Pinter Electrical Consulting Inc.
7229 Heritage Court
Lake Country, British Columbia
V4V 2L3
403-701-1563
jim@pinterco.ca

Via Electronic Submission

January 16, 2020

British Columbia Utilities Commission
ATTN: Mr. Patrick Wruck, Commission Secretary
900 Howe Street
Sixth Floor
Vancouver, British Columbia
V6Z 2N3

RE: Project No. 1599020
Application of CB Powerline Ltd. for an exemption from Part 3 of the Utilities Commission Act, pursuant to section 88(3)
Response to British Columbia Utilities Commission IR No. 2

Dear Mr. Wruck,

Further to the June 13, 2019 filing of the above-noted application, and in accordance with the regulatory timetable established by Order G-315-19 , please find enclosed CB Powerline's response to the British Columbia Utilities Commission Information Request No. 2.

For further information contact Jim Pinter at 403-701-1563 or by email at jim@pinterco.ca

Regards,

Jim Pinter

bcuc
British Columbia
Utilities Commission

Suite 410, 900 Howe Street
Vancouver, BC Canada V6Z 2N3
bcuc.com

P: 604.660.4700
TF: 1.800.663.1385
F: 604.660.1102

CB Powerline Ltd.
Application for an exemption from Part 3 of the *Utilities Commission Act*, pursuant to section 88(3)

INFORMATION REQUEST NO. 2 TO CB POWERLINE LTD.

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A. APPLICANT

20.0 Reference: CB POWERLINE LTD.
Exhibit B-2, BCUC IR 3.1, 3.3, 3.4, 3.4.1.1, 3.5, 3.11
Applicant

In response to British Columbia Utilities Commission (BCUC) Information Request (IR) 3.1, CB Powerline Ltd. (CBP) stated:

> Monopoly power risks can include actions such as deferring or eliminating various maintenance activities in order to maximize short-term value for the corporation (i.e., externalizing risk/cost to its shareholders). As discussed in section 4.2 of the original application, for example, this risk does not exist for CBP's shareholders (i.e., the Buyers), as CBP:
>
> - Is a community member founded and administered not-for-profit corporation.
> - Directors and officers are members of the Cosens Bay community.
> - Buyers are members of the Cosens Bay community.
> - Service area is limited to Cosens Bay.
>
> Practically, CBP cannot externalize such risk in a manner that a public utility with monopoly power could. Further, as community members are responsible for the decisions of CBP they are the ones that would incur any related consequences; there is simply no incentive or structure for CBP to behave like a public utility with monopoly power.

In response to BCUC IR 3.3, CBP stated:

> As required by the Shareholders' Agreement, there will be at least one annual meeting

of shareholders. At the annual meeting, or other properly constituted shareholder meetings, decisions such as the election/re-election of Directors, project budgeting, and the annual operating budgets will be subject to an ordinary (i.e., majority or 50%) resolution of the shareholders. CBP recognizes that annual budget approval by shareholders may be unusual, however, given the close-knit community and the capital dollars involved, it was proactively decided to seek shareholder approval of the budget annually.

20.1 Please explain why CBP decided to have the project budgeting and the annual operating budgets subject to an ordinary resolution of the shareholders.

Response:

CBP has a relatively small number of Buyers (55 at present), each of whom will have invested a significant amount of personal capital, in order to have electric service made available to their property line. Of these 55 Buyers, 1 is the KPE pumphouse and 6 owners hold title to more than one property. The net number of 48 Buyers currently represent the immediate talent pool of interdisciplinary talent available to help by providing input and feedback on important matters as well as to fill future board positions. One of these important matters is the annual budget.

Building upon the response to IR 3.3, the decision to include both the project budget and the annual operating budget in the list of items requiring an ordinary resolution was made after consultation with the Cosens Bay/KPE community in the spring of 2019. CBP also believes that member consultation through an ordinary resolution is a prudent way to receive input and keep the membership informed at the same time.

An ordinary resolution, proposing the project capital budget ($2,650,000), was approved by shareholders on September 3, 2019.

20.1.1 Please explain whether CBP considered alternatives to having the budgets subject to ordinary resolution of the shareholder. If so, please provide details of the options considered and explain why the options were discounted.

Response:

The normal course of conducting business as a utility provider would be that the board of directors would approve capital and operating budgets. However, as shown in response to IRs 3.1 and 20.1 for example, CBP is not governed in this manner given that: its customers and shareholders are one and the same; its very small size, serving just one community; and the small number of Buyers involved.

During the initial contemplations of forming CBP, CBP did consider the option of making budget approvals in the traditional manner. However, as a result of community consultation in the spring of 2019, it was decided to involve the Buyers (i.e., the customers) in the process of approving the project capital and annual operating budgets.

20.2 CBP states that an example of monopoly power risks can include actions such as deferring or eliminating various maintenance activities in order to maximize short-term value for the corporation. Considering that project budgeting and annual operating budgets will be subject to an ordinary resolution of the shareholders and that the end-users of the utility are also the shareholders, please explain what mechanisms are be in place to ensure that essential

maintenance activities are not deferred or eliminated because the individual shareholders may not be willing or able to meet the capital required to undertake the work.

Response:

An ordinary resolution requires a simple majority, which means that with just 48 Buyers, only 25 in favour are needed to approve a budget. CBP does not consider this onerous nor atypical for a community founded and managed project. This decision-making structure also reflects community input as discussed in response to IR 20.1.

The ordinary resolution process also means that even if a few Buyers wish to defer or alter what the board recommends, reason will ultimately prevail (in part because everyone voting on the resolution is relying upon the electrical service provided by CBP). Thus, there is no reasonably foreseeable risk that essential maintenance activities would be deferred or not occur.

Nevertheless, in the highly improbable case where essential maintenance has been deferred, the officers/directors remain responsible for ensuring that essential maintenance activities are carried out in a timely manner. In carrying out this responsibility, the following tools are available to the officers/directors under the Shareholders Agreement, among others:

- **section 2.1(a) requires "…the Shareholders agree to vote their Shares…to approve and ratify decisions approved in accordance with this Agreement…".**
- **section 2.1(a) provides "…nothing herein shall…cause any Director to violate or act in contravention of any duty or obligation that…Director may have under the Act or under Law."**
- **Section 2.2 provides "…(ii) approve any single development, capital expenditure or other expenditure which was not included in the Budget, to a maximum of $15,000 per event…".**

While the probability for shareholders to defeat a resolution in support of essential maintenance remains highly improbable, the officers/directors have sufficient tools available to them to ensure the continued and safe operation of the Project.

In response to BCUC IR 3.4, CBP stated:

> Section 2.3 of the Shareholders' Agreement states that the corporation shall have up to five (5) directors. Each of these directors concurrently hold the positions of officers. CBP does not have any employees, nor are any contemplated. There is no minimum number of directors specified in the Shareholders' Agreement; nevertheless, at all times the directors must adhere to the terms and conditions of the Shareholders' Agreement. It is CBP's view that this structure, and associated number of directors, is sufficient for it to function effectively

20.3 Please explain why the Shareholders' Agreement does not specify a minimum number of directors.

Response:

A restriction by stating a minimum number of directors was felt to be unnecessary at the time CBP was incorporated because the company wished to retain maximum flexibility as is allowed under the *Business Corporations Act* (British Columbia).

Further, it is reasonably expected that CBP will, as it does today, maintain a full complement of

officers/directors into the future. This expectation is based upon, in part, the belief that the present pool of 48 Buyers will grow (i.e., as Series 2 and 3 Buyers are added) in the coming years. Also, a turnover of existing owners (e.g., by sale or inheritance) will provide a pool of additional talent available to assist in comprising the board of directors. The composition of future boards, including the number of directors, will be at the prerogative of the shareholders.

See also the response to IR 20.6.1, regarding the expanded talent pool available to CBP.

20.4 In the absence of any employees, please discuss what the roles and responsibilities of CBP's volunteer directors would be.

Response:

The CBP officers/directors have the same fiduciary responsibilities of any corporation. They are ultimately responsible for the strategic direction, management, and administration of all aspects of CBP's business of delivering electric power to its customers. The current board has expertise in engineering, construction, finance, accounting and management, all as outlined in response to IR 3.4.1 for example.

Additionally, in support of the day-to-day operations given there are no planned employees, the officers/directors will retain and oversee all necessary third-party expertise. Such expertise may include technical and operations support (including emergency response) as well as accounting, billing, and collection services.

In response to BCUC 3.4.1.1, CBP stated:

> CBP remains of the view that this management approach is both practicable and sufficient for the efficient, on-going operation of CBP. Further, such a management approach is common across many private enterprises in Canada.

20.5 Please provide examples of any public utilities that utilize a similar management approach to the one proposed by CBP.

Response:

The response quoted above (from BCUC 3.4.1.1) refers to how CBP will gather expertise in support of its duly elected officers/directors. This management approach is common across many private enterprises in Canada, however, British Columbia utility examples include:

- **Barriere Ridge Power Inc. (BC0908544) ("Barriere"): was incorporated in order to supply electricity via a submarine cable to several previously off-grid residential/recreational properties. Like CBP, Barriere is owned and operated by the residents it serves, but is not regulated by BCUC. It is CBP's understanding that Barriere outsources its day-to-day operational needs, just as CBP is planning to.**
- **Yoho Power Ltd. ("Yoho"): for many years prior to being interconnected to the BCH system, Yoho operated as a small standalone public utility to generate and distribute electricity to its residents. Prior to interconnection, and as CBP is planning to, it utilized various third parties to support its operational needs.**
- **McNair Creek & Tyson Creek hydro plants – it is CBP's understanding that, prior to their sale in 2015, the then current plant owners utilized third party expertise to assist their day-to-day operational needs.**

In response to BCUC IR 3.11, CBP stated:

> It is the view of CBP's officers/directors, all of whom have more than 30 years direct industry experience with private and public enterprise, that the standard of care is the same.

20.6 Please discuss what risks to the ongoing safe and reliable operation of the utility and to customers if future directors with comparable industry experience cannot be identified.

Response:

Until the Project achieves commercial operation, CBP's current officers/directors will continue to stand for consecutive re-election. It is also possible that the same officers/directors will also stand for re-election during the initial operation phase.

Further into the operations phase other Buyers will stand for election. As shown in response to IR 3.4.1, with a current Buyer group of 48, there are individuals within the community with experience in engineering, construction, finance, accounting, and management. See also the response to IR 20.6.1, regarding the expanded talent pool available to CBP.

As demonstrated in response to IRs 3.4.1 and 20.4 for example, in order to assist the on-going safe and reliable operation of the Project, officers/directors will be supported with third-party expertise. This expertise will, among others, support the day-to-day engineering and maintenance needs as well as accounting and administrative purposes. This operational management approach will significantly assist in lessening the work burden on officers/directors members.

By taking this balanced approach to management throughout the Project's lifecycle, CBP is ensuring any risks to the on-going safe and reliable operation of the Project (e.g., gaps in expertise and/or operational needs) are properly mitigated. CBP remains of the view that this management approach is both practicable and sufficient for the efficient, on-going operation of CBP.

20.6.1 Please discuss whether CBP would seek to employ external directors with relevant experience that are not shareholders of CBP. If not, why not? And what steps will CBP take to ensure the continued safe and reliable operation of the utility?

Response:

CBP does not expect to employ external directors that are not CBP shareholders. However, if for some unforeseen reason there are no volunteers among the Buyers willing to stand for election, then CBP would:

- **as permitted under the Shareholder Agreement, consider anyone who is a full or part-time resident of Cosens Bay (e.g., family or extended family members of the Buyers, those with a vested interest in ensuring the ongoing operation of electrical service) to fill these roles. This approach provides CBP with an extended talent pool far greater than the current 48 Buyers.**
- **In the unlikely event that the extended talent pool did not yield volunteers, CBP could consider passing a resolution that would allow it look to non-affiliated members in order to fulfill those roles.**

In any case, should no new officers/directors stand for election, then as demonstrated in response to IR 3.5.2.1, the then existing officers/directors will stand for another year. Further, it is the current

board's responsibility to ensure there is a succession plan in place such that qualified oversight of CBP is maintained as officers/directors are replaced over the years.

It is CBP's view that this approach towards securing officers/directors, and when coupled with the retention of third-party expertise, is a reasonable and practicable approach towards ensuring the safe and reliable operation of the Project.

21.0 Reference: CB POWERLINE LTD.
Exhibit B-2, BCUC IR 3.7, 3.7.1, 3.8.3, 3.8.5, 3.10.1; Exhibit B-1, Attachment A-1
Operation and Maintenance Contractor

In response to BCUC IR 3.7, CBP provided examples of the Pinter Electrical Consulting Inc.'s (PEC) experience in undertaking project of this type and cites experience with submarine cable specification, procurement, and installation and directional drilling.

21.1 Please discuss further PEC's experience with submarine cables and directional drilling. Please provide: details of the referenced projects; discus any issues or challenges encountered with the work; and explain how the lessons learnt have informed the design of CBP's project.

Response:

The submarine cable portion of the referenced project (i.e., Wolfe Island Wind Project) for PEC included:

- **Conducting bathymetric surveys to understand lake bottom contours.**
- **Preparation of a cable specification that was acceptable to the project and regulators including the ISO (Independent Electric System Operator) and TFO (Hydro One Networks Inc).**
- **Electrical system design studies including load flow, short circuit, grounding and cable circulating currents.**
- **Conducting a procurement process to ensure the project received a technically acceptable cable at a competitive cost and within the project's schedule needs.**
- **Conducting a global search for a submarine cable installer that had the expertise and equipment to transport the 8,000 meters of cable from Norway to Lake Ontario and install the cable.**
- **Conducting an on-site review of the cable manufacturing facility.**
- **Overseeing installation of the cable across Lake Ontario aboard the cable laying vessel.**
- **Design and oversight of the terminations of the submarine cable to underground cable.**
- **Testing and energization of the cable.**

The directional drilling portion of PEC's work of the reference project included project planning and technical reviews as well as on-site supervision of:

- **Drill under Highway 96, Wolfe Island (2 lane paved) into Lake Ontario to facilitate installation of the submarine cable.**
- **Drill under Front Road, Kingston (4 lane paved) to facilitate underground cable installation.**
- **Drill under Cataract Creek (sensitive wetland) to facilitate underground cable installation.**

- **Jack and bore under Bath Road, Kingston (4 land paved) to facilitate underground cable installation.**
- **Jack and bore under rail line, Kingston (2 sets of rails) to facilitate underground cable installation.**

Challenges with the submarine cable and directional drill included:

- **Issues with the submarine cable's continuous extrusion process exceeding equipment manufacturing intervals. The issue was managed by installing a cable splice at the factory in order that one continuous piece of cable could be supplied to the project.**
- **Timing and logistics of the installation vessels passage through the St. Lawrence Seaway (e.g., the Seaway closes during the winter season), to ensure all vessels exit prior to closure.**
- **Effectively managing installation of the submarine cable to avoid existing underwater powerlines and a manufacturing facility's water intake supplying critical processes requiring fresh water. The issues were mitigated by conducting a thorough underwater survey, working directly with the manufacturer to ensure intake integrity and water quality, and deploying divers to monitor sediment as the cable was laid.**
- **Shore landing of the cable requiring a directional drill under a paved roadway into the Lake on one side and a directional drill into the Lake through bedrock on the other side. After a geotechnical review of the bed rock and technical review of drilling capabilities, it was determined that an open trench be excavated into the Lake (along with appropriate environmental protections) to avoid possible drill issues.**
- **The length of directional drill, under the Cataract Creek wetland, required a detailed engineering review to determine feasibility. Calculations were also conducted to ensure cable pulling tensions would not be exceeded. A highly specialized pulling lubricant consultant was also engaged and managed by PEC to source a product that would reduce cable pulling friction to acceptable levels.**
- **The rail line was a high traffic main line through Kingston (connecting Toronto with Ottawa and points beyond). Given the critical transportation link of this rail line, detailed coordination and permits were managed by PEC with the rail operator.**
- **Managing the capacitance of 8,000 meters of submarine cable along with 4,000 meters of underground cable, which introduces 30 MVARS of charging current into the transmission system. The effects of this charging current on the IESO grid were studied prior to energization to confirm it was in compliance with the IESO market rules.**

Lessons learned applicable to the CBP project include:

- **Lesson: directional drilling requires detailed planning and coordination with contractors.**
  Action: CBP has engaged a directional drill contractor who has experience in the immediate vicinity of the Project.
- **Lesson: engineering is required to ensure that maximum cable pulling tensions are respected during cable installation into directional drilled pipe.**
  Action: an engineering study will be completed to determine the tension applied to cables during installation.
- **Lesson: detailed bathymetry is required to determine lake features and hazards, assist design activities, and support issue mitigation.**
  Action: the Project has completed a bathymetric survey of the cable routes (Attachment 21.1).

- **Lesson: given the depth of Kalamalka Lake, proper cable installation is important to ensure the cable does not coil and is not subjected to unacceptable tensions.**

  Action: In addition to PEC, CBP has engaged an installation contractor that has extensive experience in submarine cable installations in British Columbia.
- **Lesson: directional drilling through bedrock can provide significant challenges and if possible open excavation can be preferred (when coupled with appropriate environmental protection measures) as the most feasible technical option.**

  Action: based upon field study and landowner consultations, the Project has chosen to not directional drill on the east side of Kalamalka Lake due to extensive bedrock in the area. Instead, as shown in the permit applications, the Project is proceeding with an open trench installation of pipe into the Lake that will subsequently be backfilled with native rock and restored
- **Lesson: required engineering load flow studies must include a focus on cable capacitance and related the reactive power effects.**

In response to BCUC IR 3.7.1 CBP provides examples of similar projects undertaken by PEC.

21.2 Please provide any further examples of distribution system projects similar to that proposed by CBP, undertaken by PEC in British Columbia.

Response:

PEC has direct, hands-on experience in British Columbia on projects that are similar to the Project, including distribution voltage class work, grid interconnection, and associated budget and schedule responsibilities for:

- **Pingston: run of river hydro power (Revelstoke).**
- **Upper Mamquam: run of river hydro power (Squamish).**
- **Culliton Creek: run of river hydro power (Squamish).**
- **Narrows Inlet: run of river hydro power (Sechelt).**

21.3 Please discuss whether CBP or PEC has undertaken any similar projects which have been subject to exemptions from regulation. Please provide details of any such projects.

Response:

Neither PEC nor CBP have undertaken any similar projects subject to exemptions from regulation by BCUC. As a recently formed single-purpose entity, CBP will not be undertaking business beyond the scope of this Project.

In response to BCUC IR 3.8.3, CBP stated:

> At this stage in the Project (i.e., design/development), it is CBP's plan to employ a qualified contractor to operate and maintain the distribution system. If/as the Project advances, CBP will evaluate and select a qualified contractor based upon a number of criteria, including for example relevant experience, proximity to project location, health, environment and safety policies, and suitable commercial terms.

CBP stated further, in response to BCUC IR 3.8.5:

> PEC has direct experience employing subcontractors to provide ongoing operations and maintenance services; it is likely CBP will rely upon this expertise at an appropriate time in the Project's lifecycle.

In Attachment A-1 of Exhibit B-1, CBP submits a copy of the Power Purchase Agreement which states that the:

> Seller [CBP] shall maintain and operate the Power Line materially in compliance with Good Operating Practice and Applicable Law and shall hold, maintain and comply with all Approvals required by Applicable Law in order to fulfill its obligations hereunder.

21.4 Please discuss the criteria CBP will use to evaluate qualified contractors to operate the utility.

Response:

To evaluate potential contractors to assist Project operation activities, CBP will utilize criteria such as:

- **Experience in the industry.**
- **Experience with the service sought.**
- **Qualifications and experience of staff.**
- **Inventory of equipment.**
- **Proximity to Project location.**
- **Environment, Health, and Safety program.**
- **Cost competitiveness.**
- **Ability to meet schedule and/or timing restrictions.**
- **Emergency response availability.**
- **Experience interfacing with BCH personnel and working knowledge of the BCH distribution system.**
- **Company Insurance coverages.**

21.4.1 Please clarify what would be an acceptable "proximity to project location."

Response:

Recognizing the Project location, CBP expects to source qualified operation contractors from Kelowna, Vernon, Salmon Arm, and/or Kamloops. Based upon CBP's knowledge of third-parties within this geographic area, CBP remains confident that services in support of technical, maintenance and operation needs, as well as accounting, billing, and collection services are readily available.

21.4.2 Please confirm whether the qualified contractor would also be required to coordinate with local area first responders in case of an emergency.

Response:

CBP will, in conjunction with an as-yet unretained qualified contractor, develop an emergency operating procedure. While the procedure has yet to be developed, and as set out in response to IR 19.2, it may require the qualified contractor coordinate directly with first responders. Regardless of the allocation of responsibility, emergency coordination would be carried out in real-time with first responders.

21.5 Please provide examples of PEC's direct experience employing subcontractors to provide ongoing operations and maintenance services of similar distribution utility projects.

Response:

PEC's experience employing subcontractors to provide operation and maintenance services on critical overhead and underground electrical distribution systems includes the following projects:

- **Pingston: run of river hydro power (Revelstoke, BC), coordination of various subcontractors to provide: overhead power line maintenance, power station and substation maintenance, emergency response to system outages, and operator training.**
- **Upper Mamquam: run of river hydro power (Squamish, BC), coordination of various subcontractors to provide: overhead power line maintenance, power station and substation maintenance, emergency response to system outages, and operator training.**
- **Wolfe Island: wind power (Kingston, ON), coordination of various subcontractors to provide: underground power line maintenance for over 150 km of buried cable, substation maintenance, emergency response to system outages, and operator training.**
- **Melancthon: wind power (Shelburne, ON), coordination of various subcontractors to provide: underground power line maintenance for over 200 km of buried cable, overhead powerline maintenance, substation maintenance, emergency response to system outages, and operator training.**
- **Soderglen: wind power (Fort Macleod, AB), coordination of various subcontractors to provide: underground power line maintenance, overhead powerline maintenance, substation maintenance, emergency response to system outages, and operator training.**
- **Bull Creek: wind power (Provost, AB), coordination of various subcontractors to provide: underground power line maintenance, point of connection equipment maintenance, emergency response to system outages, and operator training.**

21.6 Please confirm whether CBP has defined to its Buyers the quality and timeliness of emergency utility service response that will be provided in compliance with Good Operating Practices.

