34	0.48	210	1700	138	140		800	55%	3.5	1.127	37,642	35,687,960	357	752,840	736,346
11099	UNNAMED INTO EAST GEORGIE R.	5543	13000	9	0.50	390	900	25	30		1500	60%	7.1	0.159	10,873	4,800,029	48	217,460	211,372
11100	UNNAMED INTO KINSKUCH	5540	12906	43	1.94	90	1200	25	20		1400	60%	6.6	0.148	9,463	3,964,414	40	189,260	176,055
11101	UNNAMED INTO KSHWAN R	5540	12945	106	5.83	120	800	25	50		5500	60%	26.0	0.064	16,103	6,370,369	64	322,060	309,553
11102	UNNAMED INTO NASS R	5531	12852	21	0.84	82	450	25	4		500	50%	2.0	0.157	2,984	2,029,242	20	59,680	45,865
11103	UNNAMED INTO NASS R	5535	12847	92	3.68	62	400	25	13		1800	50%	7.1	0.109	7,445	2,841,015	28	148,900	131,389
11104	UNNAMED INTO NASS R	5544	12849	12	0.48	120	900	25	1		500	50%	2.0	0.115	2,183	1,303,417	13	43,660	30,852
11105	UNNAMED INTO PORTLAND CANAL	5534	13005	18	0.99	120	600	25	35		900	60%	4.3	0.282	11,558	10,232,981	102	231,160	219,384
11106	UNNAMED INTO PORTLAND CANAL	5538	13005	24	1.32	120	800	25	33		1200	60%	5.7	0.215	11,731	5,141,026	51	234,620	222,967
11107	UNNAMED INTO WHITE R.	5553	12915	5	0.28	300	900	25	20		600	55%	2.6	0.287	7,190	6,233,359	62	143,800	133,861
11108	UNNAMED INTO WILLOUGHBY CR	5557	12924	42	2.31	90	800	25	20	Y	1600	55%	6.9	0.141	9,437	3,912,899	39	188,740	174,929
11109	UTSUN CR	5527	12735	31	0.74	122	1450	25	5		700	50%	2.8	0.135	3,598	2,592,014	26	71,960	59,050
11110	WEBER CR	5531	12827	8	0.32	212	1000	25	30	Y	500	50%	2.0	0.280	5,305	4,400,993	44	106,100	94,469
11111	WEBER CR	5531	12827	20	0.80	92	100	25	30	Y	600	50%	2.4	0.230	5,233	4,180,948	42	104,660	90,646
11112	WEGILADAP CR	5510	12928	13	0.78	330	1700	25	38	Y	2000	60%	9.5	0.114	10,391	4,492,108	45	207,820	202,515
11113	WILLOUGHBY CR	5557	12924	65	3.58	120	1500	25	20	Y	3400	55%	14.7	0.092	13,125	5,259,539	53	262,500	245,251
11114	WILSON CR	5504	12819	17	0.70	120	1800	25	5		700	60%	3.3	0.111	3,533	2,525,934	25	70,660	58,247
11115	WILYAYAANOOTH CR	5510	12928	7.5	3.00	420	1800	25	35	Y	9900	60%	46.8	0.047	21,350	8,880,967	89	427,000	451,170
13001	BEATTY CR	5807	13111	418	4.15	90	1400	69	85		2900	45%	10.3	0.235	23,321	10,210,914	102	466,420	440,687
13002	DEASE CR	5841	13008	450	4.70	30	800	25	30	Y	1100	45%	3.9	0.201	7,547	2,934,949	29	150,940	129,095
13003	DODJATIN CR	5753	13118	73	0.78	210	1100	25	12		1300	45%	4.6	0.096	4,254	1,554,783	16	85,080	73,610
13004	FOURTH OF JULY CR	5940	13339	190	1.92	90	1600	25	8		1400	30%	3.3	0.155	4,934	1,765,690	18	98,680	81,493
13005	HARTZ CR	5803	13100	33	0.33	210	1600	69	82	Y	500	45%	1.8	0.883	15,075	13,886,015	139	301,500	287,801
13006	HITCHCOCK CR	5954	13346	175	1.80	60	900	25	42		800	30%	1.9	0.352	6,415	5,143,713	51	128,300	110,536
13007	MESS CR	5753	13111	2340	24.00	90	2500	25	3		16900	45%	60.0	0.057	33,086	8,569,892	86	661,720	655,149
13008	PINE CR DITCH	5935	13335	540	5.40	30	700	25	9		1300	30%	3.1	0.189	5,600	1,928,058	19	112,000	87,630
13009	TUTESHETA CR	5806	13120	62	0.61	150	800	25	25		700	45%	2.5	0.345	8,240	7,130,033	71	164,800	152,595
13010	UNNAMED CR	5726	13051	60	0.61	120	1100	138	200		600	45%	2.1	2.665	54,628	52,176,256	522	1,092,560	1,071,943
13011	UNNAMED CR	5737	13020	55	0.55	150	2000	138	217		600	45%	2.1	2.682	54,961	52,530,252	525	1,099,220	1,077,810
13012	WINTER CR	5754	13120	31	0.31	330	2000	25	14	Y	800	45%	2.8	0.111	3,025	2,138,699	21	60,500	49,796
13013	ZENAZIE CR	5945	13246	100	0.77	100	1900	25	50		600	30%	1.4	0.803	10,971	9,763,703	98	219,420	205,227

Table 2. Monthly Generation

Ref No	Stream Name	Monthly Average Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Firm Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Capacity Factor (%) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Hydr. zone
1001	ARROW PARK CR	338	350	555	1182	1546	1562	1507	1155	881	789	745	457	272	253	313	865	1552	1562	1325	756	554	433	385	330	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1002	ARTHURS CR	91	82	111	370	662	633	452	213	248	156	146	111	69	68	71	162	670	527	167	90	85	87	84	80	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
1003	ASHER CR	644	668	1056	2251	2945	2976	2871	2201	1677	1503	1418	871	519	482	596	1647	2956	2976	2523	1439	1056	824	734	629	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1004	ASSINIBOINE CR	51	35	27	170	666	743	735	617	438	284	154	91	38	81	24	38	556	744	705	382	262	164	101	61	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1005	BANNOCK CR	193	200	317	675	883	893	861	660	503	451	426	261	156	145	179	494	887	893	757	432	317	247	220	189	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1006	BEATRICE CR	773	801	1267	2702	3534	3571	3445	2641	2013	1803	1702	1045	622	579	716	1976	3548	3571	3028	1727	1267	989	881	755	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1007	BEATTON CR	532	551	871	1857	2430	2455	2368	1815	1384	1240	1170	719	428	398	492	1359	2439	2455	2082	1187	871	680	606	519	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1008	BEHRMAN CR	209	217	343	732	957	967	933	715	545	488	461	283	169	157	194	535	961	967	820	468	343	268	239	204	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1009	BEN ABLE CR	46	31	24	153	599	669	662	555	394	256	138	82	34	73	22	34	500	670	635	344	236	148	91	55	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1010	BERNARD CR	387	401	634	1351	1767	1786	1723	1320	1006	902	851	523	311	289	358	988	1774	1786	1514	864	634	494	441	377	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1011	BLANKET CR FALLS	258	267	422	901	1178	1190	1148	880	671	601	567	348	207	193	239	659	1183	1190	1009	576	422	330	294	252	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1012	BOYD CR	693	718	1135	2420	3166	3199	3086	2366	1803	1615	1525	937	558	518	641	1770	3178	3199	2713	1547	1135	886	789	676	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1013	BREMNER CR	532	551	871	1857	2430	2455	2368	1815	1384	1240	1170	719	428	398	492	1359	2439	2455	2082	1187	871	680	606	519	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1014	BRUCE CR	145	150	238	507	663	670	646	495	377	338	319	196	117	109	134	371	665	670	568	324	238	185	165	142	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1015	CAMPBELL CR	821	851	1347	2871	3755	3794	3660	2806	2139	1916	1808	1111	661	615	760	2100	3769	3794	3217	1835	1347	1050	936	802	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1016	CARIBOU CR	773	801	1267	2702	3534	3571	3445	2641	2013	1803	1702	1045	622	579	716	1976	3548	3571	3028	1727	1267	989	881	755	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1017	CASCADE CR	435	451	713	1520	1988	2009	1938	1485	1132	1014	957	588	350	326	403	1112	1996	2009	1703	971	713	556	496	425	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1018	CHAMPION CR	113	117	185	394	515	521	502	385	294	263	248	152	91	84	104	288	517	521	442	252	185	144	128	110	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1019	CLINT CR	741	768	1215	2589	3387	3422	3302	2531	1929	1728	1631	1002	597	555	686	1894	3400	3422	2902	1655	1215	947	844	723	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1020	CLUTE CR	628	651	1030	2195	2871	2902	2799	2146	1636	1465	1383	849	506	470	582	1606	2882	2902	2460	1403	1030	803	716	613	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1021	COCHRANE CR	213	191	259	864	1546	1477	1055	497	579	363	340	258	160	158	166	377	1562	1230	389	209	199	203	195	186	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
1022	COFFEE CR	306	317	502	1069	1399	1414	1364	1045	797	714	674	414	246	229	283	782	1404	1414	1199	684	502	391	349	299	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1023	COOKE CR	483	501	792	1689	2209	2232	2153	1650	1258	1127	1064	653	389	362	447	1235	2217	2232	1893	1079	792	618	551	472	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1024	COOPER CR	1063	1101	1743	3715	4859	4910	4737	3631	2768	2479	2340	1437	856	796	984	2717	4878	4910	4164	2375	1743	1359	1211	1038	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1025	CORN CR	177	184	290	619	810	818	789	605	461	413	390	240	143	133	164	453	813	818	694	396	290	227	202	173	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1026	COUGAR CR	161	167	264	563	736	744	718	550	419	376	355	218	130	121	149	412	739	744	631	360	264	206	184	157	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1027	CRAWFORD CR	354	367	581	1238	1620	1637	1579	1210	923	826	780	479	285	265	328	906	1626	1637	1388	792	581	453	404	346	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1028	CREIGHTON CR	51	46	62	206	368	352	251	118	138	86	81	62	38	38	39	90	372	293	93	50	47	48	46	44	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
1029	CULTUS CR	612	634	1003	2139	2798	2827	2727	2091	1594	1427	1347	828	493	458	567	1564	2809	2827	2397	1367	1003	783	697	597	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1030	DAVIS CR	129	134	211	450	589	595	574	440	335	301	284	174	104	96	119	329	591	595	505	288	211	165	147	126	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1031	DENNIS CR	161	167	264	563	736	744	718	550	419	376	355	218	130	121	149	412	739	744	631	360	264	206	184	157	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1032	DERRY CR	499	517	819	1745	2282	2306	2225	1705	1300	1165	1099	675	402	374	462	1276	2291	2306	1956	1115	819	638	569	487	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1033	DIORITE CR	256	173	136	849	3328	3715	3677	3085	2189	1422	768	454	190	404	121	191	2778	3720	3526	1912	1310	821	506	303	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1034	DOG CR	51	46	62	206	368	352	251	118	138	86	81	62	38	38	39	90	372	293	93	50	47	48	46	44	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
1035	DRIMMIE CR	242	250	396	844	1104	1116	1077	825	629	563	532	327	195	181	224	618	1109	1116	946	540	396	309	275	236	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1036	DUNBAR CR FALLS	177	184	290	619	810	818	789	605	461	413	390	240	143	133	164	453	813	818	694	396	290	227	202	173	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1037	EAST CR	177	184	290	619	810	818	789	605	461	413	390	240	143	133	164	453	813	818	694	396	290	227	202	173	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1038	EAST CR #1	886	918	1452	3096	4049	4092	3947	3026	2307	2066	1950	1198	713	663	820	2264	4065	4092	3470	1979	1452	1133	1010	865	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1039	ENTERPRISE CR (TUNNEL)	805	834	1320	2814	3681	3720	3589	2751	2097	1878	1773	1089	648	603	746	2058	3695	3720	3154	1799	1320	1030	918	786	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1040	FALL CR	290	300	475	1013	1325	1339	1292	990	755	676	638	392	233	217	268	741	1330	1339	1136	648	475	371	330	283	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1041	FARNHAM FALLS	148	101	79	492	1930	2155	2133	1790	1270	825	446	263	110	234	70	110	1611	2158	2045	1109	760	476	293	176	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1042	FENNELL CR	161	167	264	563	736	744	718	550	419	376	355	218	130	121	149	412	739	744	631	360	264	206	184	157	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1043	FENWICK CR	41	28	22	136	532	594	588	494	350	228	123	73	30	65	19	30	444	595	564	306	210	131	81	49	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1044	FERRY CR	209	217	343	732	957	967	933	715	545	488	461	283	169	157	194	535	961	967	820	468	343	268	239	204	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1045	FITZSTUBBS CR	838	868	1373	2927	3828	3869	3732	2861	2181	1953	1844	1133	674	627	775	2141	3843	3869	3280	1871	1373	1071	954	818	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1046	FORSTER CR FALLS	51	35	27	170	666	743	735	617	438	284	154	91	38	81	24	38	556	744	705	382	262	164	101	61	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1047	FORSTER FALLS	102	69	54	340	1331	1486	1471	1234	876	569	307	182	76	162	48	76	1111	1488	1410	765	524	329	202	121	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1048	FOSTHALL CR #1	1015	1051	1664	3546	4638	4687	4522	3466	2642	2367	2234	1372	817	760	939	2594	4656	4687	3974	2267	1663	1298	1156	991	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1049	FOSTHALL CR #2	628	651	1030	2195	2871	2902	2799	2146	1636	1465	1383	849	506	470	582	1606	2882	2902	2460	1403	1030	803	716	613	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1050	GIEGERICH CR	580	601	951	2026	2650	2678	2584	1981	1510	1352	1277	784	467	434	537	1482	2661	2678	2271	1295	951	741	661	566	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1051	GOATSKIN CR	91	82	111	370	662	633	452	213	248	156	146	111	69	68	71	162	670	527	167	90	85	87	84	80	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
1052	GRIZZLY CR	161	167	264	563	736	744	718	550	419	376	355	218	130	121	149	412	739	744	631	360	264	206	184	157	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1053	GWILLIM CR (TUNNEL)	644	668	1056	2251	2945	2976	2871	2201	1677	1503	1418	871	519	482	596	1647	2956	2976	2523	1439	1056	824	734	629	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1054	HADOW CR	709	734	1162	2477	3239	3274	3158	2421	1845	1653	1560	958	571	530	656	1811	3252	3274	2776	1583	1162	906	808	692	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1055	HALFWAY HOTSPRINGS	982	1018	1611	3433	4491	4538	4378	3356	2558	2291	2163	1329	791	735	910	2511	4508	4538	3848	2195	1611	1256	1120	959	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1056	HALL CR	225	234	370	788	1031	1042	1005	770	587	526	496	305	182	169	209	576	1035	1042	883	504	370	288	257	220	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1057	HELLROARER CR	223	200	271	905	1619	1548	1106	521	607	380	356	271	168	165	174	395	1637	1288	408	219	208	213	204	195	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
1058	HOPE CR	225	234	370	788	1031	1042	1005	770	587	526	496	305	182	169	209	576	1035	1042	883	504	370	288	257	220	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1059	HORSETHIEF FALLS	161	167	264	563	736	744	718	550	419	376	355	218	130	121	149	412	739	744	631	360	264	206	184	157	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1060	HOUGHTON CR	177	184	290	619	810	818	789	605	461	413	390	240	143	133	164	453	813	818	694	396	290	227	202	173	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1061	HUNTERS CR	242	250	396	844	1104	1116	1077	825	629	563	532	327	195	181	224	618	1109	1116	946	540	396	309	275	236	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1062	INCOMAPPLEUX R	2142	2220	3512	7486	9792	9895	9546	7317	5578	4996	4716	2897	1725	1603	1983	5476	9830	9895	8390	4786	3512	2739	2441	2091	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1063	IRON CR	145	150	238	507	663	670	646	495	377	338	319	196	117	109	134	371	665	670	568	324	238	185	165	142	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1064	JOFFRE CR	67	45	35	221	865	966	956	802	569	370	200	118	49	105	31	50	722	967	917	497	341	214	131	79	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1065	JOHN CR	145	150	238	507	663	670	646	495	377	338	319	196	117	109	134	371	665	670	568	324	238	185	165	142	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1066	KAIN CR	97	66	52	323	1264	1412	1397	1172	832	540	292	173	72	153	46	72	1056	1414	1340	727	498	312	192	115	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1067	KELLIE CR	564	584	924	1970	2577	2604	2512	1926	1468	1315	1241	762	454	422	522	1441	2587	2604	2208	1259	924	721	642	550	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1068	KUSHANAX CR	1127	1168	1848	3940	5154	5208	5024	3851	2936	2630	2482	1525	908	844	1044	2882	5174	5208	4416	2519	1848	1442	1285	1101	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1069	LADYBIRD CR	306	317	502	1069	1399	1414	1364	1045	797	714	674	414	246	229	283	782	1404	1414	1199	684	502	391	349	299	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1070	LAIDLAW CR	419	434	687	1463	1914	1934	1866	1430	1090	977	922	566	337	313	388	1070	1922	1934	1640	936	686	535	477	409	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1071	LASCA CR	564	584	924	1970	2577	2604	2512	1926	1468	1315	1241	762	454	422	522	1441	2587	2604	2208	1259	924	721	642	550	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1072	LATEWHOS CR	370	384	607	1295	1693	1711	1651	1265	965	864	816	501	298	277	343	947	1700	1711	1451	828	607	474	422	362	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1073	LEGERWOOD CR	161	167	264	563	736	744	718	550	419	376	355	218	130	121	149	412	739	744	631	360	264	206	184	157	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1074	LEXINGTON CR	306	317	502	1069	1399	1414	1364	1045	797	714	674	414	246	229	283	782	1404	1414	1199	684	502	391	349	299	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13

Table 2. Monthly Generation

Ref No	Stream Name	Monthly Average Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Firm Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Capacity Factor (%) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Hydr. zone
1075	LILLIAN CR	145	150	238	507	663	670	646	495	377	338	319	196	117	109	134	371	665	670	568	324	238	185	165	142	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1076	LITTLE GLACIER CR	97	100	158	338	442	446	431	330	252	225	213	131	78	72	89	247	443	446	379	216	158	124	110	94	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1077	LOFTUS CR	242	250	396	844	1104	1116	1077	825	629	563	532	327	195	181	224	618	1109	1116	946	540	396	309	275	236	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1078	LOKI CR	467	484	766	1632	2135	2158	2081	1595	1216	1089	1028	632	376	350	432	1194	2143	2158	1829	1043	766	597	532	456	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1079	LOST LEDGE CR	145	150	238	507	663	670	646	495	377	338	319	196	117	109	134	371	665	670	568	324	238	185	165	142	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1080	LUXOR CR	41	28	22	136	532	594	588	494	350	228	123	73	30	65	19	30	444	595	564	306	210	131	81	49	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1081	MAURIER CR	225	234	370	788	1031	1042	1005	770	587	526	496	305	182	169	209	576	1035	1042	883	504	370	288	257	220	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1082	MCDONALD CR	564	584	924	1970	2577	2604	2512	1926	1468	1315	1241	762	454	422	522	1441	2587	2604	2208	1259	924	721	642	550	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1083	MCDOUGAL CR	644	668	1056	2251	2945	2976	2871	2201	1677	1503	1418	871	519	482	596	1647	2956	2976	2523	1439	1056	824	734	629	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1084	MEADOW CR	145	150	238	507	663	670	646	495	377	338	319	196	117	109	134	371	665	670	568	324	238	185	165	142	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1085	MENHINICK CR	145	150	238	507	663	670	646	495	377	338	319	196	117	109	134	371	665	670	568	324	238	185	165	142	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1086	MIDGE CR	209	217	343	732	957	967	933	715	545	488	461	283	169	157	194	535	961	967	820	468	343	268	239	204	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1087	MITCHELL R FALLS	31	21	16	102	399	446	441	370	263	171	92	54	23	48	15	23	333	446	423	229	157	99	61	36	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1088	MOHAWK CR	209	217	343	732	957	967	933	715	545	488	461	283	169	157	194	535	961	967	820	468	343	268	239	204	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1089	MORRISSEY CR	56	38	30	187	732	817	809	679	482	313	169	100	42	89	27	42	611	818	776	421	288	181	111	67	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1090	MULVEHILL CR	354	367	581	1238	1620	1637	1579	1210	923	826	780	479	285	265	328	906	1626	1637	1388	792	581	453	404	346	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1091	NEMO CR	1240	1285	2033	4334	5669	5729	5526	4236	3229	2893	2730	1677	999	928	1148	3170	5691	5729	4857	2771	2033	1586	1413	1211	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1092	NEXT CR	548	567	898	1914	2503	2530	2440	1871	1426	1277	1206	740	441	410	507	1400	2513	2530	2145	1223	898	700	624	535	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1093	OCTOPUS CR	81	73	99	329	589	563	402	189	221	138	129	98	61	60	63	144	595	468	148	80	76	77	74	71	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
1094	OUTLET CR	113	117	185	394	515	521	502	385	294	263	248	152	91	84	104	288	517	521	442	252	185	144	128	110	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1095	PALLISER FALLS #1	36	24	19	119	466	520	515	432	307	199	108	64	27	57	17	27	389	521	494	268	183	115	71	42	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1096	PALLISER FALLS #2	82	55	44	272	1065	1189	1177	987	701	455	246	145	61	129	39	61	889	1190	1128	612	419	263	162	97	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1097	PAYNE CR	209	217	343	732	957	967	933	715	545	488	461	283	169	157	194	535	961	967	820	468	343	268	239	204	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1098	POOL CR	1111	1152	1822	3884	5080	5134	4952	3796	2894	2592	2447	1503	895	832	1029	2841	5100	5134	4353	2483	1822	1421	1266	1085	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1099	POPLAR CR	628	651	1030	2195	2871	2902	2799	2146	1636	1465	1383	849	506	470	582	1606	2882	2902	2460	1403	1030	803	716	613	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1100	POWDER CR	660	684	1083	2308	3019	3050	2943	2256	1719	1540	1454	893	532	494	611	1688	3030	3050	2586	1475	1083	844	753	645	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1101	QUARRIE CR	26	17	14	85	333	372	368	309	219	142	77	45	19	40	12	19	278	372	353	191	131	82	51	30	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1102	RAPID CR	451	467	739	1576	2061	2083	2010	1540	1174	1052	993	610	363	338	417	1153	2069	2083	1766	1007	739	577	514	440	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1103	RIOULX CR	225	234	370	788	1031	1042	1005	770	587	526	496	305	182	169	209	576	1035	1042	883	504	370	288	257	220	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1104	RUSSEL CR	274	284	449	957	1252	1265	1220	935	713	639	603	370	220	205	253	700	1256	1265	1072	612	449	350	312	267	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1105	SANCA CR	354	367	581	1238	1620	1637	1579	1210	923	826	780	479	285	265	328	906	1626	1637	1388	792	581	453	404	346	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1106	SCHROEDER CR	242	250	396	844	1104	1116	1077	825	629	563	532	327	195	181	224	618	1109	1116	946	540	396	309	275	236	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1107	SEPTET CR	82	55	44	272	1065	1189	1177	987	701	455	246	145	61	129	39	61	889	1190	1128	612	419	263	162	97	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1108	SHANNON CR	338	350	555	1182	1546	1562	1507	1155	881	789	745	457	272	253	313	865	1552	1562	1325	756	554	433	385	330	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1109	SHAW CR	338	350	555	1182	1546	1562	1507	1155	881	789	745	457	272	253	313	865	1552	1562	1325	756	554	433	385	330	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1110	SHUSWAP R BRENDA F	982	1018	1611	3433	4491	4538	4378	3356	2558	2291	2163	1329	791	735	910	2511	4508	4538	3848	2195	1611	1256	1120	959	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1111	SICAMOUS CR	403	417	660	1407	1841	1860	1794	1375	1048	939	887	544	324	301	373	1029	1848	1860	1577	900	660	515	459	393	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1112	SKOOKUMCHUCK F	67	45	35	221	865	966	956	802	569	370	200	118	49	105	31	50	722	967	917	497	341	214	131	79	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1113	SLEWISKIN CR	258	267	422	901	1178	1190	1148	880	671	601	567	348	207	193	239	659	1183	1190	1009	576	422	330	294	252	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1114	SMYTH CR	225	234	370	788	1031	1042	1005	770	587	526	496	305	182	169	209	576	1035	1042	883	504	370	288	257	220	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1115	SNOW CR	177	184	290	619	810	818	789	605	461	413	390	240	143	133	164	453	813	818	694	396	290	227	202	173	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1116	SOUTH CRANBERRY CR	676	701	1109	2364	3092	3125	3014	2311	1761	1578	1489	915	545	506	626	1729	3104	3125	2650	1511	1109	865	771	660	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1117	SOWSAP CR	113	117	185	394	515	521	502	385	294	263	248	152	91	84	104	288	517	521	442	252	185	144	128	110	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1118	SPECTRUM CR FALLS	161	167	264	563	736	744	718	550	419	376	355	218	130	121	149	412	739	744	631	360	264	206	184	157	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1119	ST.LEON CR	1321	1368	2165	4615	6037	6101	5885	4511	3439	3080	2908	1786	1063	989	1223	3376	6060	6101	5173	2950	2165	1689	1505	1289	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1120	STOCKDALE CR	251	170	133	832	3261	3641	3604	3024	2146	1394	753	445	186	396	119	187	2722	3646	3455	1874	1284	805	496	297	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1121	SUNDOWN CR	51	35	27	170	666	743	735	617	438	284	154	91	38	81	24	38	556	744	705	382	262	164	101	61	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1122	TAM O'SHANTER CR	596	617	977	2083	2724	2753	2656	2036	1552	1390	1312	806	480	446	552	1523	2735	2753	2334	1331	977	762	679	582	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1123	TEA CR	177	184	290	619	810	818	789	605	461	413	390	240	143	133	164	453	813	818	694	396	290	227	202	173	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1124	TEMPLETON CR	322	334	528	1126	1472	1488	1435	1100	839	751	709	436	259	241	298	823	1478	1488	1262	720	528	412	367	314	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1125	TENDERFOOT CR	451	467	739	1576	2061	2083	2010	1540	1174	1052	993	610	363	338	417	1153	2069	2083	1766	1007	739	577	514	440	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1126	TOWN CR	242	250	396	844	1104	1116	1077	825	629	563	532	327	195	181	224	618	1109	1116	946	540	396	309	275	236	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1127	TSUIUS CR	950	985	1558	3321	4344	4390	4235	3246	2474	2216	2092	1285	765	711	880	2429	4361	4390	3722	2123	1558	1215	1083	928	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1128	UNNAMED CR	92	62	49	306	1198	1338	1324	1111	788	512	277	163	68	145	44	69	1000	1339	1269	688	472	296	182	109	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1129	UNNAMED CR	36	24	19	119	466	520	515	432	307	199	108	64	27	57	17	27	389	521	494	268	183	115	71	42	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1130	UNNAMED CR	129	134	211	450	589	595	574	440	335	301	284	174	104	96	119	329	591	595	505	288	211	165	147	126	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1131	UNNAMED CR	129	134	211	450	589	595	574	440	335	301	284	174	104	96	119	329	591	595	505	288	211	165	147	126	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1132	UNNAMED CR	177	184	290	619	810	818	789	605	461	413	390	240	143	133	164	453	813	818	694	396	290	227	202	173	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1133	UNNAMED CR	113	117	185	394	515	521	502	385	294	263	248	152	91	84	104	288	517	521	442	252	185	144	128	110	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1134	UNNAMED CR	177	184	290	619	810	818	789	605	461	413	390	240	143	133	164	453	813	818	694	396	290	227	202	173	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1135	UNNAMED CR	97	100	158	338	442	446	431	330	252	225	213	131	78	72	89	247	443	446	379	216	158	124	110	94	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1136	UNNAMED CR	161	167	264	563	736	744	718	550	419	376	355	218	130	121	149	412	739	744	631	360	264	206	184	157	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1137	UNNAMED CR	274	284	449	957	1252	1265	1220	935	713	639	603	370	220	205	253	700	1256	1265	1072	612	449	350	312	267	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1138	UNNAMED CR	451	467	739	1576	2061	2083	2010	1540	1174	1052	993	610	363	338	417	1153	2069	2083	1766	1007	739	577	514	440	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1139	UNNAMED CR	193	200	317	675	883	893	861	660	503	451	426	261	156	145	179	494	887	893	757	432	317	247	220	189	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1140	UNNAMED CR	118	80	63	390	1531	1709	1691	1419	1007	654	353	209	87	186	56	88	1278	1711	1622	880	603	378	233	140	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1141	VAN HOUTEN CR	71	64	86	288	515	492	352	166	193	121	113	86	53	53	55	126	521	410	130	70	66	68	65	62	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
1142	VICTOR CR	193	200	317	675	883	893	861	660	503	451	426	261	156	145	179	494	887	893	757	432	317	247	220	189	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1143	VOWELL CR	118	80	63	390	1531	1709	1691	1419	1007	654	353	209	87	186	56	88	1278	1711	1622	880	603	378	233	140	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1144	WAP CR FALLS	161	167	264	563	736	744	718	550	419	376	355	218	130	121	149	412	739	744	631	360	264	206	184	157	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1145	WARREN CR	307	208	163	1019	3993	4459	4413	3702	2627	1707	922	545	228	485	145	229	3333	4464	4231	2294	1572	986	607	364	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
1146	WEE SANDY CR	403	417	660	1407	1841	1860	1794	1375	1048	939	887	544	324	301	373	1029	1848	1860	1577	900	660	515	459	393	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1147	WHATSHAN L DAM & F	162	146	197	658	1178	1125	804	379	441	277	259	197	122	120	126	288	1190	937	297	159	151	155	149	142	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
1148	WILSON CR	451	467	739	1576	2061	2083	2010	1540	1174	1052	993	610	363	338	417	1153	2069	2083	1766	1007	739	577	514	440	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13