Response:

During community consultations CBP indicated to the community members that electricity would be provided on a good operating basis. The approach to Good Operating Practice was subsequently defined in the PPA; a PPA that the Buyers have executed.

As noted to in response to IR 21.4.2, at this stage of the Project, CBP has yet to contract third-party expertise to provide for an emergency operating procedure, including response quality and timeliness. Nevertheless, this operating procedure will be completed prior to Project commercialization and communicated to the Buyers.

See also the response to IR 21.6.2 for discussion on good operating practice principles.

21.6.1 If not, does CBP intend to do so. If so, please elaborate on the quality and timeliness of emergency response that will be expected.

Response: See response to IR 21.6.

21.6.2 Please elaborate on Power Purchase Agreement definition of Good Operating Practices.

Response:

In support of the definition established in the PPA, CBP's good operating practice principles include:

- **Managing CBP in a holistic, non-partitioned manner, continuously striving to achieve efficiencies.**
- **Operating the Project in a safe and reliable manner and in accordance with applicable law.**
- **Utilizing experienced third parties and technology effectively.**
- **Implementing a restoration plan to return power to users within a reasonable amount of time.**
- **Conducting regular inspections and testing of equipment.**
- **Providing available energy use, cost and efficiency information to users.**

21.6.3 Please discuss what responsibilities CBP anticipates the contractor will need to undertake to operate and maintain the distribution system.

Response:

The contractor(s) will primarily be responsible for:

- **Switching of the distribution equipment as required by CBP or as requested by BCH.**
- **Emergency response.**
- **Inspection and testing of equipment as set out by CBP.**
- **Maintenance of equipment as required by the manufactures' warranties and guidelines and direction of CBP.**
- **Repairs of the distribution system equipment as may be required.**

In response to BCUC IR 3.10.1, CBP provided an overview of the inspection work required for the submarine cable.

21.7 Please explain whether CBP's forecast operating costs currently include any allowances for inspecting the submarine cable.

Response:

Confirmed, once completed and approved by shareholders (see response to IR 18.4), the annual operating budget will include all forecast submarine inspection and testing costs.

21.7.1 If so, please provide the allowance amount and detail the assumptions made.

Response:

Building from response to IR 3.10.1, the following operating allowances have been estimated (which include an annual two percent inflation adjustment) and will be included in the annual operating budget:

- **After the first year of operation.**
  - **Visual inspection - $3,000**
- **After 5 years of operation.**
  - **Visual inspection - $3,300**

- **Electrical testing - $2,200**

- **After 10, 20, and 30 years of operation.**
  - **Visual inspection - $3,650/$4,450/ $5,400 respectively**
  - **Electrical testing - $2,400/$3,000/$3,600 respectively**
  - **Sidescan and or multibeam remote sensing survey - $18,000/$22,000/$27,000 respectively**

21.7.2 If not, please discuss how CBP would fund the inspection costs.

Response:

N/A

21.8 Please explain whether CBP's forecast operating costs currently include any allowances for contracted third parties.

Response:

See response to IR 18.4, which notes that operating costs have not been fully developed at this time by CBP. Nevertheless, once prepared, the forecast of operating costs will include allowances for contracted third parties.

21.8.1 If so, please provide the allowance amount and detail the assumptions made.

Response:

See responses to IRs 18.4 and 21.8. Nevertheless, CBP's operating expenses will consist of contracted third party expenses, including the cost of electrical repairs and maintenance, engineering services, safety inspections, property and liability insurance, accounting services, legal services, snow removal, and earthworks on an as needed basis.

For reasons provided, these costs have yet to be competitively bid and contracted. As established in the PPA (e.g., section 5), cost recovery by CBP for all operating costs is made through the Contract Price paid by the Buyers; this recovery will be at cost, without markup, as incurred during each billing period.

See also responses to IRS 37.2 and 37.3 that involve the management of forecasted costs during each billing period.

21.8.2 If not, please discuss how CBP would fund the costs for contracted third parties.

Response:

N/A

B. PROJECT NEED, ALTERNATIVES AND JUSTIFICATION

22.0 Reference: PROJECT RATIONALE
Exhibit B-2, BCUC IR 4.10, 5.2, 5.3, 10.2; Attachment 4.10
Project Alternatives

In response to BCUC IR 4.10, CBP provided correspondence between CBP and British Columbia Hydro

and Power Authority (BC Hydro) regarding the possible connection options and alternatives.

Page 1 of Attachment 4.10 provides e-mail correspondence between BC Hydro and PEC, which states:

> BCHydro will not be building or taking ownership of customer build lines for the proposed Cosens bay project however we may be able to secondary meter customers and bill them directly given that services are built to BCH standards (see our secondary metering guide). The CB powerline would receive a credit for owning and maintaining the infrastructure through our rate structure.

22.1 Please discuss what consideration CBP gave to the option of BC Hydro providing secondary meter services. In your response please discuss the possible benefits or risks considered and explain why the option was deemed to not be feasible.

Response:

After due consideration, CBP chose not to request a proposal for secondary metering from BCH. CBP declined this consideration, for example, given there would be direct operating, line loss, insurance, and other costs associated with the deployment of the secondary meters; all aspects that would necessitate additional billing services by CBP to its Buyers. Also, having BCH deploy secondarily meters and invoice CBP's Buyers is seen as an unnecessary duplication of effort as well as extra administrative expense.

Further, CBP's plan as outlined in response to IR 34.1, is to account for distributed generation from its Buyers internally via its own accounting system.

As a result, a proposal for secondary metering is seen by CBP as unnecessary and no further work is being undertaken in this regard.

In response to BCUC IR 10.2, CBP stated:

> The material agreements required to support route alternatives 2B and 2C, which will allow the Project to proceed as planned, include the following:
>
> - Option Agreements have been signed with three property owners on the west side of Kalamalka Lake. These agreements, and the subsequent statutory right-of -way agreements, will allow CBP to gain access from the BCH proposed point of connection along Highway 97 down to the lakeshore. It should be noted that since the Option Agreements have been executed, one agreement holder has signaled their desire to withdraw from the Project. At this stage, CBP is attempting to work with this landowner to see if they would rejoin the Project; in the meantime, it is the Project's view that a valid agreement remains in place and both alternate routes remain feasible.
>
> - A statutory right-of-way agreement with KPE for Landing Site #2, where the submarine cable lands on the east side of Kalamalka Lake, and for Project infrastructure on KPE lands is required. CBP currently has a letter of support from KPE indicating they intend to enter into a formal agreement with CBP.
>
> - A road use agreement is required by MOTI for use and occupation of a provincial public highway by Project infrastructure. This agreement would cover all Project works within MOTI roadways including Landing Site #1 (if ultimately

advanced). CBP met with the MOTI on June 20, 2019 to review the Project and no issues were immediately raised by MOTI based on the Project scope presented by CBP.

In response to BCUC IR 5.2, CBP provides Table 5.2 which summarizes the comparative evaluation of the route alternatives considered for the Project:

Table 5.2: Comparative Evaluation	Route Alternative					
Route Selection Criteria	**1A**	**2A**	**1B**	**2B**	**1C**	**2C**
BC Hydro three phase power proximity	A	A	✓	✓	A	A
Access to West Kalamalka Lake	x	x	✓	✓	A	A
Access to East Kalamalka Lake	A	✓	A	✓	A	✓
Private landowner negotiations	x	x	A	A	✓	✓
Horizontal Directional Drill into Kalamalka Lake	x	x	✓	✓	A	A
Regulatory and environmental constraints	A	✓	A	A	A	✓
Submarine Cable Length	✓	✓	x	A	x	A

The result of this comparative evaluation was the identification two feasible alternatives: 2B and 2C. In comparing alternatives 2B and 2C, and noting both remain feasible, it was determined to pursue both options in parallel as the Project works through its regulatory process.

In response to BCUC IR 5.3, CBP stated:

> During the Project's operations phase, revenue requirements are simply the sum of incurred third-party costs, both of a variable and fixed cost nature. The revenue requirement is equal to the recovery of actual costs incurred (again CBP is operated as a not-for-profit entity). Given that, collectively, the Seller and Buyers under the [Power Purchase Agreements] PPAs are one and the same, determining the revenue requirement of CBP is not seen as a meaningful measure and thus has not been done.

22.2 Please explain whether CBP considered capital costs in its evaluation of the alternative route options.

Response:

See responses to IRs 5.1 and 5.2 for evaluation criteria of the route alternatives. As shown therein, CBP did not consider capital costs in the comparative evaluation of the six route alternatives.

For avoidance of doubt, following completion of the comparative evaluation, CBP did identify capital costs for the two feasible alternatives, 2B and 2C (see Attachment 17.1).

22.2.1 If so, please provide details on estimated costs for each option.

Response:

N/A – see response to IR 22.2.

22.2.2 If not, please explain why not.

Response:

In evaluating the six route alternatives, CBP elected to focus on the factors shown in responses to IRs 5.1 and 5.2 – which did not include a cost element. CBP elected to take this approach, given if a route

was not technically feasible and/or environmentally approvable, there was no point evaluating the route further. CBP saw, and continues to see, no benefit in expending resources on route alternatives that were/are not feasible.

Since the completion of the comparative evaluation, CBP has continued to focus its efforts on the two feasible routes (i.e., routes 2B and 2C). This effort has resulted in selection of route 2C being preferred.

22.3 Please elaborate further on the statement that "determining the revenue requirement of CBP is not seen as a meaningful measure." In your response please discuss what consideration CBP gave to ongoing operating costs, emergency reserve funds and the affordability of rates.

Response:

The Cosens Bay community has never had electricity supply in its 60+ years of existence. Electricity is seen as a necessity for both convenience and safety to its residents. The determination of the revenue requirement was said 'not to be a meaningful measure' of whether it is worth or not worth having electricity: electricity is worth having.

From an operations perspective, as demonstrated in response to IR 5.3, the 'revenue requirement' for CBP is simply the sum of all incurred costs. As CBP is operating on a not-for-profit basis, the revenue requirement is in turn equal to the recovery of actual costs from its Buyers (i.e., no mark-up). These costs (e.g., operating costs, capital projects reserve, and administrative costs), as set down in section 5 of the PPA, are defined and included within the Contract Price. Thus, operating on a not-for-profit basis, CBP will not generate "revenue" in the traditional sense for its shareholders.

In support of rate affordability, CBP is:

- **utilizing volunteer officers/directors**
- **employing no staff**
- **utilizing qualified third-parties**
- **purchasing electricity from BCH in bulk**

These elements, combined with the cost-recovery model of CBP (i.e., no mark-ups), support the affordability of the Contract Price. It is CBP's view, which is supported through the Buyers voluntarily execution of the PPA, that the Contract Price is both fair and reasonable. Further, assisting the affordability of its Contract Price, the:

- **actual cost to each Buyer will change over time based upon the number of Buyers (e.g., to share the fixed cost burden more widely), such that this burden will decrease every time a new customer executes the Shareholders Agreement and PPA.**
- **capital budget for the Project includes a working capital provision as well as a provision to establish and maintain a reserve fund for minor capital projects on an ongoing basis.**

Building from the information contained within the originating application to BCUC, it remains CBP's view that the Contract Price is just, reasonable, and non-discriminatory to its Buyers.

22.4 Please provide an update on the progress of CBP's negotiations with the landowner who has signaled a desire to withdraw from the Project.

Response:

While CBP remains of the view that a valid agreement remains in place with the landowner in

question, in an effort to accommodate this landowner's wish, CBP has been actively working to source an alternate land option. This work has resulted in an alternate land option being secured by CBP.

The alternate land option is south of the land in question and involves a landowner who has signed an Agreement with CBP. CBP has submitted (October 3, 2019) an application with BCH for electrical service at this alternate location. Environmental work on this property is complete and has been included within the applications to FrontCounter BC, the ALC, the RDNO (rail trail), and BCH for this revised Point of Connection ("POC") location.

22.5 If CBP's negotiations with the landowner are not successful, please explain whether preferred route alternatives 2B and 2C remain viable.

Response:

See response to IR 22.4; the feasibility of route alternative 2C is not affected by the landowner negotiations. Route 2C, utilizing the new land base, has been identified by CBP as the preferred route for the Project.

22.5.1 If 2B and 2C are not viable, please discuss which route alternatives CBP will pursue and provide the anticipated costs.

Response:

See response to IR 22.4; the feasibility of route alternative 2C is not affected by the landowner negotiations.

22.6 Please provide a copy of the Option Agreement.

Response:

See Attachment 22.6 for a copy of the Agreement.

22.7 Please confirm if CBP has entered into a statutory right-of-way agreement with KPE.

Response:

Following execution of its PPA and Shareholders Agreement, CBP has had multiple discussions with KPE regarding a blanket statutory right-of-way over KPE land. Based upon those discussions, CBP has directed its counsel to prepare the document for review, comment, and subsequent execution by KPE. It is reasonably anticipated that this agreement will be executed during Q2 2020.

22.7.1 If confirmed, please provide details of the agreement.

Response:

See response to IR 22.7.

22.7.2 If not confirmed, please discuss when the agreement is set to take place.

Response:

See response to IR 22.7.

22.8 Please discuss the impact to the Project and the proposed routing should Kalamalka Park Estates

(KPE) not enter into this agreement with CBP.

Response:

KPE have already indicated their support for the Project (e.g., noting the benefits of a stable supply of electricity to their pumphouse) and executed the Shareholders Agreement and PPA. Consequently, CBP has every reasonable expectation that KPE will continue to remain part of the Project and reasonably implement the associated right-of-way agreement.

Given KPE's document execution, this question becomes purely theoretical. Within this theoretical context, if KPE were to exit the Project, CBP would still need to undertake the statutory right-of-way agreement with KPE. Should a right-of-way agreement not be obtained, CBP would need to conduct alternate route selection around KPE land. CBP would employ similar efforts as it did with the landowner discussion set out in response to IR 22.4.

22.9 Please provide an update on the required road use agreement by the Ministry of Transportation and Infrastructure (MOTI).

Response:

CBP has submitted an application to MOTI for a permit to construct works within the public road right-of-ways. MOTI has reviewed the application and subsequently requested revisions to the application. CBP expects to submit the amended application in January 2020 and anticipates permit issuance in Q1 2020.

23.0 Reference: PROJECT RATIONALE
Exhibit B-2, BCUC IR 7.1.1; Exhibit C1-3, BCUC IR 1.1.3
Project Alternatives

In response to BCUC IR 7.1.1, CBP stated:

> In addition to the work with the community, from November 2018 thru January/February 2019, CBP had meetings that culminated in a presentation to the Greater Vernon Advisory Committee ("GVAC"). GVAC is a sub-committee of the Regional District of North Okanagan ("RDNO"). This presentation resulted in GVAC passing a resolution in support of CBP drilling under the Okanagan Rail Trail (note: land title of the relevant section of the Trail is in RDNO's name) to bring electricity to the Cosens Bay community. In February 2019, the RDNO board accepted the GVAC that recommendation. A CBP crossing agreement is currently under development with RDNO.

In response to BCUC IR 1.1.3, BC Hydro stated:

> The Lake Option requires the installation of an underground power line under the Okanagan Rail Trail. When BC Hydro assessed the Lake Option, the Regional District of North Okanagan (RDNO) declined to grant a statutory right of way for that crossing….The required statutory right of way agreements for permanent and safe access on private property have not been obtained.

23.1 Please provide an update on CBP's crossing agreement with RDNO.

Response:

Following the RDNO's resolution, an information package (in lieu of no available application form), including drawings showing details of the power lines crossing under the Okanagan Rail Trail, has been prepared by CBP and submitted to the RDNO for inclusion in the crossing agreement. This information was sent to the RDNO in Q4 2019 and since that time it is CBP's understanding that the RDNO is preparing a draft of the agreement for review and comment. It is anticipated that the draft crossing agreement will be available to CBP in Q1 2020 for review and comment.

See Attachment 23.1 for the information package submitted to the RDNO.

23.1.1 Please provide the term length of the agreement with RDNO.

Response:

See response to IR 23.1.

24.0 Reference: THE PROJECT
Exhibit B-2, BCUC IR 5.1; Exhibit C1-3, BCUC IR 1.3.5
Project Alternatives and Justification

In response to BCUC IR 5.1, CBP stated:

> Following the failed search for a feasible connection alternative with Fortis and BCH, the concept of an islanded electrical system was contemplated by CBP as a possible solution to the year-round supply of electricity. However, after contemplation, an islanded system was not considered a feasible option for community power. This consideration was made in part because an islanded system presents numerous challenges, versus a grid connected system, including:
>
> - No dependable or clean fuel source is available in the area of Cosens Bay
> - Complicated generator infrastructure would be required.
> - Operation of an islanded electrical generation and distribution system would require resources well beyond what is necessary to operate a grid connected system.
> - The power supply, based upon the above challenges, would not be as reliable as grid connected power.
>
> Based upon these considerations, CBP abandoned any further work on an islanded electrical system; in turn focusing its efforts on its own grid connected system.

In response to BCUC IR 1.3.5, BC Hydro stated:

> The following is a non-exhaustive list of potential issues that BC Hydro has identified with CBP's project that could result in a delay to interconnect the project at the proposed point of delivery (based on the two options identified in BC Hydro's response to BCUC IR 1.3.4):
>
> - MOTI approvals and permits associated with BC Hydro overhead build on Highway 97 (previous applications rejected by MOTI);
> - MOTI approvals and permits associated with directional drilling under Highway 97;

- BC Hydro acquisition of SRW on Crown land;
- Geotechnical work to ensure feasibility of directional drill (anticipate rock);
- BC Hydro acquisition and registration for SRW on private property; and
- Obtaining access rights to BC Hydro assets for operation and maintenance.

Based on BC Hydro's knowledge of CBP's Project, the following is a non-exhaustive list of potential issues beyond BC Hydro's point of delivery:

- Consultation with First Nations;
- Environmental and heritage impacts and mitigation;
- Acquiring necessary property rights on private property;
- Acquiring necessary property rights on the "Rail Trail";
- Design and construction of the submarine cable crossing and egress;
- Obtaining necessary approvals and permits from all regulatory bodies; and
- Mitigation of UXOs.

24.1 Please discuss whether the potential issues identified by BC Hydro regarding the proposed project were taken into consideration when CBP decided not to proceed further with an islanded system option.

Response:

The general list of potential issues identified by BCH exist for any project of this scope, islanded or non-islanded, and as such are taken into consideration as a matter of normal project execution. With specific regard to the Project, and more precisely the portion within CBP's control (i.e., the non-BCH lead portion), CBP has:

- ***Indigenous Engagement*: proactively engaged with the Okanagan Indian Band (see responses to IRs 6 and 25.1).**
- ***Environment & Heritage*: contracted third party expertise to assess existing resources, identify potential effects, and recommend protective and mitigation strategies. This work is reflected in the applications to FrontCounter BC for example.**
- ***Private Property*: secured agreements with the participating landowners (see responses to IRs 10.2 and 22.4).**
- ***RDNO*: submitted an information package to RDNO and is presently awaiting a draft of the crossing agreement (see response to IR 23.1).**
- ***Submarine Cable*: completed detailed bathymetry for the two feasible routes and is currently utilizing that information in support of preliminary design of the cable crossing and cable egress points (see response to IR 21.1 and 29.2).**
- ***Regulatory*: as summarized in Attachment 33.2, filed applications and information in support of the following permits and approvals:**
  - **BCUC Exemption application.**
  - **RDNO Rail Trail Crossing Agreement.**
  - **FrontCounter BC Crown Land Tenure Application for the Kalamalka Lake crossing.**
  - **FrontCounter BC Crown Land Tenure Application for access to land connecting KPE to Cosens Bay.**
  - **FrontCounter BC Change Approval for works in and about a stream.**
  - **Agricultural Land Commission ("ALC") for approval to construct and operate project works within the Agricultural Land Reserve.**
  - **MOTI road use application.**
  - **BCH connection application for the supply of electricity.**

- ***Unexploded Ordinance*: spoken with representatives from the Department of National Defence ("DND") and currently reviewing if/how UXOs may impact the Project.**

24.2 Please discuss whether any cost estimates have been completed for an islanded system with fossil fuel generation.

Response:

For the reasons provided in response to IR 5.1, an islanded option for the Project is not being considered further. Additionally, as set out in section 3.2 of CBP's application, a fossil fuel powered electric system for the Project would not align with the objectives of the *Clean Energy Act* of BC.

Therefore, given these considerations, CBP did not undertake a cost estimate for an islanded system with fossil fuel generation.

C. CONSULTATION

25.0 Reference: REGULATORY
Exhibit B-2, BCUC IR 6.1, 6.2, 6.3.1
Indigenous Consultation

In response to BCUC IR 6.1, CBP stated:

> It is our understanding that only the Crown can consult; as such any consultation must be carried out by the Crown. This understanding was discussed with FLNRO during the July 4, 2019 meeting (see below). It is also understood that the Crown may delegate the procedural aspects of consultation to a project proponent (as further discussed in IR 6.2).
>
> The following is the discussion record with FrontCounter BC:
>
> - July 2, 2019: Telephone conversation between Jim Pinter (PEC) and Patrick Tobin, Senior Authorizations Officer, Ministry of Forests, Lands and Natural Resource (FLNRO), Vernon office, introducing the Project.
> - July 2, 2019: Patrick Tobin reply email to the above telephone call explaining that FrontCounter BC would manage the project from their Kamloops office, see Attachment 6.1
> - July2, 2019: Telephone conversation between Jim Pinter (PEC) and Jason Ladyman (FLNRO) in the Kamloops office introducing the Project.
> - July 2, 2019: Jason Ladyman (FLNRO) reply email to the above telephone conversation confirming that FrontCounter BC would manage the project from their Kamloops office, see Attachment 6.1
> - July 4, 2019: Meeting at FrontCounterBC office in Kamloops, present were; Jim Pinter (PEC), Dave Ethier (CBP), Darryl Arsenault (by phone, Arsenault Environmental), and Jason Ladyman and Keith Weir (FLNRO). One of the topics of the meeting was First Nations consultation, where it was confirmed by FLNRO that they will consult with the First Nations as part of the project application if/as necessary. FLNRO also emphasized and encouraged the Project to engage with First Nations independent of FLNRO's consultation obligations.