Table 2. Monthly Generation

Ref No	Stream Name	Monthly Average Energy (MWh)												Monthly Firm Energy (MWh)												Monthly Capacity Factor (%)												Hydr. zone
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
1149	WILSON CR FALLS	693	718	1135	2420	3166	3199	3086	2366	1803	1615	1525	937	558	518	641	1770	3178	3199	2713	1547	1135	886	789	676	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1150	WODEN CR	387	401	634	1351	1767	1786	1723	1320	1006	902	851	523	311	289	358	988	1774	1786	1514	864	634	494	441	377	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1151	WOODBURY CR	725	751	1188	2533	3313	3348	3230	2476	1887	1690	1596	980	584	543	671	1853	3326	3348	2839	1619	1188	927	826	708	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1152	WRAGGE CR	338	350	555	1182	1546	1562	1507	1155	881	789	745	457	272	253	313	865	1552	1562	1325	756	554	433	385	330	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
1153	YARD CR	580	601	951	2026	2650	2678	2584	1981	1510	1352	1277	784	467	434	537	1482	2661	2678	2271	1295	951	741	661	566	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
2001	ADAMS R RAPIDS	1337	1385	2192	4672	6111	6175	5957	4566	3481	3118	2943	1808	1076	1001	1238	3417	6134	6175	5236	2986	2192	1709	1523	1305	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
2002	AIRPLANE CR	568	581	620	1072	1532	1551	1397	1016	927	1152	949	664	216	209	283	681	1485	1497	1054	642	459	922	622	299	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2003	ANDERSON CR	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2004	ASHLU CR (TUNNEL)	11686	11945	12763	22057	31515	31901	28739	20900	19075	23702	19523	13665	4436	4289	5818	14001	30546	30792	21685	13211	9446	18957	12789	6154	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2005	BASTION CR	97	100	158	338	442	446	431	330	252	225	213	131	78	72	89	247	443	446	379	216	158	124	110	94	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
2006	BEAR CR	1244	1272	1359	2349	3356	3397	3060	2225	2031	2524	2079	1455	472	457	619	1491	3253	3279	2309	1407	1006	2019	1362	655	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2007	BIG SILVER CR	2759	2820	3014	5208	7441	7532	6786	4935	4504	5596	4610	3227	1047	1013	1374	3306	7212	7270	5120	3119	2230	4476	3020	1453	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2008	BILLYGOAT CR	2678	2737	2925	5055	7222	7311	6586	4790	4371	5432	4474	3132	1017	983	1333	3209	7000	7057	4970	3028	2165	4344	2931	1410	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2009	BIRKENHEAD R	4031	4120	4402	7608	10870	11003	9912	7209	6579	8175	6734	4713	1530	1479	2007	4829	10536	10620	7479	4557	3258	6539	4411	2123	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2010	BLACKCOMB & HORSTMAN CR	406	415	443	766	1094	1108	998	726	662	823	678	474	154	149	202	486	1061	1069	753	459	328	658	444	214	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2011	BLOWDOWN CR	100	80	85	224	708	818	818	802	588	341	216	127	92	84	86	122	498	818	818	757	434	238	120	104	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2012	BLURTON CR	242	250	396	844	1104	1116	1077	825	629	563	532	327	195	181	224	618	1109	1116	946	540	396	309	275	236	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
2013	BOBB CR	173	139	147	387	1223	1413	1414	1385	1015	589	373	220	159	144	148	210	860	1414	1414	1307	750	412	207	179	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2014	BOISE CR	2732	2793	2984	5157	7368	7458	6719	4886	4460	5542	4564	3195	1037	1003	1360	3273	7142	7199	5070	3089	2208	4432	2990	1439	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2015	BOX CANYON CR	649	664	709	1225	1751	1772	1597	1161	1060	1317	1085	759	246	238	323	778	1697	1711	1205	734	525	1053	711	342	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2016	BRANDYWINE CR	1839	1880	2009	3472	4961	5022	4524	3290	3003	3731	3073	2151	698	675	916	2204	4808	4847	3413	2080	1487	2984	2013	969	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2017	BREMNER CR	406	415	443	766	1094	1108	998	726	662	823	678	474	154	149	202	486	1061	1069	753	459	328	658	444	214	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2018	BROHM R #1	2029	2074	2216	3829	5471	5538	4989	3628	3312	4115	3389	2372	770	745	1010	2431	5303	5346	3765	2294	1640	3291	2220	1068	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2019	BROHM R #2 (TUNNEL/PEN)	2218	2267	2423	4187	5982	6055	5455	3967	3621	4499	3706	2594	842	814	1104	2658	5798	5845	4116	2508	1793	3598	2428	1168	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2020	BUCKLIN CR	2002	2046	2186	3778	5398	5465	4923	3580	3267	4060	3344	2341	760	735	997	2398	5232	5275	3715	2263	1618	3247	2191	1054	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2021	CADWALLADER CR	173	139	147	387	1223	1413	1414	1385	1015	589	373	220	159	144	148	210	860	1414	1414	1307	750	412	207	179	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2022	CALLAGHAN CR	2029	2074	2216	3829	5471	5538	4989	3628	3312	4115	3389	2372	770	745	1010	2431	5303	5346	3765	2294	1640	3291	2220	1068	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2023	CANTELON/YOLA CR	676	691	739	1276	1824	1846	1663	1209	1104	1372	1130	791	257	248	337	810	1768	1782	1255	765	547	1097	740	356	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2024	CAPILANO R DAM	4058	4148	4432	7659	10943	11077	9979	7257	6623	8230	6779	4745	1540	1489	2020	4862	10606	10692	7530	4587	3280	6582	4441	2137	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2025	CASCADE CR	325	332	355	613	875	886	798	581	530	658	542	380	123	119	162	389	849	855	602	367	262	527	355	171	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2026	CAYOOSH CR #1	712	570	604	1590	5022	5799	5803	5684	4168	2418	1530	901	651	592	608	862	3531	5803	5803	5365	3078	1691	849	735	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2027	CAYOOSH CR #2	953	1007	1459	2985	3639	2129	2635	1373	1265	1295	1429	1071	539	616	784	1811	3646	2454	1350	370	329	512	468	445	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
2028	CAYOOSH CR #3 (TUNNEL)	3053	3225	4675	9564	11660	6822	8443	4400	4053	4150	4580	3430	1728	1973	2511	5802	11681	7862	4325	1185	1055	1642	1499	1426	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
2029	CHAPMAN CR FALLS	298	304	325	562	802	812	732	532	486	604	497	348	113	109	148	357	778	784	552	336	241	483	326	157	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2030	CHASE CR	81	73	99	329	589	563	402	189	221	138	129	98	61	60	63	144	595	468	148	80	76	77	74	71	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
2031	CHEEKYE R	433	442	473	817	1167	1182	1064	774	706	878	723	506	164	159	215	519	1131	1140	803	489	350	702	474	228	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2032	CHICKWAT CR	1407	1438	1536	2655	3794	3840	3459	2516	2296	2853	2350	1645	534	516	700	1685	3677	3706	2610	1590	1137	2282	1539	741	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2033	CHIPMUNK CR	1704	1742	1861	3217	4596	4652	4191	3048	2782	3457	2847	1993	647	626	848	2042	4455	4491	3162	1927	1378	2765	1865	898	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2034	CINNAMON CR	173	139	147	387	1223	1413	1414	1385	1015	589	373	220	159	144	148	210	860	1414	1414	1307	750	412	207	179	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2035	CINQUEFOIL CR	389	411	596	1218	1485	869	1076	561	516	529	583	437	220	251	320	739	1488	1002	551	151	134	209	191	182	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
2036	CLEAR CR	460	470	502	868	1240	1255	1131	822	751	933	768	538	175	169	229	551	1202	1212	853	520	372	746	503	242	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2037	CLOWHOM R	1001	1023	1093	1889	2699	2732	2461	1790	1634	2030	1672	1170	380	367	498	1199	2616	2637	1857	1132	809	1624	1095	527	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2038	CLOWHOM R	1163	1189	1270	2196	3137	3175	2861	2080	1899	2359	1943	1360	442	427	579	1394	3041	3065	2158	1315	940	1887	1273	613	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2039	CLOWHOM R	920	940	1005	1736	2480	2511	2262	1645	1501	1865	1537	1076	349	338	458	1102	2404	2423	1707	1040	743	1492	1007	484	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2040	COGBURN CR	1244	1272	1359	2349	3356	3397	3060	2225	2031	2524	2079	1455	472	457	619	1491	3253	3279	2309	1407	1006	2019	1362	655	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2041	CONNEL CR	438	351	372	978	3091	3568	3571	3498	2565	1488	941	555	401	365	374	530	2173	3571	3571	3302	1894	1041	523	453	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2042	CORBOLD CR	1867	1908	2039	3523	5034	5095	4590	3338	3047	3786	3118	2183	709	685	929	2236	4879	4918	3464	2110	1509	3028	2043	983	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2043	CRAWFORD CR	433	442	473	817	1167	1182	1064	774	706	878	723	506	164	159	215	519	1131	1140	803	489	350	702	474	228	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2044	CULLITON CR	2029	2074	2216	3829	5471	5538	4989	3628	3312	4115	3389	2372	770	745	1010	2431	5303	5346	3765	2294	1640	3291	2220	1068	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2045	DE BECK	1677	1714	1832	3166	4523	4578	4125	3000	2738	3402	2802	1961	637	616	835	2009	4384	4419	3112	1896	1356	2721	1835	883	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2046	DEMPSTER CR	1028	1051	1123	1940	2772	2806	2528	1838	1678	2085	1717	1202	390	377	512	1232	2687	2709	1907	1162	831	1668	1125	541	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2047	DOUGLAS CR	3138	3207	3427	5923	8462	8566	7717	5612	5122	6365	5242	3669	1191	1152	1562	3760	8202	8268	5823	3547	2536	5090	3434	1653	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2048	DOWNTON CR	429	344	364	958	3026	3494	3497	3425	2512	1457	922	543	392	357	366	519	2128	3497	3497	3233	1855	1019	512	443	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2049	DURUISEAU CR	61	55	74	247	442	422	302	142	165	104	97	74	46	45	47	108	446	351	111	60	57	58	56	53	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
2050	DUTEAU CR	162	146	197	658	1178	1125	804	379	441	277	259	197	122	120	126	288	1190	937	297	159	151	155	149	142	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
2051	EATON CR	541	553	591	1021	1459	1477	1330	968	883	1097	904	633	205	199	269	648	1414	1426	1004	612	437	878	592	285	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2052	ELAHO CR	6871	7023	7504	12969	18530	18757	16897	12288	11215	13936	11479	8035	2608	2522	3420	8232	17960	18105	12750	7768	5554	11146	7519	3619	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2053	FIRE CR	2976	3042	3250	5616	8025	8123	7318	5322	4857	6035	4971	3480	1130	1092	1481	3565	7778	7841	5522	3364	2405	4827	3256	1567	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2054	FISH HATCHERY CR	1569	1604	1714	2961	4231	4283	3858	2806	2561	3182	2621	1835	596	576	781	1880	4101	4134	2911	1774	1268	2545	1717	826	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2055	FITZSIMMONS CR	1650	1687	1802	3115	4450	4505	4058	2951	2693	3347	2757	1930	626	606	821	1977	4313	4348	3062	1865	1334	2677	1806	869	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2056	FOLEY CR	433	442	473	817	1167	1182	1064	774	706	878	723	506	164	159	215	519	1131	1140	803	489	350	702	474	228	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2057	FRIES CR	622	636	680	1174	1678	1698	1530	1113	1016	1262	1039	728	236	228	310	745	1626	1639	1155	703	503	1009	681	328	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2058	FURRY CR	1758	1797	1920	3319	4742	4800	4324	3145	2870	3566	2937	2056	667	645	875	2107	4596	4633	3263	1988	1421	2852	1924	926	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2059	GRAVELL CR	2083	2129	2275	3932	5617	5686	5122	3725	3400	4225	3480	2436	791	765	1037	2496	5445	5488	3865	2355	1684	3379	2280	1097	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2060	GRAY CR	730	747	798	1379	1970	1994	1796	1306	1192	1481	1220	854	277	268	364	875	1909	1925	1355	826	590	1185	799	385	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2061	HAYLMORE CR	338	271	286	754	2382	2751	2753	2696	1977	1147	726	428	309	281	288	409	1675	2753	2753	2545	1460	802	403	349	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2062	HICKS CR	216	221	236	408	584	591	532	387	353	439	362	253	82	79	108	259	566	570	402	245	175	351	237	114	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2063	HIGH CR	974	995	1064	1838	2626	2658	2395	1742	1590	1975	1627	1139	370	357	485	1167	2546	2566	1807	1101	787	1580	1066	513	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2064	HIGH FALLS CR	2191	2240	2393	4136	5909	5982	5388	3919	3577	4444	3661	2562	832	804	1091	2625	5727	5774	4066	2477	1771	3555	2398	1154	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2065	HILLS CR	209	217	343	732	957	967	933	715	545	488	461	283	169	157	194	535	961	967	820	468	343	268	239	204	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
2066	HIXON CR	460	470	502	868	1240	1255	1131	822	751	933	768	538	175	169	229	551	1202	1212	853	520	372	746	503	242	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2067	HORNET CR (TUNNEL)	1217	1244	1330	2298	3283	3323	2994	2177	1987	2469	2034	1423	462	447	606	1458	3182	3208	2259	1376	984	1975	1332	641	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2068	HUMMING BIRD CR	97	100	158	338	442	446	431	330	252	225	213	131	78	72	89	247	443	446	379	216	158	124	110	94	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
2069	HURLEY R (TUNNEL)	2382	1909	2021	5321	16806	19403	19418	19019	13948	8091	5119	3016	2180	1982	2034	2883	11815	19418	19418	17953	10300	5658	2842	2461	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15

Table 2. Monthly Generation

Ref No	Stream Name	Monthly Average Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Firm Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Capacity Factor (%) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Hydr. zone
2070	JOFFRE CR	2110	2157	2305	3983	5690	5760	5189	3774	3444	4280	3525	2467	801	774	1050	2528	5515	5560	3915	2385	1705	3423	2309	1111	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2071	KAKILA CR	1812	1853	1980	3421	4888	4948	4457	3241	2958	3676	3028	2119	688	665	902	2172	4738	4776	3363	2049	1465	2940	1983	955	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2072	KEARY CR	173	139	147	387	1223	1413	1414	1385	1015	589	373	220	159	144	148	210	860	1414	1414	1307	750	412	207	179	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2073	KOOKIPI CR	4247	4341	4639	8016	11453	11594	10444	7596	6932	8614	7095	4966	1612	1559	2114	5089	11101	11191	7881	4801	3433	6890	4648	2237	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2074	KWOIEK CR	5491	5613	5998	10365	14809	14991	13504	9821	8963	11138	9174	6421	2085	2016	2734	6579	14354	14470	10190	6208	4439	8908	6010	2892	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2075	LAFORGUE CR	406	415	443	766	1094	1108	998	726	662	823	678	474	154	149	202	486	1061	1069	753	459	328	658	444	214	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2076	LAKE LOVELY WATER	1326	1355	1448	2502	3575	3618	3260	2371	2164	2688	2214	1550	503	487	660	1588	3465	3493	2460	1499	1071	2150	1451	698	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2077	LAKEVIEW CR	142	128	172	576	1030	985	704	331	386	242	227	172	107	105	110	252	1042	820	260	139	133	135	130	124	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
2078	LIVINGSTON & GOWAN CR	3490	3567	3811	6587	9411	9526	8582	6241	5696	7078	5830	4081	1325	1281	1737	4181	9122	9195	6475	3945	2821	5661	3819	1838	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2079	LIZZIE CR	1948	1991	2127	3676	5253	5317	4790	3483	3179	3950	3254	2278	739	715	970	2334	5091	5132	3614	2202	1574	3160	2132	1026	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2080	LOG CR	2299	2350	2511	4340	6201	6277	5655	4112	3753	4664	3841	2689	873	844	1145	2755	6010	6059	4267	2599	1859	3730	2516	1211	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2081	LOST CR	406	415	443	766	1094	1108	998	726	662	823	678	474	154	149	202	486	1061	1069	753	459	328	658	444	214	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2082	LOST VALLEY CR	237	190	201	530	1674	1933	1934	1895	1389	806	510	300	217	197	203	287	1177	1934	1934	1788	1026	564	283	245	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2083	LYNN CR	622	636	680	1174	1678	1698	1530	1113	1016	1262	1039	728	236	228	310	745	1626	1639	1155	703	503	1009	681	328	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2084	MAIMEN CR	514	525	561	970	1386	1403	1264	919	839	1042	859	601	195	189	256	616	1343	1354	954	581	415	834	562	271	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2085	MAMQUAM R	8846	9042	9661	16696	23855	24148	21754	15820	14439	17941	14778	10344	3358	3247	4404	10598	23122	23308	16414	10000	7150	14350	9681	4659	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2086	MANATEE CR	2435	2489	2659	4595	6566	6646	5987	4354	3974	4938	4067	2847	924	894	1212	2917	6364	6415	4518	2752	1968	3949	2664	1282	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2087	MARA CR	145	150	238	507	663	670	646	495	377	338	319	196	117	109	134	371	665	670	568	324	238	185	165	142	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
2088	MARSHALL CR (TUNNEL)	265	212	225	591	1867	2156	2158	2113	1550	899	569	335	242	220	226	320	1313	2158	2158	1995	1144	629	316	273	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2089	MASELPANIK CR	1461	1493	1595	2757	3939	3988	3592	2612	2384	2963	2440	1708	555	536	727	1750	3818	3849	2711	1651	1181	2370	1599	769	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2090	MAWBY CR	812	830	886	1532	2189	2215	1996	1451	1325	1646	1356	949	308	298	404	972	2121	2138	1506	917	656	1316	888	427	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2091	MCGILLIVARY CR	301	241	256	673	2125	2453	2455	2405	1764	1023	647	381	276	251	257	365	1494	2455	2455	2270	1302	715	359	311	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2092	MCNAIR CR	812	830	886	1532	2189	2215	1996	1451	1325	1646	1356	949	308	298	404	972	2121	2138	1506	917	656	1316	888	427	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2093	MCNULTY CR	253	228	308	1028	1840	1759	1256	592	690	432	405	308	191	188	197	449	1860	1464	464	249	237	242	232	221	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
2094	MEHATL CR	5140	5254	5614	9701	13861	14031	12640	9192	8389	10425	8587	6010	1951	1886	2559	6158	13435	13543	9537	5811	4154	8338	5625	2707	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2095	MISERY CR FALLS	2705	2765	2954	5106	7295	7385	6652	4838	4415	5487	4519	3163	1027	993	1347	3241	7071	7128	5020	3058	2187	4388	2960	1425	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2096	MONMOUTH CR	595	608	650	1123	1605	1625	1464	1064	971	1207	994	696	226	218	296	713	1556	1568	1104	673	481	965	651	313	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2097	MOWHOKAM CR	298	304	325	562	802	812	732	532	486	604	497	348	113	109	148	357	778	784	552	336	241	483	326	157	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2098	NICOAMEN CR	447	472	685	1401	1708	999	1237	645	594	608	671	503	253	289	368	850	1711	1152	634	174	155	241	220	209	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
2099	NOEL CR	119	95	101	265	837	966	967	947	695	403	255	150	109	99	101	144	588	967	967	894	513	282	142	123	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2100	NORTH CR	2326	2378	2541	4391	6274	6351	5721	4161	3797	4719	3887	2720	883	854	1158	2787	6081	6130	4317	2630	1880	3774	2546	1225	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2101	NORTH SLOQUET CR	1136	1161	1241	2144	3064	3102	2794	2032	1854	2304	1898	1329	431	417	566	1361	2970	2994	2108	1284	918	1843	1243	598	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2102	OWL CR	1190	1217	1300	2247	3210	3249	2927	2129	1943	2414	1988	1392	452	437	593	1426	3111	3136	2209	1346	962	1931	1303	627	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2103	PAUL CR	61	55	74	247	442	422	302	142	165	104	97	74	46	45	47	108	446	351	111	60	57	58	56	53	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
2104	PEBBLE CR	2705	2765	2954	5106	7295	7385	6652	4838	4415	5487	4519	3163	1027	993	1347	3241	7071	7128	5020	3058	2187	4388	2960	1425	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2105	PERKETTS CR	1380	1410	1507	2604	3721	3766	3393	2467	2252	2798	2305	1613	524	506	687	1653	3606	3635	2560	1560	1115	2238	1510	727	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2106	PHAIR CR	219	176	186	489	1545	1784	1786	1749	1283	744	471	277	200	182	187	265	1086	1786	1786	1651	947	520	261	226	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2107	PHELIX CR	460	470	502	868	1240	1255	1131	822	751	933	768	538	175	169	229	551	1202	1212	853	520	372	746	503	242	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2108	PINECONE CR	2381	2433	2600	4493	6420	6498	5854	4257	3886	4828	3977	2784	904	874	1185	2852	6222	6272	4417	2691	1924	3862	2605	1254	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2109	PLACER CR	142	128	172	576	1030	985	704	331	386	242	227	172	107	105	110	252	1042	820	260	139	133	135	130	124	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
2110	POST CR	298	304	325	562	802	812	732	532	486	604	497	348	113	109	148	357	778	784	552	336	241	483	326	157	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2111	POTLATCH CR	135	138	148	255	365	369	333	242	221	274	226	158	51	50	67	162	354	356	251	153	109	219	148	71	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2112	RAFFUSE CR	2056	2101	2245	3880	5544	5612	5056	3677	3356	4170	3435	2404	780	755	1023	2463	5374	5417	3815	2324	1662	3335	2250	1083	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2113	RAINY R	1812	1853	1980	3421	4888	4948	4457	3241	2958	3676	3028	2119	688	665	902	2172	4738	4776	3363	2049	1465	2940	1983	955	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2114	RED CR	61	55	74	247	442	422	302	142	165	104	97	74	46	45	47	108	446	351	111	60	57	58	56	53	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
2115	RED TUSK CR	1217	1244	1330	2298	3283	3323	2994	2177	1987	2469	2034	1423	462	447	606	1458	3182	3208	2259	1376	984	1975	1332	641	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2116	REINECKER CR	129	134	211	450	589	595	574	440	335	301	284	174	104	96	119	329	591	595	505	288	211	165	147	126	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
2117	ROARING CR	595	608	650	1123	1605	1625	1464	1064	971	1207	994	696	226	218	296	713	1556	1568	1104	673	481	965	651	313	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2118	ROGERS CR	2543	2599	2777	4799	6858	6942	6253	4548	4151	5157	4248	2973	965	933	1266	3047	6647	6700	4719	2875	2055	4125	2783	1339	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2119	RUBBLE CR	4328	4424	4727	8169	11672	11815	10644	7741	7065	8779	7231	5061	1643	1589	2155	5186	11313	11405	8032	4893	3498	7021	4737	2279	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2120	RUTHERFORD CR	6790	6940	7416	12816	18311	18535	16698	12143	11083	13771	11343	7940	2578	2492	3380	8135	17748	17891	12599	7676	5488	11015	7431	3576	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2121	RYAN CR	2624	2682	2866	4953	7076	7163	6453	4693	4283	5322	4384	3068	996	963	1306	3144	6859	6914	4869	2966	2121	4257	2872	1382	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2122	SCUZZZY CR	1163	1189	1270	2196	3137	3175	2861	2080	1899	2359	1943	1360	442	427	579	1394	3041	3065	2158	1315	940	1887	1273	613	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2123	SECHELT CR	1948	1991	2127	3676	5253	5317	4790	3483	3179	3950	3254	2278	739	715	970	2334	5091	5132	3614	2202	1574	3160	2132	1026	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2124	SHALE CR	1271	1300	1389	2400	3429	3471	3127	2274	2075	2579	2124	1487	483	467	633	1523	3323	3350	2359	1437	1028	2063	1391	670	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2125	SHULAPS CR	175	185	268	548	668	391	484	252	232	238	263	197	99	113	144	333	670	451	248	68	60	94	86	82	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
2126	SIGURD CR FALLS	1326	1355	1448	2502	3575	3618	3260	2371	2164	2688	2214	1550	503	487	660	1588	3465	3493	2460	1499	1071	2150	1451	698	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2127	SIWASH CR	1271	1300	1389	2400	3429	3471	3127	2274	2075	2579	2124	1487	483	467	633	1523	3323	3350	2359	1437	1028	2063	1391	670	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2128	SLOQUET CR	1758	1797	1920	3319	4742	4800	4324	3145	2870	3566	2937	2056	667	645	875	2107	4596	4633	3263	1988	1421	2852	1924	926	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2129	SNOWCAP CR	3327	3401	3634	6280	8973	9083	8183	5951	5431	6749	5559	3891	1263	1221	1656	3987	8697	8767	6174	3762	2689	5398	3641	1752	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2130	SOUTH SLOQUET CR	1028	1051	1123	1940	2772	2806	2528	1838	1678	2085	1717	1202	390	377	512	1232	2687	2709	1907	1162	831	1668	1125	541	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2131	SOWERBY CR	1271	1300	1389	2400	3429	3471	3127	2274	2075	2579	2124	1487	483	467	633	1523	3323	3350	2359	1437	1028	2063	1391	670	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2132	SPUZZUM CR	2353	2406	2570	4442	6347	6425	5788	4209	3841	4773	3932	2752	893	864	1172	2820	6152	6201	4367	2661	1902	3818	2576	1239	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2133	SQUAKUM CR	2435	2489	2659	4595	6566	6646	5987	4354	3974	4938	4067	2847	924	894	1212	2917	6364	6415	4518	2752	1968	3949	2664	1282	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2134	SQUAMISH R	3300	3373	3604	6229	8900	9009	8116	5902	5387	6694	5513	3859	1253	1211	1643	3954	8627	8696	6124	3731	2668	5354	3612	1738	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2135	STAWAMUS CR	1326	1355	1448	2502	3575	3618	3260	2371	2164	2688	2214	1550	503	487	660	1588	3465	3493	2460	1499	1071	2150	1451	698	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2136	STEVE CR	622	636	680	1174	1678	1698	1530	1113	1016	1262	1039	728	236	228	310	745	1626	1639	1155	703	503	1009	681	328	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2137	STOKKE CR	676	691	739	1276	1824	1846	1663	1209	1104	1372	1130	791	257	248	337	810	1768	1782	1255	765	547	1097	740	356	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2138	SWANEE CR	216	221	236	408	584	591	532	387	353	439	362	253	82	79	108	259	566	570	402	245	175	351	237	114	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2139	TACHEWANA CR	1244	1272	1359	2349	3356	3397	3060	2225	2031	2524	2079	1455	472	457	619	1491	3253	3279	2309	1407	1006	2019	1362	655	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2140	TANTALUS CR	1326	1355	1448	2502	3575	3618	3260	2371	2164	2688	2214	1550	503	487	660	1588	3465	3493	2460	1499	1071	2150	1451	698	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2141	TAQUAT CR	2002	2046	2186	3778	5398	5465	4923	3580	3267	4060	3344	2341	760	735	997	2398	5232	5275	3715	2263	1618	3247	2191	1054	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2142	TATLOW & FALK	1650	1687	1802	3115	4450	4505	4058	2951	2693	3347	2757	1930	626	606	821	1977	4313	4348	3062	1865	1334	2677	1806	869	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2143	TEREPOCKI CR	406	415	443	766	1094	1108	998	726	662	823	678	474	154	149	202	486	1061	1069	753	459	328	658	444	214	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B

Table 2. Monthly Generation

Ref No	Stream Name	Monthly Average Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Firm Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Capacity Factor (%) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Hydr. zone
2144	TEXAS CR	350	370	536	1097	1337	782	968	504	465	476	525	393	198	226	288	665	1339	901	496	136	121	188	172	164	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
2145	TEXAS CR	603	637	923	1888	2302	1347	1667	869	800	819	904	677	341	390	496	1146	2306	1552	854	234	208	324	296	282	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
2146	THORNHILL CR	1163	1189	1270	2196	3137	3175	2861	2080	1899	2359	1943	1360	442	427	579	1394	3041	3065	2158	1315	940	1887	1273	613	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2147	TIPELLA CR	676	691	739	1276	1824	1846	1663	1209	1104	1372	1130	791	257	248	337	810	1768	1782	1255	765	547	1097	740	356	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2148	TOMMY CR	256	205	217	571	1803	2082	2083	2040	1496	868	549	324	234	213	218	309	1268	2083	2083	1926	1105	607	305	264	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2149	TRETHEWAY CR	2110	2157	2305	3983	5690	5760	5189	3774	3444	4280	3525	2467	801	774	1050	2528	5515	5560	3915	2385	1705	3423	2309	1111	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2150	TRUAX CR	146	117	124	326	1030	1189	1190	1166	855	496	314	185	134	122	125	177	724	1190	1190	1101	631	347	174	151	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2151	TSILEUH CR	1298	1327	1418	2451	3502	3545	3193	2322	2119	2634	2169	1518	493	477	646	1556	3394	3421	2409	1468	1050	2106	1421	684	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2152	TUWASUS CR	2408	2461	2629	4544	6493	6572	5921	4306	3930	4883	4022	2815	914	884	1199	2885	6293	6344	4468	2722	1946	3906	2635	1268	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2153	TWENTYONE MILE CR	2516	2571	2748	4748	6785	6868	6187	4499	4106	5103	4203	2942	955	923	1252	3014	6576	6629	4668	2844	2033	4081	2753	1325	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2154	TWIN ONE CR	2083	2129	2275	3932	5617	5686	5122	3725	3400	4225	3480	2436	791	765	1037	2496	5445	5488	3865	2355	1684	3379	2280	1097	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2155	TYAUGHTON CR (TUNNEL)	1369	1097	1161	3058	9658	11151	11160	10930	8016	4650	2942	1733	1253	1139	1169	1657	6790	11160	11160	10318	5919	3252	1633	1414	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2156	TZOONIE CR	703	719	768	1328	1897	1920	1730	1258	1148	1427	1175	822	267	258	350	843	1838	1853	1305	795	568	1141	770	370	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2157	UNNAMED CR	2272	2323	2482	4289	6128	6203	5588	4064	3709	4609	3796	2657	863	834	1131	2723	5940	5987	4217	2569	1837	3686	2487	1197	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2158	UNNAMED CR	1434	1465	1566	2706	3866	3914	3526	2564	2340	2908	2395	1677	544	526	714	1718	3748	3778	2660	1621	1159	2326	1569	755	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2159	UNNAMED CR	1082	1106	1182	2042	2918	2954	2661	1935	1766	2195	1808	1265	411	397	539	1296	2828	2851	2008	1223	875	1755	1184	570	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2160	UNNAMED CR	1196	958	1014	2670	8435	9739	9746	9546	7001	4061	2569	1514	1094	995	1021	1447	5930	9746	9746	9011	5170	2840	1426	1235	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2161	UNNAMED CR	460	470	502	868	1240	1255	1131	822	751	933	768	538	175	169	229	551	1202	1212	853	520	372	746	503	242	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2162	UNNAMED CR	622	636	680	1174	1678	1698	1530	1113	1016	1262	1039	728	236	228	310	745	1626	1639	1155	703	503	1009	681	328	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2163	UNNAMED CR	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2164	UNNAMED CR	352	359	384	664	948	960	865	629	574	713	587	411	133	129	175	421	919	927	653	398	284	570	385	185	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2165	UNNAMED CR	406	415	443	766	1094	1108	998	726	662	823	678	474	154	149	202	486	1061	1069	753	459	328	658	444	214	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2166	UNNAMED CR	298	304	325	562	802	812	732	532	486	604	497	348	113	109	148	357	778	784	552	336	241	483	326	157	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2167	UNNAMED CR	730	747	798	1379	1970	1994	1796	1306	1192	1481	1220	854	277	268	364	875	1909	1925	1355	826	590	1185	799	385	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2168	UNNAMED CR	325	332	355	613	875	886	798	581	530	658	542	380	123	119	162	389	849	855	602	367	262	527	355	171	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2169	UNNAMED CR	514	525	561	970	1386	1403	1264	919	839	1042	859	601	195	189	256	616	1343	1354	954	581	415	834	562	271	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2170	UNNAMED CR	893	912	975	1685	2407	2437	2195	1597	1457	1811	1491	1044	339	328	444	1070	2333	2352	1657	1009	722	1448	977	470	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2171	UNNAMED CR	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2172	UNNAMED CR	1434	1465	1566	2706	3866	3914	3526	2564	2340	2908	2395	1677	544	526	714	1718	3748	3778	2660	1621	1159	2326	1569	755	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2173	UNNAMED CR	784	802	857	1481	2116	2142	1929	1403	1280	1591	1311	917	298	288	391	940	2051	2067	1456	887	634	1273	859	413	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2174	UNNAMED CR	595	608	650	1123	1605	1625	1464	1064	971	1207	994	696	226	218	296	713	1556	1568	1104	673	481	965	651	313	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2175	UNNAMED CR	1353	1383	1477	2553	3648	3692	3326	2419	2208	2743	2260	1582	513	496	673	1621	3535	3564	2510	1529	1093	2194	1480	712	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2176	UNNAMED CR	1353	1383	1477	2553	3648	3692	3326	2419	2208	2743	2260	1582	513	496	673	1621	3535	3564	2510	1529	1093	2194	1480	712	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2177	UNNAMED CR	649	664	709	1225	1751	1772	1597	1161	1060	1317	1085	759	246	238	323	778	1697	1711	1205	734	525	1053	711	342	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2178	UNNAMED CR	1271	1300	1389	2400	3429	3471	3127	2274	2075	2579	2124	1487	483	467	633	1523	3323	3350	2359	1437	1028	2063	1391	670	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2179	UNNAMED CR	1082	1106	1182	2042	2918	2954	2661	1935	1766	2195	1808	1265	411	397	539	1296	2828	2851	2008	1223	875	1755	1184	570	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2180	UNNAMED CR	1785	1825	1950	3370	4815	4874	4391	3193	2914	3621	2983	2088	678	655	889	2139	4667	4704	3313	2018	1443	2896	1954	940	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2181	UNNAMED CR	893	912	975	1685	2407	2437	2195	1597	1457	1811	1491	1044	339	328	444	1070	2333	2352	1657	1009	722	1448	977	470	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2182	UNNAMED CR	1055	1078	1152	1991	2845	2880	2594	1887	1722	2140	1762	1234	400	387	525	1264	2758	2780	1958	1193	853	1711	1155	556	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2183	UNNAMED CR FALLS	568	581	620	1072	1532	1551	1397	1016	927	1152	949	664	216	209	283	681	1485	1497	1054	642	459	922	622	299	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2184	UPPER CHEAKAMUS	2299	2350	2511	4340	6201	6277	5655	4112	3753	4664	3841	2689	873	844	1145	2755	6010	6059	4267	2599	1859	3730	2516	1211	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2185	UPPER LILLOOET R	3814	3899	4166	7199	10286	10412	9380	6821	6226	7736	6372	4460	1448	1400	1899	4570	9970	10050	7078	4312	3083	6188	4174	2009	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2186	UPPER MAMQUAM R	5167	5281	5643	9752	13934	14105	12706	9240	8434	10479	8632	6042	1961	1896	2572	6190	13505	13614	9588	5841	4176	8382	5654	2721	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2187	UPPER STAVE R	1948	1991	2127	3676	5253	5317	4790	3483	3179	3950	3254	2278	739	715	970	2334	5091	5132	3614	2202	1574	3160	2132	1026	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2188	URE CR	3949	4037	4314	7455	10651	10781	9713	7063	6447	8010	6598	4618	1499	1450	1966	4732	10324	10407	7329	4465	3192	6407	4322	2080	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2189	UZTLIUS CR	920	940	1005	1736	2480	2511	2262	1645	1501	1865	1537	1076	349	338	458	1102	2404	2423	1707	1040	743	1492	1007	484	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2190	VANCOUVER CR	1461	1493	1595	2757	3939	3988	3592	2612	2384	2963	2440	1708	555	536	727	1750	3818	3849	2711	1651	1181	2370	1599	769	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2191	VICKERS CR	622	636	680	1174	1678	1698	1530	1113	1016	1262	1039	728	236	228	310	745	1626	1639	1155	703	503	1009	681	328	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2192	WHITECAP CR	100	80	85	224	708	818	818	802	588	341	216	127	92	84	86	122	498	818	818	757	434	238	120	104	12%	10%	10%	27%	87%	100%	100%	98%	72%	42%	26%	16%	15
2193	WILLIS CR	71	64	86	288	515	492	352	166	193	121	113	86	53	53	55	126	521	410	130	70	66	68	65	62	14%	12%	17%	55%	99%	95%	68%	32%	37%	23%	22%	17%	12B
2194	WRAY CR	541	553	591	1021	1459	1477	1330	968	883	1097	904	633	205	199	269	648	1414	1426	1004	612	437	878	592	285	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
2195	ZENITH CR	271	277	295	511	730	738	665	484	442	549	452	316	103	99	135	324	707	713	502	306	219	439	296	142	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
4001	ADOLPH CR #1	757	784	1241	2645	3460	3497	3373	2586	1971	1766	1667	1024	610	567	701	1935	3474	3497	2965	1691	1241	968	863	739	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4002	ADOLPH CR #2	209	217	343	732	957	967	933	715	545	488	461	283	169	157	194	535	961	967	820	468	343	268	239	204	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4003	ALLAN CR	499	517	819	1745	2282	2306	2225	1705	1300	1165	1099	675	402	374	462	1276	2291	2306	1956	1115	819	638	569	487	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4004	ARCHIE CR	209	217	343	732	957	967	933	715	545	488	461	283	169	157	194	535	961	967	820	468	343	268	239	204	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4005	BILL MINER CR	918	951	1505	3208	4197	4241	4091	3136	2390	2141	2021	1241	739	687	850	2347	4213	4241	3596	2051	1505	1174	1046	896	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4006	BLUE R	113	117	185	394	515	521	502	385	294	263	248	152	91	84	104	288	517	521	442	252	185	144	128	110	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4007	BOBBIE BURNS CR	87	59	46	289	1131	1263	1250	1049	744	484	261	154	65	137	41	65	944	1265	1199	650	445	279	172	103	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4008	BOULDERY CR	2110	2186	3459	7373	9645	9746	9402	7207	5494	4921	4645	2853	1699	1579	1953	5393	9682	9746	8264	4714	3459	2698	2404	2060	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4009	BULLDOG CR	220	149	117	730	2862	3195	3162	2653	1883	1223	661	390	163	347	104	164	2389	3199	3032	1644	1127	706	435	261	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4010	CAMP CR	97	66	52	323	1264	1412	1397	1172	832	540	292	173	72	153	46	72	1056	1414	1340	727	498	312	192	115	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4011	CARIBOU CR	82	55	44	272	1065	1189	1177	987	701	455	246	145	61	129	39	61	889	1190	1128	612	419	263	162	97	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4012	CHUA CHUA CR	350	370	536	1097	1337	782	968	504	465	476	525	393	198	226	288	665	1339	901	496	136	121	188	172	164	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
4013	CLEARWATER RAPID-2	3422	3615	5241	10722	13071	7648	9465	4933	4543	4652	5135	3845	1937	2212	2815	6504	13094	8814	4849	1329	1183	1841	1680	1599	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
4014	CLEARWATER RAPID-3	1731	1828	2650	5422	6610	3867	4786	2494	2297	2352	2596	1945	980	1118	1423	3289	6622	4457	2452	672	598	931	850	808	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
4015	CLEMINA CR	154	104	82	509	1997	2229	2206	1851	1314	853	461	272	114	242	73	114	1667	2232	2116	1147	786	493	303	182	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4016	CUPOLA CR	87	59	46	289	1131	1263	1250	1049	744	484	261	154	65	137	41	65	944	1265	1199	650	445	279	172	103	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4017	DAVE HENRY CR #1	77	52	41	255	998	1115	1103	926	657	427	230	136	57	121	36	57	833	1116	1058	574	393	246	152	91	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4018	DAVE HENRY CR #2	128	87	68	424	1664	1858	1839	1543	1095	711	384	227	95	202	61	95	1389	1860	1763	956	655	411	253	152	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4019	DEADMAN R @ FALLS	117	123	179	366	446	261	323	168	155	159	175	131	66	75	96	222	446	300	165	45	40	63	57	55	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
4020	DECEPTION CR	117	123	179	366	446	261	323	168	155	159	175	131	66	75	96	222	446	300	165	45	40	63	57	55	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
4021	DOMINION CR	483	501	792	1689	2209	2232	2153	1650	1258	1127	1064	653	389	362	447	1235	2217	2232	1893	1079	792	618	551	472	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4022	DOUBLE EDDY CR	46	31	24	153	599	669	662	555	394	256	138	82	34	73	22	34	500	670	635	344	236	148	91	55	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14