> It is based upon this early and direct work with FLNRO that the Project understands the Crown would lead all consultation efforts; with the proponent leading any requisite engagement activities.

25.1 Please provide an update on consultation efforts carried out by the Crown and/or CBP.

Response:

Building upon the list of efforts set out in response to IR 6.4.1.ii, the following is an update of engagement efforts by CBP with the Okanagan Indian Band ("OIB").

- **December 16, 2019: Email from PEC to Ms. Marchand and OIB general email box to provide a project update including notification of filing of the FrontCounter BC land tenure application to cross Kalamalka Lake and copy of Project newsletter #3.**
- **January 14, 2020: Email from PEC to Ms. Marchand and OIB general email box to provide a project update including notification of filing of the FrontCounter BC land tenure application to for the portion of road connecting Cosens Bay to KPE.**

At the time of submission of IR No. 2 responses, CBP was not aware of any consultation undertaken by the Crown.

25.2 Please provide information on any further discussions held with FLNRO and/or FrontCounter BC since July 4, 2019.

Response:

Discussions with FrontCounter BC have been ongoing since July 4, 2019 including telephone calls to the Kamloops office and an in person visit to the Vernon FrontCounter BC office. Building upon these efforts, the Project has filed 3 applications with FrontCounter BC as detailed below.

1. **November 19, 2109: Crown Land Tenure Application, tracking number 100302971. This is the application for a statutory right of way across Kalamalka Lake.**
2. **November 19, 2020: Change Approval Application, tracking number 100300090. This application is for work in and about a stream.**
3. **January 6, 2020: Crown Land Tenure Application, tracking number 100306430. This application is for the installation of works within crown land located between KPE and Cosens Bay.**

In response to BCUC IR 6.2, CBP stated:

> Notwithstanding the Government's consultation obligations and advising role, CBP has proactively conducted a review of First Nations in the project area to help assess which Indigenous community(ies) might be potentially affected by the Project.
>
> The results of the CAD search (see Attachment 6.2.b) did not identify any First Nations in the immediate project area. Given the results of this search, the Project expanded its consideration to the closest First Nation to the Project, the Okanagan Indian Band.

In response to BCUC IR 6.3.1, CBP stated: "Information regarding the Project was sent by email to the Colleen Marchand, Director of Territorial Stewardship, Okanagan Indian Band on July 12, 2019. No response has been received to date."

25.3 Please discuss if CBP has received any response from the Okanagan Indian Band. In your response please provide any related correspondence.

Response:

At the time of submission of IR No. 2 responses, no response has been received from the OIB. See also response to IR 25.1.

25.4 Please confirm if any other Indigenous groups have been identified in or near to the project area.

Response:

Based upon the rationale provided in response to IR 6.2, CBP has not identified any other Indigenous groups in or near to the Project area. Given these efforts, CBP is not planning any further identification work.

At the time of submission of IR No. 2, CBP is not aware of the Crown identifying any Indigenous groups requiring consultation. Nevertheless, as noted in response to IR 6.4.1. ix, should the Crown ultimately direct, the Project will engage with other Indigenous communities to advance the Project.

25.4.1 If confirmed, please discuss any consultation that is planned to take place with the Indigenous groups affected or potentially affected by the Project.

Response:

N/A – see response to IR 25.4.

D. PROJECT DESCRIPTION

26.0 Reference: PROJECT DESCRIPTION
Exhibit B-2, BCUC IR 8.1, 8.2.1, 8.3
Load Forecast

In response to BCUC IR 8.1, CBP stated:

> Given the electrical history of Cosens Bay (i.e., no third-party grid connected service and any generation that does exists has been created on a property-specific basis), there is no historical load data for the Cosens Bay community.
>
> […]
>
> The 20-year load forecast completed for CBP was based upon the following set of parameters:
>
> - Average base load of 4 MWh/yr per Buyer (i.e., per PPA), which for the avoidance of doubt includes the KPE water pumphouse.
> - Estimated growth in connected Buyers of 2 per year for 20 years.
> - Average yearly load increase is linear to 8 MWh/yr per Buyer at year 20.
> - Attachment 8.1.1 shows the Project's 20-year load forecast.

26.1 Please explain how the average base load of 4MWh/year per Buyer was estimated. In your response please provide details of any data referenced and explain why the base load is considered to be appropriate.

Response:

As noted in response to IR 8.1, there is no historical load data for the community and thus no direct data to draw upon for the load forecasts. Nevertheless, generalized data exists in BC for average dwellings. As shown below, it is this information that was applied to the estimate of load.

Specifically, the average base load of 4 MWh/yr was extrapolated for the size and type of dwelling units within the Cosens Bay community compared to BCH's average household load for their service area. This data was sourced from
https://www.bchydro.com/search.html?q=What+is+the+average+power+usage+for+a+residential+customer%3F
which provides for an average load of 900 kWh per month (an annual equivalent of 10.8 MWh/yr) for a residential customer in BCH's service area. Given the seasonal occupancy of many of the dwellings within the community, as well as the vacant or underdeveloped nature of many PPA subscribed lots, the extrapolation to 4 MWh/yr was determined by CBP to be both reasonable and appropriate for its planning/design activities.

26.2 Please explain why the growth in connected Buyers is estimated to be 2 per year for 20 years.

Response:

It is anticipated that following Buyer electrification, many non-participating landowners will eventually elect to connect to the electrical system. 40 additional buyers represents the vast majority of the remaining unsubscribed lots within the community connecting over the 20 year period. In preparing the growth forecast, this rate was considered by CBP to be both reasonable and appropriate for its planning/design activities.

26.3 Please explain how the yearly load increase up to 8 MWh/yr per Buyer at year 20 was estimated. In your response please provide details of any data referenced and explain why the load increase amount is considered to be appropriate.

Response:

Building the response to IR 26.1, it is anticipated that over time the Buyers will continue to upgrade or construct newer dwellings; dwellings that will more closely reflect the average load for a dwelling in BC (i.e., 900 kWh/mth). Taking into account that many of the current dwellings within the community are seasonal, while newer upgrades/builds may be permanent (i.e., more than seasonal) 8 MWh/yr was determined by CBP to be both reasonable and appropriate for its planning/design activities.

In response to BCUC IR 8.2.1, CBP stated:

> There is no historical load data for the Cosens Bay community. As shown in response to IR 8.1, the load:
>
> - Has been classified as a residential load that is seasonal in nature.
> - Is anticipated to grow (including peak load growth)

The 20-year peak load forecast is based upon the following set of parameters:

- Average base peak load of 5 kW per customer.
- Estimated growth in connected customers, 2 per year for 20 years.
- Average yearly peak load increase per customer linear to 7 kw at year 20.

In response to BCUC IR 8.3 CBP stated:

The 2-year monthly peak load forecast is based upon the following set of parameters:

- 12-month average peak load profile that varies from 1 kW in winter to 5 kW in summer per Buyer.

26.4 Please explain how the average base peak load of 5kW per customer was estimated. In your response please provide details of any data referenced and explain why the base peak load is considered to be appropriate.

Response:

Given there is no historical load data for the Cosens Bay community, CBP turned its attention to third party data sources. Key among these sources were:

- **Fortis Alberta URD Design Guide**
- **ATCO Electric Specifications for New Underground Residential Distribution Systems**
- **Sask Power Requirements for the Design and Installation of Electrical Distribution Systems in Underground Residential**

Based upon review of these data sources, and experience of PEC, it was determined by CBP that 5 kW/customer was both reasonable and appropriate for its planning/design activities.

26.5 Please explain how the yearly peak load increase up to 7 kW at year 20 was estimated. In your response please provide details of any data referenced and explain why the peak load increase amount is considered to be appropriate.

Response:

Similar to the methodology provided in response to IR 26.3, it is anticipated that over time the Buyers will continue to upgrade or construct newer dwellings; dwellings that will more closely reflect the peak load for an average home. Taking into account that many of the current dwellings within the community are seasonal, while newer upgrades/builds may be permanent (i.e., more than seasonal), 7 kW at year 20 is considered by CBP to be both reasonable and appropriate for its planning/design activities.

26.6 Please explain how the average base peak load of 1kW per customer in winter and 5kW per customer in summer was estimated. In your response please provide details of any data referenced and explain why the base peak load is considered to be appropriate.

Response:

See response to IR 26.4.

27.0 Reference: PROJECT DESCRIPTION

Exhibit B-2, BCUC IR 9.6; Exhibit C1-3, BCUC IR 1.1.5
New Public Works

In response to BCUC IR 9.6, CBP stated: "Based upon the current design, the only new public works required by the Project is BCH's installation of a single power pole within the Highway 97 right-of-way in order to connect the Project."

In response to BCUC IR 1.1.5, BC Hydro stated: "BC Hydro is unable to obtain permits for adding BC Hydro assets on Highway 97."

27.1 Please confirm whether CBP is responsible for the cost to design and install any new public works.

Response:

For context, it is important to clarify that CBP understands the above noted comment by BCH was made in relation to BCH Option 1 (i.e., undertaking all aspects of service to the community), not to the Project.

Within the context of the Project, it is CBP's understanding that CBP is responsible for the reasonable costs incurred by BCH to upgrade any of its facilities to connect the Project. As shown within line item 1.1 of the construction budget for route alternatives 2B and 2C (Attachment 36.1), these connection costs are included within the Project's capital budget.

27.1.1 If not confirmed, please explain who is responsible for this work.

Response:

N/A

27.2 Please discuss whether CB Powerline has obtained any assurances that installing a new power pole within the Highway 97 right-of-way is feasible.

Response:

Per the BCH Primary Guide, it is within BCH's scope and responsibility to provide a connection for the Project. Part of providing the connection, includes securing applicable permits and approvals. Nevertheless, to assist BCH in its work, CBP will continue to work with BCH.

At the time of submission, BCH has not directly indicated to CBP that is unable to provide a connection. Further, CBP has every reasonable expectation that with diligent effort BCH will be able to secure its requisite permits / approvals.

27.2.1 If BC Hydro is unable to install the power pole, what impact will this have on the project.

Response:

Given BCH has declined to provide electrical service to Cosens Bay, the Project requires a connection from BCH in order to provide electrical service to the Buyers.

28.0 Reference: PROJECT DESCRIPTION
Exhibit C1-3, BCUC IR 1.1.4, 1.3.2
Point of Connection

In response to BCUC IR 1.1.4, BC Hydro stated: "CBP is currently in the process of submitting a formal PSC application to BC Hydro. However, as discussed in BC Hydro's response to BCUC IR 1.1.3, CBP has not finalized a location to take service from BC Hydro."

In response to BCUC IR 1.3.2, BC Hydro stated: "BC Hydro notes that CBP must provide its permit for connection from Technical Safety BC, as well as a permit to operate as a utility, before BC Hydro would authorize CBP's connection to BC Hydro's system."

28.1 Please explain whether CBP has identified the final location to take service from BC Hydro.

Response:

As noted in response to IR 22.4, CBP has finalized the location to take service from BCH. This location was provided to BCH on October 3, 2019, as shown in BCH's response to BCUC IR 1.1.4, Attachment 1, page 77 of 90.

28.1.1 If so, please identify the final location.

Response:

The final location to take service from BCH is civil address 165, Highway 97, Vernon. See Attachment 28.1.1 for the drawing provided to BCH on October 3, 2019, which details the final location to take service.

28.1.2 If not, please explain when CBP anticipates finalizing the location.

Response:

N/A

28.1.3 If the final location is anticipated to be different from the location identified for Route Alternative 2B, please discuss the impact that this location will have on the project costs, schedule and risks.

Response:

Since the first round of IRs were filed with BCUC, CBP has selected route alternative 2C as the preferred route for the Project. The key impact differential to route alternative 2B is cost, including the:

- **route is longer, which will add cost to the submarine cables.**
- **directional drill is longer, which will add cost and risk to the drill portion.**
- **BCH connection costs are anticipated to increase.**

28.2 Please provide an update on CBP's discussions with Technical Safety BC.

Response:

On January 10, 2020, CBP attended a meeting with Technical Safety BC ("TSBC") at their office in Vernon. During this review meeting all aspects of the Project were reviewed, including:

- **CBP's designation as a public utility.**
- **BC's adoption of the 2018 Canadian Electrical Code Part I as the BC Electrical Code.**
- **Connection to BCH's distribution system.**
- **Submarine cable installation methods.**
- **Possible equipment requiring a code variance.**
- **Underground residential distribution system equipment and installation.**
- **Landowner consumer service configurations.**
- **Requirements for TSBC inspection of landowner's electrical systems.**
- **Requirements for the TSBC issuance of permits to landowner's to connect to CBP, including a verification system of permit validity.**
- **Revenue metering installation and applicable changes to the 2018 BC Electrical Code.**
- **Electrical contractors in the Project area familiar with this type of Project.**

The Project review with the TSBC did not identify any issues that would prevent the Project from obtaining a connection from BCH or from CBP connecting its Buyers.

28.3 Please confirm which authority provides the "permit to operate as a utility."

Response:

CBP is not aware of which permit BCH is referring to. However, in its originating application, CBP has acknowledged it would meet the test for and thus would be defined as a "public utility" under the *Utilities Commission Act*.

28.3.1 Please provide an update on CBP's application for this permit.

Response:

N/A

29.0 Reference: PROJECT DESCRIPTION
Exhibit C1-3, BCUC IR 1.2.5
Submarine Cable

In response to BCUC IR 1.2.5, BC Hydro stated:

> BC Hydro continues to decline to take ownership of CBP's proposed project, given the complexity of CBP's submarine cable project anticipated. The design and construction of submarine cables requires expertise from several disciplines and is, relative to the construction of overhead distribution lines, orders of magnitude more complex.
>
> A factor that BC Hydro considers in its decision to take ownership of a customer-built powerline is whether, in BC Hydro's opinion, the customer can construct the powerline in a manner consistent with how BC Hydro would construct the powerline. In this case, BC Hydro is not certain that CBP would be able to design and construct the submarine cable to have the equivalent operating life or maintainability as a submarine cable designed and constructed by BC Hydro.
>
> BC Hydro designs submarine crossings to have an operating life of at least 40 years. As discussed in BC Hydro's response to BCUC IR 1.3.8, every submarine cable presents

unique design considerations and, therefore, BC Hydro is unable to develop standard design or construction requirements for them. Instead, BC Hydro relies on its specialist engineers and subject matter experts to be involved in all aspects of a submarine cable project, including:

- Materials: BC Hydro audits and inspects manufacturers during production and testing of submarine cables;
- Route design: BC Hydro designs a crossing route based on a topographic marine survey. The selected route for the cable mitigates the mechanical stress on the cable along the marine floor and also the future repairability of the cable, so the route is typically not the shortest point-to-point route; and
- Cable installation: Submarine cables typically experience the greatest stress during the laying of the cable, which may significantly affect its longevity. Inspections after installation are not able to determine whether the cable was subject to such mechanical stress. BC Hydro does not rely on external contractors to perform such work, but procures the equipment and resources so that it is able to undertake the work itself.

29.1 Please discuss whether CBP intends to instruct subject matter experts to be involved in the submarine cable aspect of the project. Please provide details of any such experts.

Response:

CBP has proactively engaged various subject matter experts specialized in all aspects of submarine cable projects, including cable specification, cable design, route design, and cable installation. These specialists include:

- **PEC: has, as shown in response to IR 21.1, experience in cable specification, design, testing, factory inspections, and installation.**
- **Terra Remote Sensing ("TRS"): has been supplying marine survey services for a vast network of both high voltage power and fibre optic submarine cables for more than 20 years. These services consist of carrying out studies of proposed corridors, route geophysical and hydrographic surveying, route development, surface and sub-surface detection of cables, real-time cable positioning, and technical support in the area of seafloor stability and dynamics. It is noted that BCH is one of TRS's clients.**
- **ITB Subsea ("ITB"): has been installing submarine cable since 1965. During the past 50 years, ITB has completed over 400 submarine cable projects and has become the predominant cable layer in the Pacific Northwest, gaining the experience and developing the equipment required to deal with the high demands of laying modern cable. It is noted that BCH is one of ITB's clients.**
- **Burton Marine: has extensive experience with barges in the area including direct experience with barge operation on the Project lake.**
- **Ironman Drilling: has completed directional drilling in the past at the project proposed directional drill location.**

29.2 Please discuss CBP's proposals with respect to materials, route design and cable installation.

Response:

- ***Materials*: PEC was charged with providing the cable specification and RFQ document used to**

run a competitive procurement process for the submarine cable.

- ***Route Design*: TRS was charged with and has completed a bathymetry study for the Project (see Attachment 21.1). Based upon that Bathymetry study, CBP in conjunction with its subject matter experts made minor modifications the lake crossing route to avoid hazards and keep cable tensions to acceptable limits.**
- ***Cable Installation*: ITB was charged with providing route planning advise, reviewing the submarine cable installation practices, and providing a cost estimate for the Project.**

29.3 Please discuss whether CBP considers it necessary to design and construct the submarine cable to have the equivalent operating life or maintainability as a submarine cable designed and constructed by BC Hydro.

Response:

CBP's submarine cable is designed, and will be installed, for a minimum design life of 40 years. This design life is directly comparable to BCH's design life of at least 40 years as set out in their IR response 1.2.5.

30.0 Reference: PROJECT DESCRIPTION
Exhibit B-2, BCUC IR 4.10, 9.1; Attachment 4.10
Direct Buried Power Cable

In response to BCUC IR 4.10, CBP has provided correspondence between the Applicant and both BC Hydro and Fortis BC. The correspondence includes BC Hydro response to a CBP question regarding ownership and operation of CBP's proposed electrical distribution system upon commercial operation. In an email included in Attachment 4.10, BC Hydro stated:

> BCHydro will not be building or taking ownership of customer build lines for the proposed Cosens bay project however we may be able to secondary meter customers and bill them directly given that services are built to BCH standards (see our secondary metering guide)

Attachment 4.10 includes correspondence with Fortis BC, including a response to CBP's question whether Fortis BC would consider a direct buried cable design. In an email included in Attachment 4.10, Fortis BC stated:

> Unfortunately our standard with underground cables is that they be installed in duct. I have attached our standard drawing for underground Duct depths for which the cables [will] reside in. This is pretty standard across BC as you've already found out with BC Hydro. Duct is required for ease of operation and access. If a piece of cable fails it can be pulled out and replaced easily with minimum interruption to customers and minimum cost to the utility to locate problem and fix/replace.

In response to BCUC IR 9.1, CBP stated that the design for the underground 25 kV power cables included as part of the Project scope shall be "direct buried to a minimum depth of 1,000 mm below grade." Similarly, the underground 240 V secondary service cables shall be "direct buried to a minimum depth of 750 mm below grade." CBP further stated in the same response that "The engineering and design of the Project will follow all applicable Codes, Standards, and Reference Guides."

30.1 Please explain the decision to proceed with a direct buried cable design.

Response:

For underground cable to be installed in duct, pull boxes with accessible lids are required to facilitate the installation of the cable(s). The pull boxes must be installed away from the travelled road surface or any area that may be subject to plowing, grading, or road improvements.

The road rights-of-way where the underground cables are proposed to be installed have little to no space available for pull boxes. The existing roads are very narrow, with steep bank encroachment to road edge in many places. This leaves little room for the Project to practically install pull boxes. Further, if the roads become actively maintained or are expanded/upgraded in the future, the pull boxes required for duct installation would have to be removed and relocated to facilitate road improvements.

With the direct burial design, the road can be actively maintained and expanded/upgraded at a later date without any affect to the installed Project infrastructure or road design.

Duct installation for underground cable is best suited for new communities and subdivisions that have land area available to design and install the duct and pull boxes; it is not well suited for remote work like that proposed by the Project.

30.1.1 Please discuss how a direct buried cable design would impact future maintenance costs in comparison to a ducted installation.

Response:

Building upon the response to IR 30.1, and recognizing the road portions where the Project's cables are proposed to be installed are narrow and not paved, a direct buried cable design will have a positive impact on future maintenance costs when compared to a duct installation. For example, with direct bury, underground cable faults are relatively easy to locate and repair in-situ with materials and equipment that are locally available. If a cable in a duct was damaged, the cable would have to be removed, the cable repaired, and the duct reconstituted, all as compared to a simple cable splice for a direct buried installation.

Hence, it remains CBP's strong preference for direct bury design and installation.

30.2 Please confirm whether a direct buried cable design would potentially limit any future involvement by BC Hydro or Fortis BC in the operation, maintenance or administration of CBP's electrical distribution system.

Response:

The Project is not in the Fortis BC service area. This factor alone negates any involvement by Fortis BC.

As shown in the IRs, BCH has declined to provide electrical service to the community of Cosens Bay and declined to assume ownership of the Project after its construction. As such, CBP will not speculate about future participation by BCH. In any case, CBP is not aware of BCH's buried cable design requirements to make any confirmation.

31.0 Reference: PROJECT DESCRIPTION
Exhibit C1-3, BCUC IR 1.3.8
Design Standards

In response to BCUC IR 1.3.8, BC Hydro states that its distribution standards are designed in accordance with the standards that form Canadian Electrical Code Part III, which include:

- CSA C22.3 No. 1-15, Overhead Systems;
- CSA-C22.3 No. 7-15, Underground Systems;
- CAN/CSA-C22.3 No. 3-98 (R 2013), Electrical Coordination;
- C22.3 No. 4-74 (R 2015), Control of Electrochemical Corrosion of Underground Metallic Structures;
- C22.3 No. 5.1-93 (R 2013), Recommended Practices for Electrical Protection - Electrical Contact Between Overhead Supply and Communication Lines;
- CAN/CSAC22.3 No. 6-13, Principles and Practices of Electrical Coordination Between Pipelines and Electric Supply Lines; and
- CAN/CSA-C22.3 No. 9-08 (R 2015), Interconnection of Distributed Resources with Electricity Supply Systems.

BC Hydro states that its distribution standards apply these national codes as the design basis to create BC hydro's design and construction standards. These standards series are:

- ES43, Overhead Distribution Standards;
- ES53, Underground Electrical Distribution Standards;
- ES54, Underground Civil Distribution Standards; and
- ES55, Distribution Design Standards.

31.1 Please confirm, or otherwise explain, whether CBP's distribution system will be designed in accordance with the Canadian Electrical Code Part III and the standards noted in the preamble above. Please discuss any areas of non-conformance.