Table 2. Monthly Generation

Ref	Stream Name	Monthly Average Energy (MWh)												Monthly Firm Energy (MWh)												Monthly Capacity Factor (%)												Hydr. zone
No		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
4023	FINN CR	564	584	924	1970	2577	2604	2512	1926	1468	1315	1241	762	454	422	522	1441	2587	2604	2208	1259	924	721	642	550	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4024	FROTH CR	258	267	422	901	1178	1190	1148	880	671	601	567	348	207	193	239	659	1183	1190	1009	576	422	330	294	252	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4025	GHITA CR	333	225	177	1103	4326	4830	4780	4011	2846	1849	999	590	247	525	157	248	3611	4836	4584	2486	1703	1068	657	394	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4026	GLENOGLE CR	26	17	14	85	333	372	368	309	219	142	77	45	19	40	12	19	278	372	353	191	131	82	51	30	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4027	GRANT BROOK	235	159	125	781	3061	3418	3383	2839	2014	1308	707	418	175	371	111	175	2556	3422	3244	1759	1205	756	465	279	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4028	HELLROAR CR	258	267	422	901	1178	1190	1148	880	671	601	567	348	207	193	239	659	1183	1190	1009	576	422	330	294	252	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4029	HOLT CR	31	21	16	102	399	446	441	370	263	171	92	54	23	48	15	23	333	446	423	229	157	99	61	36	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4030	HOWARD CR	72	49	38	238	932	1040	1030	864	613	398	215	127	53	113	34	53	778	1042	987	535	367	230	142	85	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4031	ISAIAH CR	419	434	687	1463	1914	1934	1866	1430	1090	977	922	566	337	313	388	1070	1922	1934	1640	936	686	535	477	409	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4032	JUMPING CR	370	384	607	1295	1693	1711	1651	1265	965	864	816	501	298	277	343	947	1700	1711	1451	828	607	474	422	362	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4033	KIMMEL CR	61	42	33	204	799	892	883	740	525	341	184	109	46	97	29	46	667	893	846	459	314	197	121	73	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4034	KIRBYVILLE CR	209	217	343	732	957	967	933	715	545	488	461	283	169	157	194	535	961	967	820	468	343	268	239	204	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4035	LIBERTY CR	258	267	422	901	1178	1190	1148	880	671	601	567	348	207	193	239	659	1183	1190	1009	576	422	330	294	252	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4036	LYNEX CR	387	401	634	1351	1767	1786	1723	1320	1006	902	851	523	311	289	358	988	1774	1786	1514	864	634	494	441	377	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4037	MAMMOTH CR	161	167	264	563	736	744	718	550	419	376	355	218	130	121	149	412	739	744	631	360	264	206	184	157	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4038	MCLENNAN R	61	42	33	204	799	892	883	740	525	341	184	109	46	97	29	46	667	893	846	459	314	197	121	73	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4039	MCLENNAN R @ N.ARM	82	55	44	272	1065	1189	1177	987	701	455	246	145	61	129	39	61	889	1190	1128	612	419	263	162	97	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4040	MCLENNAN R @ S.ARM	138	94	73	458	1797	2006	1986	1666	1182	768	415	245	102	218	65	103	1500	2009	1904	1032	707	444	273	164	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4041	MILEDGE CR	338	350	555	1182	1546	1562	1507	1155	881	789	745	457	272	253	313	865	1552	1562	1325	756	554	433	385	330	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4042	MOLSON CR	128	87	68	424	1664	1858	1839	1543	1095	711	384	227	95	202	61	95	1389	1860	1763	956	655	411	253	152	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4045	MOLYBDENITE	253	267	387	792	965	565	699	364	336	344	379	284	143	163	208	480	967	651	358	98	87	136	124	118	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
4046	MOONBEAM CR	177	184	290	619	810	818	789	605	461	413	390	240	143	133	164	453	813	818	694	396	290	227	202	173	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4047	MOOSE R	389	263	207	1290	5058	5647	5589	4690	3328	2162	1168	690	288	614	184	290	4222	5654	5359	2906	1991	1248	769	461	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4048	NORTH BLUE R	258	267	422	901	1178	1190	1148	880	671	601	567	348	207	193	239	659	1183	1190	1009	576	422	330	294	252	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4049	OLDMAN CR	26	17	14	85	333	372	368	309	219	142	77	45	19	40	12	19	278	372	353	191	131	82	51	30	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4050	PACKSADDLE CR	77	52	41	255	998	1115	1103	926	657	427	230	136	57	121	36	57	833	1116	1058	574	393	246	152	91	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4051	PALMER CR	82	55	44	272	1065	1189	1177	987	701	455	246	145	61	129	39	61	889	1190	1128	612	419	263	162	97	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4052	PTARMIGAN CR	230	156	122	764	2995	3344	3309	2777	1971	1280	691	409	171	363	109	171	2500	3348	3173	1721	1179	739	455	273	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4053	ROARING R	1917	1986	3142	6698	8761	8854	8541	6547	4991	4470	4220	2592	1543	1435	1774	4899	8795	8854	7507	4282	3142	2451	2184	1871	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4054	SERPENTINE CR	612	634	1003	2139	2798	2827	2727	2091	1594	1427	1347	828	493	458	567	1564	2809	2827	2397	1367	1003	783	697	597	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4055	SOARDS CR	403	417	660	1407	1841	1860	1794	1375	1048	939	887	544	324	301	373	1029	1848	1860	1577	900	660	515	459	393	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4056	SUNSET CR	242	250	396	844	1104	1116	1077	825	629	563	532	327	195	181	224	618	1109	1116	946	540	396	309	275	236	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4057	SWAN CR	51	35	27	170	666	743	735	617	438	284	154	91	38	81	24	38	556	744	705	382	262	164	101	61	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4058	SWIFT CR #1	123	83	65	407	1597	1783	1765	1481	1051	683	369	218	91	194	58	91	1333	1786	1692	918	629	394	243	146	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4059	SWIFT CR #2	92	62	49	306	1198	1338	1324	1111	788	512	277	163	68	145	44	69	1000	1339	1269	688	472	296	182	109	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4060	UNNAMED CR	97	103	149	305	371	217	269	140	129	132	146	109	55	63	80	185	372	250	138	38	34	52	48	45	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
4061	UNNAMED CR	97	103	149	305	371	217	269	140	129	132	146	109	55	63	80	185	372	250	138	38	34	52	48	45	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
4062	UNNAMED CR	338	350	555	1182	1546	1562	1507	1155	881	789	745	457	272	253	313	865	1552	1562	1325	756	554	433	385	330	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4063	UNNAMED CR	154	104	82	509	1997	2229	2206	1851	1314	853	461	272	114	242	73	114	1667	2232	2116	1147	786	493	303	182	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4064	UNNAMED CR	384	260	204	1273	4991	5573	5516	4628	3284	2133	1152	681	285	606	182	286	4167	5580	5289	2868	1965	1232	759	455	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4065	WATT CR	902	935	1479	3152	4123	4166	4019	3081	2348	2104	1986	1220	726	675	835	2305	4139	4166	3533	2015	1479	1153	1028	881	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
4066	WOOD R	409	277	218	1358	5324	5945	5883	4937	3503	2276	1229	726	304	646	194	305	4444	5952	5641	3059	2096	1314	809	485	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
4067	YELLOWJACKET CR	82	55	44	272	1065	1189	1177	987	701	455	246	145	61	129	39	61	889	1190	1128	612	419	263	162	97	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
5001	ABBOTT CR	741	768	1215	2589	3387	3422	3302	2531	1929	1728	1631	1002	597	555	686	1894	3400	3422	2902	1655	1215	947	844	723	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
5002	BEAVER CR @ FALLS	136	144	208	426	520	304	376	196	181	185	204	153	77	88	112	259	521	351	193	53	47	73	67	64	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
5003	BLACKBEAR CR	209	217	343	732	957	967	933	715	545	488	461	283	169	157	194	535	961	967	820	468	343	268	239	204	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
5004	CHAPMAN CR	211	169	141	199	666	744	744	698	544	543	469	296	135	126	115	122	638	744	744	605	417	325	248	190	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5005	CHESHI CR	126	101	85	120	400	446	446	419	326	326	281	178	81	75	69	73	383	446	446	363	250	195	149	114	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5006	COLWELL CR	590	472	395	558	1866	2083	2082	1955	1522	1521	1312	830	378	352	322	340	1786	2083	2083	1695	1167	910	696	533	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5007	FALLS R	906	725	607	856	2866	3199	3198	3002	2337	2335	2015	1275	581	540	494	522	2743	3199	3199	2603	1793	1398	1068	819	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5008	GILMAN CR	433	442	473	817	1167	1182	1064	774	706	878	723	506	164	159	215	519	1131	1140	803	489	350	702	474	228	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
5009	GRAIN CR	612	634	1003	2139	2798	2827	2727	2091	1594	1427	1347	828	493	458	567	1564	2809	2827	2397	1367	1003	783	697	597	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
5010	GUN CR (TUNNEL)	5075	5361	7772	15900	19383	11341	14036	7315	6737	6899	7614	5702	2872	3280	4174	9646	19418	13070	7190	1971	1754	2730	2492	2371	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
5011	HELL RAVING CR	190	152	127	179	600	670	669	628	489	489	422	267	122	113	103	109	574	670	670	545	375	293	224	171	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5012	JAMISON CR	379	303	254	359	1200	1339	1339	1257	978	978	844	534	243	226	207	219	1148	1339	1339	1090	751	585	447	343	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5013	KLINAKLINI CR	253	202	169	239	800	893	892	838	652	652	562	356	162	151	138	146	766	893	893	726	500	390	298	229	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5014	MACKIN CR	253	267	387	792	965	565	699	364	336	344	379	284	143	163	208	480	967	651	358	98	87	136	124	118	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
5015	MAYDOE CR	211	169	141	199	666	744	744	698	544	543	469	296	135	126	115	122	638	744	744	605	417	325	248	190	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5016	MCCLINCHY CR	148	118	99	139	467	521	521	489	380	380	328	207	95	88	80	85	447	521	521	424	292	228	174	133	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5017	MOREHEAD CR	676	701	1109	2364	3092	3125	3014	2311	1761	1578	1489	915	545	506	626	1729	3104	3125	2650	1511	1109	865	771	660	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
5018	MOSLEY CR	12714	12996	13886	23997	34288	34708	31267	22738	20753	25787	21240	14867	4826	4667	6329	15233	33233	33501	23593	14373	10277	20625	13914	6696	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
5019	NUDE CR FALLS	947	968	1034	1787	2553	2585	2328	1693	1545	1920	1582	1107	359	348	471	1134	2475	2495	1757	1070	765	1536	1036	499	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
5020	PUNTZI CR	564	596	864	1767	2154	1260	1560	813	749	767	846	634	319	364	464	1072	2158	1452	799	219	195	303	277	263	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
5021	QUARTZ CR	148	118	99	139	467	521	521	489	380	380	328	207	95	88	80	85	447	521	521	424	292	228	174	133	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5022	RASMUSSEN CR	271	277	295	511	730	738	665	484	442	549	452	316	103	99	135	324	707	713	502	306	219	439	296	142	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
5023	RAZOR CR	253	202	169	239	800	893	892	838	652	652	562	356	162	151	138	146	766	893	893	726	500	390	298	229	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5024	RELIANCE CR	253	202	169	239	800	893	892	838	652	652	562	356	162	151	138	146	766	893	893	726	500	390	298	229	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5025	SELLER CR	258	267	422	901	1178	1190	1148	880	671	601	567	348	207	193	239	659	1183	1190	1009	576	422	330	294	252	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
5026	STIKELAN CR #1	232	185	155	219	733	818	818	768	598	597	516	326	149	138	126	134	702	818	818	666	459	358	273	209	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5027	STIKELAN CR #2	400	320	268	378	1266	1414	1413	1326	1033	1032	890	563	257	239	218	231	1212	1414	1414	1150	792	618	472	362	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5028	UNNAMED CR	105	84	71	100	333	372	372	349	272	272	234	148	68	63	57	61	319	372	372	303	208	163	124	95	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5029	UNNAMED CR	105	84	71	100	333	372	372	349	272	272	234	148	68	63	57	61	319	372	372	303	208	163	124	95	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11

Table 2. Monthly Generation

Ref No	Stream Name	Monthly Average Energy (MWh)												Monthly Firm Energy (MWh)												Monthly Capacity Factor (%)												Hydr. zone
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
5030	UNNAMED CR	590	472	395	558	1866	2083	2082	1955	1522	1521	1312	830	378	352	322	340	1786	2083	2083	1695	1167	910	696	533	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5031	UNNAMED CR	272	288	417	853	1040	608	753	392	361	370	408	306	154	176	224	517	1042	701	386	106	94	146	134	127	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
5032	UNNAMED CR	379	303	254	359	1200	1339	1339	1257	978	978	844	534	243	226	207	219	1148	1339	1339	1090	751	585	447	343	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
5033	UNNAMED CR	225	234	370	788	1031	1042	1005	770	587	526	496	305	182	169	209	576	1035	1042	883	504	370	288	257	220	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
5034	UNNAMED CR	370	384	607	1295	1693	1711	1651	1265	965	864	816	501	298	277	343	947	1700	1711	1451	828	607	474	422	362	22%	22%	35%	76%	99%	100%	96%	74%	56%	50%	48%	29%	13
5035	VALLEAU CR	169	135	113	159	533	595	595	558	435	435	375	237	108	100	92	97	510	595	595	484	334	260	199	152	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
6001	CACOOHTIN CR	757	774	827	1430	2043	2068	1863	1355	1236	1536	1265	886	288	278	377	908	1980	1996	1406	856	612	1229	829	399	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6002	CHRISTENSON CR	541	553	591	1021	1459	1477	1330	968	883	1097	904	633	205	199	269	648	1414	1426	1004	612	437	878	592	285	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6003	CLAYTON FALLS CR	839	857	916	1583	2262	2289	2062	1500	1369	1701	1401	981	318	308	417	1005	2192	2210	1556	948	678	1360	918	442	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6004	CRAG CR	1163	1189	1270	2196	3137	3175	2861	2080	1899	2359	1943	1360	442	427	579	1394	3041	3065	2158	1315	940	1887	1273	613	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6005	GYLLENSPETZ CR	843	674	565	797	2666	2976	2975	2792	2174	2173	1875	1186	540	502	460	486	2552	2976	2976	2421	1668	1301	994	762	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
6006	HUMPBACK CR	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6007	JUMP ACROSS CR #1	1298	1327	1418	2451	3502	3545	3193	2322	2119	2634	2169	1518	493	477	646	1556	3394	3421	2409	1468	1050	2106	1421	684	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6008	JUMP ACROSS CR #2	1380	1410	1507	2604	3721	3766	3393	2467	2252	2798	2305	1613	524	506	687	1653	3606	3635	2560	1560	1115	2238	1510	727	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6009	KALONE CR	460	470	502	868	1240	1255	1131	822	751	933	768	538	175	169	229	551	1202	1212	853	520	372	746	503	242	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6010	MILL CR (UNNAMED)	1488	1521	1625	2808	4012	4062	3659	2661	2428	3018	2486	1740	565	546	741	1783	3889	3920	2761	1682	1203	2414	1628	784	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6011	NECLEETSCONNAY R	541	553	591	1021	1459	1477	1330	968	883	1097	904	633	205	199	269	648	1414	1426	1004	612	437	878	592	285	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6012	NIEUMIAMUS CR	460	470	502	868	1240	1255	1131	822	751	933	768	538	175	169	229	551	1202	1212	853	520	372	746	503	242	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6013	NOEICK R	3571	3650	3900	6740	9630	9748	8781	6386	5828	7242	5965	4176	1356	1311	1778	4278	9334	9409	6626	4037	2886	5793	3908	1881	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6014	NOOKLIKONNIK CR	1298	1327	1418	2451	3502	3545	3193	2322	2119	2634	2169	1518	493	477	646	1556	3394	3421	2409	1468	1050	2106	1421	684	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6015	NOOMST CR #1	1163	1189	1270	2196	3137	3175	2861	2080	1899	2359	1943	1360	442	427	579	1394	3041	3065	2158	1315	940	1887	1273	613	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6016	NOOSESECK R	1271	1300	1389	2400	3429	3471	3127	2274	2075	2579	2124	1487	483	467	633	1523	3323	3350	2359	1437	1028	2063	1391	670	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6017	NOOSGULCH CR	541	553	591	1021	1459	1477	1330	968	883	1097	904	633	205	199	269	648	1414	1426	1004	612	437	878	592	285	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6018	NORDSCHOW CR	885	708	593	837	2799	3125	3124	2932	2283	2281	1968	1245	567	528	483	510	2680	3125	3125	2542	1751	1366	1043	800	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
6019	SALLOOMT CR	541	553	591	1021	1459	1477	1330	968	883	1097	904	633	205	199	269	648	1414	1426	1004	612	437	878	592	285	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6020	SMITELY R #1	1894	1936	2068	3574	5107	5169	4657	3387	3091	3841	3163	2214	719	695	943	2269	4950	4989	3514	2141	1531	3072	2072	997	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6021	SMITELY R #2	406	415	443	766	1094	1108	998	726	662	823	678	474	154	149	202	486	1061	1069	753	459	328	658	444	214	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6022	SMITELY R @ FALLS	1190	1217	1300	2247	3210	3249	2927	2129	1943	2414	1988	1392	452	437	593	1426	3111	3136	2209	1346	962	1931	1303	627	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6023	SNOOTLI CR	703	719	768	1328	1897	1920	1730	1258	1148	1427	1175	822	267	258	350	843	1838	1853	1305	795	568	1141	770	370	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6024	SWALLOP CR	757	774	827	1430	2043	2068	1863	1355	1236	1536	1265	886	288	278	377	908	1980	1996	1406	856	612	1229	829	399	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6025	TASTSQUAN CR	352	359	384	664	948	960	865	629	574	713	587	411	133	129	175	421	919	927	653	398	284	570	385	185	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6026	THORSEN CR	1028	1051	1123	1940	2772	2806	2528	1838	1678	2085	1717	1202	390	377	512	1232	2687	2709	1907	1162	831	1668	1125	541	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6027	TSEAPSEAHOOLZ CR	730	747	798	1379	1970	1994	1796	1306	1192	1481	1220	854	277	268	364	875	1909	1925	1355	826	590	1185	799	385	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6028	TSINI-TSINI CR	421	337	282	398	1333	1488	1487	1396	1087	1086	937	593	270	251	230	243	1276	1488	1488	1211	834	650	497	381	28%	23%	19%	27%	90%	100%	100%	94%	73%	73%	63%	40%	11
6029	UNNAMED CR	189	194	207	357	511	517	466	339	309	384	316	221	72	70	94	227	495	499	351	214	153	307	207	100	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6030	UNNAMED CR	2083	2129	2275	3932	5617	5686	5122	3725	3400	4225	3480	2436	791	765	1037	2496	5445	5488	3865	2355	1684	3379	2280	1097	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6031	UNNAMED CR	325	332	355	613	875	886	798	581	530	658	542	380	123	119	162	389	849	855	602	367	262	527	355	171	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6032	UNNAMED CR	757	774	827	1430	2043	2068	1863	1355	1236	1536	1265	886	288	278	377	908	1980	1996	1406	856	612	1229	829	399	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6033	UNNAMED CR	1217	1244	1330	2298	3283	3323	2994	2177	1987	2469	2034	1423	462	447	606	1458	3182	3208	2259	1376	984	1975	1332	641	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6034	UNNAMED CR	2408	2461	2629	4544	6493	6572	5921	4306	3930	4883	4022	2815	914	884	1199	2885	6293	6344	4468	2722	1946	3906	2635	1268	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6035	UNNAMED CR	298	304	325	562	802	812	732	532	486	604	497	348	113	109	148	357	778	784	552	336	241	483	326	157	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6036	UNNAMED CR	352	359	384	664	948	960	865	629	574	713	587	411	133	129	175	421	919	927	653	398	284	570	385	185	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6037	UNNAMED CR	352	359	384	664	948	960	865	629	574	713	587	411	133	129	175	421	919	927	653	398	284	570	385	185	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6038	UNNAMED CR	568	581	620	1072	1532	1551	1397	1016	927	1152	949	664	216	209	283	681	1485	1497	1054	642	459	922	622	299	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6039	UNNAMED CR	1001	1023	1093	1889	2699	2732	2461	1790	1634	2030	1672	1170	380	367	498	1199	2616	2637	1857	1132	809	1624	1095	527	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6040	UNNAMED CR	812	830	886	1532	2189	2215	1996	1451	1325	1646	1356	949	308	298	404	972	2121	2138	1506	917	656	1316	888	427	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
6041	UNNAMED CR	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
7001	BERNICE CR	87	59	46	289	1131	1263	1250	1049	744	484	261	154	65	137	41	65	944	1265	1199	650	445	279	172	103	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7002	BOUNDING CR	31	21	16	102	399	446	441	370	263	171	92	54	23	48	15	23	333	446	423	229	157	99	61	36	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7003	CARROLE FALLS	156	164	238	487	594	348	430	224	207	211	233	175	88	101	128	296	595	401	220	60	54	84	76	73	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
7004	CENTENNIAL CR	36	24	19	119	466	520	515	432	307	199	108	64	27	57	17	27	389	521	494	268	183	115	71	42	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7005	CLYDE CR #1	82	55	44	272	1065	1189	1177	987	701	455	246	145	61	129	39	61	889	1190	1128	612	419	263	162	97	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7006	CLYDE CR #2	41	28	22	136	532	594	588	494	350	228	123	73	30	65	19	30	444	595	564	306	210	131	81	49	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7007	DORE CR #1	251	170	133	832	3261	3641	3604	3024	2146	1394	753	445	186	396	119	187	2722	3646	3455	1874	1284	805	496	297	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7008	DORE CR #2	189	128	101	628	2462	2749	2721	2283	1620	1052	568	336	140	299	90	141	2056	2753	2609	1415	969	608	374	225	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7009	DORE CR #3	67	45	35	221	865	966	956	802	569	370	200	118	49	105	31	50	722	967	917	497	341	214	131	79	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7010	EAST TWIN CR	97	66	52	323	1264	1412	1397	1172	832	540	292	173	72	153	46	72	1056	1414	1340	727	498	312	192	115	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7011	EDDY CR	77	52	41	255	998	1115	1103	926	657	427	230	136	57	121	36	57	833	1116	1058	574	393	246	152	91	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7012	FLEET CR	72	49	38	238	932	1040	1030	864	613	398	215	127	53	113	34	53	778	1042	987	535	367	230	142	85	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7013	FORGETMENOT CR	174	118	93	577	2263	2526	2500	2098	1489	967	522	309	129	275	82	130	1889	2530	2398	1300	891	559	344	206	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7014	HELLROARING CR	220	149	117	730	2862	3195	3162	2653	1883	1223	661	390	163	347	104	164	2389	3199	3032	1644	1127	706	435	261	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7015	HIXON CR	97	103	149	305	371	217	269	140	129	132	146	109	55	63	80	185	372	250	138	38	34	52	48	45	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
7016	HOLLIDAY CR	67	45	35	221	865	966	956	802	569	370	200	118	49	105	31	50	722	967	917	497	341	214	131	79	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7017	HORSEY CR	287	194	152	951	3727	4161	4118	3456	2452	1593	860	508	213	452	136	213	3111	4166	3949	2141	1467	920	566	340	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7018	LEGRAND	31	21	16	102	399	446	441	370	263	171	92	54	23	48	15	23	333	446	423	229	157	99	61	36	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7019	MCINTOSH CR	46	31	24	153	599	669	662	555	394	256	138	82	34	73	22	34	500	670	635	344	236	148	91	55	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7020	PANTAGE CR	233	247	357	731	891	521	645	336	310	317	350	262	132	151	192	443	893	601	331	91	81	126	115	109	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
7021	ROBSON R	148	101	79	492	1930	2155	2133	1790	1270	825	446	263	110	234	70	110	1611	2158	2045	1109	760	476	293	176	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7022	SMALL CR	220	149	117	730	2862	3195	3162	2653	1883	1223	661	390	163	347	104	164	2389	3199	3032	1644	1127	706	435	261	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7023	SNOWSHOE CR	77	52	41	255	998	1115	1103	926	657	427	230	136	57	121	36	57	833	1116	1058	574	393	246	152	91	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7024	SWIFTCURRENT CR	143	97	76	475	1863	2081	2059	1728	1226	796	430	254	106	226	68	107	1556	2083	1974	1071	734	460	283	170	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7025	UNNAMED CR	287	194	152	951	3727	4161	4118	3456	2452	1593	860	508	213	452	136	213	3111	4166	3949	2141	1467	920	566	340	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7026	UNNAMED CR	92	62	49	306	1198	1338	1324	1111	788	512	277	163	68	145	44	69	1000	1339	1269	688	472	296	182	109	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7027	UNNAMED CR	133	90	71	441	1730	1932	1912	1604	1139	740	399	236	99	210	63	99	1444	1934	1833	994	681	427	263	158	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14