Response:

The Project distribution system will be designed in accordance with the all applicable codes and standards, including the Canadian Electrical Code Part I, II, and III. In addition to the Canadian Electrical Code, and the standards and codes provided in response to IR 9.1, the following is a list of guides and standards that form the design basis for the Project:

- **CSA C22.1-18 Canadian Electrical Code Part I**
- **CSA C22.3 No. 1-15, Overhead Systems;**
- **CAN/CSAC22.3 No. 6-13, Principles and Practices of Electrical Coordination Between Pipelines and Electric Supply Lines;**
- **CSA-C22.3 No. 7-15, Underground Systems;**
- **C22.3 No. 5.1-93 (R 2013), Recommended Practices for Electrical Protection - Electrical Contact Between Overhead Supply and Communication Lines;**
- **C22.2 No. 0.2 Insulation Coordination;**

- **CSA 015-05 – Wood utility poles and reinforcing stubs;**
- **IEEE Std. C57.91 – IEEE Guide for Loading Mineral-Oil-Immersed Transformers;**
- **IEEE C62.22 – 2009 IEEE Guide for the Application of Metal-Oxide Surge Arrestors for Alternating-Current Systems;**
- **IEEE C62.92.4 – IEEE Guide for the Application of Neutral Grounding in Electrical Utility Systems, Part IV-Distribution;**
- **CSA-C68.3 – Shielded and Concentric Neutral Power Cables Rated 5-46 kV;**
- **IEEE Std. 575 – IEEE Guide for the Application of Sheath-Bonding Methods for Single-Conductor Cables and the Calculation of Induced Voltages and Currents in Cable Sheaths;**
- **IEEE 1120 – IEEE Guide for the Planning, Design, Installation, and Repair of Submarine Power Cable Systems;**
- **IEEE Std. 80 – IEEE Guide for Safety in AC Substation Grounding;**
- **IEEE Std. 81 – IEEE Guide for Measuring Earth Resistivity, Ground Impedance, and Earth Surface Potentials of a Ground System;**
- **IEEE Std. 48 – IEEE Standard Test Procedures and Requirements for Alternating Current Cable Terminations 2.5 kV Through 765 kV;**
- **IEEE Std. 404 – IEEE Standard for Extruded and Laminated Dielectric Shielded Cable Joints Rated 2500 V to 500 000 V; and**
- **IEEE Std C95.6 – IEEE Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0 – 3 Khz;**

32.0 Reference: PROJECT DESCRIPTION
Exhibit B-2, BCUC IR 9.3
Metering

In response to BCUC IR 9.3, CBP stated: "Buyer revenue meters will be installed at a location determined by the customer on their property, i.e. CBP is not responsible for any project infrastructure on customers property."

32.1 Please explain what type of meters CBP proposes to use for Buyer revenue meters.

Response:

CBP proposes to use solid state, single phase residential electricity meters, see Attachment 32.1 for a description of this type of meter.

32.1.1 Please provide the anticipated costs for the meters and explain whether the costs have been included in the capital costs.

Response:

The anticipated order of magnitude cost of the revenue meters is $100 per meter. The purchase cost of 55 meters is included in the Project's capital cost estimate. For continued clarity, the cost to install the meter base and associated infrastructure on the Buyer's property is the sole responsibility of the landowner (see response to IRs 9.2 and 9.3).

32.1.2 In the event CBP decides to engage in BC Hydro's secondary metering program, please discuss if CBP's proposed meters would meet BC Hydro's requirements for secondary voltage revenue metering.

Response:

CBP does not intend to engage in BCH's secondary metering program. CBP's proposed solid state, single phase residential electricity meters will meet the requirements of Measurement Canada.

33.0 Reference: PROJECT DESCRIPTION
Exhibit B-2, BCUC IR 5.5, 10.1, 10.5
Permits

In response to BCUC IR 5.5, CBP stated: "Presently, Arsenault Environmental Consulting is carrying out the environmental impact assessment that will ultimately be utilized by the Project in its filings with FrontCounter BC."

In response to BCUC IR 10.5, CBP stated:

> Arsenault Environmental Consulting's scope is to undertake all works necessary to support the Project's combined Environmental Impact Assessment ("EIA") and Environmental Management Plan ("EMP") filings with, and through to approval by, FrontCounter BC. Arsenault has the same scope for work under the Water Sustainability Act, Navigable Waters Act, and Fisheries Act as shown in Attachment 10.1

33.1 Please provide an update on the environmental work being carried out by Arsenault Environmental Consulting.

Response:

Ongoing work by Arsenault Environmental Consulting ("AEC") includes:

- **Preparation of a combined Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) for the Project. (see Attachment 23.1)**
- **Filing of a Crown Land Tenure application for the Kalamalka Lake crossing with FrontCounter BC**
- **Filing of a Change Approval application as required under the *Water Sustainability Act* with FrontCounter BC.**
- **Filing of a Self Advice Letter to Fisheries and Oceans Canada.**

In response to BCUC IR 10.1, CBP stated: "Attachment 10.1 shows a detailed list of approvals, permits, licences, or authorizations required for the Project, along with each permit's forecasted timing, the responsible agency, and current status."

33.2 Please provide an update to Attachment 10.1 detailing any progress made on the current status of required approvals.

Response:

See response to IR 24.1 for an update on permits and approvals along with Attachment 33.2.

34.0 Reference: PROJECT DESCRIPTION
Exhibit B-2, BCUC IR 16.1, 16.3; Exhibit C1-3, BCUC IR 1.3.1
Clean Electricity

In response to BCUC IR 16.1, CBP stated:

> No, CBP will not be considered a Net Metering customer of BC Hydro as the Project does not anticipate distributed generation ("DG") connected its distribution system will generate a sufficient amount of electricity to offset the load demand of all the Buyers.
>
> In the event that the capacity of DG connected to the CBP distribution system approaches the load demand of the community, CBP will implement the following measures to ensure that CBP does not generate electricity into the BCH distribution system:
>
> - Reduce the amount of DG generation during off peak seasons.
> - Only allow DGs to offset on-site energy consumption (e.g., DGs would not generate into the CBP distribution system).
> - Revise the connection with BCH to allow CBP to export electricity.

In response to BCUC IR 16.3.1, CBP stated: "Should CBP implement a net metering program, the DG connected Buyers would be allowed to participate in net metering, see IR 16.1."

In response to BCUC IR 1.3.1, BC Hydro stated:

> In addition, based on CBP's response to BCUC IR 16.2 and 16.3 (Exhibit B-2), BC Hydro understands that CBP intends to offer a service similar to BC Hydro's Net Metering service (rate schedule 1289). Doing so would result in a connection of generation parallel to BC Hydro's system that, per section 3.9.2 of BC Hydro's Primary Guide for primary voltage services, would require compliance with BC Hydro's Distribution Generator Interconnection requirements. BC Hydro has not received an application from CBP to generate power parallel to BC Hydro's supply.

34.1 Please confirm, or otherwise explain, whether distributed generation located within the Cosens Bay community will be connected to the distribution system.

Response:

Confirmed, Buyer's distributed generation within the Cosens Bay community is proposed to be connected to the distribution system.

34.1.1 If so, please confirm that CBP will submit an application to generate power parallel to
BC Hydro's supply for each distributed generation system a Buyer proposes to connect to CBP's distribution system.

Response:

CBP intends to submit a single application to BCH for a complex distributed generator ("DG") 100 kW or less. It is CBP's understanding that approach will result in its Buyers not being required to submit individual applications to BCH (as CBP will manage the Buyer's connection).

34.1.2 Please provide the expected cost for an application to BC Hydro.

Response:

CBP is currently not aware of the cost of the DG application, nevertheless in review of BCH's DG Technical Interconnection Requirements 100 kW and Below (DGTIR-100), the Project does not expect the application requirements to be cost prohibitive. In the event that cost does become prohibitive, CBP will review its course of action and any next steps related to connecting its Buyers DG (which may include winding-up this Project element).

34.2 Please explain how CBP will administer the net metering program.

Response:

CBP will account for its Buyer's distributed generation system internally. Buyers will simply see an accounting credit for their generation contributed as an offset to total electricity purchased by CBP for all its Buyers from BCH during each billing period. As noted, the PPA defines the billing period to be twice yearly for simplicity and convenience to the Buyers who are also the CBP shareholders.

34.3 Please discuss whether BC Hydro's application requirements for Buyers who wish to generate power parallel to BC Hydro's supply will impact CBP's ability to offer or administer the proposed net metering program.

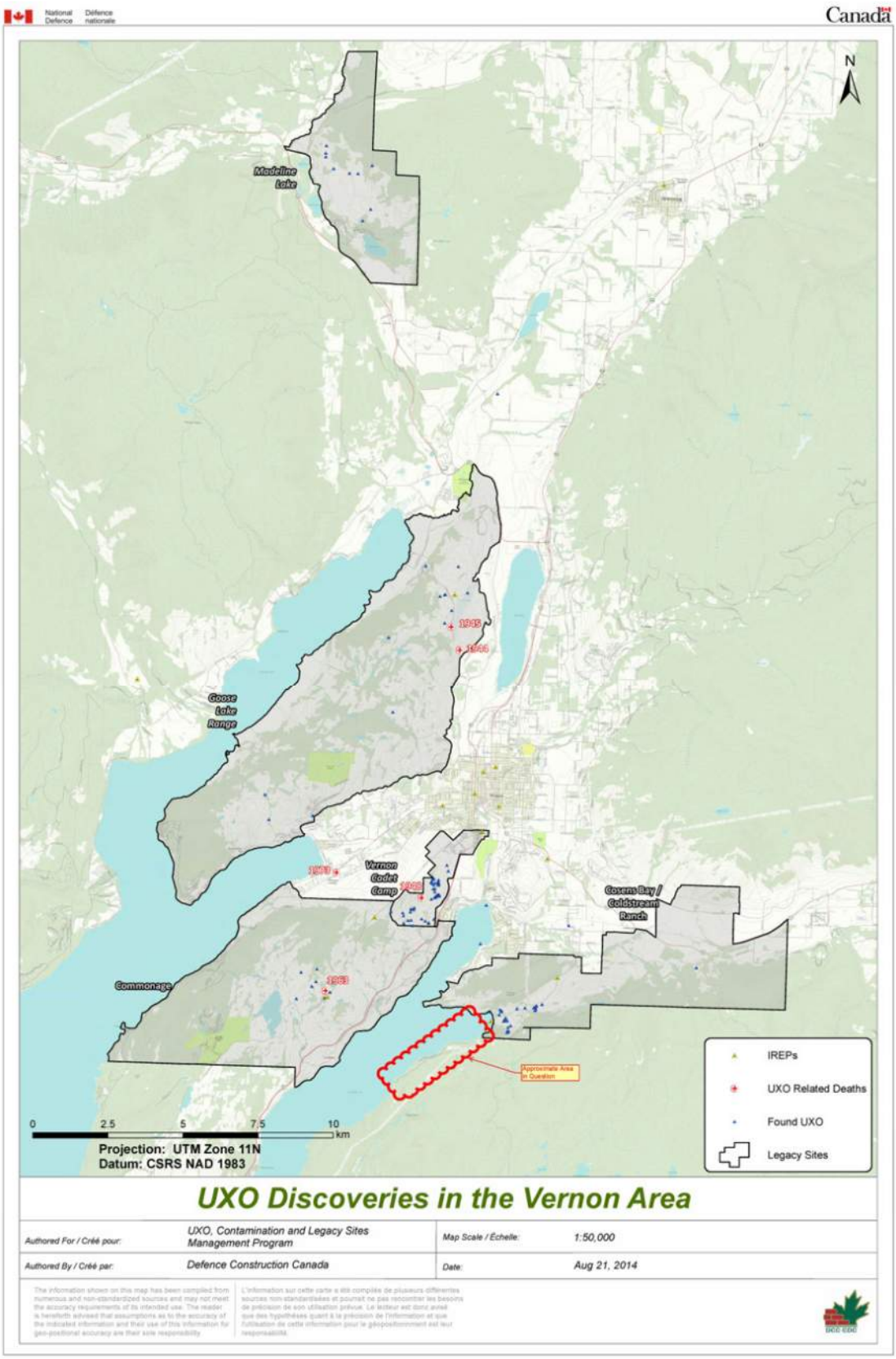
Response:

N/A – See response 34.1.1.

35.0 Reference: PROJECT DESCRIPTION
Exhibit C1-3, BCUC IR 1.1.3, 1.3.5
Unexploded Ordnance

In response to BCUC IR 1.3.5, BC Hydro stated:

> Specifically regarding the last point, the mitigation of UXOs, the Department of National defence has confirmed that the greater Vernon area has several locations of increased risk of UXOs. See the attached map (Attachment 1)[1], which shows locations where UXOs have been found and where there have been UXO related deaths.
>
> [1] In the legend on the map there is a reference to "IREP", which BC Hydro understands to be an abbreviation for "Explosive Ordnance Disposal Initial Report."



In response to BCUC IR 1.1.3, BC Hydro stated:

> As with the Park Option, BC Hydro has also not been able to fully assess whether the

Lake Option is safe, because the risk of UXOs near and under the Lake has not been fully assessed by Department of National Defense. Please refer to BC Hydro's response to BCUC IR 1.3.5.

35.1 Please provide details of CBP's discussions with the Department of National Defense with respect to unexploded ordnances (UXO) and CBP's proposed project.

Response:

The following is the discussion record with the DND:

- **September 3, 2019: originating discussion between CBP and the Range & Training Area Development Officer, Chilliwack, Canadian Armed Forces. CBP was directed to the Sargent of CD1 Range Control, Vernon Cadet Training Centre.**
- **September 4, 2019: Sargent provided the following information:**
  - **Cosens Bay beach and ridge areas at the end of the bay were used extensively in WW II as a mortar range for beach head training. There have been historic findings in the immediate area of the beach, within 200 meters of the beach area, up into the adjacent ridge line, and in the field within the provincial park.**
  - **No UXOs have ever been found outside of the park boundary on Cosens Bay Road or within the existing subdivision.**
  - **The current beach area is open to the general public, is a well-used beach, and there are numerous hiking trails in the surrounding provincial park.**

Based upon the information from DND, CBP notes the following:

- **the Project submarine cable work area is more than 3,500 meters away from the Cosens Bay beach area and ridge.**
- **all roads proposed for cable routing within the community were constructed after WW II and there has never been a report of UXOs within the work areas.**
- **excavation work for roads, building foundations, lot grading, and driveway development has been ongoing in the community since approximately 1955, without any reported UXOs findings.**

Additionally, MOTI has recently (e.g., 2019) undertaken on-site UXO investigations on Cosens Bay Road. It is CBP's understanding that these investigations did not identify any UXOs.

Finally, based upon the DND UXO mapping submitted by BCH, the project area is generally outside of DND's "legacy sites". This graphically supports the information provided by the Sargent on September 4, 2019.

35.2 Please confirm, or otherwise explain, whether CBP intends to request that the Department of National Defense assess the lake and CBP's proposed route for UXO.

Response:

As discussed in response to IR 35.2.2, CBP will continue to engage with DND in an on-going effort to obtain as much information as possible regarding UXOs in relation to the Project area. However, the work completed to date with DND indicates the Lake area and land routes proposed for the Project are not in areas used for WW II training.

See also the response to IR 35.1.

35.2.1 If not, please explain why not and how the public interest would be served by not assessing the lake and proposed route for potential UXO.

Response:

N/A – see response to IR 35.2.

35.2.2 If confirmed, please provide the anticipated timeline and costs for conducting the assessment.

Response:

CBP understands the next step with DND to be consultation with their UXO data base in Ottawa. This consultation is targeted for Q1 2020 and as a desk-top consultation little to no cost to CBP is anticipated. However, given the first-hand information provided from the Sargent (see response to IR 35.1), no change in UXO understanding is anticipated.

35.2.3 Please discuss whether CBP has factored in a UXO assessment, and any potential outcomes of that assessment, on the cost estimate and timeline previously provided for the project.

Response:

See responses to IRs 35.1 and 35.2.2. Based upon the UXO information collected to date from DND, no impact to Project's schedule or capital costs are anticipated.

35.3 Please explain if the customers of CBP are aware of the risk of UXO.

Response:

Most landowners in Cosens Bay are aware the Province has conducted several "sweeps" looking for UXOs in Kalamalka Park over the years. Additionally, CBP's Newsletter No. 3 to stakeholders indicted that CBP was conducting a UXO review (Attachment 35.3).

35.3.1 Please discuss what steps CBP will take to mitigate any risks mentioned above.

Response:

As shown in the response to IR 35.2, CBP will continue its engagement with DND to advance its UXO investigation. Information received from DND to date indicates the risks to be very low to non-existent for the Project area. Nevertheless, construction contractors will be provided with all available information.

E. PROJECT COST ESTIMATE

36.0 Reference: THE PROJECT
Exhibit B-1, Section 2, pp. 4–5; Exhibit B-2, BCUC IR 17.1, 17.4, 17.5, 17.6, 17.6.1, 17.7; Attachment 17.1; Attachment 3.2, p. 9; Exhibit C1-3, BCUC IR 1.1.8
Project Costs

In response to BCUC IR 17.1, CBP has provided the cost estimate for the project including the actual expenses incurred to date in Attachment 17.1 under both alternatives 2B and 2C.

36.1 Please provide a detailed rationale including the sources of the estimates for each line item of the project construction budget provided in Attachment 17.1 under both alternatives 2B and 2C.

Response:

See Attachment 36.1.

36.1.1 Has CBP acquired any quotes or entered into any contracts for installation and equipment as detailed in Attachment 17.1.

Response:

Yes.

36.1.2 If yes, please provide details of such third-party quotes/contracts.

Response:

CBP has received firm quotes for submarine cable, underground cable, and padmount transformers. CBP has also received budget pricing for submarine cable installation.

CBP can confirm that the quotes and budget pricing received support the associated Project budget and schedule elements. However, given the business sensitivity and confidentiality of the quotes and budget pricing, CBP is not in a position to provide additional details.

36.2 In your response to the question above, please confirm if CBP has any comparable data to support the project budget provided in Attachment 17.1.

Response:

As noted in response to IR 36.1.2, the quotes and budget pricing received for equipment support the Project budget (i.e., all equipment quotes received to date for the Project are equal to or lower than the costs estimated in the Project budget).

Given CBP has quotes in hand, there is no need to defer to comparable data.

36.2.1 If yes, please provide details of such comparable project cost data including the source for the same.

Response:

N/A

In response to BCUC IR 17.1, CBP stated the following: "Project contingency amount is $58,678 and $58,920 for options 2B and 2C respectively based on 10% of the installation portion of construction (Line Item 5.7)."

36.3 Please explain CBP's rationale to include contingencies only for the installation portion of the project estimate.

Response:

As indicated in response to IR 36.1.2, the Project has firm quotation information to support the key equipment costs in the budget. Therefore, contingency is not reasonably required on these items as

there is low risk the price will see any significant increase.

36.4 Please confirm whether CBP has entered into or intends to enter into fixed or time and material based contracts for the equipment and installation required for the construction of the project.

Response:

For construction, CBP intends to enter into fixed price contracts for key Project components, including:

- **Point of connection overhead pole(s), isolation, protection, and metering equipment.**
- **Submarine cable and installation works.**
- **Underground cable and transformers**
- **Underground (residential) distribution system installation.**

In response to BCUC IR 17.5, CBP stated the following: "The $50,000 funding cap was decided upon in 2017 at a community meeting; simply as a maximum, reasonable threshold that the Cosens Bay landowners could possibly afford."

Further in response to BCUC IR 17.6.1, CBP stated: "55 PPAs were legally closed on August 15, 2019. As supported by the response to IR 17.4, this is considered by CBP to be the minimum number required."

36.5 In the event that the cost of the construction of the project is higher than the estimate (e.g. $3.5 million), please provide details of CBP's plan to ensure that the project remains fully funded and on schedule.

Response:

A capital budget of $2,650,000 was approved by Buyers on September 3, 2019. Capital commitments of the Buyers is $2,793,500; a quantum sufficient to cover the approved capital budget, plus an overrun of $143,500. Within the approved capital budget, there is contingency for unforeseen costs during construction of $54,553, in addition to CBP's $50,000 working capital allowance. CBP continues to make every reasonable effort to manage the capital costs of the Project within the confines of the approved capital budget.

In the event that construction costs exceed the Buyer's funding commitments, CBP's board has proactively discussed the following plan: it will ask Buyers willing to participate, to loan the necessary funding shortfall to CBP with repayment guaranteed from future participants signing up as Series 3 subscribers. Based upon these discussions, CBP is confident that there are enough Buyers, whom have the means and the motivation, to ensure any unlikely cost overruns above the capital commitments are funded on this basis.

Further in response to BCUC IR 17.7, CBP stated: "Nevertheless, in the instance where a PPA is terminated, CBP would not request additional funding from its remaining Buyers."

Further in response to BCUC IR 17.7, CBP stated: "Nevertheless, in the instance where a PPA is terminated, CBP would not request additional funding from its remaining Buyers."

36.6 If CBP considered 55 participants to be the minimum number required to fund the project and only the minimum number of participants have signed the executed PPAs, please detail CBP's plan in the event of a Buyers inability to pay the funding cap or the above-mentioned cost overruns occurring?

Response:

CBP does not reasonably believe there is a risk that any Buyer will be unwilling or unable to pay to their funding cap obligation. This belief is underscored by the fact that 55% of each Buyers obligation has already been paid to CBP. It is extremely doubtful that any Buyer would give up their access to electricity when less than half of the funding liability remains outstanding.

In the event of a construction cost overrun, or an unlikely funding default by a Buyer, the funding plan outlined in response to IR 36.5 will ensure the Project is completed and all capital costs are paid.

In response to BCUC IR 17.4, CBP stated:

> The available capital determination was calculated as follows:
>
> • 53 (full cost) Series 1 Buyers (53 x $47,500 = $2,517,500)
> • 1 (half cost) Series 1 Buyer (0.5 x $47,500 = $23,750)
> • 1 Series 2 Buyer (1 x $90,000 = $90,000)
> • EOI funding ($162,250)

Further in response to BCUC IR 17.6, CBP stated: "The Series 1 Buyer's development funding commitment is capped at $50,000 (comprised of $2,500 under the EOI and $47,500 under the PPA). The funding cap for a Series 2 Buyer is $90,000 and the funding cap for the Series 3 Buyer is $100,000."