Table 2. Monthly Generation

Ref No	Stream Name	Monthly Average Energy (MWh)												Monthly Firm Energy (MWh)												Monthly Capacity Factor (%)												Hydr. zone
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
7028	UNNAMED CR	107	73	57	356	1398	1560	1544	1296	920	597	323	191	80	170	51	80	1167	1562	1481	803	550	345	212	127	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7029	UNNAMED CR	143	97	76	475	1863	2081	2059	1728	1226	796	430	254	106	226	68	107	1556	2083	1974	1071	734	460	283	170	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
7030	WALLOP CR	159	107	84	526	2063	2304	2280	1913	1357	882	476	281	118	250	75	118	1722	2306	2186	1185	812	509	314	188	7%	5%	4%	23%	89%	100%	99%	83%	59%	38%	21%	12%	14
8001	ALICE CR	91	81	85	303	931	1042	1042	1026	889	666	316	140	78	73	71	154	781	1042	1042	1012	727	477	187	117	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8002	ANDERSON CR	325	332	355	613	875	886	798	581	530	658	542	380	123	119	162	389	849	855	602	367	262	527	355	171	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8003	ATLIN CR	97	103	149	305	371	217	269	140	129	132	146	109	55	63	80	185	372	250	138	38	34	52	48	45	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
8004	ATNA LAKE	45	40	43	151	465	521	521	513	445	333	158	70	39	37	35	77	390	521	521	506	363	238	94	58	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8005	AUGIER/BABINE LAKE	1948	1562	1508	4381	12121	12520	10755	5815	5592	8220	5480	3264	1504	1279	1314	2035	11065	12574	9153	4536	3085	3987	2817	2263	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
8006	BOLTON CR	622	636	680	1174	1678	1698	1530	1113	1016	1262	1039	728	236	228	310	745	1626	1639	1155	703	503	1009	681	328	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8007	BOWBYES CR	352	359	384	664	948	960	865	629	574	713	587	411	133	129	175	421	919	927	653	398	284	570	385	185	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8008	BUCK CR	91	81	85	303	931	1042	1042	1026	889	666	316	140	78	73	71	154	781	1042	1042	1012	727	477	187	117	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8009	CHIMDEMASH CR	71	63	67	238	731	818	818	806	699	523	249	110	62	58	56	121	613	818	818	795	571	375	147	92	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8010	CHIST CR #1	216	221	236	408	584	591	532	387	353	439	362	253	82	79	108	259	566	570	402	245	175	351	237	114	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8011	CHIST CR #2	352	359	384	664	948	960	865	629	574	713	587	411	133	129	175	421	919	927	653	398	284	570	385	185	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8012	COLDWATER CR	541	553	591	1021	1459	1477	1330	968	883	1097	904	633	205	199	269	648	1414	1426	1004	612	437	878	592	285	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8013	DAHL CR	460	470	502	868	1240	1255	1131	822	751	933	768	538	175	169	229	551	1202	1212	853	520	372	746	503	242	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8014	DASQUE CR	487	498	532	919	1313	1329	1197	871	795	988	813	569	185	179	242	583	1273	1283	904	550	394	790	533	256	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8015	DOCKRILL CR	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8016	DOUGLAS CR	104	92	97	346	1064	1190	1190	1173	1017	761	362	160	89	84	81	176	892	1190	1190	1157	830	545	214	134	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8017	EIGHT MILE CR	84	75	79	281	864	967	967	953	826	618	294	130	73	68	66	143	725	967	967	940	675	443	174	109	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8018	ERLANDSEN CR	123	109	116	411	1263	1414	1413	1393	1207	903	429	189	106	100	96	209	1059	1414	1414	1374	986	647	254	159	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8019	EXISTING DAMS @ FULTON R	1233	989	955	2774	7674	7927	6809	3682	3541	5205	3470	2067	953	810	832	1288	7005	7961	5795	2872	1953	2525	1783	1433	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
8020	FLINT CR	71	63	67	238	731	818	818	806	699	523	249	110	62	58	56	121	613	818	818	795	571	375	147	92	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8021	GOAT CR	78	69	73	259	798	893	893	880	762	571	271	120	67	63	61	132	669	893	893	868	623	409	160	100	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8022	HADENSCHILD CR	52	46	49	173	532	595	595	586	508	380	181	80	45	42	40	88	446	595	595	578	415	272	107	67	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8023	HAMPSON CR	129	115	122	432	1330	1488	1488	1466	1271	951	452	199	112	105	101	220	1115	1488	1488	1446	1038	681	267	167	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8024	HANKIN CR	45	40	43	151	465	521	521	513	445	333	158	70	39	37	35	77	390	521	521	506	363	238	94	58	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8025	HARDSCRABBLE CR	91	81	85	303	931	1042	1042	1026	889	666	316	140	78	73	71	154	781	1042	1042	1012	727	477	187	117	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8026	HATCHERY CR	216	221	236	408	584	591	532	387	353	439	362	253	82	79	108	259	566	570	402	245	175	351	237	114	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8027	HOULT CR	271	277	295	511	730	738	665	484	442	549	452	316	103	99	135	324	707	713	502	306	219	439	296	142	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8028	HOUSTON TOMMY CR	58	52	55	195	598	670	670	660	572	428	203	90	50	47	45	99	502	670	670	651	467	306	120	75	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8029	HOWSON CR	92	74	71	207	574	593	509	275	265	389	259	155	71	61	62	96	524	595	433	215	146	189	133	107	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
8030	HUMPHRYS CR	352	359	384	664	948	960	865	629	574	713	587	411	133	129	175	421	919	927	653	398	284	570	385	185	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8031	HUNTER CR	325	332	355	613	875	886	798	581	530	658	542	380	123	119	162	389	849	855	602	367	262	527	355	171	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8032	KLEANZA CR	427	380	401	1427	4388	4910	4910	4838	4193	3138	1491	658	369	346	333	727	3680	4910	4910	4772	3426	2247	882	551	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8033	LITTLE OLIVER CR	129	115	122	432	1330	1488	1488	1466	1271	951	452	199	112	105	101	220	1115	1488	1488	1446	1038	681	267	167	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8034	LORNE CR	181	161	170	605	1861	2083	2083	2053	1779	1331	633	279	157	147	141	308	1561	2083	2083	2025	1453	953	374	234	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8035	LOWRIE CR	45	40	43	151	465	521	521	513	445	333	158	70	39	37	35	77	390	521	521	506	363	238	94	58	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8036	MAROON CR	220	196	207	735	2260	2530	2529	2492	2160	1617	768	339	190	178	172	374	1896	2530	2530	2459	1765	1158	454	284	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8037	MCKAY CR	1569	1604	1714	2961	4231	4283	3858	2806	2561	3182	2621	1835	596	576	781	1880	4101	4134	2911	1774	1268	2545	1717	826	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8038	MOLYBDENUM CR	78	69	73	259	798	893	893	880	762	571	271	120	67	63	61	132	669	893	893	868	623	409	160	100	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8039	MORAINE CR	58	52	55	195	598	670	670	660	572	428	203	90	50	47	45	99	502	670	670	651	467	306	120	75	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8040	NABEELAH CR	271	277	295	511	730	738	665	484	442	549	452	316	103	99	135	324	707	713	502	306	219	439	296	142	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8041	OLIVER CR	194	173	182	649	1994	2232	2232	2199	1906	1426	678	299	168	157	151	330	1673	2232	2232	2169	1557	1021	401	250	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8042	PINE CR	69	55	54	156	430	444	382	206	199	292	195	116	53	45	47	72	393	446	325	161	110	142	100	80	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
8043	PINKUT CR FALLS #1	173	139	134	389	1076	1111	955	516	496	730	486	290	134	114	117	181	982	1116	812	403	274	354	250	201	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
8044	PINKUT CR FALLS #2	161	129	125	363	1004	1037	891	482	463	681	454	270	125	106	109	169	917	1042	758	376	256	330	233	188	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
8045	QUILL CR	233	207	219	778	2393	2678	2678	2639	2287	1712	814	359	201	189	182	396	2007	2678	2678	2603	1868	1226	481	301	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8046	RALEY CR	298	304	325	562	802	812	732	532	486	604	497	348	113	109	148	357	778	784	552	336	241	483	326	157	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8047	REISETER CR	277	222	214	622	1721	1778	1527	826	794	1167	778	464	214	182	187	289	1571	1786	1300	644	438	566	400	321	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
8048	SCHULBUCKHAND CR	271	277	295	511	730	738	665	484	442	549	452	316	103	99	135	324	707	713	502	306	219	439	296	142	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8049	SHAMES R	568	581	620	1072	1532	1551	1397	1016	927	1152	949	664	216	209	283	681	1485	1497	1054	642	459	922	622	299	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8050	SHANNON CR	91	81	85	303	931	1042	1042	1026	889	666	316	140	78	73	71	154	781	1042	1042	1012	727	477	187	117	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8051	SINCLAIR CR	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8052	STAR CR	84	75	79	281	864	967	967	953	826	618	294	130	73	68	66	143	725	967	967	940	675	443	174	109	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8053	STE CROIX	104	92	97	346	1064	1190	1190	1173	1017	761	362	160	89	84	81	176	892	1190	1190	1157	830	545	214	134	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8054	STEWARD CR	39	35	36	130	399	446	446	440	381	285	136	60	34	31	30	66	335	446	446	434	311	204	80	50	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8055	THOMAS CR #1	58	52	55	195	598	670	670	660	572	428	203	90	50	47	45	99	502	670	670	651	467	306	120	75	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8056	THOMAS CR #2	52	46	49	173	532	595	595	586	508	380	181	80	45	42	40	88	446	595	595	578	415	272	107	67	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8057	TRAPLINE CR	91	81	85	303	931	1042	1042	1026	889	666	316	140	78	73	71	154	781	1042	1042	1012	727	477	187	117	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8058	TROUT CR	69	55	54	156	430	444	382	206	199	292	195	116	53	45	47	72	393	446	325	161	110	142	100	80	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
8059	TSHESINK/FRANCOIS LAKES	272	288	417	853	1040	608	753	392	361	370	408	306	154	176	224	517	1042	701	386	106	94	146	134	127	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
8060	UNNAMED CR	514	525	561	970	1386	1403	1264	919	839	1042	859	601	195	189	256	616	1343	1354	954	581	415	834	562	271	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8061	UNNAMED CR	135	138	148	255	365	369	333	242	221	274	226	158	51	50	67	162	354	356	251	153	109	219	148	71	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8062	UNNAMED CR	189	194	207	357	511	517	466	339	309	384	316	221	72	70	94	227	495	499	351	214	153	307	207	100	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8063	UNNAMED CR	243	249	266	460	657	665	599	435	397	494	407	285	92	89	121	292	636	642	452	275	197	395	266	128	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8064	UNNAMED CR	568	581	620	1072	1532	1551	1397	1016	927	1152	949	664	216	209	283	681	1485	1497	1054	642	459	922	622	299	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8065	UNNAMED CR	541	553	591	1021	1459	1477	1330	968	883	1097	904	633	205	199	269	648	1414	1426	1004	612	437	878	592	285	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8066	UNNAMED CR INTO MORICE L	45	40	43	151	465	521	521	513	445	333	158	70	39	37	35	77	390	521	521	506	363	238	94	58	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8067	UNNAMED INTO CLEAR CR	91	81	85	303	931	1042	1042	1026	889	666	316	140	78	73	71	154	781	1042	1042	1012	727	477	187	117	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8068	UNNAMED INTO CLORE R	65	58	61	216	665	744	744	733	635	475	226	100	56	52	50	110	558	744	744	723	519	340	134	83	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8069	UNNAMED INTO CLORE R	65	58	61	216	665	744	744	733	635	475	226	100	56	52	50	110	558	744	744	723	519	340	134	83	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8070	UNNAMED INTO CLORE R	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8071	UNNAMED INTO CLORE R	52	46	49	173	532	595	595	586	508	380	181	80	45	42	40	88	446	595	595	578	415	272	107	67	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8

Table 2. Monthly Generation

Ref No	Stream Name	Monthly Average Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Firm Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Capacity Factor (%) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Hydr. zone
8072	UNNAMED INTO LEGATE CR	58	52	55	195	598	670	670	660	572	428	203	90	50	47	45	99	502	670	670	651	467	306	120	75	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8073	UNNAMED INTO ZYMOETE R.	65	58	61	216	665	744	744	733	635	475	226	100	56	52	50	110	558	744	744	723	519	340	134	83	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8074	WESACH CR	117	104	109	389	1197	1339	1339	1320	1144	856	407	180	101	94	91	198	1004	1339	1339	1302	934	613	241	150	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
8075	WHITE CR	243	249	266	460	657	665	599	435	397	494	407	285	92	89	121	292	636	642	452	275	197	395	266	128	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8076	WILLIAMS CR	974	995	1064	1838	2626	2658	2395	1742	1590	1975	1627	1139	370	357	485	1167	2546	2566	1807	1101	787	1580	1066	513	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
8077	ZYMOETZ R	150	120	116	337	932	963	827	447	430	632	422	251	116	98	101	157	851	967	704	349	237	307	217	174	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
9001	ARDEN CR	866	885	945	1634	2334	2363	2129	1548	1413	1756	1446	1012	329	318	431	1037	2263	2281	1606	979	700	1404	947	456	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9002	AYTON CR	298	304	325	562	802	812	732	532	486	604	497	348	113	109	148	357	778	784	552	336	241	483	326	157	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9003	COLONEL JOHNSON CR	162	166	177	306	438	443	399	290	265	329	271	190	62	60	81	194	424	428	301	183	131	263	178	85	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9004	CUTHBERT CR	514	525	561	970	1386	1403	1264	919	839	1042	859	601	195	189	256	616	1343	1354	954	581	415	834	562	271	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9005	KHTADA CR	1975	2018	2157	3727	5326	5391	4856	3532	3223	4005	3299	2309	750	725	983	2366	5162	5203	3664	2232	1596	3203	2161	1040	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9006	MARION CR	271	277	295	511	730	738	665	484	442	549	452	316	103	99	135	324	707	713	502	306	219	439	296	142	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9007	MATHISON CR	298	304	325	562	802	812	732	532	486	604	497	348	113	109	148	357	778	784	552	336	241	483	326	157	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9008	MCDONALD CR	812	830	886	1532	2189	2215	1996	1451	1325	1646	1356	949	308	298	404	972	2121	2138	1506	917	656	1316	888	427	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9009	TALA HAAT CR	189	194	207	357	511	517	466	339	309	384	316	221	72	70	94	227	495	499	351	214	153	307	207	100	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9010	UNION CR	1677	1714	1832	3166	4523	4578	4125	3000	2738	3402	2802	1961	637	616	835	2009	4384	4419	3112	1896	1356	2721	1835	883	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9011	UNNAMED CR	243	249	266	460	657	665	599	435	397	494	407	285	92	89	121	292	636	642	452	275	197	395	266	128	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9012	UNNAMED CR	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9013	UNNAMED CR	135	138	148	255	365	369	333	242	221	274	226	158	51	50	67	162	354	356	251	153	109	219	148	71	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9014	UNNAMED CR	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9015	UNNAMED CR	595	608	650	1123	1605	1625	1464	1064	971	1207	994	696	226	218	296	713	1556	1568	1104	673	481	965	651	313	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9016	UNNAMED CR	352	359	384	664	948	960	865	629	574	713	587	411	133	129	175	421	919	927	653	398	284	570	385	185	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9017	UNNAMED INTO EXCHAMSIKS R	1028	1051	1123	1940	2772	2806	2528	1838	1678	2085	1717	1202	390	377	512	1232	2687	2709	1907	1162	831	1668	1125	541	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9018	UNNAMED INTO EXCHAMSIKS R	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9019	UNNAMED INTO EXSTEW R	541	553	591	1021	1459	1477	1330	968	883	1097	904	633	205	199	269	648	1414	1426	1004	612	437	878	592	285	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9020	UNNAMED INTO EXSTEW R #1	866	885	945	1634	2334	2363	2129	1548	1413	1756	1446	1012	329	318	431	1037	2263	2281	1606	979	700	1404	947	456	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9021	UNNAMED INTO EXSTEW R #2	1190	1217	1300	2247	3210	3249	2927	2129	1943	2414	1988	1392	452	437	593	1426	3111	3136	2209	1346	962	1931	1303	627	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9022	UNNAMED INTO EXSTEW R #3	866	885	945	1634	2334	2363	2129	1548	1413	1756	1446	1012	329	318	431	1037	2263	2281	1606	979	700	1404	947	456	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9023	UNNAMED INTO EXSTEW R #4	1461	1493	1595	2757	3939	3988	3592	2612	2384	2963	2440	1708	555	536	727	1750	3818	3849	2711	1651	1181	2370	1599	769	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9024	UNNAMED INTO ISHKHEENICKH R #1	595	608	650	1123	1605	1625	1464	1064	971	1207	994	696	226	218	296	713	1556	1568	1104	673	481	965	651	313	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9025	UNNAMED INTO ISHKHEENICKH R #2	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9026	UNNAMED INTO KASIKS R	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9027	UNNAMED INTO KHTADA LAKE	406	415	443	766	1094	1108	998	726	662	823	678	474	154	149	202	486	1061	1069	753	459	328	658	444	214	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9028	UNNAMED INTO KHTADA LAKE	730	747	798	1379	1970	1994	1796	1306	1192	1481	1220	854	277	268	364	875	1909	1925	1355	826	590	1185	799	385	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9029	UNNAMED INTO KHYEX R	433	442	473	817	1167	1182	1064	774	706	878	723	506	164	159	215	519	1131	1140	803	489	350	702	474	228	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9030	UNNAMED INTO SKEENA R	1028	1051	1123	1940	2772	2806	2528	1838	1678	2085	1717	1202	390	377	512	1232	2687	2709	1907	1162	831	1668	1125	541	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9031	UNNAMED INTO SKEENA R	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9032	UNNAMED INTO SKEENA R	352	359	384	664	948	960	865	629	574	713	587	411	133	129	175	421	919	927	653	398	284	570	385	185	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9033	UNNAMED LAKE INTO EXCHAMSIKS	514	525	561	970	1386	1403	1264	919	839	1042	859	601	195	189	256	616	1343	1354	954	581	415	834	562	271	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
9034	VOSHELL CR	406	415	443	766	1094	1108	998	726	662	823	678	474	154	149	202	486	1061	1069	753	459	328	658	444	214	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
11001	AMERICAN CR	298	265	280	995	3058	3422	3422	3372	2923	2187	1039	459	257	241	232	507	2565	3422	3422	3326	2387	1566	615	384	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11002	ANSEDAGAN CR	91	81	85	303	931	1042	1042	1026	889	666	316	140	78	73	71	154	781	1042	1042	1012	727	477	187	117	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11003	ANTHONY CR	71	63	67	238	731	818	818	806	699	523	249	110	62	58	56	121	613	818	818	795	571	375	147	92	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11004	BARNEY GULCH	487	498	532	919	1313	1329	1197	871	795	988	813	569	185	179	242	583	1273	1283	904	550	394	790	533	256	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
11005	BEAR R	78	69	73	259	798	893	893	880	762	571	271	120	67	63	61	132	669	893	893	868	623	409	160	100	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11006	BLACKSTOCK CR	39	35	36	130	399	446	446	440	381	285	136	60	34	31	30	66	335	446	446	434	311	204	80	50	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11007	BURDICK CR	52	46	49	173	532	595	595	586	508	380	181	80	45	42	40	88	446	595	595	578	415	272	107	67	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11008	CARRIGAN CR	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11009	CASCADE CR	79	79	86	184	460	591	595	595	571	447	235	119	66	55	63	108	349	595	595	595	529	338	168	80	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
11010	CAUSQUA CR	81	65	62	181	502	519	445	241	232	340	227	135	62	53	54	84	458	521	379	188	128	165	117	94	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
11011	CLARY CR	486	432	456	1622	4986	5580	5580	5498	4765	3566	1695	748	419	393	379	826	4182	5580	5580	5423	3893	2554	1002	626	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11012	CORYA CR	92	74	71	207	574	593	509	275	265	389	259	155	71	61	62	96	524	595	433	215	146	189	133	107	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
11013	DAK R	568	581	620	1072	1532	1551	1397	1016	927	1152	949	664	216	209	283	681	1485	1497	1054	642	459	922	622	299	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
11014	GINGIETL CR	214	226	328	670	817	478	592	308	284	291	321	240	121	138	176	407	818	551	303	83	74	115	105	100	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
11015	GINMILTKUN CR	58	52	55	195	598	670	670	660	572	428	203	90	50	47	45	99	502	670	670	651	467	306	120	75	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11016	GISWATZ CR	117	104	109	389	1197	1339	1339	1320	1144	856	407	180	101	94	91	198	1004	1339	1339	1302	934	613	241	150	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11017	GLACIER CR	138	139	151	322	806	1035	1041	1041	999	783	411	208	116	96	111	189	610	1041	1042	1042	925	592	294	139	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
11019	GWUNYA CR	216	221	236	408	584	591	532	387	353	439	362	253	82	79	108	259	566	570	402	245	175	351	237	114	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
11020	INSECT CR	97	86	91	324	997	1116	1116	1100	953	713	339	150	84	79	76	165	836	1116	1116	1085	779	511	200	125	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11021	JADE LAKE INTO WHITE R.	123	109	116	411	1263	1414	1413	1393	1207	903	429	189	106	100	96	209	1059	1414	1414	1374	986	647	254	159	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11022	JUNIPER CR	58	52	55	195	598	670	670	660	572	428	203	90	50	47	45	99	502	670	670	651	467	306	120	75	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11023	KELSKIIST CR	471	476	517	1106	2762	3549	3570	3570	3425	2684	1408	713	398	331	380	649	2091	3569	3571	3571	3171	2031	1007	478	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
11024	KINSHUCH LAKE	1298	1327	1418	2451	3502	3545	3193	2322	2119	2634	2169	1518	493	477	646	1556	3394	3421	2409	1468	1050	2106	1421	684	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
11025	KSHADIN CR	136	121	128	454	1396	1562	1562	1539	1334	998	475	209	117	110	106	231	1171	1562	1562	1519	1090	715	281	175	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11026	KWINATAHL R	414	369	389	1384	4255	4762	4761	4692	4066	3043	1446	638	358	336	323	705	3569	4762	4762	4628	3322	2179	855	534	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11027	LUND CR	69	55	54	156	430	444	382	206	199	292	195	116	53	45	47	72	393	446	325	161	110	142	100	80	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
11029	MARMOT R	265	268	291	622	1554	1996	2008	2008	1926	1510	792	401	224	186	214	365	1176	2008	2009	2009	1784	1142	567	269	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
11030	MAY CR	201	179	189	670	2061	2306	2306	2273	1970	1474	701	309	173	163	157	341	1729	2306	2306	2242	1609	1055	414	259	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11031	MIKE CR	84	75	79	281	864	967	967	953	826	618	294	130	73	68	66	143	725	967	967	940	675	443	174	109	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11032	MILL CR	311	329	476	975	1188	695	860	448	413	423	467	350	176	201	256	591	1190	801	441	121	108	167	153	145	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
11033	PANORAMA CR	78	69	73	259	798	893	893	880	762	571	271	120	67	63	61	132	669	893	893	868	623	409	160	100	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11034	RITCHIE CR	110	98	103	368	1130	1265	1265	1246	1080	808	384	170	95	89	86	187	948	1265	1265	1229	882	579	227	142	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8

Table 2. Monthly Generation

Ref No	Stream Name	Monthly Average Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Firm Energy (MWh) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Monthly Capacity Factor (%) Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Hydr. zone
11035	ROSEVELT CR	295	297	323	691	1726	2218	2231	2231	2140	1678	880	446	249	207	238	406	1307	2231	2232	2232	1982	1269	630	299	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
11036	SANSKISOOT CR	104	83	80	233	645	667	573	310	298	438	292	174	80	68	70	108	589	670	487	242	164	212	150	121	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
11037	SANYAM CR	104	92	97	346	1064	1190	1190	1173	1017	761	362	160	89	84	81	176	892	1190	1190	1157	830	545	214	134	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11038	SCOTT CR	91	81	85	303	931	1042	1042	1026	889	666	316	140	78	73	71	154	781	1042	1042	1012	727	477	187	117	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11039	SEASKINNISH CR	168	150	158	562	1728	1934	1934	1906	1652	1236	588	259	145	136	131	286	1450	1934	1934	1880	1349	885	348	217	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11040	SEDAN CR	428	452	655	1340	1634	956	1183	617	568	582	642	481	242	276	352	813	1637	1102	606	166	148	230	210	200	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
11041	SHANALOPE	104	83	80	233	645	667	573	310	298	438	292	174	80	68	70	108	589	670	487	242	164	212	150	121	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
11042	SHEGISIC CR	92	74	71	207	574	593	509	275	265	389	259	155	71	61	62	96	524	595	433	215	146	189	133	107	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
11043	SHEWILILBA CR	92	74	71	207	574	593	509	275	265	389	259	155	71	61	62	96	524	595	433	215	146	189	133	107	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
11044	SKOWILL CR	220	196	207	735	2260	2530	2529	2492	2160	1617	768	339	190	178	172	374	1896	2530	2530	2459	1765	1158	454	284	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11045	STEEP CANYON CR	58	46	45	130	359	370	318	172	165	243	162	97	45	38	39	60	327	372	271	134	91	118	83	67	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
11046	SUPLHURETS CR	560	565	614	1313	3280	4214	4240	4239	4067	3188	1672	847	472	393	452	771	2483	4239	4241	4241	3766	2412	1196	568	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
11047	SWEETIN R	81	65	62	181	502	519	445	241	232	340	227	135	62	53	54	84	458	521	379	188	128	165	117	94	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
11048	TODD CR	123	109	116	411	1263	1414	1413	1393	1207	903	429	189	106	100	96	209	1059	1414	1414	1374	986	647	254	159	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11049	TONY CR	117	104	109	389	1197	1339	1339	1320	1144	856	407	180	101	94	91	198	1004	1339	1339	1302	934	613	241	150	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11050	UNNAMED CR	253	267	387	792	965	565	699	364	336	344	379	284	143	163	208	480	967	651	358	98	87	136	124	118	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
11051	UNNAMED CR	233	247	357	731	891	521	645	336	310	317	350	262	132	151	192	443	893	601	331	91	81	126	115	109	26%	28%	40%	82%	100%	58%	72%	38%	35%	36%	39%	29%	12A
11052	UNNAMED CR	39	35	36	130	399	446	446	440	381	285	136	60	34	31	30	66	335	446	446	434	311	204	80	50	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11053	UNNAMED CR	129	115	122	432	1330	1488	1488	1466	1271	951	452	199	112	105	101	220	1115	1488	1488	1446	1038	681	267	167	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11054	UNNAMED CR	52	46	49	173	532	595	595	586	508	380	181	80	45	42	40	88	446	595	595	578	415	272	107	67	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11055	UNNAMED CR	78	69	73	259	798	893	893	880	762	571	271	120	67	63	61	132	669	893	893	868	623	409	160	100	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11056	UNNAMED CR	104	92	97	346	1064	1190	1190	1173	1017	761	362	160	89	84	81	176	892	1190	1190	1157	830	545	214	134	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11057	UNNAMED CR	123	109	116	411	1263	1414	1413	1393	1207	903	429	189	106	100	96	209	1059	1414	1414	1374	986	647	254	159	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11058	UNNAMED CR	104	92	97	346	1064	1190	1190	1173	1017	761	362	160	89	84	81	176	892	1190	1190	1157	830	545	214	134	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11059	UNNAMED CR	104	92	97	346	1064	1190	1190	1173	1017	761	362	160	89	84	81	176	892	1190	1190	1157	830	545	214	134	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11060	UNNAMED CR	155	138	146	519	1596	1786	1785	1759	1525	1141	542	239	134	126	121	264	1338	1786	1786	1735	1246	817	321	200	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11061	UNNAMED CR	71	63	67	238	731	818	818	806	699	523	249	110	62	58	56	121	613	818	818	795	571	375	147	92	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11062	UNNAMED CR	354	357	388	829	2072	2662	2678	2678	2569	2013	1056	535	298	248	285	487	1568	2677	2678	2678	2379	1523	755	358	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
11063	UNNAMED CR	84	75	79	281	864	967	967	953	826	618	294	130	73	68	66	143	725	967	967	940	675	443	174	109	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11064	UNNAMED CR	52	46	49	173	532	595	595	586	508	380	181	80	45	42	40	88	446	595	595	578	415	272	107	67	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11065	UNNAMED CR	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11066	UNNAMED CR	91	81	85	303	931	1042	1042	1026	889	666	316	140	78	73	71	154	781	1042	1042	1012	727	477	187	117	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11067	UNNAMED CR	84	75	79	281	864	967	967	953	826	618	294	130	73	68	66	143	725	967	967	940	675	443	174	109	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11068	UNNAMED CR	136	121	128	454	1396	1562	1562	1539	1334	998	475	209	117	110	106	231	1171	1562	1562	1519	1090	715	281	175	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11069	UNNAMED CR	39	35	36	130	399	446	446	440	381	285	136	60	34	31	30	66	335	446	446	434	311	204	80	50	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11070	UNNAMED CR	168	150	158	562	1728	1934	1934	1906	1652	1236	588	259	145	136	131	286	1450	1934	1934	1880	1349	885	348	217	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11071	UNNAMED CR	104	92	97	346	1064	1190	1190	1173	1017	761	362	160	89	84	81	176	892	1190	1190	1157	830	545	214	134	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11072	UNNAMED CR	147	149	162	345	863	1109	1116	1116	1070	839	440	223	124	103	119	203	653	1115	1116	1116	991	635	315	149	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
11073	UNNAMED CR	240	213	225	800	2460	2753	2753	2712	2351	1759	836	369	207	194	187	407	2063	2753	2753	2675	1920	1260	495	309	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11074	UNNAMED CR	65	58	61	216	665	744	744	733	635	475	226	100	56	52	50	110	558	744	744	723	519	340	134	83	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11075	UNNAMED CR	78	69	73	259	798	893	893	880	762	571	271	120	67	63	61	132	669	893	893	868	623	409	160	100	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11076	UNNAMED CR	136	121	128	454	1396	1562	1562	1539	1334	998	475	209	117	110	106	231	1171	1562	1562	1519	1090	715	281	175	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11077	UNNAMED CR	58	52	55	195	598	670	670	660	572	428	203	90	50	47	45	99	502	670	670	651	467	306	120	75	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11078	UNNAMED CR	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11079	UNNAMED CR	110	98	103	368	1130	1265	1265	1246	1080	808	384	170	95	89	86	187	948	1265	1265	1229	882	579	227	142	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11080	UNNAMED CR	52	46	49	173	532	595	595	586	508	380	181	80	45	42	40	88	446	595	595	578	415	272	107	67	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11081	UNNAMED CR	71	63	67	238	731	818	818	806	699	523	249	110	62	58	56	121	613	818	818	795	571	375	147	92	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11082	UNNAMED CR	196	198	216	461	1151	1479	1488	1488	1427	1119	587	297	166	138	158	271	871	1487	1488	1488	1321	846	420	199	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
11083	UNNAMED CR	84	75	79	281	864	967	967	953	826	618	294	130	73	68	66	143	725	967	967	940	675	443	174	109	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11084	UNNAMED CR	78	69	73	259	798	893	893	880	762	571	271	120	67	63	61	132	669	893	893	868	623	409	160	100	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11085	UNNAMED CR	45	40	43	151	465	521	521	513	445	333	158	70	39	37	35	77	390	521	521	506	363	238	94	58	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11086	UNNAMED CR	91	81	85	303	931	1042	1042	1026	889	666	316	140	78	73	71	154	781	1042	1042	1012	727	477	187	117	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11087	UNNAMED CR	104	92	97	346	1064	1190	1190	1173	1017	761	362	160	89	84	81	176	892	1190	1190	1157	830	545	214	134	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11088	UNNAMED CR	71	63	67	238	731	818	818	806	699	523	249	110	62	58	56	121	613	818	818	795	571	375	147	92	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11089	UNNAMED CR	117	104	109	389	1197	1339	1339	1320	1144	856	407	180	101	94	91	198	1004	1339	1339	1302	934	613	241	150	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11090	UNNAMED CR	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11091	UNNAMED CR	108	109	119	253	633	813	818	818	785	615	323	163	91	76	87	149	479	818	818	818	727	465	231	110	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
11092	UNNAMED CR	84	75	79	281	864	967	967	953	826	618	294	130	73	68	66	143	725	967	967	940	675	443	174	109	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11093	UNNAMED CR	104	92	97	346	1064	1190	1190	1173	1017	761	362	160	89	84	81	176	892	1190	1190	1157	830	545	214	134	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11094	UNNAMED CR	45	40	43	151	465	521	521	513	445	333	158	70	39	37	35	77	390	521	521	506	363	238	94	58	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11095	UNNAMED CR	71	63	67	238	731	818	818	806	699	523	249	110	62	58	56	121	613	818	818	795	571	375	147	92	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11096	UNNAMED CR	71	63	67	238	731	818	818	806	699	523	249	110	62	58	56	121	613	818	818	795	571	375	147	92	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11097	UNNAMED CR	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11098	UNNAMED CR	52	46	49	173	532	595	595	586	508	380	181	80	45	42	40	88	446	595	595	578	415	272	107	67	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11099	UNNAMED INTO EAST GEORGIE R.	406	415	443	766	1094	1108	998	726	662	823	678	474	154	149	202	486	1061	1069	753	459	328	658	444	214	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
11100	UNNAMED INTO KINSKUCH	379	387	414	715	1021	1034	931	677	618	768	633	443	144	139	189	454	990	998	703	428	306	614	414	199	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
11101	UNNAMED INTO KSHWAN R	1488	1521	1625	2808	4012	4062	3659	2661	2428	3018	2486	1740	565	546	741	1783	3889	3920	2761	1682	1203	2414	1628	784	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
11102	UNNAMED INTO NASS R	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11103	UNNAMED INTO NASS R	117	104	109	389	1197	1339	1339	1320	1144	856	407	180	101	94	91	198	1004	1339	1339	1302	934	613	241	150	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11104	UNNAMED INTO NASS R	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11105	UNNAMED INTO PORTLAND CANAL	243	249	266	460	657	665	599	435	397	494	407	285	92	89	121	292	636	642	452	275	197	395	266	128	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
11106	UNNAMED INTO PORTLAND CANAL	325	332	355	613	875	886	798	581	530	658	542	380	123	119	162	389	849	855	602	367	262	527	355	171	36%	37%	40%	69%	98%	99%	89%	65%	59%	74%	61%	43%	9B
11107	UNNAMED INTO WHITE R.	39	35	36	130	399	446	446	440	381	285	136	60	34	31	30	66	335	446	446	434	311	204	80	50	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11108	UNNAMED INTO WILLOUGHBY CR	104	92	97	346	1064	1190	1190	1173	1017	761	362	160	89	84	81	176	892	1190	1190	1157	830	545	214	134	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8