In Attachment 3.2 of Exhibit B-2, CBP submits a copy of the Shareholders' Agreement which on page 9 states:

> 2.11 Commitments under Power Purchase Agreements
>
> Unless otherwise approved by the Shareholders pursuant to Section 2.10(e), any Power Purchase Agreement entered into with:
>
> (a) a Series 1 Buyer will have a Funding Cap of $47,500;
> (b) a Series 2 Buyer will have a Funding Cap equal to:
> ($2,500 + the amount of anticipated Funding Requests for an individual Series 1 Buyer) x 1.8 to a maximum of $90,000; and
> (c) a Series 3 Buyer will have an upfront participation fee of $100,000
>
> collectively, the "Commitment Levels."

36.7 Please explain what is a 'half-cost' Series 1 buyer and if they would receive any different services compared to a Series 1, 2 or 3 buyers.

Response:

The reference to a 'half-cost' Series 1 Buyer is to the KPE pumphouse. As shown in response to IR 17.4, there is only one 'half-cost' Buyer and it will receive exactly the same services and Contract Price as a Series 1, 2, or 3 Buyer.

The KPE pumphouse is simply the pump station facility that supplies the KPE community with their drinking water. The pumphouse will use substantially less electricity than all other Buyers, so the 'half-price' was a negotiated capital commitment to participate. On this basis, the rest of the Buyers in Cosens Bay are not seen as subsidizing the KPE Buyers and is thus both fair and reasonable.

36.8 Please explain the rationale for higher funding requirements for Series 2 and 3 buyers. In your response please explain how the funding cap for Series 2 and 3 buyers was decided.

Response:
Series 2 and Series 3 Buyers are those Cosens Bay landowners requesting electric service after the initial (i.e., Series 1) financial commitment occurred. Specifically, as set out in the Shareholders' Agreement:

- **Series 2 Buyers are landowners who did not execute an expression of interest, but whom have executed the PPA and SA prior the Project achieving commercial operation.**
- **Series 3 Buyers are landowners who enter into the PPA and SA subsequent to the Project achieving commercial operation.**

Three series of Buyers were identified by CBP to reflect distinct points of Project risk. Clearly, the highest risk belongs to the Series 1 Buyers – this is the group that supported the Project concept from the beginning by financing the feasibility phase of assessment, preliminary design, and legal costs of incorporation and document preparation (e.g., the PPA and Shareholders' Agreement) for example. With risk continuing throughout the permitting and construction phase, CBP considers anyone subscribing during this phase to be Series 2 Buyers. Then, the Series 3 Buyer represents those landowners choosing to wait until there is no permitting and construction risk remaining to enter the Project.

It is import to again note that there is a fixed number of lots with a fixed number of owners that were given the chance to support or not to support the initiative since 2017.

Series 1 Buyers will each pay their share of actual construction costs up to the Funding Cap. Similarly, Series 2 Buyers will pay a premium of 80% over the risk-taking Series 1 Buyers, again subject to a Funding Cap which is set at $90,000. There is no funding cap for Series 3 since the participation amount is a fixed $100,000 (again, this amount is fixed because permitting and construction risk has been removed and associated capital costs have been sunk). These amounts were determined by CBP, following community consultation, to be fair and reasonable given all the landowners of Cosens Bay have been engaged, or had the opportunity to engage, with the Project from the beginning.

Finally, it is important to remember the Project is being designed and built to support the full electrical load of the 100 lots within Cosens Bay (recall only 55 lots are presently part of the Project). This means that the Series 1 Buyers are fronting these costs towards the future benefit of the Series 2 and 3 Buyers. CBP is undertaking this design and build effort in order to provide future participants with the same ability to receive electrical service; it is sinking these costs so as to remain an inclusive service provider within Cosens Bay.

36.9 Please explain why a Series 3 buyer has an upfront participation fee equal to their funding cap.

Response:

See response to IR 36.8. There is no funding cap for Series 3 as the upfront participation fee for

electric service is set at $100,000.

36.10 Please explain why a funding cap is not mentioned for a Series 3 buyer in the Shareholders Agreement.

Response:

See response to IR 36.8. There is no funding cap for Series 3 as the upfront participation fee for electric service is set at $100,000.

36.11 Please discuss what funding, if any, CBP would pursue should the project be cancelled.

Response:

To be clear, should the Project not proceed, this would be a catastrophic event for the community of Cosens Bay. However, from a funding perspective, should the Project be unsupported, for example, by the regulatory authorities or BCH (e.g., interconnection), CBP would not pursue funding above the funding caps from its shareholders. It would not do so given it is a single purpose corporation with the goal of bringing desperately needed electricity to the community. Any funds remaining after all costs have been paid would be returned pro-rata to its shareholders and the agreements terminated.

Further on page 9 of Attachment 3.2 the Shareholder's Agreement states:

> Following the commercial operation date of the Power Line, the Directors may, from time to time and in their discretion, pay to Series 1 Buyers (on a pro rata basis) an amount up to the Funding Requests actually paid by the Series 1 Buyers, from amounts received from Series 2 Buyers and Series 3 Buyers in respect of their Commitment Levels. Following the full repayment of the Series 1 Buyers, the Directors may, from time to time and in their discretion, pay to Series 2 Buyers (on a pro rata basis) an amount up to the Funding Requests actually paid by the Series 2 Buyers, from amounts received from Series 3 Buyers in respect of their Commitment Levels.

36.12 Please explain why the Series 1 and 2 buyers will be paid back up to the Funding Requests made from amounts received from subsequent buyers.

Response:

Building from the risk structure set out in IR 36.8, this repayment structure was established by CBP to compensate the early Buyers (i.e., Series 1, then Series 2) for taking on development and construction risk (which the Series 3 Buyers are not taking). This repayment structure also reflects the fact that it is the Series 1 Buyers who are paying for the 100 lot load design / build, even though at present only 55 lots are participating. CBP established this repayment structure based upon consultation with the community.

While the total number of Series 2 and Series 3 Buyers cannot be known at this time, it is plausible that there will never be sufficient Series 3 Buyers to fully repay the Series 1 Buyers (let alone the Series 2 Buyers). Nevertheless, given the Project's risk profile and design / build approach, this is a prudent and forward-looking provision should excess capital arrive into CBP's (i.e., a single purpose/project, customer owned company) treasury over the next several decades.

Finally, any repayment to a Series 1 or 2 Buyer will only be made at the discretion of the CBP board of

directors and only then to the extent it has capital in its possession that is in excess of its forecasted needs.

36.13 In the event that the project does not go through please confirm if the Series 1 buyers will be paid back from the amounts collected from Series 2 buyers.

Response:

No, this is not the case. Please refer to the response in IR No. 36.11.

36.14 If confirmed, please explain why this is the case.

Response:

N/A

In response to BCUC IR 1.1.8, BC Hydro has provided its estimate of costs of providing service with a BC Hydro engineered submarine cable excluding the distribution system under Kalamalka Lake (Lake Option) would be $8.0 million (-50% to +200%) based on the routing proposed by CBP.

36.15 Please comment on the cost estimate provided by BC Hydro above and explain, if possible, why CBP's cost estimate for the project is significantly lower.

Response:

CBP is not in a position to provide any commentary on BCH's concept level cost estimate; other than continuing to point out it is a concept estimate.

With regard to CBP's budget estimate, based upon its environmental, engineering, and design work, CBP has obtained firm quotes and budget pricing for key Project equipment (see response to IR 36.1.2). This includes a firm quote for submarine cable supply and budget pricing for the submarine cable installation; two elements that CBP views as having the most complexity and budget risk. These costs are reflected in the Project's capital costs.

In response to BCUC IR 1.3.4, BC Hydro has provided its estimate of costs based on CBP's proposed point of delivery on the west side of Kalamalka Lake.

36.16 Please comment on the cost estimate provided by BC Hydro and explain, if possible, why CBP's cost estimate for the project is significantly lower.

Response:

The original Project cost estimate was based upon earlier indications from BCH regarding connection costs. The new information provided by BCH is a concept level estimate for interconnection; it is anticipated that as actual work advances this cost will be refined downwards. Nevertheless, for CBP's planning purposes, the concept level estimate will be factored into the Project's capital cost budget.

37.0 Reference: PPA STRUCTURE
Exhibit B-1, Section 2, p. 5; Section 4.1, p. 9; Attachment A-1, p. 4; Exhibit B-2, BCUC IR

18.3, 18.4
Rates & Working Capital

In response to BCUC IR 18.3, CBP stated:

> As to the total rate applicable to these 55 Buyers, this will be calculated based upon the formula set out in PPA section 5, summarized as:
>
> Contract Price = Procurement Price + O&M Fee + Recovery Amount

37.1 Please provide complete details on the process of setting yearly rates for the Contract Price. In your response please include details on the frequency of setting the Contract Price, how this will be communicated to the Participants and any other details of the Contract Price setting process.

Response:

The process for setting the Contract Price is established in the PPA, specifically section 5 and more particularly subsections (c) and (d). For each billing period, the Contract Price will be set based upon the above formula, supported with actual costs where available and CBP's reasonable estimate where actuals are unavailable at the time of billing.

As set down in PPA section 6, CBP will invoice Buyers twice yearly: September 30 and March 31. Invoices will be provided to Buyers 60 days after the billing period, which should allow most costs to be included at the actual amount.

As the Contract Price is primarily a cost-recovery mechanism, it will be communicated to Participants at the time of invoicing. Nevertheless, Buyers may at any time make such inquiry with CBP.

In response to BCUC IR 18.4, CBP stated:

> The logic in not forecasting these costs at this time is that the quantum of each cost is extremely difficult to ascertain and will depend upon time spent for administrative, reporting, compliance, engineering, legal, accounting, and repairs and maintenance.
>
> Cost discovery after the first and second year of operations will greatly improve the ability of CBP to forecast its annual operating budget. In any case, the annual operating budget must be approved by the shareholders.

37.2 Please confirm if the O&M fee of the Contract Price will be for the first and second year of operations will be based on forecast or actual operating costs.

Response:

At this time, and to the extent practicable, it is CBP's intention that this portion of the Contract Price will be based upon actual operating costs; such costs initially funded by CBP from its working capital. However, where necessary and as noted in response to IR 37.1, some forecast of operating costs may be required.

37.3 Please explain how CBP will manage the yearly variance between forecast and actual annual operating budget after CBP commences operations and how the shortfall, if any, will be funded.

Response:

It is CBP's intention to adjust any shortfall (or excess) as a minor item in each successive year's operating budget. Further, such amount will be reflected in the subsequent billing period to the Buyers.

List of Attachments

Attachment 21.1

Project Bathymetry

Attachment 22.6

Landowner Agreement

Attachment 23.1

RDNO Rail Trail Information Package (Includes EIA)

Attachment 28.1.1

BC Hydro Point of Connection

Attachment 32.1

Revenue Meters

Attachment 33.2

Permits and Approvals Tracker

Attachment 35.3

Newsletter #3

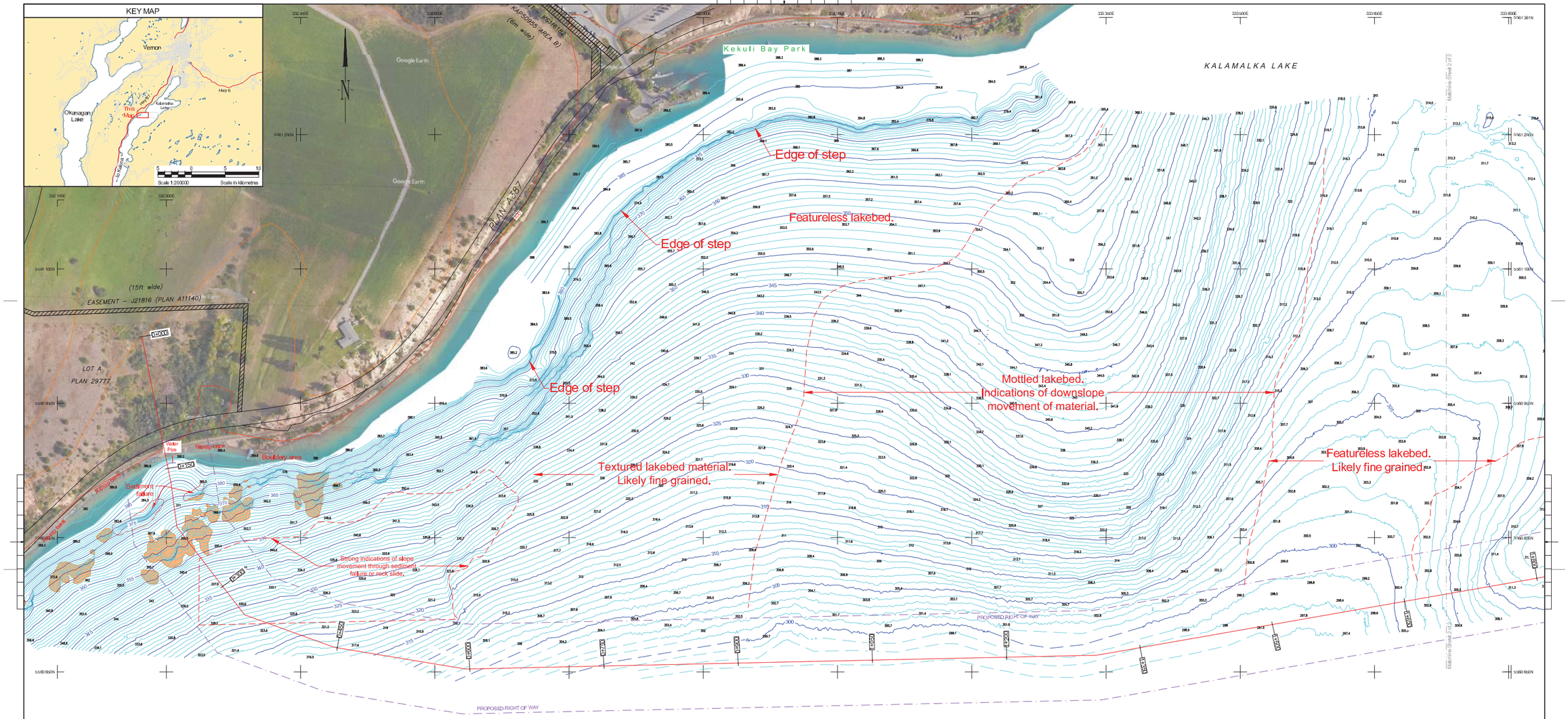
Attachment 36.1

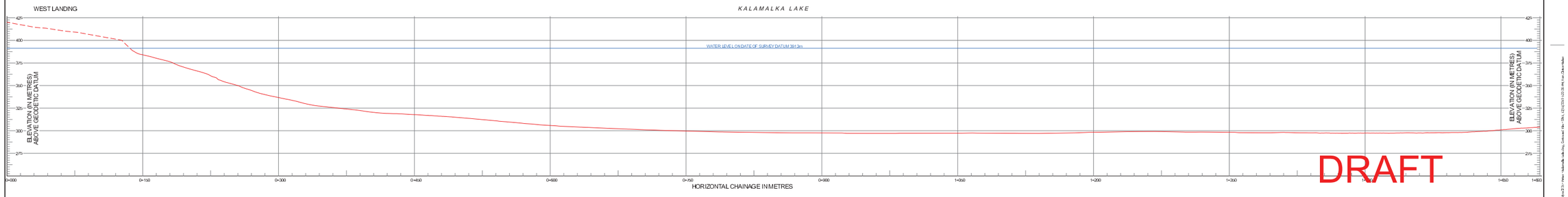
Construction Budget Rationale

Attachment 21.1

Project Bathymetry

KEY MAP





NOTES

1. DURING 16 OCTOBER 2019, TERRA REMOTE SENSING INC (TRSI) CONDUCTED BATHYMETRIC AND SIDESCAN SURVEYS AT KALAMALKA LAKE.
2. POSITION, HEADING AND ATTITUDE DATA FOR THE MULTIBEAM AND TOPOGRAPHIC SURVEY WERE RECORDED BY HYPACK 2018 AND APPLANIX POSVIEW SOFTWARE. SIDESCAN AND SUB-BOTTOM SURVEY GPS DATA WERE RECORDED BY TRSI'S PROPRIETARY NAVIGATION AND DATA LOGGING SOFTWARE (ETC). ALL GPS DATA WERE DIFFERENTIALLY CORRECTED IN POST PROCESSING.
3. SOUNDINGS WERE COLLECTED USING A RESON 7125 MULTIBEAM ECHO SOUNDER AND WERE REDUCED TO GEODETIC DATUM (CGVD28).
4. THE SHORELINE AND LAND FEATURES SHOWN ON THE DRAWINGS WERE PROVIDED BY CLIENT. UPLAND CONTOURS WERE DIGITIZED FROM DRAWINGS LISTED IN REFERENCE TABLE AND HAVE NOT BEEN VERIFIED BY TRSI.
5. PROPERTY LINES WERE SUPPLIED BY THE CLIENT.

REFERENCE DRAWINGS

REF#	DRAWING NUMBER	TITLE
1	GBSL014	Google Earth Air Photo
2		GeoBC Topo Map (Dated 2018/06)

REVISIONS

NO	REMARKS	DATE	TRADE	INDEP CHKD	DFTG	DFTG CHKD	INSPD	REV	ACPT
A	Submitted in draft	12 Nov 2019	EXISTING CONDITIONS	tnl	MR	KK	client	client	client

GENERAL NOTES

SURV	KK TCB	16 Oct 2019
PROCD	KK TCB	18 Oct 2019
DFTG	MR	30 Oct 2019
CHKD	KK	12 Nov 2019
REVD		
REV		
ACPT		

Equipment:
Survey vessel: Dozier
Subbie Positioning: tsmsidemVS111
Navigation/Acquisition Software: Hypack(R)C
Bathymetry: Reson(R)7125 MB
Morphology and Subsurface Stratigraphy: EdgeTech 4200 SS
Drawing parameters:
Projection: UTM Zone 11 Datum: NAD83
Central Meridian (CM): 117°W
Scale Factor at CM: 0.9996
False Easting: 500000 False Northing: 0
Vertical Datum: CGVD28

CLIENT

PROJECT
Cosens Bay Power Project
- Kalamalka Lake, BC -

TITLE
Contoured Lakebed Elevations

TERRA REMOTE SENSING INC.
1902 Mills Road
Sidney, BC Canada
V8L 5Y3
Ph: (250) 656-0031
Fax: (250) 656-0034
Web: www.terraremote.com

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PR DWG NO CAD —
R A
SHT NO. 1 of 2

TRSI PROJECT No. 0001-0228

KALAMALKA LAKE

Featureless lakebed. Likely fine grained.

Featureless lakebed. Likely fine grained.

Mottled lakebed. Indications of possible downslope movement of lakebed sediments.

Lead edge of ridge. Possible downslope material movement.

Bottom edge of bedrock zone

Hummocky irregular lakebed

Steep slope, mostly bedrock, with irregular concavities

Steep slope, mostly bedrock, with irregular concavities

PROPOSED RIGHT OF WAY

Matrix Shelf 1 of 2

Matrix Shelf 2 of 2

KEY MAP

Vernon

Okanagan Lake

Kalamalka Lake

This Map

Hwy 6

Hwy 97

To Kelowna

Scale 1:200000

Scale in kilometres

Scale 1:1500

Scale in metres

KALAMALKA LAKE

EAST LANDING

ELEVATION (IN METRES) ABOVE GEODETIC DATUM

WATER LEVEL ON DATE OF SURVEY DATUM 391.2m

HORIZONTAL CHAINAGE IN METRES

DRAFT

NOTES

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A	Submitted in draft	12 Nov 2019	EXISTING CONDITIONS	tnl	MR	KK	client	client	client

SURV	KK TCB	16 Oct 2019
PROCD	KK TCB	18 Oct 2019
DFTG	MR	30 Oct 2019
CHKD	KK	12 Nov 2019
REVD		
REV		
ACPT		

GENERAL NOTES

Equipment:
Survey vessel: Zodiac
Surface Positioning: Hemisphere VS111
Navigation/Acquisition Software: Hypack(R)C
Bathymetry: Reson(7125 MB)
Morphology and Stratigraphy: EdgeTech 4200 SS

Drawing Parameters:
Projection: UTM Zone 11 Datum: NAD83
Central Meridian (CM): 119°W
Scale Factor at CM: 0.9996
False Easting: 500000 False Northing: 0
Vertical Datum: CGVD28

CLIENT

PROJECT: Cosens Bay Power Project - Kalamalka Lake, BC -

TITLE: Contoured Lakebed Elevations

TERRA REMOTE SENSING INC.
1962 Mills Road
Sidney, BC Canada
V8L 5Y3
Ph: (250) 656-0231
Fax: (250) 655-4505
Web: www.terraremote.com

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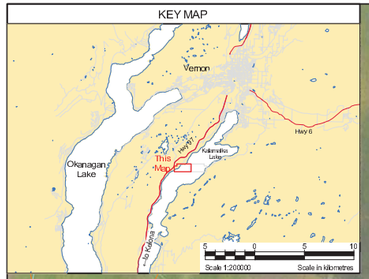
TRSI PROJECT No. 0001228

S:\TRSI\Drawings\2019\01-Dec\Kalamalka\02-Drawing\Kal-2-2-1-Main-Kalamalka-Lake-Map_Contoured-Lake-Bed-Elevations.dwg 12/11/2019 10:25:41 PM by Kim Dierschke

KEY MAP



Kekuli Bay Park

KALAMALKA LAKE

Edge of step

Featureless lakebed.

Edge of step

Edge of step

Mottled lakebed.
Indications of downslope movement of material.

Textured lakebed material.
Likely fine grained.

Featureless lakebed.
Likely fine grained.

Strong indications of slope movement through sediment failure or rock slide.

Sediment Failure

Boulders area

Water Pipe

Rapids Creek

Rapids Creek

(15ft wide)

ASSIGNMENT – J21816 (PLAN A1)

0+000

1+150

1+500

1+750

1+900

2+050

2+200

2+350

2+500

2+650

2+800

2+950

3+100

PROPOSED RIGHT OF WAY

PROPOSED RIGHT OF WAY

Matches Sheet 2 of 2

Matches Sheet 2 of 2

5961 200N

5961 100N

5960 900N

5960 800N

5960 700N

5960 620N

332 100E

332 200E

332 300E

332 400E

332 500E

332 600E

332 700E

332 800E

332 900E

333 000E

333 100E

333 200E

333 300E

333 400E

333 500E

333 600E

333 700E

333 800E

Scale 1:1500

Scale in metres

DRAFT

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5. PROPERTY LINES WERE SUPPLIED BY THE CLIENT.