Table 2. Monthly Generation

Ref No	Stream Name	Monthly Average Energy (MWh)												Monthly Firm Energy (MWh)												Monthly Capacity Factor (%)												Hydr. zone
		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
11109	UTSUN CR	81	65	62	181	502	519	445	241	232	340	227	135	62	53	54	84	458	521	379	188	128	165	117	94	15%	12%	12%	35%	96%	100%	86%	46%	44%	65%	44%	26%	7
11110	WEBER CR	32	29	30	108	332	372	372	367	318	238	113	50	28	26	25	55	279	372	372	362	260	170	67	42	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11111	WEBER CR	39	35	36	130	399	446	446	440	381	285	136	60	34	31	30	66	335	446	446	434	311	204	80	50	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11112	WEGILADAP CR	129	115	122	432	1330	1488	1488	1466	1271	951	452	199	112	105	101	220	1115	1488	1488	1446	1038	681	267	167	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11113	WILLOUGHBY CR	220	196	207	735	2260	2530	2529	2492	2160	1617	768	339	190	178	172	374	1896	2530	2530	2459	1765	1158	454	284	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11114	WILSON CR	45	40	43	151	465	521	521	513	445	333	158	70	39	37	35	77	390	521	521	506	363	238	94	58	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
11115	WILYAYAANOOTH CR	641	570	602	2141	6582	7366	7365	7257	6290	4707	2237	987	554	519	500	1090	5521	7366	7366	7159	5138	3371	1323	826	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
13001	BEATTY CR	616	509	438	406	1042	2142	2158	2156	2060	1814	1261	814	484	457	403	380	574	2141	2158	2154	1877	1186	790	580	29%	24%	20%	19%	48%	99%	100%	100%	95%	84%	58%	38%	2
13002	DEASE CR	234	193	166	154	395	812	818	818	782	688	478	309	183	173	153	144	218	812	818	817	712	450	300	220	29%	24%	20%	19%	48%	99%	100%	100%	95%	84%	58%	38%	2
13003	DODJATIN CR	84	75	79	281	864	967	967	953	826	618	294	130	73	68	66	143	725	967	967	940	675	443	174	109	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
13004	FOURTH OF JULY CR	298	246	212	196	503	1034	1042	1041	995	876	609	393	233	221	195	184	277	1034	1042	1040	906	572	382	280	29%	24%	20%	19%	48%	99%	100%	100%	95%	84%	58%	38%	2
13005	HARTZ CR	106	88	76	70	180	369	372	372	355	313	217	140	83	79	70	66	99	369	372	371	324	204	136	100	29%	24%	20%	19%	48%	99%	100%	100%	95%	84%	58%	38%	2
13006	HITCHCOCK CR	170	140	121	112	287	591	595	595	568	500	348	224	133	126	111	105	158	591	595	594	518	327	218	160	29%	24%	20%	19%	48%	99%	100%	100%	95%	84%	58%	38%	2
13007	MESS CR	1094	974	1028	3654	11235	12574	12573	12389	10737	8035	3819	1685	945	887	853	1861	9424	12574	12574	12220	8771	5754	2259	1411	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
13008	PINE CR DITCH	276	228	197	182	467	960	967	966	924	813	565	365	217	205	181	170	257	960	967	966	841	531	354	260	29%	24%	20%	19%	48%	99%	100%	100%	95%	84%	58%	38%	2
13009	TUTESHETA CR	149	123	106	98	252	517	521	520	497	438	304	196	117	110	97	92	139	517	521	520	453	286	191	140	29%	24%	20%	19%	48%	99%	100%	100%	95%	84%	58%	38%	2
13010	UNNAMED CR	59	59	65	138	345	444	446	446	428	336	176	89	50	41	48	81	261	446	446	446	396	254	126	60	13%	13%	14%	31%	77%	99%	100%	100%	96%	75%	39%	20%	9A
13011	UNNAMED CR	39	35	36	130	399	446	446	440	381	285	136	60	34	31	30	66	335	446	446	434	311	204	80	50	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
13012	WINTER CR	52	46	49	173	532	595	595	586	508	380	181	80	45	42	40	88	446	595	595	578	415	272	107	67	9%	8%	8%	29%	89%	100%	100%	99%	85%	64%	30%	13%	8
13013	ZENAZIE CR	128	105	91	84	216	443	446	446	426	375	261	168	100	95	83	79	119	443	446	446	388	245	164	120	29%	24%	20%	19%	48%	99%	100%	100%	95%	84%	58%	38%	2

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
1001	ARROW PARK CR	N	N	N	N
1002	ARTHURS CR	N	Y	Y	N
1003	ASHER CR	N	N	N	N
1004	ASSINIBOINE CR	N	N	N	Y
1005	BANNOCK CR	N	N	N	N
1006	BEATRICE CR	Y	Y	Y	Y
1007	BEATTON CR	N	Y	N	Y
1008	BEHRMAN CR	N	N	N	N
1009	BEN ABLE CR	N	Y	Y	N
1010	BERNARD CR	Y	Y	Y	Y
1011	BLANKET CR FALLS	N	N	Y	Y
1012	BOYD CR	N	N	N	N
1013	BREMNER CR	N	N	N	N
1014	BRUCE CR	N	N	N	N
1015	CAMPBELL CR	N	Y	N	Y
1016	CARIBOU CR	N	N	N	N
1017	CASCADE CR	N	N	N	N
1018	CHAMPION CR	N	N	N	N
1019	CLINT CR	N	N	N	N
1020	CLUTE CR	N	N	N	N
1021	COCHRANE CR	N	N	N	Y
1022	COFFEE CR	N	Y	N	Y
1023	COOKE CR	N	N	N	Y
1024	COOPER CR	N	Y	N	N
1025	CORN CR	N	Y	N	Y
1026	COUGAR CR	N	Y	Y	N
1027	CRAWFORD CR	Y	Y	N	N
1028	CREIGHTON CR	Y	Y	Y	Y
1029	CULTUS CR	N	Y	N	Y
1030	DAVIS CR	N	N	N	Y
1031	DENNIS CR	Y	N	Y	N
1032	DERRY CR	N	Y	N	Y
1033	DIORITE CR	N	Y	Y	Y
1034	DOG CR	Y	Y	Y	Y
1035	DRIMMIE CR	Y	Y	N	Y
1036	DUNBAR CR FALLS	N	Y	Y	Y
1037	EAST CR	N	Y	Y	Y
1038	EAST CR #1	N	Y	N	Y
1039	ENTERPRISE CR (TUNNEL)	N	Y	Y	Y
1040	FALL CR	N	N	N	Y
1041	FARNHAM FALLS	N	N	N	Y
1042	FENNELL CR	N	Y	N	N
1043	FENWICK CR	N	Y	Y	Y
1044	FERRY CR	N	Y	N	Y
1045	FITZSTUBBS CR	Y	Y	Y	Y
1046	FORSTER CR FALLS	N	N	N	N
1047	FORSTER FALLS	N	N	N	N
1048	FOSTHALL CR #1	N	Y	Y	N
1049	FOSTHALL CR #2	N	Y	Y	N
1050	GIEGERICH CR	N	N	N	N
1051	GOATSKIN CR	N	N	N	Y
1052	GRIZZLY CR	N	Y	N	N
1053	GWILLIM CR (TUNNEL)	N	N	N	N
1054	HADOW CR	N	N	N	N
1055	HALFWAY HOTSPRINGS	Y	Y	N	N
1056	HALL CR	N	N	N	N
1057	HELLROARER CR	N	N	N	N
1058	HOPE CR	N	N	N	N
1059	HORSETHIEF FALLS	Y	Y	Y	N
1060	HOUGHTON CR	Y	Y	N	N
1061	HUNTERS CR	N	N	N	N
1062	INCOMAPPLEUX R	Y	Y	N	Y
1063	IRON CR	N	N	N	Y
1064	JOFFRE CR	N	N	N	N
1065	JOHN CR	Y	Y	N	Y
1066	KAIN CR	N	N	N	Y
1067	KELLIE CR	N	N	N	N
1068	KUSHANAX CR	Y	Y	N	N

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
1069	LADYBIRD CR	N	Y	N	Y
1070	LAIDLAW CR	N	N	N	N
1071	LASCA CR	Y	Y	Y	Y
1072	LATEWHOS CR	N	N	N	N
1073	LEGERWOOD CR	N	N	N	N
1074	LEXINGTON CR	N	N	N	N
1075	LILLIAN CR	N	N	N	N
1076	LITTLE GLACIER CR	N	N	N	N
1077	LOFTUS CR	N	N	N	N
1078	LOKI CR	N	N	N	Y
1079	LOST LEDGE CR	N	N	N	N
1080	LUXOR CR	N	N	Y	N
1081	MAURIER CR	N	Y	N	Y
1082	MCDONALD CR	N	N	Y	N
1083	MCDOUGAL CR	N	N	N	N
1084	MEADOW CR	N	Y	Y	N
1085	MENHINICK CR	N	N	N	N
1086	MIDGE CR	N	Y	N	Y
1087	MITCHELL R FALLS	N	Y	Y	Y
1088	MOHAWK CR	N	N	N	N
1089	MORRISSEY CR	N	Y	N	N
1090	MULVEHILL CR	N	Y	N	N
1091	NEMO CR	N	N	N	Y
1092	NEXT CR	Y	Y	Y	N
1093	OCTOPUS CR	Y	Y	Y	Y
1094	OUTLET CR	N	N	N	Y
1095	PALLISER FALLS #1	N	Y	Y	Y
1096	PALLISER FALLS #2	N	Y	Y	Y
1097	PAYNE CR	Y	N	N	Y
1098	POOL CR	N	N	N	Y
1099	POPLAR CR	N	Y	N	N
1100	POWDER CR	Y	Y	Y	Y
1101	QUARRIE CR	Y	Y	Y	Y
1102	RAPID CR	N	N	N	N
1103	RIOULX CR	N	Y	N	N
1104	RUSSEL CR	N	Y	Y	N
1105	SANCA CR	Y	Y	Y	N
1106	SCHROEDER CR	N	N	N	Y
1107	SEPTET CR	N	Y	Y	N
1108	SHANNON CR	N	Y	Y	Y
1109	SHAW CR	N	N	N	N
1110	SHUSWAP R BRENDA F	Y	Y	Y	Y
1111	SICAMOUS CR	N	Y	N	Y
1112	SKOOKUMCHUCK F	N	Y	N	Y
1113	SLEWISKIN CR	Y	Y	N	N
1114	SMYTH CR	Y	Y	N	Y
1115	SNOW CR	N	Y	Y	N
1116	SOUTH CRANBERRY CR	N	Y	Y	N
1117	SOWSAP CR	N	N	N	N
1118	SPECTRUM CR FALLS	N	Y	Y	Y
1119	ST.LEON CR	Y	Y	N	Y
1120	STOCKDALE CR	N	N	N	N
1121	SUNDOWN CR	N	Y	N	N
1122	TAM O'SHANTER CR	Y	N	Y	N
1123	TEA CR	N	N	N	N
1124	TEMPLETON CR	N	N	Y	Y
1125	TENDERFOOT CR	N	Y	N	N
1126	TOWN CR	N	N	N	Y
1127	TSUIUS CR	N	N	N	Y
1128	UNNAMED CR	N	Y	Y	N
1129	UNNAMED CR	N	N	N	Y
1130	UNNAMED CR	N	N	N	N
1131	UNNAMED CR	N	N	N	N
1132	UNNAMED CR	N	Y	N	N
1133	UNNAMED CR	N	N	N	N
1134	UNNAMED CR	N	N	N	N
1135	UNNAMED CR	N	N	N	N
1136	UNNAMED CR	N	Y	N	N

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
1137	UNNAMED CR	N	N	N	Y
1138	UNNAMED CR	N	N	N	N
1139	UNNAMED CR	N	N	N	Y
1140	UNNAMED CR	N	Y	Y	N
1141	VAN HOUTEN CR	Y	N	N	Y
1142	VICTOR CR	N	N	N	N
1143	VOWELL CR	N	N	N	Y
1144	WAP CR FALLS	Y	Y	N	Y
1145	WARREN CR	N	N	N	N
1146	WEE SANDY CR	N	Y	Y	N
1147	WHATSHAN L DAM & F	Y	Y	Y	Y
1148	WILSON CR	N	N	N	N
1149	WILSON CR FALLS	N	Y	Y	Y
1150	WODEN CR	N	Y	N	Y
1151	WOODBURY CR	N	Y	Y	Y
1152	WRAGGE CR	N	Y	Y	N
1153	YARD CR	N	Y	N	N
2001	ADAMS R RAPIDS	Y	Y	Y	Y
2002	AIRPLANE CR	N	N	N	Y
2003	ANDERSON CR	Y	Y	N	Y
2004	ASHLU CR (TUNNEL)	Y	Y	Y	Y
2005	BASTION CR	N	N	N	N
2006	BEAR CR	N	N	Y	N
2007	BIG SILVER CR	N	Y	N	Y
2008	BILLYGOAT CR	N	N	N	N
2009	BIRKENHEAD R	Y	Y	Y	Y
2010	BLACKCOMB & HORSTMAN CR	Y	Y	Y	N
2011	BLOWDOWN CR	N	N	N	N
2012	BLURTON CR	Y	Y	N	N
2013	BOBB CR	N	N	Y	N
2014	BOISE CR	N	N	N	Y
2015	BOX CANYON CR	N	N	N	N
2016	BRANDYWINE CR	N	N	N	Y
2017	BREMNER CR	N	N	N	N
2018	BROHM R #1	Y	Y	N	Y
2019	BROHM R #2 (TUNNEL/PEN)	Y	Y	Y	Y
2020	BUCKLIN CR	N	N	N	N
2021	CADWALLADER CR	N	Y	N	Y
2022	CALLAGHAN CR	Y	Y	Y	N
2023	CANTELON/YOLA CR	N	Y	Y	N
2024	CAPILANO R DAM	Y	Y	Y	N
2025	CASCADE CR	N	N	N	Y
2026	CAYOOSH CR #1	Y	Y	Y	Y
2027	CAYOOSH CR #2	Y	Y	Y	Y
2028	CAYOOSH CR #3 (TUNNEL)	Y	Y	Y	Y
2029	CHAPMAN CR FALLS	N	N	N	Y
2030	CHASE CR	N	N	Y	Y
2031	CHEEKYE R	N	N	N	N
2032	CHICKWAT CR	N	Y	N	Y
2033	CHIPMUNK CR	N	Y	N	N
2034	CINNAMON CR	N	N	N	N
2035	CINQUEFOIL CR	N	N	N	N
2036	CLEAR CR	N	Y	N	Y
2037	CLOWHOM R	N	Y	N	Y
2038	CLOWHOM R	N	Y	N	Y
2039	CLOWHOM R	N	Y	N	Y
2040	COGBURN CR	Y	Y	N	Y
2041	CONNEL CR	N	N	N	Y
2042	CORBOLD CR	Y	Y	Y	Y
2043	CRAWFORD CR	Y	Y	N	N
2044	CULLITON CR	N	Y	N	Y
2045	DE BECK	N	N	N	N
2046	DEMPSTER CR	N	N	N	N
2047	DOUGLAS CR	Y	Y	N	Y
2048	DOWNTON CR	N	Y	N	N
2049	DURUISEAU CR	N	N	N	Y
2050	DUTEAU CR	N	Y	Y	Y
2051	EATON CR	N	Y	N	N

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
2052	ELAHO CR	N	Y	Y	Y
2053	FIRE CR	N	Y	Y	Y
2054	FISH HATCHERY CR	N	N	N	Y
2055	FITZSIMMONS CR	N	N	N	Y
2056	FOLEY CR	Y	Y	Y	Y
2057	FRIES CR	N	N	N	N
2058	FURRY CR	N	Y	N	Y
2059	GRAVELL CR	N	N	N	N
2060	GRAY CR	N	Y	Y	Y
2061	HAYLMORE CR	N	Y	N	N
2062	HICKS CR	N	N	N	N
2063	HIGH CR	N	N	N	N
2064	HIGH FALLS CR	Y	Y	N	Y
2065	HILLS CR	N	N	Y	Y
2066	HIXON CR	Y	Y	Y	Y
2067	HORNET CR (TUNNEL)	N	Y	N	Y
2068	HUMMING BIRD CR	N	Y	N	Y
2069	HURLEY R (TUNNEL)	N	N	N	N
2070	JOFFRE CR	N	Y	N	N
2071	KAKILA CR	N	Y	N	N
2072	KEARY CR	N	Y	N	Y
2073	KOOKIPI CR	N	Y	N	Y
2074	KWOIEK CR	N	Y	N	N
2075	LAFORGUE CR	N	N	N	N
2076	LAKE LOVELY WATER	N	Y	Y	N
2077	LAKEVIEW CR	N	Y	Y	N
2078	LIVINGSTON & GOWAN CR	Y	Y	N	Y
2079	LIZZIE CR	N	Y	Y	N
2080	LOG CR	N	Y	N	N
2081	LOST CR	N	Y	Y	N
2082	LOST VALLEY CR	N	N	N	Y
2083	LYNN CR	Y	Y	N	Y
2084	MAIMEN CR	N	N	N	Y
2085	MAMQUAM R	N	Y	N	Y
2086	MANATEE CR	N	N	N	N
2087	MARA CR	N	N	N	Y
2088	MARSHALL CR (TUNNEL)	N	Y	Y	Y
2089	MASELPANIK CR	N	N	N	Y
2090	MAWBY CR	N	N	N	N
2091	MCGILLIVARY CR	N	N	N	Y
2092	MCNAIR CR	Y	Y	N	Y
2093	MCNULTY CR	N	Y	Y	N
2094	MEHATL CR	N	N	N	N
2095	MISERY CR FALLS	N	Y	N	Y
2096	MONMOUTH CR	Y	Y	Y	N
2097	MOWHOKAM CR	N	N	N	N
2098	NICOAMEN CR	N	N	N	N
2099	NOEL CR	N	N	N	Y
2100	NORTH CR	N	N	N	N
2101	NORTH SLOQUET CR	N	Y	N	N
2102	OWL CR	N	Y	Y	N
2103	PAUL CR	N	Y	N	Y
2104	PEBBLE CR	N	N	N	N
2105	PERKETTS CR	N	N	N	N
2106	PHAIR CR	N	N	N	N
2107	PHELIX CR	N	Y	N	N
2108	PINECONE CR	N	N	N	N
2109	PLACER CR	N	Y	Y	N
2110	POST CR	Y	Y	Y	N
2111	POTLATCH CR	N	Y	N	Y
2112	RAFFUSE CR	N	N	N	Y
2113	RAINY R	Y	Y	N	Y
2114	RED CR	N	Y	Y	N
2115	RED TUSK CR	N	N	N	N
2116	REINECKER CR	N	N	N	N
2117	ROARING CR	N	N	Y	N
2118	ROGERS CR	N	N	N	Y
2119	RUBBLE CR	N	Y	Y	N

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
2120	RUTHERFORD CR	N	N	Y	Y
2121	RYAN CR	N	N	N	Y
2122	SCUZZZY CR	N	Y	Y	Y
2123	SECHELT CR	Y	Y	N	Y
2124	SHALE CR	N	N	N	Y
2125	SHULAPS CR	N	Y	Y	Y
2126	SIGURD CR FALLS	N	N	N	Y
2127	SIWASH CR	N	N	N	N
2128	SLOQUET CR	Y	Y	N	Y
2129	SNOWCAP CR	Y	Y	Y	Y
2130	SOUTH SLOQUET CR	N	N	N	Y
2131	SOWERBY CR	N	N	Y	N
2132	SPUZZUM CR	N	Y	Y	N
2133	SQUAKUM CR	N	N	N	N
2134	SQUAMISH R	N	N	N	Y
2135	STAWAMUS CR	Y	Y	N	Y
2136	STEVE CR	N	N	N	N
2137	STOKKE CR	N	N	N	N
2138	SWANEE CR	N	N	Y	N
2139	TACHEWANA CR	N	Y	N	N
2140	TANTALUS CR	N	N	N	Y
2141	TAQUAT CR	N	N	N	N
2142	TATLOW & FALK	N	N	N	N
2143	TEREPOCKI CR	N	Y	Y	Y
2144	TEXAS CR	N	Y	N	Y
2145	TEXAS CR	N	Y	N	Y
2146	THORNHILL CR	N	Y	N	N
2147	TIPELLA CR	Y	Y	N	Y
2148	TOMMY CR	N	N	N	N
2149	TRETHEWAY CR	N	N	N	N
2150	TRUAX CR	N	N	N	Y
2151	TSILEUH CR	N	Y	Y	N
2152	TUWASUS CR	N	N	N	N
2153	TWENTYONE MILE CR	N	Y	N	Y
2154	TWIN ONE CR	N	N	N	N
2155	TYAUGHTON CR (TUNNEL)	N	Y	Y	N
2156	TZOONIE CR	Y	Y	N	N
2157	UNNAMED CR	N	N	N	N
2158	UNNAMED CR	Y	Y	N	Y
2159	UNNAMED CR	N	N	N	Y
2160	UNNAMED CR	N	N	N	N
2161	UNNAMED CR	N	N	N	N
2162	UNNAMED CR	N	N	N	N
2163	UNNAMED CR	N	N	N	N
2164	UNNAMED CR	N	N	N	N
2165	UNNAMED CR	N	N	N	Y
2166	UNNAMED CR	N	Y	N	N
2167	UNNAMED CR	N	Y	N	Y
2168	UNNAMED CR	N	Y	N	Y
2169	UNNAMED CR	N	Y	N	N
2170	UNNAMED CR	Y	Y	N	N
2171	UNNAMED CR	N	N	N	N
2172	UNNAMED CR	N	N	N	N
2173	UNNAMED CR	N	Y	N	N
2174	UNNAMED CR	N	Y	N	N
2175	UNNAMED CR	N	N	N	N
2176	UNNAMED CR	N	Y	N	N
2177	UNNAMED CR	N	Y	N	N
2178	UNNAMED CR	N	N	N	Y
2179	UNNAMED CR	Y	Y	N	Y
2180	UNNAMED CR	Y	Y	N	Y
2181	UNNAMED CR	Y	Y	N	Y
2182	UNNAMED CR	Y	Y	N	Y
2183	UNNAMED CR FALLS	N	N	N	Y
2184	UPPER CHEAKAMUS	N	Y	Y	N
2185	UPPER LILLOOET R	Y	Y	N	Y
2186	UPPER MAMQUAM R	N	Y	N	Y
2187	UPPER STAVE R	N	Y	Y	Y

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
2188	URE CR	N	N	N	N
2189	UZTLIUS CR	N	Y	N	Y
2190	VANCOUVER CR	Y	Y	N	Y
2191	VICKERS CR	N	N	N	N
2192	WHITECAP CR	N	N	N	N
2193	WILLIS CR	N	Y	Y	N
2194	WRAY CR	N	N	N	N
2195	ZENITH CR	N	N	N	N
4001	ADOLPH CR #1	N	Y	N	N
4002	ADOLPH CR #2	N	N	N	N
4003	ALLAN CR	N	N	N	N
4004	ARCHIE CR	N	Y	Y	Y
4005	BILL MINER CR	N	N	N	Y
4006	BLUE R	N	N	Y	Y
4007	BOBBIE BURNS CR	N	N	N	N
4008	BOULDERY CR	N	N	N	Y
4009	BULLDOG CR	N	N	N	Y
4010	CAMP CR	N	Y	N	N
4011	CARIBOU CR	N	N	N	N
4012	CHUA CHUA CR	N	N	N	N
4013	CLEARWATER RAPID-2	Y	Y	Y	Y
4014	CLEARWATER RAPID-3	Y	Y	Y	N
4015	CLEMINA CR	N	N	N	N
4016	CUPOLA CR	N	N	N	N
4017	DAVE HENRY CR #1	N	Y	N	Y
4018	DAVE HENRY CR #2	N	Y	N	Y
4019	DEADMAN R @ FALLS	N	Y	Y	Y
4020	DECEPTION CR	N	N	N	Y
4021	DOMINION CR	Y	Y	N	N
4022	DOUBLE EDDY CR	N	N	N	N
4023	FINN CR	Y	Y	Y	N
4024	FROTH CR	N	Y	Y	N
4025	GHITA CR	N	N	N	N
4026	GLENOGLE CR	N	Y	N	N
4027	GRANT BROOK	N	N	N	N
4028	HELLROAR CR	N	Y	N	Y
4029	HOLT CR	N	N	N	N
4030	HOWARD CR	N	N	N	Y
4031	ISAIAH CR	N	N	N	N
4032	JUMPING CR	N	Y	N	N
4033	KIMMEL CR	N	N	N	N
4034	KIRBYVILLE CR	N	Y	N	Y
4035	LIBERTY CR	Y	Y	N	Y
4036	LYNEX CR	Y	Y	N	N
4037	MAMMOTH CR	N	N	N	N
4038	MCLENNAN R	Y	N	N	N
4039	MCLENNAN R @ N.ARM	Y	N	N	N
4040	MCLENNAN R @ S.ARM	Y	N	N	N
4041	MILEDGE CR	N	Y	N	Y
4042	MOLSON CR	N	Y	N	N
4045	MOLYBDENITE	N	Y	N	N
4046	MOONBEAM CR	N	Y	N	Y
4047	MOOSE R	N	Y	N	N
4048	NORTH BLUE R	N	Y	N	Y
4049	OLDMAN CR	N	N	N	N
4050	PACKSADDLE CR	N	Y	N	N
4051	PALMER CR	N	N	N	Y
4052	PTARMIGAN CR	N	Y	N	N
4053	ROARING R	Y	Y	N	Y
4054	SERPENTINE CR	N	N	N	N
4055	SOARDS CR	N	Y	N	Y
4056	SUNSET CR	N	N	N	N
4057	SWAN CR	N	N	N	N
4058	SWIFT CR #1	N	N	N	Y
4059	SWIFT CR #2	N	N	N	Y
4060	UNNAMED CR	N	Y	N	N

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
4061	UNNAMED CR	N	N	N	N
4062	UNNAMED CR	N	N	N	N
4063	UNNAMED CR	N	Y	N	N
4064	UNNAMED CR	N	N	N	Y
4065	WATT CR	Y	N	Y	N
4066	WOOD R	Y	Y	N	Y
4067	YELLOWJACKET CR	N	Y	N	N
5001	ABBOTT CR	N	N	N	Y
5002	BEAVER CR @ FALLS	Y	Y	Y	Y
5003	BLACKBEAR CR	N	N	N	Y
5004	CHAPMAN CR	N	N	N	Y
5005	CHESHI CR	N	N	N	N
5006	COLWELL CR	N	Y	N	N
5007	FALLS R	N	N	N	Y
5008	GILMAN CR	N	N	N	Y
5009	GRAIN CR	N	Y	N	N
5010	GUN CR (TUNNEL)	N	N	Y	N
5011	HELL RAVING CR	N	N	N	N
5012	JAMISON CR	N	N	N	N
5013	KLINAKLINI CR	N	N	N	N
5014	MACKIN CR	N	Y	N	N
5015	MAYDOE CR	N	Y	N	Y
5016	MCCLINCHY CR	N	Y	N	N
5017	MOREHEAD CR	Y	Y	N	Y
5018	MOSLEY CR	N	Y	Y	N
5019	NUDE CR FALLS	N	N	N	Y
5020	PUNTZI CR	N	Y	N	Y
5021	QUARTZ CR	N	N	N	N
5022	RASMUSSEN CR	N	Y	N	Y
5023	RAZOR CR	N	N	N	N
5024	RELIANCE CR	N	N	N	N
5025	SELLER CR	N	Y	N	Y
5026	STIKELAN CR #1	N	N	N	N
5027	STIKELAN CR #2	N	N	N	N
5028	UNNAMED CR	N	N	N	N
5029	UNNAMED CR	N	N	N	N
5030	UNNAMED CR	N	N	N	N
5031	UNNAMED CR	N	N	N	N
5032	UNNAMED CR	N	N	N	N
5033	UNNAMED CR	N	N	N	Y
5034	UNNAMED CR	Y	Y	N	N
5035	VALLEAU CR	N	N	N	Y
6001	CACOOHTIN CR	N	N	N	N
6002	CHRISTENSON CR	N	N	N	N
6003	CLAYTON FALLS CR	N	N	N	Y
6004	CRAG CR	N	N	N	N
6005	GYLLENSPETZ CR	N	N	N	N
6006	HUMPBACK CR	N	N	N	N
6007	JUMP ACROSS CR #1	N	N	N	
6008	JUMP ACROSS CR #2	N	Y	N	N
6009	KALONE CR	N	N	N	Y
6010	MILL CR (UNNAMED)	N	Y	N	Y
6011	NECLEETSCONNAY R	N	N	N	N
6012	NIEUMIAMUS CR	N	N	N	Y
6013	NOEICK R	N	N	N	Y
6014	NOOKLIKONNIK CR	N	N	N	N
6015	NOOMST CR #1	N	N	N	N
6016	NOOSESECK R	N	N	N	N
6017	NOOSGULCH CR	Y	Y	Y	Y
6018	NORDSCHOW CR	N	N	N	N
6019	SALLOOMT CR	N	Y	N	Y
6020	SMITELY R #1	N	N	N	N
6021	SMITELY R #2	N	N	N	N
6022	SMITELY R @ FALLS	Y	N	N	Y
6023	SNOOTLI CR	Y	Y	N	Y
6024	SWALLOP CR	N	Y	N	N
6025	TASTSQUAN CR	Y	Y	N	N
6026	THORSEN CR	Y	Y	N	Y

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
6027	TSEAPSEAHOOLZ CR	N	N	N	N
6028	TSINI-TSINI CR	N	N	N	N
6029	UNNAMED CR	N	N	N	N
6030	UNNAMED CR	N	N	N	N
6031	UNNAMED CR	N	N	N	N
6032	UNNAMED CR	N	N	N	N
6033	UNNAMED CR	N	N	N	N
6034	UNNAMED CR	N	N	N	N
6035	UNNAMED CR	Y	Y	N	N
6036	UNNAMED CR	Y	Y	N	N
6037	UNNAMED CR	N	N	N	N
6038	UNNAMED CR	N	N	N	N
6039	UNNAMED CR	N	N	N	N
6040	UNNAMED CR	N	N	N	Y
6041	UNNAMED CR	N	N	N	Y
7001	BERNICE CR	N	N	N	N
7002	BOUNDING CR	N	N	N	N
7003	CARROLE FALLS	N	Y	N	N
7004	CENTENNIAL CR	N	Y	N	N
7005	CLYDE CR #1	N	N	N	N
7006	CLYDE CR #2	N	N	N	N
7007	DORE CR #1	N	N	N	N
7008	DORE CR #2	N	N	N	N
7009	DORE CR #3	N	N	N	N
7010	EAST TWIN CR	N	N	N	Y
7011	EDDY CR	N	N	N	Y
7012	FLEET CR	N	N	N	N
7013	FORGETMENOT CR	N	N	N	Y
7014	HELLROARING CR	N	N	N	N
7015	HIXON CR	Y	N	N	Y
7016	HOLLIDAY CR	N	N	N	N
7017	HORSEY CR	N	N	N	N
7018	LEGRAND	N	N	N	N
7019	MCINTOSH CR	N	N	N	Y
7020	PANTAGE CR	N	Y	N	Y
7021	ROBSON R	N	N	N	Y
7022	SMALL CR	N	N	N	N
7023	SNOWSHOE CR	N	N	N	N
7024	SWIFTCURRENT CR	N	N	N	Y
7025	UNNAMED CR	N	N	N	N
7026	UNNAMED CR	N	N	N	Y
7027	UNNAMED CR	N	N	N	N
7028	UNNAMED CR	N	N	N	N
7029	UNNAMED CR	Y	N	N	Y
7030	WALLOP CR	N	N	N	Y
8001	ALICE CR	Y	Y	N	Y
8002	ANDERSON CR	N	Y	N	Y
8003	ATLIN CR	N	Y	N	Y
8004	ATNA LAKE	Y	Y	N	Y
8005	AUGIER/BABINE LAKE	Y	Y	N	-
8006	BOLTON CR	N	N	N	Y
8007	BOWBYES CR	N	N	N	Y
8008	BUCK CR	N	Y	N	Y
8009	CHIMDEMASH CR	Y	Y	N	N
8010	CHIST CR #1	N	N	N	Y
8011	CHIST CR #2	N	N	N	Y
8012	COLDWATER CR	Y	Y	N	Y
8013	DAHL CR	N	N	N	N
8014	DASQUE CR	N	Y	N	Y
8015	DOCKRILL CR	N	N	N	N
8016	DOUGLAS CR	Y	Y	N	N
8017	EIGHT MILE CR	N	N	N	N
8018	ERLANDSEN CR	N	Y	N	N
8019	EXISTING DAMS @ FULTON R	N	Y	N	Y
8020	FLINT CR	N	N	N	Y
8021	GOAT CR	Y	Y	N	N
8022	HADENSCHILD CR	Y	Y	N	N
8023	HAMPSON CR	Y	Y	N	N

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
8024	HANKIN CR	Y	N	N	N
8025	HARDSCRABBLE CR	N	Y	N	N
8026	HATCHERY CR	Y	Y	N	N
8027	HOULT CR	N	N	N	Y
8028	HOUSTON TOMMY CR	Y	N	Y	N
8029	HOWSON CR	N	Y	N	Y
8030	HUMPHRYS CR	N	N	N	Y
8031	HUNTER CR	N	N	N	Y
8032	KLEANZA CR	Y	Y	N	Y
8033	LITTLE OLIVER CR	N	N	N	Y
8034	LORNE CR	N	N	N	Y
8035	LOWRIE CR	Y	N	N	N
8036	MAROON CR	N	N	N	N
8037	MCKAY CR	N	N	N	Y
8038	MOLYBDENUM CR	N	N	N	Y
8039	MORAINE CR	N	Y	N	N
8040	NABEELAH CR	Y	N	N	N
8041	OLIVER CR	N	N	N	N
8042	PINE CR	Y	Y	N	N
8043	PINKUT CR FALLS #1	Y	N	N	N
8044	PINKUT CR FALLS #2	Y	N	N	Y
8045	QUILL CR	N	N	N	Y
8046	RALEY CR	N	N	N	N
8047	REISETER CR	N	Y	N	N
8048	SCHULBUCKHAND CR	Y	N	N	N
8049	SHAMES R	N	N	N	N
8050	SHANNON CR	Y	N	N	N
8051	SINCLAIR CR	N	Y	N	N
8052	STAR CR	N	N	N	Y
8053	STE CROIX	N	N	N	N
8054	STEWARD CR	N	Y	N	N
8055	THOMAS CR #1	N	N	N	N
8056	THOMAS CR #2	N	N	N	N
8057	TRAPLINE CR	N	Y	N	N
8058	TROUT CR	Y	Y	Y	N
8059	TSHESINK/FRANCOIS LAKES	Y	Y	N	-
8060	UNNAMED CR	N	N	N	Y
8061	UNNAMED CR	N	Y	Y	Y
8062	UNNAMED CR	N	N	N	N
8063	UNNAMED CR	N	N	N	Y
8064	UNNAMED CR	N	Y	N	N
8065	UNNAMED CR	N	N	N	N
8066	UNNAMED CR INTO MORICE L	N	N	N	N
8067	UNNAMED INTO CLEAR CR	N	N	N	N
8068	UNNAMED INTO CLORE R	N	N	N	Y
8069	UNNAMED INTO CLORE R	N	Y	N	Y
8070	UNNAMED INTO CLORE R	N	N	N	Y
8071	UNNAMED INTO CLORE R	N	N	N	Y
8072	UNNAMED INTO LEGATE CR	N	N	N	Y
8073	UNNAMED INTO ZYMOETE R.	N	N	N	N
8074	WESACH CR	N	N	N	N
8075	WHITE CR	N	Y	N	N
8076	WILLIAMS CR	N	N	N	Y
8077	ZYMOETZ R	Y	Y	N	Y
9001	ARDEN CR	N	N	N	Y
9002	AYTON CR	N	Y	N	N
9003	COLONEL JOHNSON CR	N	N	N	N
9004	CUTHBERT CR	N	N	N	Y
9005	KHTADA CR	Y	Y	N	Y
9006	MARION CR	N	Y	N	N
9007	MATHISON CR	N	N	N	N
9008	MCDONALD CR	N	Y	N	Y
9009	TALA HAAT CR	Y	N	N	N
9010	UNION CR	Y	Y	N	Y
9011	UNNAMED CR	N	Y	N	Y
9012	UNNAMED CR	N	Y	N	Y
9013	UNNAMED CR	N	N	N	N
9014	UNNAMED CR	N	N	N	N

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
9015	UNNAMED CR	N	N	N	N
9016	UNNAMED CR	N	N	N	N
9017	UNNAMED INTO EXCHAMSIKS R	N	N	N	N
9018	UNNAMED INTO EXCHAMSIKS R	N	N	N	N
9019	UNNAMED INTO EXSTEW R	N	N	N	N
9020	UNNAMED INTO EXSTEW R #1	N	N	N	N
9021	UNNAMED INTO EXSTEW R #2	N	N	N	N
9022	UNNAMED INTO EXSTEW R #3	N	N	N	N
9023	UNNAMED INTO EXSTEW R #4	N	N	N	Y
9024	UNNAMED INTO ISHKHEENICKH R #1	N	N	N	N
9025	UNNAMED INTO ISHKHEENICKH R #2	N	N	N	N
9026	UNNAMED INTO KASIKS R	N	N	N	Y
9027	UNNAMED INTO KHTADA LAKE	N	N	N	Y
9028	UNNAMED INTO KHTADA LAKE	N	N	N	Y
9029	UNNAMED INTO KHYEX R	N	N	N	Y
9030	UNNAMED INTO SKEENA R	N	N	N	N
9031	UNNAMED INTO SKEENA R	N	N	N	N
9032	UNNAMED INTO SKEENA R	N	N	N	N
9033	UNNAMED LAKE INTO EXCHAMSIKS	N	N	N	N
9034	VOSHELL CR	N	N	N	N
11001	AMERICAN CR	N	N	N	N
11002	ANSEDAGAN CR	N	N	N	Y
11003	ANTHONY CR	N	N	N	N
11004	BARNEY GULCH	N	N	N	N
11005	BEAR R	Y	N	N	N
11006	BLACKSTOCK CR	N	N	N	Y
11007	BURDICK CR	N	N	N	N
11008	CARRIGAN CR	N	N	N	Y
11009	CASCADE CR	N	N	N	N
11010	CAUSQUA CR	N	N	N	Y
11011	CLARY CR	N	Y	Y	N
11012	CORYA CR	N	Y	N	Y
11013	DAK R	N	N	N	Y
11014	GINGIETL CR	Y	Y	N	N
11015	GINMILTKUN CR	N	N	N	Y
11016	GISWATZ CR	N	Y	N	N
11017	GLACIER CR	N	N	N	N
11019	GWUNYA CR	N	N	N	Y
11020	INSECT CR	Y	Y	N	Y
11021	JADE LAKE INTO WHITE R.	N	Y	Y	N
11022	JUNIPER CR	N	Y	N	N
11023	KELSKIIST CR	N	N	N	N
11024	KINSHUCH LAKE	N	N	N	N
11025	KSHADIN CR	N	N	N	N
11026	KWINATAHL R	N	N	Y	
11027	LUND CR	N	N	N	N
11029	MARMOT R	Y	Y	N	N
11030	MAY CR	N	Y	N	N
11031	MIKE CR	N	N	N	N
11032	MILL CR	N	Y	N	Y
11033	PANORAMA CR	N	Y	N	N
11034	RITCHIE CR	N	N	N	Y
11035	ROSEVELT CR	N	N	N	N
11036	SANSKISOOT CR	N	N	N	N
11037	SANYAM CR	N	Y	N	Y
11038	SCOTT CR	N	Y	N	Y
11039	SEASKINNISH CR	N	N	N	N
11040	SEDAN CR	N	N	N	N
11041	SHANALOPE	N	N	N	Y
11042	SHEGISIC CR	N	N	N	N
11043	SHEWILILBA CR	N	N	N	N
11044	SKOWILL CR	N	N	N	N
11045	STEEP CANYON CR	N	N	N	N
11046	SUPLHURETS CR	N	Y	N	Y
11047	SWEETIN R	N	Y	N	Y
11048	TODD CR	N	N	N	Y

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
11049	TONY CR	N	N	N	N
11050	UNNAMED CR	N	N	N	N
11051	UNNAMED CR	N	N	N	N
11052	UNNAMED CR	N	N	N	N
11053	UNNAMED CR	N	N	N	Y
11054	UNNAMED CR	N	N	N	N
11055	UNNAMED CR	N	N	N	Y
11056	UNNAMED CR	N	N	N	N
11057	UNNAMED CR	N	N	N	Y
11058	UNNAMED CR	N	N	N	Y
11059	UNNAMED CR	N	N	N	Y
11060	UNNAMED CR	N	N	N	Y
11061	UNNAMED CR	N	N	N	Y
11062	UNNAMED CR	N	N	N	N
11063	UNNAMED CR	N	N	N	Y
11064	UNNAMED CR	N	N	N	Y
11065	UNNAMED CR	N	N	N	N
11066	UNNAMED CR	N	N	N	N
11067	UNNAMED CR	N	N	N	N
11068	UNNAMED CR	N	N	N	N
11069	UNNAMED CR	N	N	N	N
11070	UNNAMED CR	N	N	N	N
11071	UNNAMED CR	N	N	N	N
11072	UNNAMED CR	N	N	N	N
11073	UNNAMED CR	N	N	N	N
11074	UNNAMED CR	N	N	N	N
11075	UNNAMED CR	N	N	N	N
11076	UNNAMED CR	N	N	N	N
11077	UNNAMED CR	N	N	N	N
11078	UNNAMED CR	N	N	N	N
11079	UNNAMED CR	N	N	N	N
11080	UNNAMED CR	N	Y	N	N
11081	UNNAMED CR	N	N	N	Y
11082	UNNAMED CR	N	N	N	N
11083	UNNAMED CR	N	N	N	N
11084	UNNAMED CR	N	N	N	N
11085	UNNAMED CR	N	N	N	N
11086	UNNAMED CR	N	N	N	N
11087	UNNAMED CR	N	N	N	N
11088	UNNAMED CR	N	N	N	N
11089	UNNAMED CR	N	N	N	N
11090	UNNAMED CR	N	N	N	N
11091	UNNAMED CR	N	N	N	N
11092	UNNAMED CR	N	N	N	N
11093	UNNAMED CR	N	Y	N	Y
11094	UNNAMED CR	N	N	N	N
11095	UNNAMED CR	N	N	N	N
11096	UNNAMED CR	N	N	N	N
11097	UNNAMED CR	N	N	N	N
11098	UNNAMED CR	N	N	N	N
11099	UNNAMED INTO EAST GEORGIE R.	N	N	N	N
11100	UNNAMED INTO KINSKUCH	N	N	N	N
11101	UNNAMED INTO KSHWAN R	N	N	N	N
11102	UNNAMED INTO NASS R	N	N	N	N
11103	UNNAMED INTO NASS R	N	N	N	N
11104	UNNAMED INTO NASS R	N	N	N	N
11105	UNNAMED INTO PORTLAND CANAL	N	N	N	N
11106	UNNAMED INTO PORTLAND CANAL	N	N	N	N
11107	UNNAMED INTO WHITE R.	N	N	N	N
11108	UNNAMED INTO WILLOUGHBY CR	N	N	N	Y
11109	UTSUN CR	N	N	N	N
11110	WEBER CR	N	N	N	N
11111	WEBER CR	N	N	N	N
11112	WEGILADAP CR	N	N	N	Y
11113	WILLOUGHBY CR	N	N	N	Y
11114	WILSON CR	N	N	N	N
11115	WILYAYAANOOTH CR	N	N	N	Y
13001	BEATTY CR	N	Y	Y	N

Table 3. Environmental issues

Ref No	Stream Name	Salmon above PH	SportFish above PH	Stocks above PH	Obstr. below PH
13002	DEASE CR	N	N	N	N
13003	DODJATIN CR	N	N	N	Y
13004	FOURTH OF JULY CR	N	N	N	Y
13005	HARTZ CR	N	Y	N	N
13006	HITCHCOCK CR	N	N	N	N
13007	MESS CR	N	N	N	Y
13008	PINE CR DITCH	N	Y	N	N
13009	TUTESHETA CR	N	N	N	N
13010	UNNAMED CR	N	N	N	N
13011	UNNAMED CR	N	N	N	N
13012	WINTER CR	Y	N	N	Y
13013	ZENAZIE CR	N	Y	N	N

APPENDIX A

GREEN CRITERIA

Low Impact Hydroelectricity Generation Projects

Socially Responsible Projects

(Note: green criteria may change to reflect evolving industry standards. The most recent version of the green criteria used by BC Hydro can be found at www.bchydro.com/greenipp.)

These criteria were prepared by BCH for the sole purpose of determining if developments are green to the standard of BCH for the purpose of BCH acquisition strategy. The determination of green by BCH does not imply certification of compliance to any certification process. BCH does not accept responsibility for the use or reliance upon these criteria and the BCH determination of green by any other party. Low environmental impact will be recognized for small hydroelectric projects if the following criteria are met:

Low Impact Principles	Descriptors	Compliance Measure/Evidence
Conserve existing fish habitat capability	The project meets the Canada Fisheries Act's "no net loss" objective for conserving fish and fish habitat.	Confirmation by a reputable scientist or regulatory agency via documentation of fish agency concurrence of the appropriateness of protection, mitigation or compensation measures in conserving all relevant parameters associated with fish and their habitat.
	Project preserves ability of anadromous fish to migrate.	Confirmation by a reputable scientist or regulatory agency via documentation of fish agency concurrence that migration of anadromous species will not be affected.
	Project preserves resident fish communities.	Where a man-made structure is placed across a stream where no natural barriers existed, fish passage facilities and protection measures (i.e. trash racks, oversized intake structures, underwater strobe and sound, and fish screens) will be installed, if required, to ensure natural migration patterns for maintaining riverine, anadromous and catadromous fish communities.
	Flows in the bypassed reach and downstream of the tailrace are adequate to support indigenous aquatic and riparian species at pre-project ranges.	Adherence to flow discharges (including seasonal flow fluctuations) as required under the Provincial Water Licensing Processes or Environmental Assessment review.
	The project has minimal impact on the water quality in the head pond, bypassed reach, and the reaches downstream of the tailrace and diversion dams/dykes.	Confirmation via scientific analyses by a reputable scientist or agency, provincial water licensing processes or Environmental Assessment reviews that operations will not result in significant changes in: • Water turbidity; • pH; • total gas pressure; • water temperature; and • physical or chemical properties that could have an acute or chronic impact on indigenous aquatic species.
	The project is operated in a manner to ensure conservation of fish habitat, including aquatic or terrestrial organisms.	The key variables identified by a reputable scientist or regulatory agency as potentially harmful to existing fish communities are monitored and reported on for the life of the project, and appropriate corrective action is taken when identified.

Low Impact Principles	Descriptors	Compliance Measure/Evidence
Maintain a minimum flow in the river	Maintain a minimum wetted channel perimeter, at all control structures, with a constant flow in the river throughout the year.	Confirmation by a reputable scientist or regulatory agency that a minimum flow is established and adhered to in the river throughout the year and under normal and dry-year operating conditions.
Conserve sensitive streams and endangered species	• Project does not threaten or harm migration or habitat of endangered species, threatened species or species of regional concern. • Project avoids "sensitive streams" as designated under the BC Fish Protection Act.	Confirmation via scientific analyses by a reputable scientist or regulatory agency, water licensing or Environmental Assessment Review that the project is not: • Located on a sensitive stream as designated under the BC Fish Protection Act; and • Impacting species designated by the Committee on the Status of Endangered Wildlife in Canada.
Conserve existing wildlife resources	A project has no significant impact on wildlife habitat and populations in existence at the time of execution of the EPA.	Confirmation via scientific analyses by a reputable scientist or regulatory agency, water licensing or Environmental Assessment Review that the project has no significant impact on wildlife habitat and populations in existence at the time of execution of the EPA.

Low Impact Principles	Descriptors	Compliance Measure/Evidence
Maintain integrity of current upstream ecosystem	Maintains an upstream ecosystem, at all control structures, which does not differ significantly from conditions at the time of execution of the EPA. Specifically, • The project design conforms to "run-of-river" concept with no seasonal storage or diversion between separate basins and the head pond capacity is limited to a maximum volume of up to 24 hours of average annual flow and does not flood land beyond the natural 10-year flood high water mark, or • The project makes use of existing natural storage (i.e. lakes) and natural hydrograph and lake levels are maintained, or • The project makes use of water storage already in existence at the time of execution of the EPA for electricity generating purposes (i.e. municipal water reservoirs or abandoned sites), increases the efficient use of the existing water storage but does not provide justification for maintenance of a site that would otherwise be dismantled; and • Natural upstream barriers that may separate distinct fauna on a waterway are not removed or submerged.	Confirmation by a reputable scientist that project design and description meets one of the three project types and that natural upstream barriers that may separate distinct fauna on a waterway have not been removed or submerged.
Maintain integrity of current downstream ecosystem	Maintains a downstream ecosystem, at all control structures, which does not differ significantly from conditions at the time of execution of the EPA.	Confirmation via scientific analysis and scientifically valid indicators, such as benthic invertebrates, that the existing ecosystem will not be significantly changed due to development.

Low Impact Principles	Descriptors	Compliance Measure/Evidence
Project development has low environmental impact on land resources	• The incremental transmission and distribution components of the project (including access roads, land clearing and powerline construction activities) and generation facilities have minimal impact on the terrestrial ecosystem. • Noise levels from operations should be below levels that would have a significant impact on area residents and other potential receptors. • Scenic, recreational and cultural values as at the time of the execution of the EPA will not be adversely affected.	• Confirmation by a reputable scientist or regulatory agency that the relevant sections of BC Forest Practices Code are complied with during project development and that the project demonstrates minimal environmental impact. • Adhere to applicable noise by-laws or regulations. • Confirmation by a reputable scientist or regulatory agency that scenic, recreational and cultural values as at the time of the execution of the EPA will not be adversely affected.

Commitment to continual improvement	• The project must be reliable, non-temporary and practical (i.e. not maintained in the development stages or as a pilot-scale demonstration project).
	• Operations are consistent with an ISO 14001 equivalent Environmental Management System (EMS) or a reasonable alternative.
	• A documented plan available for review on a periodic basis for commercially reasonable opportunities for increasing the efficiency or reducing the environmental impact of the project.
	• Plant operations are coordinated, to the extent commercially reasonable, with any other hydroelectric facility on the same stream to reduce impacts and protect indigenous species and habitats.
	• May complete a verifiable life-cycle analysis for the project.
		• A BCH-approved EMS that is:
		  • Consistent with ISO 14001;
		  • Commensurate with the complexity of the operations; and
		  • Provided, for approval, not later than 90 days before first generation of electricity.
		• A commitment to provide performance-checking reports (audits) of the EMS to BCH every three years from the Commercial Operation Date (COD).
		• A documented plan for commercially reasonable opportunities for increasing efficiency or reducing the environmental impact of the project.
		• The verifiable life-cycle analysis for the project may consider all stages of power generation, including upstream raw material acquisition, fuel production, manufacturing, operation, maintenance and final decommissioning.

Notes:
1. A reputable scientist is defined as a biologist who is registered or eligible for registration with the Association of Professional Biologists of BC, and who has never been disciplined for unethical activities.

These criteria were prepared by BCH for the sole purpose of determining if developments are socially responsible to the standard of BCH for the purpose of BCH acquisition strategy. The determination of social responsibility by BCH does not imply certification of compliance to any certification process. BCH does not accept responsibility for the use or reliance upon these criteria and the BCH determination of social responsibility by any other party.

Social Responsibility Principles	Descriptors	Compliance Measure/Evidence
Aboriginal community	Relevant members of the aboriginal community have been contacted, consulted and there is no significant objection from a majority of the relevant members.	Assurance via documentation and summary of consultation processes.
Community values	Involve the public in processes that help create the project plan and assure: • No important community values have been adversely affected; and • Recreational access existing at the time of execution of the EPA is maintained.	Assurance via documentation and summary of consultation processes.

Project contributes to local l community and economy	Project balances project development with supporting local community's economy by:
	• Providing employment opportunities; or
	• Using local products and resources; or
	• Making an explicit contribution to the community.
		• Policies and procedures that outline practical, commercially reasonable and measurable efforts to:
		  • Provide employment opportunities; or
		  • Use local products and resources; or
		  • Make an explicit contribution to the community.
		• Evidence of any jobs created in the community.
		• Evidence of any contracts with local suppliers or contractors.
		• Evidence of any contribution to local community (i.e. volunteer work).

Quality health and safety programs	Demonstrates a commitment to the health and safety of employees and general public.	Polices and procedures that demonstrate a commitment to health and safety including but not limited to: • Public safety issues; • Emergency preparedness and response; and • Incident prevention and reporting.

Social Responsibility Principles	Descriptors	Compliance Measure/Evidence
Operates in an ethical manner	Demonstrates a commitment to operate in an ethical manner commensurate with being a resource user in the province (relative to the size and level of the company): • Demonstrates transparency in public disclosure of information on financial, environmental and social performance of the project; and • Maintains accounting records and controls in accordance with generally accepted accounting practices to ensure finances are managed in responsible manner.	• Polices and procedures on public disclosure that demonstrate transparency. • Evidence of public disclosure on the project such as press releases, triple bottom line reports, minutes of meetings with stakeholders and the public. • Commitment to maintain accounting records and controls in accordance with generally acceptable accounting practices. • Any other policies and procedures that demonstrate a commitment to operate in an ethical manner.

APPENDIX B

LATEST TECHNOLOGY FOR SMALL HYDRO SYSTEMS

(Tables)

B.

LATEST TECHNOLOGY FOR SMALL HYDRO SYSTEMS

This section contains material previously included in the **Handbook of Micro Hydro Development in British Columbia**, prepared for BC Hydro by Sigma Engineering Ltd, August 2000. New material is marked with (NEW). This section contains the following:

INNOVATIVE MICRO HYDRO DEVELOPMENTS

PACKAGED PLANT DEVELOPMENTS

DEVELOPMENT	**PACKAGED PLANT DEVELOPMENT**		
NAME	Moose Rapids Hydroelectric Plant	**LOCATION**	Sudbury, ONT.
OPERATOR	Canadian Hydro Developers, Inc.		
PLANT SUMMARY	Turbine Turbine types Generator Plant Capacity Average Annual Energy Design Head Design Flow Machine Speed Runner Diameter	Canadian Hydro Components inclined Kaplan & Propeller Westinghouse (Induction) 1.3 MW 5 GWh 5.0 m 25 m^3/s 900 rpm 1,250 mm	
DESCRIPTION	Canadian Hydro Developers constructed Moose Rapids Plant in 1997 on the Wanapitei River, approximately 5 km downstream from Wanapitei Lake. Equipment was supplied by Canadian Hydro Components. Power is generated using three induction generators coupled through gearboxes to propeller and Kaplan turbines. Generated electricity is sold to Ontario Hydro under the terms of a 30-year Power Sale Agreement which expires on November 13, 2027.		
REFERENCE	http://www.canadianhydro.com/mooserapids/htm (Link is not active)		
CONTACT DETAILS	**Canadian Hydro Components Ltd.** 16 Main Street Box 640 Almonte, ONT K0A 1A0 Ph: 613-256-1983 Fax: 613-256-4235 Email: inquiries@canadianhydro.com Website: http://www.canadianhydro.com		

DEVELOPMENT	**PACKAGED PLANT DEVELOPMENT**		
NAME	APPLETON HYDROELECTRIC PLANT	**LOCATION**	Almonte, ONT
OPERATOR	Canadian Hydro Developers, Inc.		
PLANT SUMMARY	Turbine Turbine Types Generator Plant Capacity Avg. Annual Energy Net Head Rated Flow Machine Speed Runner Diameter	Canadian Hydro Components Inclined Kaplan & Propeller Westinghouse (Induction) 1.5 MW 6.3 GWh 7.0 m 20 m³/s 1,200 rpm 1,250 mm	
DESCRIPTION	Canadian Hydro's Appleton Plant is located adjacent to a residential community in the town of Appleton, near Ottawa. It was constructed in 1994 on the Mississippi River at the site of an old mill. Power is generated using three induction generators coupled through gearboxes to propeller and Kaplan turbines manufactured by Canadian Hydro Components in nearby Almonte. Generated electricity is sold to Ontario Hydro under the terms of a 30 year Power Sale Contract.		
REFERENCE	http://www.canadianhydro.com/appelton.htm (Link is not active)		
CONTACT DETAILS	**Canadian Hydro Components Ltd.** 16 Main Street Box 640 Almonte, ONT K0A 1A0 Ph: 613-256-1983 Fax: 613-256-4235 Email: inquiries@canadianhydro.com Website: http://www.canadianhydro.com		

DEVELOPMENT	**REPLACEMENT OF DIESEL GENERATION**		
NAME	Hluey Lake Hydroelectric Project	**LOCATION**	Dease Lake, B.C.
OPERATOR	Regional Power		
PLANT SUMMARY	Turbine Type	Alstom single pelton turbine-generator unit	
	Plant Capacity	3MW	
	Expected annual generation	6.2 gigawatt-hours	
	Estimated Cost	$15m	
DESCRIPTION	The Hluey Lake project began commercial operation in March 2000. BC Hydro is buying, distributing and marketing the electricity from this northern BC development enabling the local Dease Lake community, 460 km north of Prince Rupert, to phase out its use of diesel, which is now used strictly to provide standby power only. The project presently operates with a single turbine-generator, but a second unit can be added for future expansion.		
REFERENCE	"Project On-Line: Hluey Lake". Hydro Review. October 2001, Vol. No. p.		

WATER SUPPLY SYSTEM DEVELOPMENTS

DEVELOPMENT	**ADJUNCT TO WATER SUPPLY SYSTEM**		
NAME	Betasso Hydroelectric Plant	**LOCATION**	Boulder, CO
OPERATOR	City of Boulder Public Works Department		
PLANT SUMMARY	Turbine Types Generator Design Head Design Flow Plant Capacity Control Cost	Two-jet horizontal Pelton wheel Oriental Engineering; Synchronous 73m .13 m^3/s 2.9 MW Westinghouse Numalogic programmable controllers $US 3.2 m (1996)	
DESCRIPTION	The Betasso plant is installed on a high-pressure water line which interconnects into the penstock of the Barker Meadow Hydroelectric Project. The plant has replaced the submerged valve previously used to reduce the pressure before the water is pumped uphill to a water treatment plant. This development is one of six installed on the City of Boulder, Colorado's water supply system over 15 years. The city managers have learned a number of lessons during the implementation of the scheme. See below.		
SPECIAL CONSIDERATIONS	water utilization is dependent on the water demand in the water distribution system extreme variations in water available potential for waterhammer		
SOLUTIONS	plant operated on a flow control mode Pelton wheel has water deflectors to interrupt water flow on the wheel in an emergency trip or overspeed situation needle valves timed to close over a 2 minute period to minimize waterhammer on the penstock		
LESSONS LEARNED	the use of existing piping reduced costs but resulted in a reduced power output of .3MW (and a loss of US60,000 p.a. revenue), when the piping proved to be undersized and produced a less than expected net head hydro plants on water treatment and distribution systems must be deigned for a full range of transmission & distribution flow scenarios the design of plants of this type should involve engineers who have experience in such designs water treatment personnel should be involved in the hydro plant and control system design to ensure compatibility with the water system requirements		

	managers of hydropower plants that are operated in non-traditional environments, such as water systems, need special training even with such training the operation of such plants in the distribution system requires a period of adjustment
REFERENCES	Busse, E., Haag, T &Coupe, L. (1992). "Generating electricity along municipal water supply systems". *Hydro Review*. 11 (2), April. p. 28-38. Cowdrey, J.M. (1996). "Making small hydro work well on a water supply system". *Hydro Review*. 15 (1), February. p. 52-60. See also: Cryer, Steve. (2000). "Generating power in the water treatment process'. *International Water Power & Dam Construction*. Vol. 52, No. 6. June. p. 27. See also: On-Line Reports. "Silver Lake Hydroelectric Project". *Hydro Review.* Vol.19. No. 7. November 2000. p 60-62.

DEVELOPMENT	**ADJUNCT TO A WATER SUPPLY SYSTEM IN AN ENVIRONMENTALLY SENSITIVE AREA**		
NAME	Dulyn Eigiau	**LOCATION**	Wales
OPERATOR	National Power Hydro, UK.		
PLANT DETAILS	Capacity Pipeline Length Interconnection	500kW 2.8km x 450mm pressure pipe laid 450mm below surface 5km old pipeline used as conduit for 11kV cabling to grid	
DESCRIPTION	A powerhouse has been constructed on a 5km pipeline between a high level reservoir and a low level water treatment works in a difficult and environmentally sensitive area.		
SPECIAL CONSIDERATIONS	designated Area of Special Scientific Interest required environmental and visual impacts to be minimized remote location and difficult topography presented problems with access and construction balance between demand for drinking water and electricity generation had to be maintained		
FEATURES/ SOLUTIONS	ground disturbance minimized by using a section of the old pipeline as a conduit for 11kV cabling to the grid new pressure pipe, chosen for its ability to follow contours, laid 450mm below surface attention paid to not mixing soil types on the pipeline route low rise powerhouse constructed of local materials work areas controlled to avoid cross contamination of ecological areas storage of upper reservoir increased by raising top of weir, using concrete colored to harmonize with surroundings automation and control integrated with water supply and river control systems discharge duct directs flow into local stream with positive effect on local fish population		
REFERENCE	Baxendale, J. (1997). “Planning the Dulyn Eigiau small hydro scheme in Wales”. *International Journal on Hydropower & Dams.* 4 (4). p. 65-68. For a description of an automation system for plant on water supply system see also: Herrin, Randy *et al*. (1999). “Automating hydro: keeping old plants profitable”. *Hydro Review*. Vol. 18. No. 2. p. 26-27.		

DEVELOPMENT	**Emergency pumping stations as pump-generation units**		
NAME	Kohler Hydroelectric Power Plant	**LOCATION**	Boulder, CO
OPERATOR	City of Boulder Public Works Department		
PLANT SUMMARY	Turbine Types Generator Design Head Design Flow Plant Capacity Control Cost	2 x Cornell horizontal reaction Francis pump-turbines, and bypass pressure reducing valves, rated at 73 kW with .13 m³/s at a design head of 73m Marathon Electric induction unit 73m .13 m³/s 150 kW Westinghouse Numalogic programmable controllers US$280,000 (1996)	
DESCRIPTION	One of 5 similar plants operated by the City of Boulder Public Works Department, this plant was designed originally as a water supply back-up pumping plant for a high-pressure zone. Energy wasted by a pressure-releasing valve has been recovered by converting the emergency pumping stations into pump-generation units. Francis turbines were selected for their pump-generation capability, and optimum efficiency for the available head and flow.		
REFERENCES	Busse, E. June et al. (1992). “Generating electricity along municipal water supply systems”. *Hydro Review*. Vol.11. No 4. April. p.28, 31-38. Cowdrey, John. (1996). “Making small hydro work on a water supply system”. *Hydro Review*. Vol. 15. No. 1. February. p. 52,56,58,60.		