REFERENCE DRAWINGS

REF #	DRAWING NUMBER	TITLE
1	082.014	Google Earth Air Photo GeoBC Topo Map (Dated 2018/06)
2		

REVISIONS

NO	REMARKS	DATE	TRADE	INIT	INDEP CHKD	DFTG	DFTG CHKG	RSPD	REV	ACPT
A	Submitted in draft	12 Nov 2019	EXISTING CONDITIONS	TM	MR	KK	client	client	client	client

GENERAL NOTES

SURV	KK TCB	16 Oct 2019
PROCD	KK TCB	18 Oct 2019
DFTG	MR	30 Oct 2019
ENGD	KK	12 Nov 2019
REVD		
REV		
ACPT		

Equipment
Survey vessel: *Explorer*
Surface Positioning: Hemisphere V-S111
Navigation/Acquisition Software: Hypack/RTC
Bathymetry: Reson 7125 MB
Morphology and Stratigraphy: EdgeTech 4200 SS
Datums/Projections
Projection: UTM Zone 11 Datum: NAD83
Central Meridian (CM): 117°W
Scale Factor at CM: 0.9996
False Easting: 500000 False Northing: 0
Vertical Datum: CGVD28

CLIENT

PROJECT
Cosens Bay Power Project
- Kalamalka Lake, BC -

TITLE
Shaded Lakebed Relief

TERRA REMOTE SENSING INC.
1902 Mills Road
Sidney, BC, Canada
V8L 3Y3
Ph: (250) 656-0177
Fax: (250) 656-0181
Web: www.terraremote.com

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SCALE A
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SHT NO. 1 of 2

TRSI PROJECT No. 0001528

I:\1902\Data\2019\15 Standby - Kalamalka Lake\Proj\Bathy\2 Sur\Hsv - Kalamalka Lake Shaded Relief - 20cm_1.2m\2019-11-20 at 11.hsv 20 nov 2019 mr

KALAMALKA LAKE

Match line Sheet 1 of 2

Match line Sheet 1 of 2

Featureless lakebed. Likely fine grained.

Featureless lakebed. Likely fine grained.

Mottled lakebed. Indications of possible downslope movement of lakebed sediments.

Lead edge of ridge. Possible downslope material movement.

Bottom edge of bedrock zone

Steep slope, mostly bedrock, with irregular crevasses

Hummocky irregular lakebed

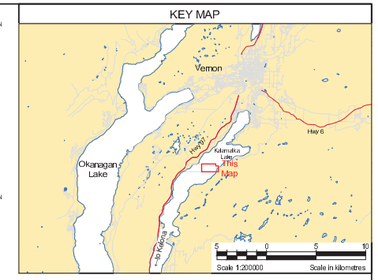
Steep slope, mostly bedrock, with irregular crevasses

PROPOSED RIGHT OF WAY

PROPOSED RIGHT OF WAY

PROPOSED RIGHT OF WAY

KEY MAP



Scale 1:1500

Scale in metres

DRAFT

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2		GeoBC Topo Map (Dated 2018/06)

REVISIONS

NO	REMARKS	DATE	TRADE	INIT	INDEP CHKD	DFTG	DFTG CHKG	RESPO	REV	ACPT
A	Submitted in draft	12 Nov 2019	EXISTING CONDITIONS	TRI	MR	KK	client	client	client	client

SURV	KK TCB	16 Oct 2019
PROCD	KK TCB	18 Oct 2019
DFTG	MR	30 Oct 2019
ENGG	KK	12 Nov 2019
APVD		
REV		
ACPT		

GENERAL NOTES

Equipment:
Survey vessel: *Dozier*
Surface Positioning: Hemisphere V111
Navigation/Acoustic Subsystem: Hypack/KIC
Bathymetry: Reson 7125 MB
Morphology and Stratigraphy: EdgeTech 4200 SS
Datums and Projection:
Projection: UTM Zone 11 Datum: NAD83
Central Meridian (CM): 117°W
Scale Factor at CM: 0.9996
False Easting: 500000 False Northing: 0
Vertical Datum: CGVD28

CLIENT

PROJECT
Cosens Bay Power Project
- Kalamalka Lake, BC -

TITLE
Shaded Lakebed Relief

TERRA REMOTE SENSING INC.
1902 Bill Road
Victoria, BC Canada
V8L 3T3
Ph: (250) 656-2931
Fax: (250) 656-2935
Web: www.terraremote.com

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SIZE A | DWG NO CAD — | REV | SHT NO. 2 of 2

TRSI PROJECT No. 0001528

I:\TRSI\Client\2019\15 Cosens Bay - Kalamalka\CAD\Layout\15-2 Hillshade Kalamalka_Shaded Lakebed_15-2_12\12\2019 11:35:39 am by Kevin Kerr

Attachment 22.6

Landowner Agreement

CB Powerline Ltd.
c/o John Keating, Treasurer
[redacted]

September 25, 2019

[redacted]

Dear [redacted]

We would like to express our sincere thanks for taking an interest in our power line project to bring electricity across Kalamalka Lake to the community of Cosens Bay.

CB Powerline Ltd. (CBP) was incorporated to develop, construct and operate a private, non-profit, community owned electricity distribution system connecting the Cosens Bay community via a submarine cable link to the BC Hydro system. We currently have 55 land parcels participating representing over 75% of the houses and cottages comprising Cosens Bay.

Thank you so much for meeting and reviewing the project with Jim Pinter. Based on those discussions we have developed a preliminary design for works on your property.

For reference, your property, which carries a Parcel Identifier number 004-188-764, is legally described as Lot A Section 31 Township 10 Osoyoos Division Yale District Plan 29777.

Should you agree with the terms herein, please consider this letter as an agreement (the "Agreement") with the following terms and conditions:

1. The purpose of the power line is to connect the Cosens Bay community to the BC Hydro electrical grid as a non-profit community sponsored project;

2. The general scope of work ("the Works") which will be the subject of the Statutory Right of Way referred to in paragraph 8 below on your property is as follows and as shown on the attached drawing 103-5: construction of an overhead point of connection (POC) to BC Hydro near highway 97; installation of an underground power line from the POC to a location suitable for directional drilling; directional drill into Kalamalka Lake; connection of the underground power line to submarine cables installed in the directional drill pipes.

3. Consideration for your agreement herein, including the granting of the Statutory Right of Way, shall be an initial payment of [redacted] upon signing this Agreement;

4. A further payment to you of [redacted] shall be paid immediately upon your receiving a written notice from CBP that all material permits and approvals to proceed to construction of the powerline have been received. The receipt of these permits and approvals will be facilitated by your granting of the Statutory Right of Way;

5. The Agreement shall be subject to a term of 18 months from the date hereof for construction to commence, failing which, subject to paragraph 6 below, this Agreement shall expire and be null and void;

6. CBP, at its option, shall have the right to extend the Agreement for a further term of 18 months by paying an additional amount of [redacted] to you prior to the expiry of the initial 18 month term of this Agreement. While it is not anticipated, there is a chance that permitting delays might require an extension;

7. Immediately subsequent to the substantial completion of all Works on your property and energization of the POC equipment to BC Hydro, CBP shall make a third (or fourth in the case of an extension payment) and final payment to you of [redacted];

8. As CBP will be incurring significant expenses to move its power line forward, it is agreed that within 60 days from the date of this Agreement CBP shall, at their expense, cause to be prepared formal Statutory Right of Way documentation, as may reasonably be recommended by its counsel and as would be typical for transactions of this type. You, as the property owner, hereby agree to review, comment and, in good faith, execute same so that the power line project can proceed in a timely manner at all times. Should you wish to engage your own counsel for this same purpose in order to properly represent yourself, all reasonable resulting legal costs will be to the account of CBP and paid within thirty (30) days of receiving it from you or your counsel.

9. All cost and effort required to restore your property to your complete satisfaction is the responsibility of CBP.

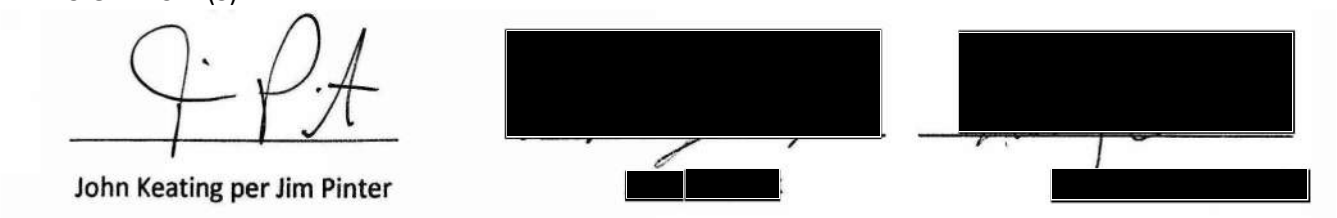
10. You agree not to transfer ownership of your property during the existence of this Agreement without requiring your purchaser to first enter into this Agreement by agreeing to enter into a form of assignment and assumption agreement acceptable to CBP, acting reasonably. This Agreement shall serve to the benefit of the parties hereto and their respective heirs, executors, administrators, successors and assigns.

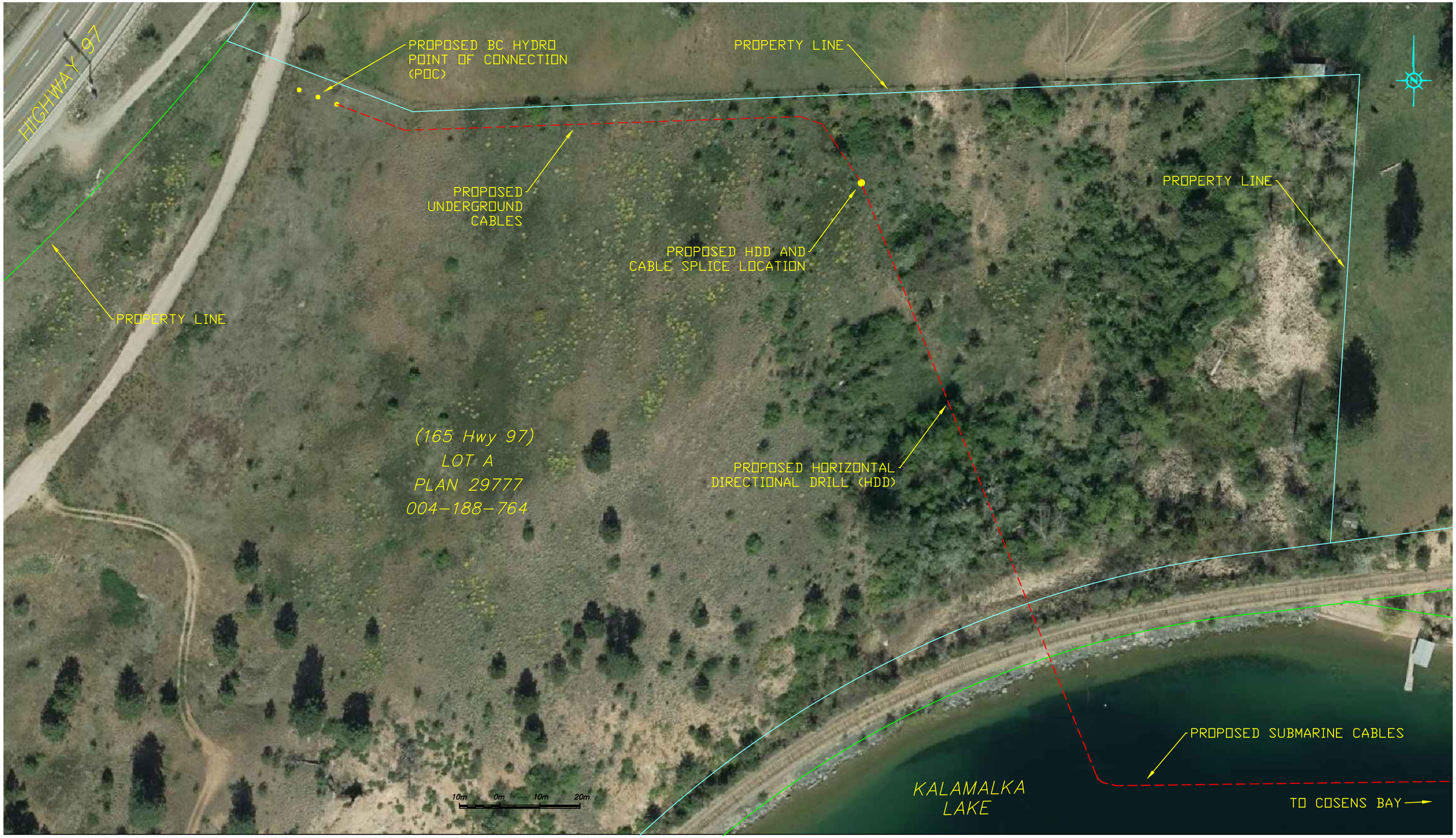
In summary, based on the above, three payments totaling [redacted] (four payments totaling [redacted] in the case of one extension) will be paid by CBP in consideration of the above.

Once again, the Cosens Bay community truly appreciates your assistance in this matter and look forward to a mutually beneficial and long-term relationship.

Should the foregoing be acceptable and in accordance with your understanding, please so indicate by signing and returning one copy of this letter to the undersigned at your earliest convenience, at which time a binding agreement will be created between us.

Yours truly and on behalf of the board,
John Keating, Treasurer CB Powerline Ltd.
Agreed to and accepted this 26th day of September 2019
SIGNATURE(S):





NOTES:
1. ALL PROPOSED EQUIPMENT LOCATIONS ARE PRELIMINARY AND SUBJECT TO TECHNICAL REVIEW AND REGULATORY APPROVAL.
2. PROPERTY LINES ARE APPROXIMATE AND SUBJECT TO CONFIRMATION AND LEGAL SURVEY.

PINTERCO

PINTER ELECTRICAL CONSULTING INC.

REV	M	D	Y	REVISION DESCRIPTION	DES	DRW	APP
B	09	25	19	ISSUED FOR REVIEW	JRP	JRP	---
A	09	21	19	ISSUED FOR REVIEW	JRP	JRP	---

NOT FOR CONSTRUCTION

PERMIT

DRAFT

ENGINEERS STAMP

CB POWERLINE LTD.
COSENS BAY POWER PROJECT

TITLE
WEST KALAMALKA LAKE
165 HIGHWAY 97
POWERLINE ROUTE

DATE 9/25/19

SCALE NTS

DWG. NO. 103-5

REV. B

Attachment 23.1

RDNO Rail Trail Information Package (Includes EIA)

CB Powerline Ltd.
Cosens Bay
Regional District of North Okanagan, BC

Via Electronic Submission

November 27, 2019

Regional District North Okanagan
ATTN: Mr. Mike Fox, GM of Community Services
9848 Aberdeen Road, Coldstream, BC, V1B 2K9

RE: Cosens Bay Power Project, Okanagan Rail Trail Crossing

Dear Mr. Fox,

CB Powerline Ltd. (CBP) is writing with respect to the Cosens Bay Power Project and the request to install a powerline beneath the Okanagan Rail Trail.

CBP is a community member founded business incorporated under the laws of the Province of British Columbia and its sole purpose is to undertake electricity supply to Cosens Bay, Regional District of North Okanagan, British Columbia.
The general project description is as follows: connect to the BC Hydro distribution system at 165 Highway 97 Vernon; run an underground powerline from the point of connection to Kalamalka Lake, cross the lake with submarine power cables, and build an underground residential distribution system to provide electricity to all land parcels within the Cosens Bay community.
To facilitate the landing of the submarine cables on the west side of Kalamalka Lake, a directional drill is required to install pipe from the 165 property into the lake, which will pass underneath the Okanagan Rail Trail.

CBP has applied to the province for crown land tenure across the lake and has the support of the 165 property owner.

CBP is providing this submission as background to enter into a formal crossing agreement with the RDNO as directed by the District Board in February.

Site Information

Legal Description: Lot A, Plan 29777, PID 004-188-764
Civic Address: 165 Highway 97 Vernon, BC

Project Description

Four high density polyethylene (HDPE) pipes will be installed from an underground splice box into Kalamalka Lake to facilitate the installation of power and communication cables. Using standard directional drill best practices, the HPDE pipe will be installed to a minimum depth of 1000 mm below existing grade along private land, it will then cross under the Okanagan Rail Trail at a minimum depth of 2 meters, and will terminate in the lake at an estimated depth of about 4 m below the lowest anticipated lake level.
Directional drilling has been chosen as the method for installation of the HDPE pipes; this will minimize environmental effects on sensitive fish and wildlife habitat (near Kokanee spawning and high value riparian/marsh area) as detailed in the attached Environmental Impact Assessment. Directional drilling will also avoid impacts to the Okanagan Rail Trail (disruption or disturbance). Four conduits for power and fibre optic cables will be drilled for a distance of approximately 150 m as shown on the attached drawings.

Project Contacts

CB Powerline:
Dave Ethier
david.m.ethier2@gmail.com
250.371.7831

Consulting Engineer:
Jim Pinter, P.Eng.
Pinter Electrical Consulting Inc.
jim@pinterco.ca
403.701.1563

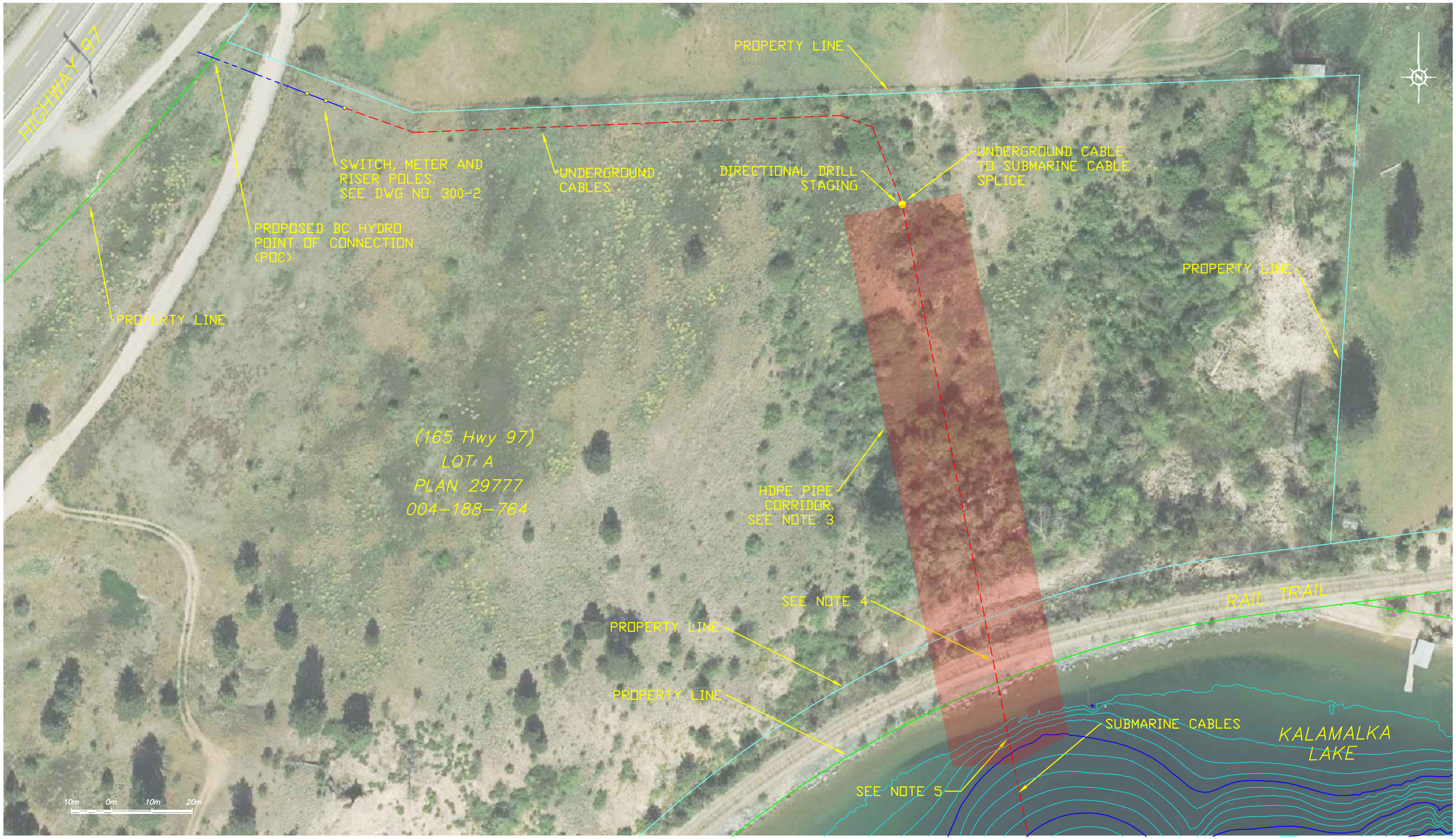
We trust this submission provides the necessary information for the RDNO to enter into a crossing agreement with CBP. Any questions or concerns please do not hesitate to contact the above noted parties.

Regards,

Jim Pinter, P.Eng.

Attachments to this letter:

1. Drawing 103-5 Revision E
2. Drawing 301-1 Revision A
3. Land owner Letter of Support
4. Project Environmental Impact Assessment



NOTES:

1. ALL PROPOSED EQUIPMENT LOCATIONS ARE PRELIMINARY AND SUBJECT TO TECHNICAL REVIEW AND REGULATORY APPROVAL.
2. PROPERTY LINES ARE APPROXIMATE AND SUBJECT TO CONFIRMATION AND LEGAL SURVEY.
3. INSTALLATION OF HDPE PIPES (4) BY DIRECTIONAL DRILL TO A MINIMUM DEPTH OF ONE METER BELOW GRADE. ALL DIRECTIONAL DRILLING TO BE WITHIN CORRIDOR BOUNDARIES, FINAL ALIGNMENT TO BE RECORDED ON AS-BUILT DRAWINGS.
4. POWERLINE CROSSES RAIL TRAIL AT COORDINATES 50.176481° LAT, -119.348890° LON, SEE DRAWING 301-1 FOR DETAIL.
5. HDPE PIPES EMERGE INTO KALAMALKA LAKE AT A MINIMUM WATER DEPTH AS REQUIRED BY THE PROJECT ENVIRONMENTAL IMPACT ASSESSMENT.