DEVELOPMENT	**IRRIGATION RESERVOIR RELEASE WATER**		
NAME	Waterton Hydroelectric Plant	**LOCATION**	Glenwood, Alberta
OPERATOR	Alberta Environment		
PLANT SUMMARY	Turbine Generator Plant Capacity Average Annual Generation Pipeline Length Design Head Design Flow	Alstom Horizontal Francis; 720 rpm; 770 mm runner Kato 2.8 MW 13.8GWh 193m of 1.5m diameter steel penstock mounted within the diversion tunnel 37-51 m 7.2 m³/s	
DESCRIPTION	The Waterton Hydroelectric Plant takes advantage of Waterton River flows released from the Waterton Reservoir by Alberta Environment. The Waterton Reservoir was constructed to meet growing irrigation demands in Southern Alberta. Water for the plant is obtained within the dam diversion tunnel valve room, and flows to the turbine through a penstock mounted within the diversion tunnel. The plant is operated strictly as a run-of-river facility with flow control by Alberta Environment. Power is sold to TransAlta Utilities under the terms of a 20-year power purchase agreement.		
REFERENCE	http://www.canadianhydro.com.waterton.htm (Link is not active)		

DEVELOPMENT	**UNIQUE INTAKE ON A WATER SUPPLY PIPELINE**		
NAME	Tie Hack Dam and Hydropower Plant	**LOCATION**	Buffalo, WY
OPERATOR	City of Buffalo		
PLANT SUMMARY	Turbine Generator Plant Capacity Average Annual Generation Pipeline Length Design Head Design Flow Interconnection Cost	225kW; 1200 rpm; 410 mm runner Reliance Electric; Induction; 3 phase, 60 Hertz 225kW 1.8Gwh 7.25km x 36cm ductile iron 172m .17 m^3/s 91m of 480-volt transmission line to existing three phase line US$1million (1999)	
DESCRIPTION	An existing ductile iron pipeline built to carry runoff water to the town of Buffalo, now feeds water to a hydroplant instead. The plant is 25kms downstream of a dam built to solve severe water shortage problems in the area. Revenue generated from the plant will be used to pay for the dam's US$9m construction costs. The project features a unique intake tower designed to meet the needs of local fish population.		
FEATURES	unique intake has 5 gates at different levels water of varying temperature and oxygen content can be drawn at different elevations to meet needs of different fish species downstream to avoid the cost of constructing a spillway, a cutout section on the rim of the dam allows additional water to spill over the top		
REFERENCE	Gross, Ken. (1999). "Tie Hack Dam project: meeting the needs of the 'Wild West'". *Hydro Review*. Vol. 18, No. 1. February. p. 34,36-7.		

DEVELOPMENT	**WATER CONDUITS TO A FISH HATCHERY**		
NAME	Dworshork	**LOCATION**	Clearwater River, Idaho
OPERATOR	Idaho Department of Water Resources		
PLANT DETAILS	Turbine Type Generator Plant Capacity Head range Design Flow	Gilkes (UK) Alconza (Spain) 2.9MW- 1x2.5MW & 1x.4MW 125m-174m 2.5 m^3 /sec for 900mm pipe and .7m^3 /sec for 450mm pipe	
DESCRIPTION	The Idaho Department of Water Resources is developing a 2.9MW plant downstream of the existing Dworshork dam and hydro plant, using the flow to fish hatcheries located 2km below. The US Army Corps of Engineers owns the dam, hydro plant and hatcheries. Water from the reservoir flows in two pipelines to a distribution box from which they divide into 4 conduits, two into the Clearwater River and two to the Dworshork National Fish Hatcheries. The plant is being built on top of the distributor box.		
SPECIAL CONSIDERATIONS	various FERC conditions are in place contamination of, and impact on, the hatcheries must be avoided pipelines must operate all year round a development of only 2MW was envisaged when the distributor box was designed visible from nearby town		
FEATURES/ SOLUTIONS	biodegradable oil is being used oil overflow sumps have been installed a continuous flow of water maintained during construction water will be diverted around the turbines if generation problems occur an operator stationed near the facility to respond to emergencies design of existing structure of distributor box has been modified to hold heavier equipment colours and textures used to blend with existing natural rock		
REFERENCE	Moxon, Suzanne. (2000). “Hatching up small hydro”. *International Water Power & Dam Construction*. 52 (2). p. 31.		

DEVELOPMENT	**WATER DISCHARGE FROM A PUMPED STORAGE PLANT RESERVOIR**		
NAME	Markersbach	**LOCATION**	Southern Germany
OPERATOR	Vereinigte Energiewerke AG		
PLANT DETAILS	Turbine Generator Design Head Capacity Av. Annual Generation Pipeline Length Control Cost	Ossberger Crossflow turbine Asynchronous generator used to feed into .4kV grid; spur gear to adapt speed of turbine (399rpm) to speed of asynchronous generator (1030 rpm) 23m - 43m 250kW 1GWh penstock connection made through a 600mm-diam bifurcation from one of the two 1000mm-diam outlet conduits remotely controlled from the pumped storage plant control centre US$1600/kW (1996)	
DESCRIPTION	A small station has been integrated into the lower level reservoir of a pumped storage plant, making use of the water of the former river, and flood water discharge. A crossflow turbine was chosen for its favorable efficiency over a wide range of flows, and its ability to run at low speed. The penstock connection is designed as a bypass of one of the two outlet conduits. Output in the first two years matched predictions, but the developers stress that this is the result of the careful planning process involved.		
SPECIAL CONSIDERATIONS	water licence stipulates discharge must be balanced with inflow minimum discharge rate of .2m^3/s head varies between 23m & 43m turbine had to be efficient over large range of flows normal functioning of the lower reservoir outlets had to be preserved year round operation with minimum discharge rates desire to minimize costs transportation of equipment and materials through by-pass tunnels by-pass tunnels needed to remain in operation		
NOTES	erection and commissioning in 8 weeks generation during first two years of operation .908GWh and 1.1GWh, confirming the generation values estimated during planning adapter conduit not properly prepared and had to be modified twice highlighting the need for accurate measurements on site		
REFERENCE	Wuntke, W. (1996). “Addition of a mini hydro station at the Markersbach pumped-storage plant”. *International Journal on Hydropower & Dams*. 3 (4). p. 54-5.		

SPECIAL ENVIRONMENTAL ISSUES

DEVELOPMENT	**RUN-OF-RIVER DEVELOPMENT ON AN ENVIRONMENTALLY SENSITIVE AND DIFFICULT SITE**		
NAME	Burton Creek Hydro Plant	**LOCATION**	Cascade Mountains, WA
OPERATOR	Burton Creek Hydro Inc.		
PLANT DETAILS	Turbine Type Generator Plant Capacity Avg. Annual Generation Design Head Design Flow Pipeline length Interconnection type	Pelton Wheel; 3 nozzles; 10cm diam runner shaft; 20cm wide bucket; 786 horsepower at 84% efficiency 550 kW, 720 rpm, 60 cycle 550 kW 2.5 GWh 183 m in 426 linear m's .42 m^3 /sec 121m plastic & 305m welded steel; both 460mm diam 293m of underground intertie to utility lines	
DESCRIPTION	Development of this family owned plant on a tributary of the Cowlitz River presented enormous challenges. Located within range of possible Native American burial sites, bald eagle habitat and fish breeding grounds, the site required extensive environmental clearance before permitting. 8 years, and 18 permits later, the physical nature of the site, a heavily wooded canyon, 2 waterfalls, sheer 457m rocky cliffs, and no road access, called for innovative solutions. Manual operation of the plant for the first year enabled problems arising to be monitored more closely. Problems with clogging of trashrack screens in the treed environment led to the application for a patent for a self cleaning trashrack, which the family invented.		
SPECIAL CONSIDERATIONS	lack of access constructing penstock in extremely difficult terrain bald eagle habitat and fish breeding grounds requirement for natural debris to remain in the stream		
INNOVATIONS & SOLUTIONS	Access 457m x 2.3cm cable logging skyline anchored from below bottom waterfall to above top one used to transport tools, equipment and & materials Penstock upper level section of penstock brought in by skyline, then transported by hand helicopter used for delivery of materials for 37m open flume used to channel water from stream access to second waterfall (274m above powerhouse with sheer cliffs) gained by felling huge tree & leaning it against cliff wall to act as anchor for permanent metal ladder this section of pipe prefabricated, then lowered by helicopter and braced to trunk with chains Protection of eagles intertie cable buried to prevent eagles flying into transmission lines		

	Protection of fish need to preserve half water for fish spawning meant powerhouse sited at base of lower falls in the canyon Debris invention of self-cleaning trashrack which operates with 2.4.m of static head and sends clear water to plant while natural debris remains in stream patent applied for
REFERENCE	Kamberg, M.L. (1998). “Burton Creek Hydro: realizing the dream”. *Hydro Review.* 17 (7), December. p.28-32.

DEVELOPMENT	**A small developer faces opposition**		
NAME	TRUISLER CHUTE POWER PLANT	**LOCATION**	North Bay, ONT
OPERATOR	Trout Creek Power		
PLANT SUMMARY	Turbine Type Generator Plant Capacity Avg. Annual Generation Design Head Design Flow Pipeline length Interconnection type Cost	Ossberger cross-flow Rebuilt induction motor; 800 horsepower; 600 kW; 900rpm; connected to turbine with Hanson gearbox 600 kW 2.8 GWh 10 m 5.5 m^3/s 92m x 1.5m diam steel 1.4km, 44-kV line ; substation at powerhouse with 600-44,000-volt transformer $1m (2000)	
DESCRIPTION	This development was beset by delays, disputes, financing problems and a flood but the developers are already looking optimistically to the future. They see the potential of doubling the size of the plant by using another waterfall upriver. Their experience offers valuable lessons to other potential small developers. The “chute” is a remote waterfall in a notch in bedrock, over which water drops 7.6m, then cascades over rapids to create a 10m head.		
PROBLEMS FACED	rumours about the development led to resident protests delayed winter construction had serious implications for work practices and costs financial institutions had little experience with non-utility developers icing problems with steel trashracks future projects will be use material other than steel maximum flows underestimated serious effects of two floods caused by rapid snow melt and stoplogs removed from dam upstream on future projects 25% will be added to estimated maximum flows		
REFERENCE	Parker, Martin. (2000). “Truisler Chute”. *Hydro Review*. Vol. 19. No. 2. April. p. 30, 32,34.		

OPERATION IN TANDEM WITH A DIESEL PLANT

DEVELOPMENT	**Operation in tandem with a diesel plant**		
NAME	Deer Lake Generating Station	**LOCATION**	Severn River, ONT
OPERATOR	Ontario Hydro Technologies		
PLANT SUMMARY	Turbines Generator Plant Capacity Cost	2 x Canadian Hydro Components 245 kW, 1250mm axial flow Kaplan pit turbines Kato 490kW $5.4m	
DESCRIPTION	The Deer Lake Generating Plant operates in tandem with the nearby Deer Lake First Nations' community diesel generating plant. It is estimated that the hydro development will save $400,000 in annual expenditure on diesel and the associated costs of transporting it, while dramatically reducing carbon dioxide emissions. The new plant is expected to meet 80-90% of the community's requirements. The project was funded by the I&NAC (Indian and Northern Affairs Canada).		
FEATURES	Tandem operation if the hydro plant can handle the load the diesel plant shuts down the diesel plant is brought on-line if the hydro plant cannot handle the load Environmental reduction in CO^2 emissions the diesel plant formerly pumped 2000 tons of CO^2 annually		
REFERENCE	"Canadian News: Deer Lake". (1999). *Hydro Review*. Vol.18. No. 1. February. p. 77-78.		
NOTE	This project has sparked much interest from similar remote communities. Ontario Hydro Technologies points out that "Climate Change Funds" are available through Environment Canada for projects designed to reduce CO^2 emissions, and hence could be accessed for similar future hydro projects.		

RESTORATION PROJECTS

DEVELOPMENT	**ANTIQUE EQUIPMENT RETAINED IN AN HISTORIC PLANT**		
NAME	THE BOWERSOCK MILLS & POWER COMPANY HYDRO PLANT	**LOCATION**	Lawrence, KA
OPERATOR	The Bowersock Mills & Power Company		
PLANT SUMMARY	Turbine Type	1 Leffel Francis 142cm F 4 Leffel Francis 99cm Z 2 Leffel Kaplan 99cm A	
	Generator	1 Electric Machine Co. (1919) 4 General Electric 109rpm (1925) 3 General Electric 220rpm (1925); all 2,300-volt direct current vertical generators with wooden foot bearings	
	Plant Capacity	2.24MW	
	Avg. Annual Generation	10-13GWh	
	Design Head	5.3m	
	Design Flow	59 m^3/s	
	Penstock	Open flume	
	Interconnection type	304m, 2300-volt, 600-amp line to utility substation	
	Cost	US$500,000 (1997)	
DESCRIPTION	This simple low head facility, with a fascinating history, has been generating electricity since 1878, and owned for most of that time by the same family The powerhouse dates from 1903 and operates today using largely antique equipment. Substantial overhauling and rehabilitation over twenty years, has increased capacity by 20%. The family owners have approached the renovations with the attitude that old equipment lasts longer and is more rugged to the upgrading, and hence that if something works, it isn't fixed or upgraded to state-of-the-art. Used equipment is used for replacements when necessary. One concession to this has been the installation of automated flashboards on the dam.		
REHABILITATION FEATURES	generators, governors and switchboard date from the 1920's only five of the seven generators have been rewound reverse current relays installed on all generators turbines overhauled one at a time while plant in operation lightning protectors, over/under voltage relays & temperature shutdown devices installed Obermeyer automated steel flashboards raised and lowered using compressed air regulated by a level controller		
REFERENCE	Kamberg, M.L. (1997). "Keeping water power in the family". *Hydro Review.* 16 (1), February. p.42-46.		

DEVELOPMENT	**RENOVATED RUN-OF-RIVER DEVELOPMENT**		
NAME	Eau Galle Renewable Energy Plant	**LOCATION**	Eau Claire, WI
OPERATOR	Eau Galle Renewable Energy Co., inc.		
PLANT SUMMARY	Turbine Type Generator Plant Capacity Avg. Annual Generation Design Head Design Flow Pipeline length Interconnection type Draft tube Cost	Flygt EL758R semi-Kaplan, four bladed, 520 rpm runner speed, automatically adjustable aluminum runner Flygt 66-76-14AA 935 submersible 14-pole induction generator 520 rpm close coupled to and directly driven by the hydraulic end 345 kW 1.4GWh 9.4m 4.6m^3/s 12m x 3.4m x 4.3m submerged intake 61m of 12.7 kV overhead lines from powerhouse to substation Cor-Ten corrosion resistant steel $US450,000 (1993)	
DESCRIPTION	Although US based this example illustrates the challenges faced by small developers in licensing, financing and arranging the sale of their power. These posed the biggest problems for a couple planning the redevelopment of an abandoned dam and small plant as a retirement investment. They did, however, turn the lengthy period of negotiation for the sale of their power to their benefit with the type of agreement drawn up. By accessing state and federal grants and subsidies, and selling a 50% share to an investor, they secured a seven-year business loan, previously unavailable. The owners expect a five year payback on the loan.		
SPECIAL CONSIDERATIONS	Project development developers with limited financial access and inexperienced in the licensing process Civil works powerhouse and turbine pit in poor condition		
INNOVATIONS & SOLUTIONS	Project development accessed federal and state grants for equipment and to subsidize interest on business loans sold 50% share in the development to local investor before commencement specialist licensing consultant hired agreement with the power purchaser includes annual incremental rise and an energy escalation clause which provides for increases to match the utility's avoided cost increases Civil works downstream end of the intake closed off with a cast-in-place concrete wall		

	wall has two openings, one used presently as the draft tube, the other for possible future expansion
REFERENCE	Kamberg, Mary-Lane. (1993). "Honey, let's start a power company!" *Hydro Review.* Vol. 12, No. 7. December. p. 36,38,40.

DEVELOPMENT	**RENOVATION OF A DISUSED PLANT**		
NAME	Galetta Generating Station	**LOCATION**	Almonte, ONT
OPERATOR	Canadian Hydro Developers		
PLANT SUMMARY	Turbines Unit Types 1 & 2 Generator Generator Speed Runner Diameter Unit Types 3 & 4 Generator Plant Capacity Avg. Annual Generation Design Head Design Flow	Canadian Hydro Components Horizontal Quad Francis Westinghouse 240 rpm 1,000 mm 2 x 175 kW Vertical Propeller; 800 mm diam. runner Induction; 900 rpm 1.6 MW 6.5 GWh 7.3 m 25 m^3/s	
DESCRIPTION	Galetta Generating Station, on the Mississippi River, was one of the first hydro plants in Ontario to be redeveloped. Much of the work was carried out by CHC who sold it in the 1980's and repurchased it in early 1998 from a local independent power producer. The plant was built in 1907 to provide power to local loads, with two 400 kW horizontal synchronous Westinghouse generators. Redevelopment has included rewinding and uprating the generators to 600 kW, adding two 175 kW vertical propeller turbines with induction generators, and replacing the original turbines with new larger machines. The control room has been rebuilt with vacuum switchgear and an automatic control system.		
REFERENCE	http://www.canadianhydro.com/galetta.htm (Link is not active)		

<table>
<tr><td>DEVELOPMENT</td><td colspan="3">RESTORATION OF A MILL PLANT WITH USED EQUIPMENT</td></tr>
<tr><td>NAME</td><td>Glen Falls Hydroelectric Project</td><td>LOCATION</td><td>Glen Falls
CONN.</td></tr>
<tr><td>OPERATOR</td><td colspan="3">Summit Hydropower</td></tr>
<tr><td>PLANT DETAILS</td><td>Turbine Type
Generator

Plant Capacity
Avg. Annual Generation
Design Head
Design Flow
Pipeline length
Interconnection type

Cost</td><td colspan="2">Double runner horizontal Francis
Westinghouse Synchronous
250kVa, 600 rpm, 600 volts
250 kW
.839 GWh
4.9 m
4.1 m^3 /sec
24m used pipe welded ; 1.8m diam
61m x 250 MCM conductor,
three 100-kVA polemounted,
600/23000-volt transformers
5000 hours & US$50,000 (1999)</td></tr>
<tr><td>DESCRIPTION</td><td colspan="3">Built originally to provide power to a textile mill, this plant on the Moosup River, Connecticut, had been abandoned for twenty years before the new owners began restoration. This involved replacing almost every component except the dam. Wherever possible used equipment was purchased, and upgraded, using new technology. Much ingenuity was applied to installations within the constraints of the existing powerhouse, particularly in relation to replacing the basement penstock. A detailed description of most procedures and components is provided in the reference article. The owners expect to recover costs in the first two years of operation.</td></tr>
<tr><td>PROBLEMS & SOLUTIONS</td><td colspan="3">100 yr-old 24m x 2m diam riveted penstock located in the mill basement with pillars 3m apart
used 1.8m diam metal pipe cut into segments to fit between the pillars
portion of old penstock top removed
segments of used pipe inserted into the existing pipe in a telescope fashion, using a bed of small rollers for ease of movement
pipes welded and braced
concrete pumped between old and new pipes and bands of concrete used at several points for additional support
removal of turbine shaft impractical
small lathe carriage set up in pressure case
shaft machined in situ using a snow-blower engine and V-belt speed reductions to turn it
old components severely corroded
after sandblasting sprayed with International Paints “Intertuff” epoxy, made for underwater use
wicket gates also dipped in epoxy</td></tr>
<tr><td>REFERENCE</td><td colspan="3">Swirbul, Kathy. (1999). “Partners use ingenuity, hard work to restore Glen Falls Hydro Plant”. Hydro Review. Vol. 18. No.4. July. p.48,50,52</td></tr>
</table>

UNDERGROUND POWERHOUSE

DEVELOPMENT	**UNDERGROUND POWERHOUSE FOR RUN-OF-RIVER PLANT**		
NAME	Twin Falls	**LOCATION**	Kagiano River, Ontario
OPERATOR	Twin Falls, L.P. (Pic Heron First Nation, Rapid-Eau Technologies, et al.		
PLANT SUMMARY	Turbine Type Generators Capacity Cost Powerhouse Penstock Intake shaft Tailrace Expected annual generation Price received	Two Canadian Hydo Components double-horizontal Francis units Kato 5MW $6.5m Underground Short: 6m 3m wide ; vertical entry to the powerhouse 300m; discharges at base of site waterfalls 27,533 MWh 4.54 cents/ kWh	
DESCRIPTION	This northern Ontario project, 20 kms west of Manitouwadge, features an unmanned remotely controlled underground powerhouse. Two vertical shafts, one to transport water, the other to provide building access, run into the powerhouse. A 300 m tailrace tunnel takes water from the turbines and discharges it at the base of water falls at the site. With the exception of a small weir directing water into an intake tunnel, the plants features are not visible from the falls. Electricity produced is sold to Ontario Power Generation under a 25 year contract, at a rate of 4.54 cents per kWh. Average annual generation is expected to be 27,533 MWh.		
FEATURES	constructed above water-falls powerhouse 60m below ground constructed in solid granite short penstocks enable the valves to be closed quickly minimal visual impact		
REFERENCE	"On-Line Report: Twin Falls". *Hydro Review*. Vol. 19. No. 2. April, 2000. p.80.		

INNOVATIVE MICRO HYDRO PRODUCTS

BELT DRIVES

TECHNOLOGY	**NEW FLAT BELT DRIVES**		
PRODUCT NAME	Extremulus		
MANUFACTURER	Siegling GmbH & Habasit AG	**LOCATION**	Germany & Switzerland
DESCRIPTION	An alternative to V-belt and other belt types and gear boxes, the new flat belts consist of three layers with a central synthetic core, usually polyamide or polyester, which offer high tensile strength and low stretch. The friction coating generally consists of high-grip elastomer materials as an alternative to chrome-leather. A top layer of woven textile fabric protects the core. In addition to increased tensile strength, the use of flat belts in step-up drives reduces initial costs and operating costs, and hence results in lower overall lifetime costs. The material combinations of synthetic tension members and elastomer coating require no maintenance. The reduction in frictional wear suffered by V-belt drives increases service life, and offers efficiencies of 98%.		
FEATURES	high tensile strength high elasticity, with no tensioning required lightweight, with low centrifugal forces high abrasion resistance with constant friction coefficients high efficiency (max >98%) and low noise can withstand approx. 250 reverse bends/sec no limitations imposed on design by belt length and width less expensive than custom-made gearboxes much longer service life than cheaper standard industrial gearbox (est. 50,000 hours) do not require the lubricating oil and general maintenance of gearboxes belts speed up to 100 m/s can be spliced on site with simple tools good design instructions from manufacturers		
REFERENCE	"Flat belts: a modern technology for small hydro plants". *International Journal of Hydropower & Dams*. Issue 3, 1999. p. 78-79.		

BREAKER FAILURE PROTECTION UNIT

DEVICE	BREAKER FAILURE PROTECTION UNIT		
DEVELOPMENT	PUMPED-STORAGE UNIT		
NAME	Mormon Flat		
OPERATOR	SRP - Sale River Project	**LOCATION**	Phoenix, AZ.
DESCRIPTION	SRP has installed a breaker failure protection system on all its unattended units following a failure during a pump start-up of it's 56MW Mormon Flat Pumped-Storage Unit 2, which resulted in extensive repairs and expensive down time. The system is capable of being installed on almost any generating unit, for a cost of about $2000 U.S. per breaker for equipment, plus cabling. Labour and engineering costs are extra.		
INNOVATIVE FEATURES	Two primary elements serving separate functions (SEL-501 supplied by Schweitzer Engineering Laboratories). the breaker phase current transformer designed to detect current in any phase after a breaker trip is initiated. Protection devices trip circuit monitoring device (EMAX RAW relay) detects __ breaker trip circuit when the breaker is closed, indicating that the breaker will fail to trip when needed. A trip initiate device (EMAX AVR) - a fast interposing relay A blocking diode A retrip circuit This configuration substantially reduced engineering costs.		
REFERENCE	Hunter, John. (2001). "Adding Breaker Failure Protection to Hydroelectric Units". *Hydro Review* . Vol. 20, No. 6. October. p 38, 40, 53-54.		

CAVITATION REPAIR

PRODUCT	**ABRASION-RESISTANT EPOXIES FOR TURBINE RUNNER REPAIR**		
PRODUCT NAME	Wearguard abrasion resistant epoxies XMH 8626 , XMH 8518, XMH 8507		
MANUFACTURER	Ciba Speciality Chemicals		
PLANT	Beaver Valley Hydroelectric Plant	**LOCATION**	Beaver Falls, PA
OPERATOR	Hydro Development Group Inc.		
PLANT DETAILS	Turbine Type Runners Plant Capacity Design Head	Horizontal double-runner Francis 1.2m diameter; 150rpm 200 kW 5.5m	
DESCRIPTION	An innovative approach was taken to addressing damage to downstream water seals, severe cavitation and damaged wicket gates, which had led to a 25% loss of efficiency. The application of abrasion resistant epoxies to the runners, crown plate and water seal plates cost one third of the alternative grinding and welding option. Although a more extensive evaluation period is required there has already been a 15% increase in output of the unit at full gate opening.		
PROBLEMS ADDRESSED	downstream water seals damaged failed downstream support bearing water seal clearances of 6 cm on upstream runner blades worn thin 1cm grooves in crown plate caused by wicket gates		
SOLUTIONS	runners sandblasted preliminary to treatment deep pits filled with sag-resistant paste with fine grind ceramics (XMH 8526) finishing layer of flexible ceramic filled epoxy (XMH 8518) fabricated metal band used as a form around water seals heavy past epoxy (XMH 8507) applied to perimeter of the crown plate metal band removed sag-resistant paste and flexible ceramic filled epoxy layered as final procedure wicket gates and related hardware replaced 2 month downtime for the procedure		
REFERENCE	Dygert, David. (1999). “Restoring turbine efficiency with abrasion-resistant epoxies.” *Hydro Review*. Vol. 18. No 7. p. 88,90.		

CONTROL SYSTEMS

PRODUCT	**AUTOMATION SYSTEM FOR PLANT ON WATER SUPPLY SYSTEM**		
MANUFACTURER	Woodward Governor Company		
SITE	Crosscut Hydroelectric Plant	**LOCATION**	Phoenix , AZ
OPERATOR	SRP		
PLANT DETAILS	Plant Capacity Design Head Design Flow Pipeline length	2MW -3 MW 32.3m $11.3m^3/s$ 805m x 2.1m diameter with bypass valve	
DESCRIPTION	This plant is located on a tie between two canals servicing SRP's water supply system. During times of high water use, water bypassed the unit. An economical automation system was needed to ensure delivery of water, maximize electricity production and minimize operating costs. A new PLC based system has dramatically increased productivity, with the greatest gain through the additional revenue from operation at low loads. Average annual production has more than doubled		
SPECIAL CONSIDERATIONS	use of manual controls meant plant was uneconomic at loads less than 2MW unit operated only during high water use season (4.5 months p.a.)		
SYSTEM FEATURES	PLC based system Woodward 517DCS digital control system includes PLC Analog feedback devices Speed signal generator setpoint control through digital input PLC increments or decrements water demand setpoint by $.14m^3/s$ or $.7m^3/s$ Control is wicket gate position versus flow Gate position indicated by magnetic linear displacement transducer Beckwith digital protection unit two RTU's for powerhouse and penstock valve house		
REFERENCE	Herrin, Randy *et al*. (1999). "Automating hydro: keeping old plants profitable". *Hydro Review*. Vol. 18. No. 2. April. p. 26-27.		
NOTE	Woodward Governor Controls has an interactive method of configuring governor control solutions available on a CD titled *Hydro Solutions*. It is available from Woodward Global Services regional office in Bellevue, WA. ph: (425) 637-8370 or email: clarkj@woodward.com		

PRODUCT	**CONTROL SYSTEM FOR REMOTE MONITORING**		
PRODUCT NAME	ABB Aqua Integrated Control System		
MANUFACTURER	ABB Generación	**COUNTRY**	Spain
DESCRIPTION	A competitively priced compact, automated and integrated control system for remote monitoring and control of small hydro developments. It addresses the particular problem of controlling small plants, i.e. providing an affordable system for a lower number of sub-systems, while maintaining performance features, and meeting the need to match the more sophisticated technology and plant design engineering requirements of the energy networks into which they feed.		
INNOVATIVE FEATURES	integrates several systems into one uses software to perform tasks previously carried out by hardware modular structure standard pre-programmed software can be configured to meet plant requirements software can be modified with conventional text-editor PC-based , Windows interface (DOS operating system) tasks carried out in real time 10ms resolution for alarms and events		
REFERENCE	Sanchez, Luis. (1996). "*Cost effective* small hydro control". *International Water Power and Dam Construction*. Vol. 48, No. 10. p.30,32-33.		

PRODUCT	**LOAD CONTROL SYSTEMS**		
MANUFACTURER	Thomson and Howe	**LOCATION**	Kimberley, BC
DESCRIPTION	Thomson and Howe is a leading international supplier of state-of-the-art small hydro load control governing equipment. The company has a continuing commitment to research and development. The website features a complete list of new products, and recent changes made to existing products. A sample of new products is listed below.		
NEW PRODUCTS	combined water control governor and turbine controller in one package, for intertied synchronous generators not to be run as stand-alone units single 15 amp solid state relay, single 20 amp solid state relay, dual 30 amp solid state relays, quad 20 amp solid state relay. level controller for up to three turbines. LCX: a load governor design for use where power requirements are beyond the "G" and "K" lines Inexpensive, directly submersed, 4-20 MA 2 wire type depth transducer/transmitter digital retrofit kit is available as a rebuild service for owners of older analog governors, built before 1984		
CONTACT DETAILS	**Thomson & Howe Energy Systems** Site 17 Box 2 SS#1 Kimberley BC V1A 2Y3 CANADA Phone: 250-427-4326 Fax: 250-427-4326 Email: thes@cyberlink.bc.ca Website: www.smallhydropower.com		

<table>
<tr><td>PRODUCT</td><td colspan="3">MODULAR AUTOMATION & PROTECTION SYSTEMS</td></tr>
<tr><td>MANUFACTURER</td><td>Powerbase Automation Systems</td><td>LOCATION</td><td>Carleton Place, ONT</td></tr>
<tr><td>DESCRIPTION</td><td colspan="3">Modular P & C systems have been developed for application in micro hydro developments, with a number of advantages. In particular, they avoid the more complex and costly system integration required with the use of a number of control components from several sources, or with generic PLC’s. Only those modules selected by user are supplied, and with these coming from a single source complex interfaces are unnecessary. The software is preprogrammed and compatible with the needs of a particular site, thus eliminating programming expenses.</td></tr>
<tr><td>FEATURES</td><td colspan="3">Standard modules
turbine/generator operation
hydraulics
generator/turbine protection
monitoring and control

Options for more sophisticated systems include
excitation systems
servo-gate actuators
excitation systems
pond level control
power and energy metering
trashrack sensing</td></tr>
<tr><td>CONTACT DETAILS</td><td colspan="3">Powerbase Automation Systems Inc.
150 Rosamond Street
Carelton Place, ONT. K72C 1V2
Ph: 613-253- 5258
Fax: 613-257-1840
Email: ygrandmaitre@powerbase.com
Website: http://www.powerbase.com/ (Link is not active)</td></tr>
</table>

PRODUCT	**LOW VOLTAGE TURBINE/GENERATOR CONTROL MODULE**		
PRODUCT NAME	**TCM-20**		
MANUFACTURER	**Powerbase Automation Systems Inc.**	**LOCATION**	Carleton Place, ONT.
DESCRIPTION	The TCM-20 is the turbine/generator control module of the Powerbase Platform. It replaces typical hydropower generation control systems such as PLCs which often require considerable system integration with other components and additional hardware/software engineering costs. The TCM-20 is designed for easy configuration and setup. It contains a series of microcomputers and fault-tolerant safety circuits, pre-coded with operating software. It connects to other Powerbase modules or third party equipment to provide the level of control required for the specific application. The TCM-20 controls turbine speed by regulating the pulse width modulation of the LAM-20 or hydraulic servo until breaker closure occurs. It also provides frequency hunting to allow generator synchronisation to poorly regulated grids. The TCM-20 can be operated in a manual gate control mode or an automatic water level maintenance mode using the Powerbase WLS-10 or WLS-11. Up to three of these modules may be installed to allow monitoring of head pond, trash rack build-up and tail race water levels. Fully automatic start, stop, synchronising and "system trip" recovery functions allow the power station to operate unattended for months.		
FEATURES	**Turbine Parameters** any water turbine with a maximum overspeed rating of 3,600 rpm single or double regulation low speed (gearbox required) or direct drive wicket gate or butterfly valve control **Generator Type** synchronous or induction single or three phase output any termination system (Wye, Delta) **Exciter Control** on/off control of exciter or voltage regulator at specific turbine speed **Hydraulic Control** high or low speed servos operation low cost PWM operation for speed or power level hunting no proportional control valve required automatic safety dump on fault oil level, pressure and coolant status monitor wicket gates, runner blades, dump valve and disk brakes operation		

	Water Resource Control monitors gross head pond adjusts runner blade angle to net head and flow monitors trash rack buildup and signals on fault level restarts automatically after fault conditions clear
REFERENCE	**Powerbase Automation Systems Inc.** 150 Rosamond Street Carelton Place, ONT. K72C 1V2 Ph: 613-253- 5358 Fax: 613-257-1840 Email: ygrandmaitre@powerbase.com Website: http://www.hydrocontrols.com/ (Link is not active)

<table>
<tr><td>PRODUCT</td><td colspan="3">PROTECTION AND CONTROL PACKAGE</td></tr>
<tr><td>MANUFACTURER</td><td>Canadian Hydro Components Ltd. (CHC)</td><td>LOCATION</td><td>Ontario, Canada</td></tr>
<tr><td>DESCRIPTION</td><td colspan="3">Switchgear/Control/Protection Package for small hydro at an affordable cost.</td></tr>
<tr><td>COMPONENTS</td><td colspan="3">Turbine Control Unit (TCU)
custom designed panel-mounted programmable logic controller, pre-coded with the necessary operating instructions required to automatically operate either single or double regulated, synchronous or induction turbines in power generating stations.