PINTERCO

PINTER ELECTRICAL CONSULTING INC.

REV	M	D	Y	REVISION DESCRIPTION	DES	REVW	APP
E	11	27	19	ISSUED FOR PERMITTING	JRP	JRP	
D	10	28	19	ISSUED FOR PERMITTING	JRP	JRP	---
C	10	20	19	ISSUED FOR PERMITTING	JRP	JRP	---
B	09	25	19	ISSUED FOR REVIEW	JRP	JRP	---
A	09	21	19	ISSUED FOR REVIEW	JRP	JRP	---

NOT FOR CONSTRUCTION

PERMIT

DRAFT

ENGINEERS STAMP

CB POWERLINE LTD.
COSENS BAY POWER PROJECT

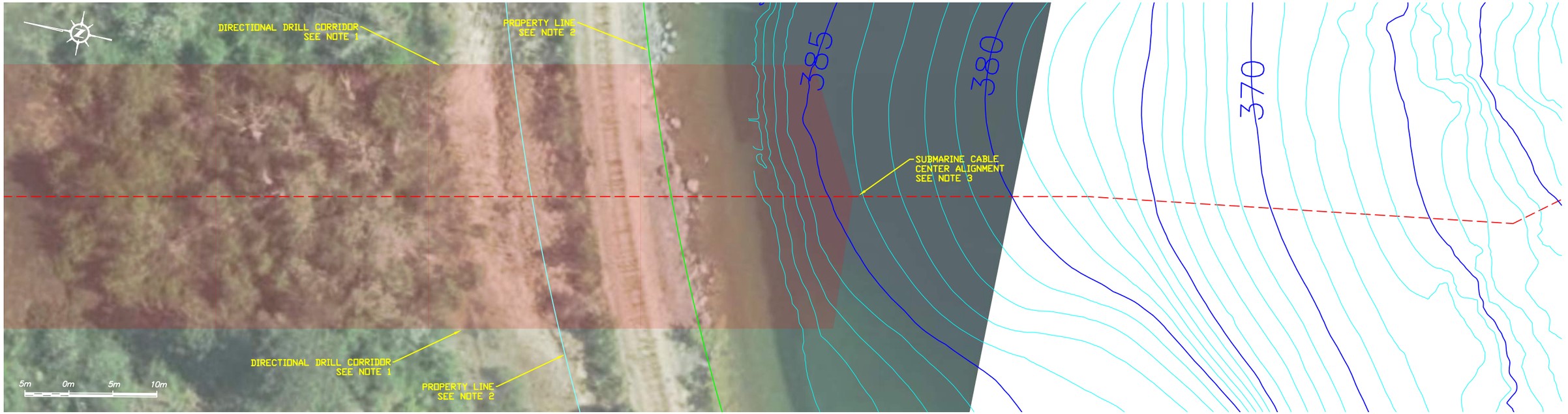
TITLE
WEST KALAMALKA LAKE
165 HIGHWAY 97
POWERLINE ROUTE

DATE 11/27/19

SCALE NTS

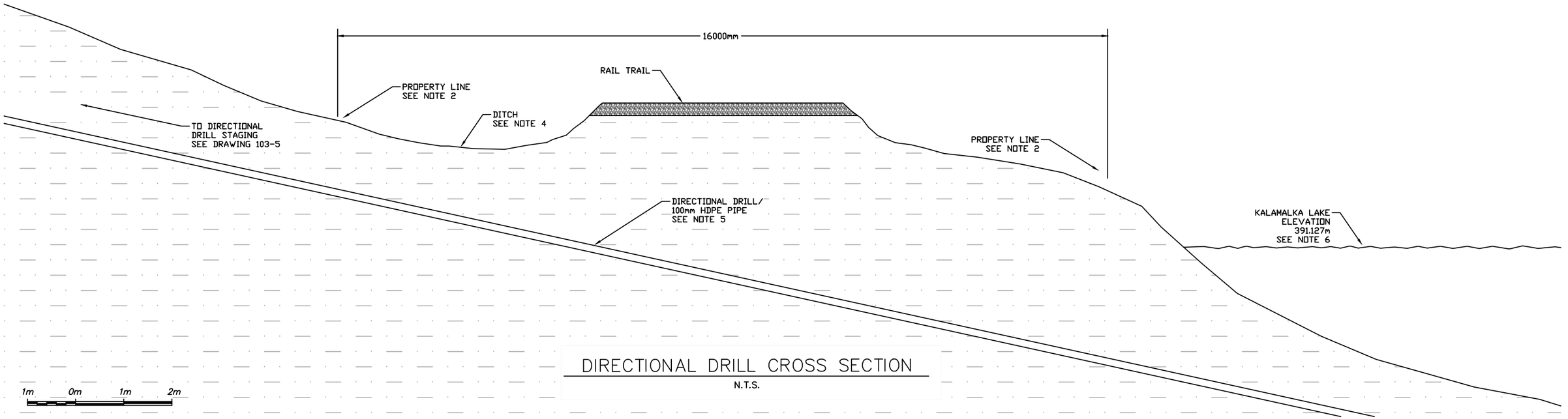
DWG. NO. 103-5

REV. E



DIRECTIONAL DRILL PLAN VIEW

N.T.S.



DIRECTIONAL DRILL CROSS SECTION

N.T.S.

NOTES:
1. ALL DIRECTIONAL DRILLING TO BE WITHIN CORRIDOR BOUNDARIES, FINAL ALIGNMENT TO BE RECORDED ON AS-BUILT DRAWINGS.
2. PROPERTY LINES ARE APPROXIMATE AND SUBJECT TO CONFIRMATION AND LEGAL SURVEY WHEN REQUIRED.
3. THREE SUBMARINE POWER CABLES AND ONE FIBRE OPTIC CABLE TO BE INSTALLED IN INDIVIDUAL 100mm HDPE PIPE.
4. A MINIMUM OF ONE METER CLEARANCE TO BE MAINTAINED BETWEEN BOTTOM OF DITCH AND TOP OF HDPE PIPE.
5. INSTALLATION OF FOUR 100mm HDPE PIPES TO A MINIMUM DEPTH OF TWO METERS BELOW RAIL TRAIL EXISTING GRADE.
6. LOWEST RECORDED LAKE LEVEL OF 391.127 METERS BASED ON VERNON CREEK HYDROMETRIC STATION 08NM143.
7. SEE ENVIRONMENTAL IMPACT ASSESSMENT FOR DIRECTIONAL DRILLING ENVIRONMENTAL MANAGEMENT PLAN.

PINTERCO

PINTER ELECTRICAL CONSULTING INC.

REV	M	D	Y	REVISION DESCRIPTION	DES	DRW	APP
A	11	27	19	ISSUED FOR PERMITTING	JRP	JRP	---

NOT FOR CONSTRUCTION

PERMIT

DRAFT

ENGINEERS STAMP

CB POWERLINE LTD.

COSENS BAY POWER PROJECT

TITLE
WEST KALAMALKA LAKE
RAIL TRAIL CROSSING
PLAN AND CROSS SECTION

DATE 11/27/19

SCALE NTS

DWG. NO. 301-1

REV. A

Alan and Mary Anne Woytuik
165 Highway 97
Vernon, BC V1H 1G1

October 17, 2019

CB Powerline Ltd.
Cosens Bay
Regional District of North Okanagan, BC
c/o John Keating, Chairman and Treasurer

Dear John,

We would like to express our support for the CB Powerline Ltd. Cosens Bay community power project located in the Regional District of North Okanagan. The project will deliver power to the residents of Cosens Bay, and we recognize the benefits the project will bring to the landowners who are currently without electricity.

Portions of the project powerline will cross over our land including access to Kalamalka Lake, recognizing portions of the powerline may be in the vicinity of a future water line and intake. We are currently working with CB Powerline to finalize agreements that will allow the project to proceed with installation of the powerline and associated infrastructure.

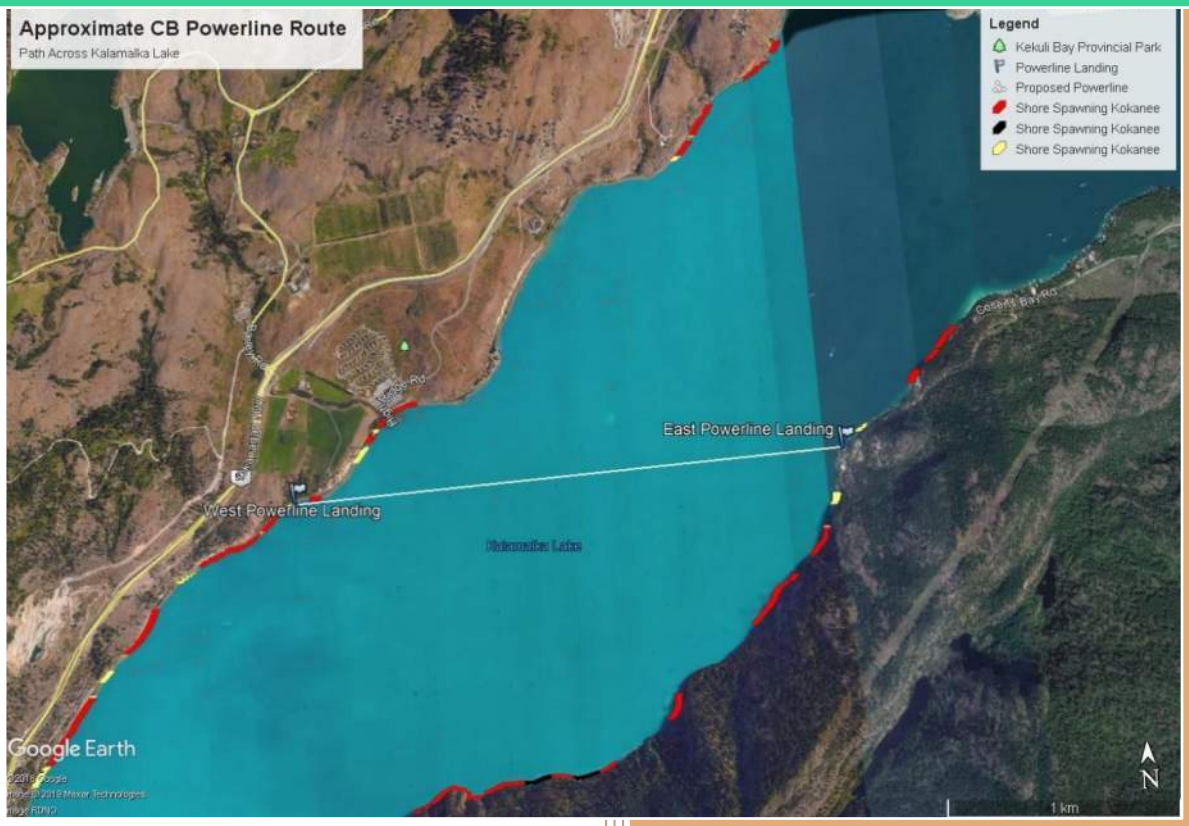
Accordingly, we strongly support the project and request that all regulators give the project due attention and facilitate its expeditious completion.

Sincerely,

Alan Woytuik Mary Anne Woytuik

2019

ENVIRONMENTAL IMPACT ASSESSMENT FOR A SUBMARINE POWERLINE ACROSS KALAMALKA LAKE, NORTH OKANAGAN, BC



Arsenault Environmental Consulting Ltd.
1059 Marathon Court, West Kelowna, BC, V1Z 3H9
(250) 300-9206, darryl.arsenault@gmail.com
Website: Arsenaultenv.ca

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Route 2C Corridor Drawing
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Appendix 2 – High Pressure Directional Drilling – DFO Ontario Operational Statement

1.0 PROJECT BACKGROUND

This Environmental Impact Assessment (EIA) and Environmental Management Plan (EMP) has been developed by Arsenault Environmental Consulting Ltd. (Arsenault) for the Cosens Bay Power Project (the Project). The Project consists of a connection to BC Hydro, installation of a 25 kV powerline and telecommunication line across Kalamalka Lake, and an electrical and telecommunication distribution system throughout the community.

The community of Cosens Bay is located along the east side of Kalamalka Lake in the Regional District of North Okanagan. It consists of approximately 100 land parcels and is surrounded on three sides by Kalamalka Lake Park, while its fourth side is formed by Kalamalka Lake. There are two subdivisions comprising the overall Cosens Bay community, the northern community referred to as Cosens Bay and the southern community referred to as Kalamalka Park Estates. There are approximately 75 cottages and homes built upon the land parcels. Land access to the area is limited to a gravel road (locally known as Cosens Bay Road) that traverses Kalamalka Lake Provincial Park to arrive at the community of Cosens Bay.

No third-party service provider has ever provided electrical service to Cosens Bay, the community has existed off-the-grid without power for over 60 years. Electrical generation has been on a property-specific basis and predominately involves the use of fossil fuel fired generators and to a lesser degree residential solar power. The Project as proposed by CB Powerline Ltd. is to provide electricity to the lot line of all 100 land parcels. Each individual land owner will be responsible for the installation of their individual electrical service to their respective revenue meter location.

The in-lake works include three components: 1) installing conduits for three power cables and one fibre optics cable under the riparian area, the Okanagan Rail Trail, and the shallow littoral zone on the west side of Kalamalka Lake; 2) installing conduits for three power cables and one fibre optics cable through the riparian and shallow littoral zone on the east side of Kalamalka Lake; and 3) pulling three power cables and one fibre optics cable through the conduits and laying the cables on the lake bottom across the lake.

The Project proposed by the applicant consists of the following key elements as detailed below:

Overhead point of connection to the BC Hydro 25 kV distribution system near Highway 97 Vernon: The Project point of connection (POC) equipment will be mounted on three wooden power poles in accordance with the BC Hydro Primary Guide. The major equipment located on the poles will include a load break switch, fused cut-outs, surge arrestors, and revenue metering including instrument transformers.

Underground 25 kV power cables from the POC to the submarine cable landing location and splice location: There will be three individual concentric neutral power cables from the POC to the splice location. The power cable characteristics are 25 kV, 1/0 Al, 100%, full Cu concentric neutral and will be direct-buried to a minimum depth of 1000 mm below grade.

West Side of Kalamalka Lake: Three high density polyethylene (HDPE) pipes will be installed into Kalamalka Lake to facilitate the installation of power and communication cables. The HDPE pipe will originate on-shore from a splice box and be installed underground down into the lake along private and public land. Using standard directional drill (DD) best practice, the HPDE pipe will be installed to a minimum depth of 1000 mm below existing grade along private land, it will then cross under the Okanagan Rail Trail at a depth agreed to by the Regional District of North Okanagan, and will terminate in the lake at an estimated depth of about 4 m below the lowest anticipated lake level (391.0 m according to information collected at Canadian Hydrometric Station 08NM143 (Kalamalka Lake at Vernon Pump House)).

Directional drilling has been chosen as the method of choice of installation of the power line at the 165 Highway 97 (west) side to minimize environmental effects on sensitive fish and wildlife habitat (near Kokanee spawning and high value riparian/marsh area). Directional drilling will also avoid impacts to the Okanagan Rail Trail (disruption or disturbance). Three conduits for power cables and fibre optic will be drilled for a distance of about 150 m starting about 55 m from a marsh area on the lower slope of the west side. The conduits would emerge into the lake at about 15 to 25 m from shore in about 4 to 7 m water depth.

East Side of Kalamalka Lake: Three HDPE pipes will be installed into Kalamalka Lake to facilitate the installation of power and communication cables to the community of Cosens Bay. The HDPE pipe will originate on-shore from a transition box and be installed underground down into the lake along private land in Kalamalka Park Estates. Bedrock is very close top the ground surface, meaning that directional drilling is not a feasible method. Using standard excavation best practice, the HPDE pipe will be installed to a minimum depth of 750 mm below existing grade on land and 750 mm below the lake shallow zone in water. This depth is based on experience installing a community water line in the same area. The excavation will terminate in the lake at an estimated depth of 1 meter below the lowest anticipated lake level of 391.0 m. The HDPE pipe will exit the excavation onto the lake bed at a water depth of 1 meter below the lowest anticipated level and continue on the lake bed to a minimum water depth of 5 meters. All exposed HDPE pipe will be protected with concrete covers which will then be covered with native rock to match the existing shoreline. Clean gravel and cobble suitable for shore-zone fish spawning will be used.

Submerged Power Line: There will be three individual concentric neutral submarine power cables and a submarine fibre optics cable installed across Kalamalka Lake starting from the splice junction box on the west side and terminating at a switching cubicle on the east side of the lake. The submarine cables will be installed one-at-a-time using a barge with cable installation equipment on-board, support boats, and divers as required. The installation route can vary somewhat depending on factors including lake bottom hazards and changing grade, cable tension requirements, and weather during installation. The submarine cables will be anchored on each end using accessories supplied by the cable manufacturer.

Table 1.0 below provides the general submarine cable specifications.

Type:	Single Conductor Submarine cable
Construction:	Galvanized Steel Wire Armour with outer serving of Polypropylene yarn
Conductor:	1/0 Aluminum
Concentric Neutral:	#2 AWG Copper
Rated Voltage:	25 kV
Insulation Rating:	100% XLPE
BIL:	150 kV
Application:	Fresh water lake, maximum depth 150 meters
Length:	3,385 m (includes distance from splice box on each side of lake) 3,175 m of cable on and under lake bed
Load:	700 kVA, 1-phase, residential
Connection:	BC Hydro, 24.94/14.4 kV, 3-phase

Table 1.0. Submarine Cable Specifications

Cables would be pulled through the conduits and lay on the lake bottom at approximately 25 to 75 m apart (to avoid crossing one another). The depth of the cable installation would vary from approximately 6 m water depth at the west side to 125 m in the middle of the lake and 5 m on the east side before routing back into the HDPE conduits.

Underground Residential Distribution (URD) Electrical System (14.4 kV): The URD system will consist of three individual 14.4 kV single-phase feeders, one feeder will supply electricity to Kalamalka Park Estates while the other two feeders will supply electricity to the residents of Cosens Bay.

The major equipment for the URD system includes underground power cable, fibre optic cable, 13 padmount transformers, 2 sectionalizing cabinets and one switching cubicle. The URD system will be designed to typical western Canada utility standards and adhere to all applicable codes and standards.

The power cable characteristics are 25 kV, #1 Al, 100%, full Cu concentric neutral and will be direct buried to a minimum depth of 1000 mm below grade. The URD system will be designed to typical western Canada utility standards using 14.4 kV / 240:120V padmount transformers to service groups of 8 – 12 land parcels.

Underground Secondary Electrical System (240V): The secondary electrical system consists of underground cables that connect each individual land parcel to a 240V collector that then connects to the padmount transformers. The secondary cables will be direct buried to a minimum depth of 750mm. The cable characteristics are USEB-90, 600V, 500 kcmil and 1/0 Al, full Cu concentric neutral.

Options Analysis: The Project considered multiple routes for connecting the community to the BC Hydro distribution system. As shown on the attached drawing, six possible options were evaluated based on criteria including:

BC Hydro distribution system access;

- Kalamalka Lake access;
- Submarine cable length;
- Favorable landowner negotiations;
- Environmental considerations;
- Construction challenges and feasibility; and
- Regulatory requirements.

Table 1.1 below compares six alternate connection configurations against a set of significant route selection criteria.

✓ indicates the selected criteria is a preferred option for the project
A indicates the selected criteria is acceptable to the project
X indicates the selected criteria is not a preferred option the project

Route Selection Criteria	1A	2A	1B	2B	1C	2C
BC Hydro POC proximity	A	A	✓	✓	A	A
Access to West Kalamalka Lake	x	x	✓	✓	A	A
Access to East Kalamalka Lake	A	✓	A	✓	A	✓
Landowner negotiations	x	x	✓	✓	✓	✓
Horizontal Directional Drill into Kalamalka Lake	x	x	✓	✓	A	A
Regulatory and environmental constraints	A	✓	A	✓	A	✓
Submarine Cable Length	✓	✓	x	A	x	A

Table 1.1. Comparison of Alternate Routes

The Project alternate connection evaluation identified two routes that met with the selection criteria, 2B and 2C. Further analysis of the routes was conducted to determine the best option for the Project and route 2C was selected as the best choice.

This document provides an environmental assessment and environmental management plan (EMP) for the west side directional drilling and east side HDPE pipe installation works for Route Option 2C. Additional details are provided in the attached revised Qualified Professional checklist (Appendix 1).

2.0 ENVIRONMENTAL ASSESSMENT

This Environmental Assessment and EMP outlines the work involved with the installation of a powerline along the bottom of Kalamalka Lake and includes:

- A site risk assessment to identify and address environmental concerns; and

- Procedures that will be in place in the event of an accident to contain and limit impacts to the environment.

This assessment references a document titled Approved Work Practices for Routine Electrical Cable Maintenance in Freshwater and Marine Coastal Areas (AWPCM). The AWPCM was developed by BC Hydro and BC Transmission Corporation and signed by Fisheries and Oceans Canada, the BC Ministry of Environment (Environmental Stewardship), BC Hydro, and BC Transmission Corporation in 2008. Best management practices are provided in the document and include measures that, when used, streamline regulatory approvals.

Field assessments were conducted during 14 November 2017, 16 May 2019, 06 June 2019, and 01 and 23 October 2019. The west and east shoreline areas were assessed from a boat and along shore transects. A qualified professional checklist was completed and is attached (Appendix 1). Photographs are provided in the checklist.

A bathymetric survey has been completed, which provides details of the lake bottom across the chosen alignment. Plots of the lake bottom conditions can be provided on request.

West Shore

The west shore connection to land starts near Highway 97 at Bailey Road. It will be trenched through private property after connecting to the BC Hydro grid. It will be directionally drilled to enter a south-facing bay that fronts the parcel of land at 165 Highway 97. The drilled powerline will cross under a grassland area that transitions down a slope into a riparian draw, then under a marsh wetland, under the Okanagan Rail Trail, under a rip-rap armoured slope, and under a shallow littoral shelf before emerging from a HDPE conduit into about 4 to 7 m water depth.