Quality of Power Relay (QPR)
monitors 1,2 or 3 phase input voltage from the generating facility and automatically signals a central office or trips the main disconnect circuit breaker when the monitored voltage or frequency exceeds the user programmed setpoints.

Resistive Temperature Device Scanner (RTDS)
designed to monitor up to eight, 100 ohm RTD probes connected to a generator/gearbox or other industrial process controls where accurate alarm and lock-out control is required.
panel-mounted and comes equipped with a global programmable alarm and trip setpoint relay.

Metering and relay process controller (ACM-3710)
accurately displays all measurements pertaining to power monitoring.
fully programmable by remote computer and most functions are easily programmed using the front panel buttons and vacuum fluorescent display.
can be used as shadow protection with tripping speed of one second.</td></tr>
<tr><td>REFERENCE</td><td colspan="3">Canadian Hydro Components Ltd.
16 Main Street Box 640
Almonte, ONT K0A 1A0
Ph: 613-256-1983
Fax: 613-256-4235
Email: inquiries@canadianhydro.com
Website: http://www.canadianhydro.com</td></tr>
</table>

GENERATORS

PRODUCT	**STATE-OF-ART GENERATOR**		
PRODUCT NAME	Powerformer		
MANUFACTURER	Alstom Power	**COUNTRY**	Pemberton, British Columbia
DESCRIPTION	The first North American installation of Alstom's revolutionary high voltage generator will take place at EPCOR's run-of-the-river Miller Creek station in south eastern B.C. in 2002. The machine provides a variety of benefits over traditional generators. The first 9.5MW Powerformer began operating in Vattenfalls Porjus Power Plant in Northern Sweden in 1998.		
INNOVATIVE FEATURES	Connects directly to the grid, eliminating need for medium voltage busworks, switchgear and step-up transformer. Eliminates need for substation space. Saves on substation construction and equipment costs. Elimination of the transformer means eliminating oil-based insulation and cooling systems, and reducing fire risk. No partial discharge activity since winding is fully insulated. Minimized risk of ozone. Higher voltage polyurethane cables are used for the station winding replacing square insulated copper conductors. These cables are of the same type as transmission and distribution cables. Has no efficiency loss (c.t. conventional transformers).		
REFERENCE	Fulton, Ed (2001) "New Hydro Equipment for a New Century". *Hydro Review* Vol. 20, No. 6 October p. 16. Website: www.power.alstom.com		

EQUIPMENT	**INDUCTION MOTORS USED AS GENERATORS**		
NAME	Morehead Valley Hydroelectric Plant	**LOCATION**	Morehead Creek, BC
OPERATOR	Morehead Valley Hydro Inc.		
PLANT SUMMARY	Site A Turbine Type Generator Plant Capacity Design Head Design Flow Penstock Cost Site B Turbine Type Generator Plant Capacity Design Head Design Flow Penstock Cost	 315 mm Kaplan 75 hp 3 phase induction motor at 1850 RPM 32 kW 8.2m .5m^3/sec 107m x 61 cm $92,300.00 315 mm Kaplan 2 x induction motors 90 kW 17m .75m^3/sec 74 m x 76 cm $209,700.00	
DESCRIPTION	Considered a model project, the Morehead Valley Plant operates at two independent sites on Morehead Creek, BC, utilizing induction motors as generators and pumps as turbines to generate a total of 120 kW. The first site uses a 315 mm Kaplan turbine which drives a 75 hp 3 phase induction motor at 1850 rpm. Capacitors are used to energize the unused leg of the three phase motor so that near three phase efficiency is produced at single phase output. The second site is located on a waterfall 4 kms downstream of the first, thus using the same water from the first hydro plant to power two pumps which drive induction motors as generators. Another 315 mm Kaplan turbine has been installed as well, giving a capacity of 90 kW.		
FEATURES	water for upper level plant reused for second plant downstream		
REFERENCE	http://smallhydropower.com/ On this site : McGirr, Sven. (1999). “Morehead Lake is the site for project which uses natural resources for power.” *Central Interior Business.*		

ICE PREVENTION

PRODUCT	**BUBBLER SYSTEM FOR ICE PREVENTION ON FLYGT MICROTURBINES**		
DEVELOPER	Spruce Mountain Design		
PLANT	Lower Robertson Generating Station & Ashuelot Project	**LOCATION**	Keen, N.H.
OPERATOR	Alonquin Power Corporation, Mississauga, ONT		
DESCRIPTION	A simple, innovative and inexpensive bubbler system has been developed and successfully installed to address problems associated with icing of Flygt microturbine gates. The system costs approximately US$3500, takes one week to install and has a life expectancy of 10 years, making it an attractive alternative to other de-icing methods.		
PROBLEM ADDRESSED	submersible Flygt turbines often use a cylindrical gate which lowers vertically to surround the turbine and shut off water in the open position the gate may sit above the water level surface and be subject to extremes of temperature gate may freeze in place and fail to close other methods of de-icing (radiant heaters, slow speed propeller type agitators etc.) are expensive, of limited use or life expectancy, or are subject to damage from freezing conditions		
SOLUTION	bubbler system a vortex air blower installed in the powerhouse blows air through 10cm PVC plastic pipe which lead to the turbine intakes pipe is partly enclosed in a square frame and suspended 101cm below the water surface multiple small holes in the exposed top of the pipe allow the bubbles of air to escape to the surface the surface water is kept sufficiently agitated to prevent it freezing		
REFERENCE	Lensink, Homer. (1999). “Bubbler system prevents icing of turbine gates”. *Hydro Review*. Vol. 18. No 1. February. p. 60.		

PACKAGED PLANTS

PRODUCT	**PACKAGED PLANTS**
DESCRIPTION	Also known as "water-to-wire" packages, packaged plants are coordinated machinery and equipment packages, fully pre-assembled, tested, tubed, and cabled. Installed in a compact transportable "powerhouse" container, they are well suited to sites with difficult access or where minimal environmental disturbance is desired.
FEATURES	Essential components pre-assembled and tested i.e. turbine, electrical equipment and control systems machines and equipment customized to suit site requirements on-site engineering minimized Time/cost savings erection and commissioning times greatly reduced powerhouse savings some claims of 50% reduction in startup costs Environmentally compatible civil works reduced smaller structure simpler foundation preparation Transportable can be "dropped" into difficult sites
SUPPLIERS	**Canadian Hydro Components Ltd.** 16 Main Street Box 640 Almonte, ONT K0A 1A0 Ph: 613-256-1983 Fax: 613-256-4235 Email: inquiries@canadianhydro.com Website: http://www.canadianhydro.com **Dependable Turbines** Unit 7, 3005 Murray Street Port Moody, BC V3H 1X3 Phone: (604) 461-3121 Fax: (604) 461-3086 Email: dtlhydro@towncore.com Sulzer Hydro 60 Worcester Road Rexdale ONT M9W 5X2 Ph: 416-674-2034 Fax: 416-213-1031 Email: thomas.taylor@sulzer.com Website: http://www.sulzer.com **Thomson & Howe Energy Systems** Site 17 Box 2 SS#1 Kimberley BC V1A 2Y3 Phone: 250-427-4326 Fax: 250-427-4326 Email: thes@cyberlink.bc.ca website: http://smallhydropower.com/thes.html

PRODUCT	**Integrated Turnkey Plant**		
PRODUCT NAME	Mini-Aqua		
MANUFACTURER	Alstom Power	**COUNTRY**	France
DESCRIPTION	Alstom Power has developed an integrated package which includes a turbine generator and control system to be used on a turnkey basis. The Mini-Aqua covers all small hydro applications including heads from 2-1000m; flows from 0.2-200m^3/sec; output from 300 kW-15MW and up to 30 MW for higher heads; and voltages from 3-15kV. A specific range of standardized small generators and a specialized control system (The Aqua) have been developed to complement the Mini-Aqua.		
INNOVATIVE FEATURES	Variable Head Applications Pelton, Francis and Kaplan turbines are used to match head applications Various configurations are available for each type Generators are coupled to suit site parameters For 10m head applications Mini-Aqua uses Sam, the upstream elbow version of Kaplan S-types. This turbine can be installed in different positions to optimize civil works. Two configurations of Kaplan turbines and high speed generators are available for very low head. Pit has been specifically designed for high flows of water. The generator and gearbox are installed in an accessible open pit, with pit walls made of concrete or steel (for higher heads), to reduce building width. Kat is a simplified fronto-spiral Kaplan. The distributor is usually fixed for simplification, or optionally adjustable for operation on a wider range of discharges and heads is required. The package's control system provides control, monitoring, voltage regulation, speed governing, synchronizing, coupling and electrical protections.		
REFERENCE	"Power in Small Packages". *International Water Power and Dam Construction*. Vol. 53, No. 8. August 2001, p.28. Contact details: Francois Berthiaume Alstom Power Canada Phone: 450-746-6565 Website: http://www.alstom.ca		

PUMPS USED AS TURBINES

PRODUCT	PUMP-TURBINES
DESCRIPTION	Pumps can be used as a cost effective and simple alternative to turbines in small scale hydro applications, where some loss of efficiency is acceptable and a wide operating range is not paramount, and when capital costs and addition of controls can be kept to a minimum. Because the cost of the pump itself is a relatively small portion of the total expense of using a pump as a turbine, a careful analysis of economics, efficiency, performance, reliability and the overall operating goals is recommended. Nevertheless it must be understood that is difficult to make an accurate estimate of the machine's performance.
APPLICATIONS	Evaluating the potential performance usually capable of operating as turbines within the limited parameters of the type of unit and the application generally operate better as turbines at higher flow and head than when used in pump mode wider range of efficiency performance characteristics in turbine mode in overload condition affected by shape of casting and other design a comparison of turbine operation to data on pump's optimum efficiency will be a guide to selection of a pump a number of conversion factors and formulæ have been developed for this overall performance not easily determined conversion process affected by shape of casing and other features even with same characteristics in the pump mode and the same speed, pumps can display different performance characteristic in turbine mode
TYPES OF PUMPS	Centrifugal pumps suit hydroturbine applications in the range of 60- 160 m heads Multistage & "super-speed" single stage centrifugal pumps can operate in the range of Pelton turbines with operating heads up to 2000m Francis type pumps used in 20-60m range Wet-pit propeller or mixed-flow machines low head range of <20m Mixed-flow machines capable of large capacities Large capacity tubular casing pumps and low-head pumps which use axial or mixed-flow configurations may be used as turbines but multiple units may be required

ADVANTAGES	can reduce capital costs by half can be adapted with few modifications require less civil works and modifications to other equipment lower maintenance costs, even less than when used for pumping
REFERENCES	Heniger, Leopold. (1995). "Putting pumps to work for generation at small hydro sites". *Hydro Review Worldwide*. Vol. 3. No. 2. Summer. p. 36,38 Heniger, Leopold. (1995). "Operating, protecting pumps installed as turbines". *Hydro Review Worldwide*. Vol. 3. No. 4. Autumn. p. 36,38 Wilson, E. & Potts, R. (1992). "Hydro development at Errwod Reservoir using a centrifugal pump as a turbine". *Proceedings of the Fifth International Conference on Small Hydro. New Delhi, India, October 1992"*. p. 176-181.

PRODUCT	**PUMP USED AS TURBINE IN WATER CONDUIT**		
OPERATOR	North West Water plc	**LOCATION**	Errwood Reservoir, UK
PLANT DETAILS	Turbine Type Design Head Design Flow Plant Capacity Efficiency	Centrifugal pump as turbine 33.6m .41m^3/sec .1MW 75%	
DESCRIPTION	A centrifugal pump has replaced a pressure adjustment valve on a conduit between two water supply reservoirs and is successfully operating as a turbine to produce .1MW of power. An economic analysis showed that a turbine suitable for the site would have cost 2.5 times as much, with approximately the same efficiency. An additional advantage was that the pump installation required minimal supporting equipment		
REFERENCE	Heniger, Leopold. (1995). “Putting pumps to work for generation at small hydro sites”. *Hydro Review Worldwide*. Vol. 3. No. 2. Summer. p. 36,38 Heniger, Leopold. (1995). “Operating, protecting pumps installed as turbines”. *Hydro Review Worldwide*. Vol. 3. No. 4. Autumn. p. 36,38 Wilson, E. & Potts, R. (1992). “Hydro development at Errwod Reservoir using a centrifugal pump as a turbine”. *Proceedings of the Fifth International Conference on Small Hydro. New Delhi, India, October 1992”.* p. 176-181.		

RUBBER DAMS

TECHNOLOGY	**RUBBER DAMS**		
MANUFACTURER	Bridgestone	**COUNTRY**	US/Canada
DESCRIPTION	Rubber dams are a low cost, low maintenance alternative to more conventional means of water storage, with the additional benefits of low environmental impact, fast installation and long life. They offer numerous direct and indirect economic benefits, from ease of installation to reduced maintenance costs. One of Bridgestone's rubber dams, an inflatable bladder, constructed of a state-of-art heavy duty nylon-reinforced rubber, has been installed at Soo River, near Whistler, BC, a Summit Power development		
INSTALLATION	Installation involves anchoring the deflated bladder onto a new foundation, or an existing spillway, by means of a simple clamping system, using standard tools. No overhead lift structures or high-pressure hydraulic systems are required. The bladder is then inflated from one side with a standard low pressure air blower. After installation the dams can be inflated or deflated manually or by the use of automatic controls. A number of control system options are available. Through reference to a water gauge the automatic controllers adjust the height of the dam, and hence the water level, by adjusting the pressure of the air inside the bladder.		
INNOVATIONS	constructed of a heavy duty nylon-reinforced rubber, developed to withstand ozone, heat and weathering by ultraviolet light, and to be resistant to cuts designed to resist damage by floods, ice and bedload movement. oscillation and vibration reduced by the use of a fin built into the body of the dam civil works minimized		
FEATURES	straightforward installation projected life of at least thirty years, and virtually maintenance free thickness, span and size of the bladder tailored to meet the requirements of the site suitable for use with any, or variable, side slopes no expansion/contraction problems no coating or lubrication required fin minimizes movement caused by water passing over the dam better flood control state-of-art material offers protection against vandalism and damage from sharp waterborne objects with small spans, as are most likely in micro hydro sites, there are no piers to create an obstruction to water flow or to catch debris		
REFERENCE	Small, Stephen. (1998). "Rubber dams improve operations, safety". *Hydro Review*. Vol. 17, No. 7. December. p. 58-59.		

SOFTWARE

<table>
<tr><td>PRODUCT</td><td colspan="3">SOFTWARE PACKAGE FOR ASSESSING UNGAUGED SMALL HYDRO SITES</td></tr>
<tr><td>PRODUCT NAME</td><td colspan="3">Integrated Method for Power (IMP 4.0)</td></tr>
<tr><td>DEVELOPER</td><td>Charles Howard and Associates and University of British Columbia</td><td>COUNTRY</td><td>Canada</td></tr>
<tr><td>DESCRIPTION</td><td colspan="3">The aim of this software package is to assists inexperienced potential developers conduct enhanced feasibility studies, save on preliminary engineering study costs and reduce investment risks. Developed over a period of 20 years for the Hydraulic Energy Program of CANMET – Natural Resources Canada, and based on a UBC model, IMP uses topographic watershed and weather data to compute the time series hydrograph flow for small mountain streams and uses it to
develop a flood frequency curve
select an appropriate penstock turbine generator set
calculate the energy capability and economic optimization of the installed capacity
assess the impact of a development on instream habitat for fish</td></tr>
<tr><td>INNOVATIVE FEATURES</td><td colspan="3">Hydrology model
Flood frequency model
Power study model
River hydraulics model
Fish habitat model
Onstream flow model
On-line help module offers support in using the software, charts, equations and documentation on the methods used in the modules</td></tr>
<tr><td>REFERENCE</td><td colspan="3">Howard, Charles & Tracey, Kenward. (2001) “Boosting the Assessment of Ungauged Small Hydro Sites”. International Water Power & Dam Construction. Vol. 53, No. 9. September. p. 20-21.</td></tr>
</table>

SPILLWAY GATES

PRODUCT	**Spillway gates**		
MANUFACTURER	Obermeyer Hydro Inc.	**LOCATION**	Ontario
DESCRIPTION	The Obermeyer Spillway gate system is a row of steel gate panels supported on their downstream side by air bladders. By controlling the pressure in the bladders the pond elevation maintained by the gates can be infinitely adjusted within the system control range and accurately maintained at user selected set-points. The air bladders consist of a Butyl rubber inner liner for excellent air retention, a section of high tensile strength rubber compounds containing multiple layers of polyester or arimid, and cord reinforcement to provide the mechanical strength needed to contain the internal pressure. A cover compound utiilizing aging and ozone resistant polymers such as EPDM is used to protect the bladder from wear and weathering. The system is installed at Regional Power's development at Sechelt, BC and at Canadian Hydro Developers' plant at Alkolkolet, near Revelstoke, BC.		
INSTALLATION	for systems up to approximately 4m high, air bladders are secured to the spillway with a row of anchor bolts. For system heights above 4 meters, an embedded clamp is used air supply lines which connect to each individual air bladder can be embedded or grouted into a saw slot in the spillway. Surface mounted air supply lines may also be used. Epoxy or non-shrink cement grout as design dictates bladder hinge flaps fastened to the gate panels		
FEATURES	modular design that simplifies installation and maintenance. custom designed to conform to any existing or desired spillway cross-section with a minimum profile when in the lowered position accurate automatic pond level control even under power failure conditions thin profile efficiently passes flood flows, ice and debris. unlike rubber dams, the steel gate panels overhang the air bladder in all positions, protecting the bladder from floating logs, debris, ice, etc.. no intermediate piers are required.		
REFERENCE	www.obermeyerhydro.com Kamberg, M.L. (1997). "Keeping water power in the family". *Hydro Review.* 16 (1), February. p.42-46.		

TURBINES

PRODUCT	**COMPACT AXIAL KAPLAN TURBINE**		
PRODUCT NAME	CAT	**LOCATION**	
MANUFACTURER	Sulzer Hydro		
DESCRIPTION	A new compact Kaplan turbine, based on a modular design concept, has particular application for run-of-river plants with heads up to 30m and flows up to $100m^3$ /sec and is especially suited to medium-altitude regions. Its modular assembly reduces erection & commissioning times significantly.		
FEATURES	optimum performance at 5-$100m^3$ /sec for heads up to 30m outputs up to 10MW the option of double regulation of runner blades and guide vanes offers benefits with variable water flows beneficial for plants with variable water flow vertical, horizontal & slant installation		
REFERENCES	Poschenrieder, Ralph. (1997). "CAT – Compact Axial Turbine*". Sulzer Technical Review*. No. 4/97. p.26-28		
CONTACT DETAILS	Sulzer Hydro 60 Worcester Road Rexdale ONT M9W 5X2 Ph: 416-674-2034 Fax: 416-213-1031 Email: thomas.taylor@sulzer.com Website: http://www.sulzerhydro.com		

<table>
<tr><td>PRODUCT</td><td colspan="3">FISH LADDER TURBINE SYSTEM</td></tr>
<tr><td>DEVELOPER</td><td colspan="3">RMD Consult</td></tr>
<tr><td>PLANT</td><td>Iffezheim Hydropower Plant</td><td>LOCATION</td><td>Germany/
France</td></tr>
<tr><td>OPERATOR</td><td colspan="3">Rheinkfraftwerk Iffezheim GmbH & Centrale Electrique Rhenanede Gambesheim (CERGA)</td></tr>
<tr><td>DESCRIPTION</td><td colspan="3">In an attempt to rejuvenate the salmon population in the upper reaches of the River Rhine, a 1.2MW turbine has been integrated into one of the largest fish ladders in Europe, at Iffezheim, on the French/German border. It has been designed with the dual purpose of attracting fish up the ladder, and increasing output from the 108MW plant. The original concept was for the use of electric pumps with downstream water creating the attractive flow. However since this would have resulted in confusion in the fish, and a loss of hydro energy, the innovative solution was to use a fish pass turbine system instead.</td></tr>
<tr><td>SYSTEM DESIGN FEATURES</td><td colspan="3">Head/flow
fish ladder designed for 11m head & upper flow of 1.2 m^3/sec
water discharge from the ladder and the fish pass turbine in the lower section is 11- 13 m^3/sec
the ladder works on the principle that river flow influences migrating salmon and increases their willingness to enter a river and move upstream

Lower section
from the tailrace three fish ladders with different waterflows guide fish to the basin with the outlet a bulb turbine
turbine uses 80-90% of the plant head to create an attractive water flow
two special fences at the bottom of the ladder in the basin guide fish to upstream ladder, and prevent them from entering the turbine outlet

Upper section
consists of 36 water basins 4.5m x 3.3m x 1.5m
vertical slot passes interconnect the bsins
each basin has resting places beside the main stream to cater for weaker fish
care taken to ensure speed of water in the subsections is not beyond the fishes’ capability</td></tr>
<tr><td>REFERENCE</td><td colspan="3">“Fish race 2000”. (1997). International Water Power & Dam Construction. Vol. 49, No. 9. September, p.38.</td></tr>
</table>

PRODUCT	**LOW HEAD, FISH-FRIENDLY VORTEX TURBINE**		
PRODUCT NAME	Vortex Turbine		
MANUFACTURER	Alstom Power	**COUNTRY**	France
DESCRIPTION	Alstom Power has developed a vortex turbine for use in low head smaller capacity installations. Based on the design of an axial flow turbine, it incorporates a number of modifications which restrict injuries to fish. Developed as an alternative to sending fish through spillways or sluices, the turbine is powered by water which would traditionally have been spilled. On the next stage Alstom will construct a model for mechanical performance testing and biological testing of the fish passage features.		
INNOVATIVE FEATURES	no traditional stay vanes or wicket gates at the intake spiraling “vortex” shape of the casing creates proper entry angle for water flow eliminates possibility of fish colliding with fixed components or becoming disoriented in turbulence created by wicket gates the propeller design runner features a minimum gap runner three blades thicker than normal and constant thickness throughout – reduce strike damage and zones of high water velocity large passages at tip of blade promote safe passage slim conical runner hub reduces downstream turbulence in the draft tube straight draft tube – reduces fish disorientation; transports fish more quickly from the plant and hence reduces risk from predators		
REFERENCE	Fulton, Ed (2001) “New Hydro Equipment for a New Century”. *Hydro Review* Vol. 20, No. 6 October p. 16.		

OIL AND GREASE FREE TURBINE

PRODUCT	**OIL AND GREASE FREE TURBINE**		
MANUFACTURER	Alstom Power	**COUNTRY**	France
DEVELOPMENT	Naussac 2		
DESCRIPTION	In the design of the 8MW Naussac 2 project mineral lubricants and operating oils were eliminated from the following components of the Deriaz design turbines: wicket gate bushings and servomotors, operating ring, runner blade bushings, blade servomotors bearings and valve and gate activators. These pump-turbines also differ from conventional reversible machines. Naussac's units are designed to prevent excessive seasonal flow variation in reaches of the Loire River. Hence they pump when there is an excess of water in the nearby Allier River; and operate in turbine mode, releasing water, during low flow periods.		
INNOVATIVE FEATURES	Runner blade control is by water servomotor, integrated in the hub. Adjustable runner blades and wicket gates to adapt to variable operating conditions. Ceramic-lined rotating seal and turbine bearing. Greaseless wicket gate bushings, operating ring and electrical operator. Hydrostatic bearing/seal The Deriaz runner allows for a constant adjustment of the pumped discharge, preventing surges in the river.		
REFERENCE	Kirejczyk, Julivsz et al. (2000). "Trends and Advances in Hydroelectric Equipment". *Hydro Review Worldwide*. Vol. 8, No. 5. November. p. 9, 11.		

PRODUCT	**S-TYPE TURBINE**		
MANUFACTURER	Ossberger-Turbinenfabrik	**LOCATION**	Germany
DESCRIPTION	The design takes the standard Kaplan tubular turbine, and changes the orientation of the inlet from vertical to horizontal. It is equipped with adjustable guide vanes and runner, which can be regulated together or separately to match efficiency requirements. The manufacturer claims this design offers a number of benefits to small hydro developers in relation to environmental compliance, and low maintenance and operating costs. An S-type turbine was selected to address the head and flow problems on a canal development in Bavaria. (See reference paper).		
INNOVATIVE FEATURES	Design horizontal inlet water moves from runner through an S-shaped draft tube, through which the turbine shaft drives a direct or geared generator runner blades constructed of almost cavitation free material closing weights equipped with customized friction bearings to improve closing reliability of guide vanes guide and runner blade bearings almost maintenance free Application main range of application from 1m -15m head with flows from 250 litres/sec to 10000 litres/sec. but standard design can be adapted for larger heads and increased power rating Efficiency efficiency 90% at optimal flows and heads highly efficient at variable heads e.g. at storage basins Operation operates with standard gearboxes and generators Environmental advantages greaseless wicket and guide vane bearings runner bearings not submerged hydraulic adjustment of wicket and guide vanes performed out water		
REFERENCE	"Driven around the S-bend". (1997). International Water Power & Dam Construction. Vol. 49, No 2. February. p. 23		
CONTACT DETAILS	Ossberger GmbH + Co Otto-Rieder-Strasse 7 91781 Weissenburg/Bayern Germany/Alemania ph. +49 (0) 91 41 - 977 - 0 fax: +49 (0) 91 41 - 977 - 20 Website: http://www.ossberger.de/engl e-Mail ossberger@ossberger.de		

<table>
<tr><td>PRODUCT</td><td colspan="3">SUBMERGED TURBINE-GENERATOR ASSEMBLIES USED ON STOP LOGS</td></tr>
<tr><td>PRODUCT NAME</td><td colspan="3">Obermeyer HYDROMATRIX ™</td></tr>
<tr><td>MANUFACTURER</td><td colspan="3">Obermeyer Hydraulic Turbines</td></tr>
<tr><td>PLANT</td><td>Colebrook Hydroelectric Facility</td><td>LOCATION</td><td>Hartford, CONN</td></tr>
<tr><td>OPERATOR</td><td colspan="3">Metropolitan District of Hartford, CONN.</td></tr>
<tr><td>PLANT DETAILS</td><td>Turbine Types

Generator

Head Range
Average Flow
Plant Capacity
Average Annual Generation
Interconnection

Cost</td><td colspan="2">6x700 horsepower variable pitch, five-bladed Kaplan; horizontal; submerged; arranged in two 4.1m x 1.7m x 4m high banks, with turbines stacked three high

6x500kW induction generators; submerged; Siemens rotors and stators; Obermeyer shafts and stator housings
7.7m - 30.5m
7m^3/sec
3 MW
7.5 GWh.
5-kV, 3-phase, 8.9cm-diam Brand-Rex cables
US $4 million (1999)</td></tr>
<tr><td>DESCRIPTION</td><td colspan="3">The Obermeyer HYDROMATRIX ™ concept stacks banks of turbine/generator assemblies and submerges them in existing stop log slots. It can be used in smaller developments where stop logs exist. It is particularly suitable where there is also low head. The concept eliminates the need for an expensive powerhouse, reduces hydraulic losses and eliminates the risk of cavitation. At Colebrook two submerged banks of three stacked turbine-generator units were successfully installed. Installation of two systems is taking place in 2001 at the US Corps of Engineers Cannelton and Smithland locks and dams on the Ohio River.</td></tr>
<tr><td>SPECIAL CONSIDERATIONS</td><td colspan="3">project costs had to meet strict budget parameters
water passageway for flood control had to be maintained in the space of the existing structure
tailwater 20m above units
weight had to be minimized to enable removal for maintenance and in flood situations
unit assemblies had to be water-tight
ice problem in winter</td></tr>
</table>

INNOVATIONS & SOLUTIONS	Design features six turbines arranged horizontally in two 4.1m x 1.7m x 4m high banks and supported on a tubular frame attached to a fabricated draft tube assembly weight reduced by almost half with this configuration compact high speed turbine-generator sets could be used without exceeding cavitation limits flow can be varied between 2.1 and 9.9 m^3 /sec separate flow through the draft tube assembly for each unit each bank has integral, modular fiberglass trash rack panels Gates discharge through pre-existing gates new hydraulic system can close gates in 45 seconds Access crane used to raise and lower the banks for service Ice prevention with the use of two oil-less compressors and a submerged PVC manifold pipe, dry compressed air bubbles to surface to prevent ice formation
REFERENCES	Anthony, Timothy. (1999). “Stacking the deck: Colebrook Hydroelectric Facility”. *Hydro Review*. Vol. 18. No. 6. October. p. 24,26,28-9. Fulton, Ed. (2001). " New Hydro Equipment for a New Century". *Hydro Review*. Vol. 20, No. 6. October. p. 12-17. http://www.obermeyerhydro.com

PRODUCT	**TURBINES TO ORDER**		
MANUFACTURER	Canadian Hydro Components Ltd.	**LOCATION**	Almonte, ONT.
DESCRIPTION	CHC manufactures standard and non-standard turbines ranging in size from 500 mm to 2000 mm for projects from 50 kW to 5 MW. The company is completely tooled to produce double regulated axial flow Kaplan turbines up to 1250mm, with other sizes currently being developed. State-of-the art-equipment and casting techniques are used to reduce machining, and decrease costs and delivery time. An extensive list of installations is available on the company's website.		
DESIGN FEATURES	turbines are made completely from cast components, including high precision, stainless steel castings for the wicket gates and runner blades different styles of intake and draft tube configurations allow for turbine to be located in a wide variety of positions		
CONTACT DETAILS	**Canadian Hydro Components Ltd.** 16 Main Street Box 640 Almonte, ONT K0A 1A0 Ph: 613-256-1983 Fax: 613-256-4235 Email: inquiries@canadianhydro.com Website: http://www.canadianhydro.com		

TECHNOLOGY	**TURBINE SEALS**		
PRODUCT NAME	Type 37 FSB mechanical end face seal		
MANUFACTURER	John Crane Italia	**LOCATION**	Milan, Italy
DESCRIPTION	An alternative to conventional carbon designs, the silicon carbide Type 37 FSB (Fully Split Balanced) mechanical end face seal, is designed to form a dynamic seal between high precision rotating flat surfaces, which means no wear or scoring on the shaft/liner and virtually no leakage. The product is easy to install, and suitable for use in retrofits of machines which are still efficient. The use of water as a lubricant makes the product environmentally sound. A number of features of the product have been patented. One installation on a 1300kW horizontal Francis turbine operated for 16,000 hours at 1000rpm without any signs of leakage.		
INNOVATION	uses extra hard silicon carbide split rings perfect smooth sliding seal surface power losses due to friction reduced by two thirds resistant to silt and other water-borne particles smooth internal profile avoids risk of particle clogging allows the possibility of flushing the seal directly with either penstock or river water includes an open slot adapter plate which allows fitting into existing bolts without reboring large-section rubber bellows allow for a level of flexibility		
FEATURES	fully split in all parts front dynamic pressure up to 10 bar g at speeds of up to 1800rpm compact axial dimensions allowing easy of installation standard radial dimensions 100-355m no oil or grease lubrication required requires less turbine maintenance downtime no expensive high filtering systems required designed to withstand axial and radial movements		
REFERENCE	"Dynamic sealing for small hydro". (1996). *International Water Power and Dam Construction*. Vol. 48, No. 11, October. p. 38.		