The grassland area is typical to the Ponderosa Pine / Bluebunch Wheatgrass Ecosystem Classification. The understory is composed of bunch grasses, lupins, and other native grassland species. Shrubs consist of Saskatoon Berry (*Amelanchier alnifolia*), Oregon Grape (*Mahonia aquafolium*), and Rabbit Brush (*Chrysothamnus viscidiflorus*).

The west side's shelf varies in width, depending on the location along the bay but at the point of recommended directional drilling the shelf is about 10 m wide at 3 m water depth. The lake bottom drops off to 4 m depth (the recommended minimum depth for emergence of conduits into the lake) at about 15 m from shore. The drop-off slope on the west side is covered with *Chara* spp., an aquatic weed that is actually algae (non-vascular plant). There is an existing pipe conduit under the Okanagan Rail Trail (see attached photo). There is also a water line for 165 Highway 97 that has been drilled under the Okanagan Rail Trail (J. Pinter, personal communication, 2019).

There is a wetland that has been mapped by the Foreshore Inventory Mapping project on the west side of the Okanagan Rail Trail (approximate location attached to QP Checklist). The wetland was dry during the October 2019 field surveys. The area was vegetated with Cattails (*Typha latifolia*), willows (*Salix* spp.), Red-osier Dogwood (*Cornus stolonifera*), and grasses. The riparian forest consists of Black Cottonwood (*Populus trichocarpa*),

Aspen (*Populus tremuloides*), Red-osier Dogwood, Black Hawthorn (*Crataegus douglasii*), Chokecherry (*Prunus virginiana*), Ponderosa Pine (*Pinus ponderosa*), Douglas Fir (*Pdeudostuga menziesii*), Bebb's Willow (*Salix bebbiana*), Water Birch (*Betula occidentalis*), Saskatoon Berry, Mock Orange (*Philadelphus coronaries*), Snowberry (*Symphoricarpos albus*), Roses (*Rosa* spp.), Oregon Grape, and grasses and forbes. Due to the directional drilling method of installation, none of the vegetation in the riparian draw above the wetland, in the wetland area, or the riparian area next to the lake will be disturbed by installation of the powerline on the west side of the lake.

Research was completed and background information was reviewed in context to potential effects on fisheries resources from installation and operation of a powerline through Kalamalka Lake. Directional drilling of three conduits for the three-phase powerline is an installation method that could have negligible effects on the riparian and aquatic environment. The excavation where drilling will commence will be placed > 120 m away from the lake and >50 m away from the marshy area upslope of the Okanagan Rail Trail. This greatly reduces the risk of drilling mud or other contaminants entering surface water and will avoid effects on riparian vegetation. The pipes will be buried at least 1 m underground, below vegetation root zones.

Kokanee (*Oncorhynchus nerka*) have been recorded spawning on the rocky point north of the west side crossing area. The Ministry of Forests, Lands and Natural Resource Operations has that area mapped as a red zone. It is located about 70 m to the east of the proposed cable egress point. There is a mapped yellow zone starting about 15 m to the west of the egress point. This information means that Kokanee could spawn within 15 m of the drill zone and that excessive sediment plumes could have a negative impact on developing eggs or alevins during late fall to early spring. There is no timing window restriction for instream work at the west side, as long as the alignment avoids the spawning zones. Regardless, care will be taken when installing the project powerline.

The marsh wetland can be protected from environmental impacts during powerline installation by providing adequate distance between the trench, upstream of the directional drilling pad, and the wetland. There will be over 55 m distance between the drill pad and the wetland. Arsenault recommends that an appropriately-installed silt fence, or berm, is placed between ground disturbance and the wetland. The disturbed areas in the grassland zone will need to be vegetated with a native grassland seed mix. Introduction of invasive weeds must be avoided.

Distance between Kalamalka Lake and trenching and drilling ground disturbance would also help to avoid impacts to the lake. Drilling the powerline below the riparian area and below the shallow littoral zone of the lake will minimize impacts to water quality, fish, and wildlife. An environmental management plan (EMP) is provided for guidance to protect from drilling mud impacts and potential fracturing-out during the drill program.

East Shore

The Ministry of Forests, Lands and Natural Resource Operations has the area at the east side of the crossing mapped as a no-colour zone. This means that there has been no recorded spawning activity of Kokanee (*Oncorhynchus nerka)* along this area of the

shore. This information also means that there is no timing window restriction for instream work at the east side of the crossing. In addition, there are no rare plants or invertebrates (particularly *Gonidea angulata*) mapped as present in either shore access area. This does not mean that rare species do not occupy the area but that there are no records. Rare and endangered species surveys were not completed for this study.

An assessment was conducted of the shoreline and nearshore habitat at the proposed egress site at Cosens Bay. The upland area consists of a trail that was previously constructed to the lake for the purpose of installing a water line for the Kalamalka Park Estates portion of the Cosens Bay community. The trail is maintained by trimming vegetation. There were no shrubs or trees observed along the proposed powerline route from the lake to the road at Kalamalka Park Estates. The shoreline substrate is composed of fractured rock. It is possible that Kokanee or other fish could spawn amongst the rocks in the nearshore area. A survey was conducted during the prime Kokanee shore-spawning season to confirm that Kokanee do not spawn where trenching is proposed. No Kokanee were observed in the area during the survey.

The east shoreline area is moderately shallow and has a littoral shelf of about 35 m wide and drops off to about 3 m deep at 18 m from shore. The drop off starts at about 9 m from shore on the east side where the water depth changes from about 1 m deep to 3 m deep over a distance of 6 m (33% grade). There is a band of aquatic macrophytes along the edge of the drop-off and a small bed of Eurasian aquatic milfoil (*Myriophyllum spicatum*) at the point that the water line emerges from the ground. These beds provide habitat for small fish, which in turn feed large predatory fish.

Bedrock is located very close to the surface at the trail area. The waterline emerged from the lakebed at only about 0.7 m below the water surface during 01 October 2019 when the water level was at 391.33 m.

The drop-off starts at about 12 m from shore. Schools of bait fish were noted among the milfoil bed at the drop-off and under the dock located immediately north of the proposed alignment. No native mussels were observed despite considerable time spent assessing the shore and via boat and underwater camera in the alignment area.

Submerged Powerline

Operation of the powerline will mean that electrical current will be passing through all three cables of the three-phase system. Electrical current creates electromagnetic radiation, which can have an effect on fish migration. Quinn and Brannon (1982) found that Sockeye Salmon fry and smolts were affected by electromagnetic fields (EMF) crossing their migratory pathways. They did not assess for effects on adult spawning Sockeye Salmon. Kokanee are land-locked Sockeye Salmon. Spawning Kokanee tend to move along the edges of the littoral zone towards shoreline areas where their ancestors have spawned over generations. In the case of Okanagan lakes, Kokanee are generally observed moving along the slope of drop-offs before moving into the shallows (about 0.3 m to 1.2 m) to spawn (J. Webster, Personal communication, 2019). The presence of shore spawning zones to the south and north of the powerline routes through the shoreline on the west and east side of the lake means that adult Kokanee spawners would migrate

along the shore at both locations. Because of the relatively low load current, and concentric neutral cable characteristics, the power cables will have low levels of EMF radiation. The distance that EMF could cause some effect would be limited to only a few centimetres (Normandeau et al. 2011). Bundling the cables through the littoral zone could mitigate the effect of EMF, although studies indicate that would not be necessary in this case (Normandeau et al. 2011). To be conservative, and to meet the guidelines provided in the Approved Work Practices for Routine Electrical Maintenance in Freshwater and Marine Coastal Areas, the power cables should be buried in the nearshore area (to between 1 and 2 m deep) in order to avoid affecting sensitive aquatic life, and particularly the ability of Kokanee Salmon to locate spawning beds near the west and east shore locations.

Powerlines laid on the lake bottom in deep water would be expected to have little effect on aquatic life as the lines are insulated and very lightly loaded and therefore will not generate much heat, and only a small electromagnetic field. Potential effects on aquatic life at depths in the lake are not known but assumed to be negligible. Kalamalka Lake owes its distinctive colour to the presence of limestone deposits left by receding glaciers. During the summer months when the lake temperature rises, the limestone crystallizes and yields the blue-green colour. Elevated water temperatures in the vicinity of the submerged cable may cause a localized increase in the concentration of blue-green limestone crystals, which is not an environmental concern.

3.0 ARCHAEOLOGICAL CONSIDERATIONS

FrontCounter BC was contacted to request information on the location of recorded archaeological sites in relation to the points that the powerline will enter and leave Kalamalka Lake. A record search was completed and no records were found for archaeological sites near 165 Highway 97 (west side) or near Kalamalka Park Estates (east side) (M.E. Grant, personal communication 16 October 2019). A careful search of the littoral zone would be prudent prior to excavation of the trench on the east shore. The directional drilling program on the west shore would avoid disruption of potential archaeological resources.

First Nations engagement was initiated by CB Powerline Ltd. via a phone call with Okanagan Indian Band and follow-up email correspondence. The correspondence will be attached within the FrontCounter BC applications.

4.0 GUIDANCE DOCUMENTS AND BMPS

The following provincial guidance documents and Best Management Practices (BMPs) have been referenced and included in the compilation of this EMP for the proposed works.

- BC MWLAP. 2004. Standards and Best Practices for Instream Works
- MFLNRO Habitat Officer’s Terms and Conditions for Changes in and about a Stream - Okanagan Region.

- Okanagan Region Large Lakes Foreshore Protocol http://www.env.gov.bc.ca/okanagan/esd/ollp/ollp.html
- High Pressure Directional Drilling – Fisheries and Oceans Canada, Ontario Operational Statement. Version 3.0.
- Approved Work Practices for Submarine Cable Maintenance https://www.bchydro.com/content/dam/hydro/medialib/internet/documents/bctc_documents/work_practices_submarine.pdf

Fisheries and Oceans Canada (known as DFO) has created an operational statement (OS) for high pressure directional drilling projects proposed in or near fish habitat (see Appendix 2 for an OS created for Ontario). The OS states that an emergency action plan should be in place to protect the lake in case a frac-out should occur. The project must also not damage the lake bed and negatively impact fish or fish habitat and must be monitored so that containment and cleanup of a potential frac-out can be implemented in a timely manner.

5.0 ENVIRONMENTAL MANAGEMENT PLAN

An EMP provides a framework to manage the environmental risks of a Project to reduce the potential for adverse effects. EMPs are a key component of attaining regulatory compliance and providing guidelines for determining that all environmental protection requirements are considered and carefully managed throughout the Project duration, from pre-construction planning to post-construction monitoring.

Directional drilling will occur from a drill pad located in a grassland about 100 m upslope of the Okanagan Rail Trail. Although the location is >140 m from Kalamalka Lake, there is the potential for spilled fluid to reach the lake via overland flow into the wetland.

Mitigation measures must be in place to prepare for a worst-case scenario. Works will also require an environmental monitor (EM) to be present on-site during instream works, which are expected to take about one week. The contractor conducting the work on Site must adhere to the recommended measures in this EMP, including those found in the Habitat Officer's Terms and Conditions (provided by the Province as part of the amended Water License). The contractor should organize a pre-construction meeting with the EM to review and discuss the EMP in advance of construction.

The Owner's Representative and subcontractor(s) will use the EMP as a guide to evaluate project impacts and develop work plans for the Project (including a schedule and subcontractor's responsibilities). The directional drilling subcontractor will provide their own environmental protection plans, including procedures to deal with potential frac-outs and drill hole failure (re-drill required).

In order to enable revisions to the EMP, Arsenault will require appropriate notice of any substantive changes to the proposed construction methods prior to implementing the change. This EMP will be a working document to accommodate any unforeseen circumstances that may occur during the Project.

Roles and Responsibilities

This section of the EMP describes the roles and assigns responsibilities to the Owner's Representative, the Site Inspector, the Contractor, and the independent Environmental Monitor (EM) for implementing, inspecting, and reporting on the effectiveness of environmental protection and mitigation measures during the construction of the Project.

The Owner's Representative and all subcontractors are responsible for the protection of environmental values in their work. Members of the Project team and those identified as subcontractor(s) will have professional responsibilities for environmental protection. These are outlined below.

Owner's Representative and Site Inspector

The current Owner's Contract Administrator for this project is Mr. Jim Pinter, P.Eng. Mr. Pinter may designate an on-site representative (Site Inspector) to monitor aspects of the proposed works. The Owner's Representative and/or the Site Inspector have the following responsibilities:

- Ensures that the EMP is communicated, accepted and implemented by the Contractor (or delegates this responsibility);
- Ensures that the EMP is revised as necessary (or delegates this responsibility);
- Ensures that environmental incidents are addressed and reported (or delegates this responsibility);
- Ensures that the commencement of work at new locations within the Project site and/or new activities does not occur until authorized to proceed by the EM; and
- Reports and assists in addressing all non-conformances with this EMP.

Overall management, implementation, and environmental performance of the Project are the responsibility of either the Owner's Representative or its sub-contractors and must be decided upon prior to start of the Project. The Owner's Representative or the Site Inspector will direct the work on the site while ensuring compliance with the requirements of the EMP, and any directions, orders, or recommendations made by the EM. As such, the Owner's Representative or the Site Inspector must ensure that all subcontractors are aware of the EMP through an environmental orientation, which will be delivered by the EM. Consequently, prior to commencing work, or in the course of completing components of the proposed work, the following issues will be addressed as appropriate:

- Aquatic (Fish and Fish Habitat) Protection;
- Sediment and Erosion Control;
- Invasive Plant Species (Noxious Weeds) Management;
- Site Restoration and Clean-up;
- Spill Response and Prevention;
- Environmental Incident Reporting; and

- Noise Control.

To assist in preparing these plans, recommended BMPs and other required environmental mitigation measures are provided in this EMP. The measures listed should not be considered to be exhaustive, and the the Owner's Representative or Site Inspector shall be responsible for ensuring that all of the regulatory requirements and provisions are met during construction planning, mobilization of equipment, and Project implementation.

Project Orientation and Meetings, Communication with Subcontractors

The Owner's Representative shall:

- With the assistance of the EM, maintain effective environmental communication among subcontractors through tailgate and other meetings so that environmental responsibilities and requirements are understood prior to the commencement of work; and
- Undertake regular inspections of the work and environmental monitoring programs to evaluate adherence to the EMP and regulatory requirements.

The Owner's Representative, assisted by the EM, is responsible for providing all Project personnel, operators, and any subcontractors with an orientation to the specific environmental issues encountered on the work site and their responsibilities with regard to environmental protection and incident reporting prior to the commencement of work. The Owner's Representative shall support the EM's role in this regard.

Work Practices

The Owner's Representative and subcontractors shall:

- Implement appropriate work procedures, instructions and controls to prevent and/or reduce adverse environmental impacts;
- Adhere to requirements set out in the EMP and all other permits and approvals; and
- Ensure Project site is restored to a safe, clean, and environmentally acceptable condition as per any requirements specified by the agencies (i.e., Ministry of Forests, Lands, and Natural Resource Operations and Rural Development, Fisheries and Oceans Canada, or Ministry of Environment) and the EM.

Incidents

The Owner's Representative, Site Inspector and Subcontractors shall:

- Respond to environmental emergencies and incidents immediately;
- Notify the EM and environmental agencies of spills of deleterious substances and other emergencies; and
- Provide documentation that corrective actions and preventative measures are undertaken in response to non-conformances with environmental approvals, the

EMP, and/or applicable environmental procedures in a timely and effective manner. Corrective actions and preventative measures shall be undertaken to the satisfaction of the EM and the agencies.

Compliance with Specifications

The Owner's Representative is responsible for ensuring that the powerline is installed in accordance with specifications provided in order to obtain permits. The design drawings should be kept onsite at all times and read in conjunction with the conditions of environmental reports and permits.

Submarine cable maintenance activities will be completed in accordance with BC Hydro's "***Approved Work Practices for Routine Cable Maintenance in Freshwater and Marine Coastal Areas (AWPCM)***" (http://www.bctc.com/NR/rdonlyres/D420E022-7E2B-4566-A8EEBE60CA276055/0/awpcm.pdf), which is an Appendix of the Protocol Agreement for Maintenance Work In and Around Water. The document was developed with input from various subject matter experts and was signed off by the Ministry of Environment, Fisheries and Oceans Canada, BC Hydro and BCTC (the "Partners") in 2008. This project should comply with the AWPCM wherever practical.

Compliance with Environmental Legislation and Regulatory Requirements

The Owner's Representative and Subcontractors shall observe and comply with all federal, provincial, municipal and local laws and regulations to ensure that construction work does not adversely affect environmental resources. In the event of conflict between the requirements set out in the EM's specifications and quality control laws, statutes, regulations and ordinances of federal, provincial, municipal or local agencies, the more restrictive requirements or regulations shall apply.

A violation of the environmental laws and regulations reported to the EM by the responsible agencies may result in the issuance of an incident report. Should the situation warrant more stringent measures, it may also result in the issuance of a stop-work order until the violation is corrected. The Owner's Representative and Subcontractors shall observe and comply with all terms and conditions of environmental approvals. Unless otherwise indicated or previously agreed to by the Owner's Representative, Subcontractors are responsible for all work needed to comply with the terms and conditions of environmental approvals. The Owner's Representative shall make copies of environmental approvals accessible to personnel on-site at a prominent and central location. These same approvals will be kept onsite for viewing by visiting regulators or inspectors.

Environmental Monitor

The EM shall inspect and monitor conditions at and in the vicinity of the Project to confirm that environmental requirements are met, including compliance with regulatory approvals and this EMP. The frequency of such inspection and monitoring efforts shall correspond to the location of construction activities, as well as to the environmental conditions (e.g., increased monitoring and inspection will be conducted during periods of inclement weather or drilling beneath the shallow foreshore area).

The EM will also:

- Communicate and monitor all environmental requirements to the Owner's Representative and its subcontractors;
- Install a sign that advertises the presence of an EM and provides contact information;
- Liaise with and provide technical advice to the Owner's Representative and its subcontractors;
- Report to and advise the Owner's Representative on effectiveness of mitigation measures being implemented, difficulties encountered, and how they were managed;
- Liaise with regulatory agencies (if necessary);
- Authorize the commencement of work at any new location and/or any new activity after evaluating the environmental issues as they apply to the work site, work practices and procedures;
- Monitor and evaluate compliance with work practices and procedures and the effectiveness of mitigation measures in this EMP;
- Verify that sufficient Emergency Spill Response Kits are available on site and appropriately stocked;
- Verify that a Spill Response Plan is posted onsite;
- Inspect site machinery prior to onsite mobilization and during construction for potential leaks and invasive weeds;
- Confirm that the Owner's Representative has a copy of the EMP and permits at the work site;
- Provide directions or recommendations to the Owner's Representative and its subcontractors for maintaining and/or improving mitigation measures, as necessary;
- Advise on methods to resolve non-conformances;
- Report all non-conformances with this EMP, under the direction of the Owner's Representative, to regulatory agencies; and
- Monitor water quality during the works. Turbidity levels exceeding provincial water quality criteria will result in a work stoppage until corrective actions are taken.
- Prepare a report that summarizes the work completed and includes a summary of environmental incidents, if any, of non-compliance, and the corrective actions taken or to be taken, such as environmental mitigation or enhancement works.
- In the unlikely event of an environmental incident, the EM will provide a report to the client and the Contractor, and if warranted, to applicable regulatory agencies as soon as practicable but within 24 hours of their response to an incident.

- **The EM has the authority to modify or halt any construction activity that is causing, or potentially causing, damage to fish and wildlife populations or their habitats**.
- Regular site visits will include but may not be limited to the following tasks:
  - Recording of weather and other environmental conditions, including the results of water quality monitoring. Water quality (turbidity) in the lake will be monitored prior to and throughout the works. Measurements will be taken in Kalamalka Lake within 15 m to 30 m to the south of the works location. Direction of water movement will be dependent on wind and current during instream works;
  - Overview of project construction progress;
  - Inspection of sediment control structures to assess conditions, and possible need for maintenance, repairs or replacement; and
  - Communications with the Contractor to discuss current observations and noted deficiencies or successes, to follow up on action items, and to anticipate and coordinate construction sequencing and tasks with erosion and sediment control practices.

Proposed Mitigation Timing

Given that the east side of the project site is located in a no-colour zone, there is no least risk timing window. The works can be done at any time of year, as long as appropriate mitigation measures are in place. Ideally, the trenching and powerline installation would occur during winter and low water when there is less biological activity and little boating activity.

Even though the west side passes within 15 m of a Kokanee spawning yellow-zone, directional drilling will avoid the potential spawning area. No timing window will be required.

Sediment and Erosion Control

Sediment-laden runoff is considered a deleterious substance that can adversely affect fish and fish habitat in Kalamalka Lake. The Owner's Representative and Subcontractors will make all practical efforts to implement sound measures of sedimentation control. In particular, frac-out of high-pressure drilling mud is of concern. The following recommended sediment control BMP's are derived from applicable municipal, provincial, and federal regulations and documents. These measures are not exhaustive and should be adapted by the Contractor as necessitated by changing site conditions.

The staging of trenching areas should be minimized and shall be conducted such that sediment is not allowed to reach surface water sources. A silt containment curtain shall be placed around the lake trenching site at the Kalamalka Park Estates site. The lake bottom shall be returned to the same condition post-construction as it was pre-construction. Fish salvage may be required and will be conducted at the discretion of the

environmental monitor. If fish salvage is required, the appropriate permit will be obtained before commencing salvage activities.

High pressure directional drilling (HPDD) can have negative environmental effects from disturbance within riparian or other sensitive areas, from leakage of drill mud or other deleterious substances from the drill site into watercourses, or from fracturing (frac-out) of high-pressure drill-mud into the lake from leakage through the lake bed. The size of staging directional drill areas should be minimized and shall be located in an area that is agreed upon by the Owner's Representative and the EM. The upland work site is planned to be located approximately 135 m from the highwater mark of Kalamalka Lake and 55 m from a marsh. In the lake, the work area can be contained on a barge. Divers will work from a boat and from a barge. The EM will have access to the work site from land and water (boat required).

Specific measures and practices will include but not be limited to the following.

- Drill deep enough below the lake bed such that a frac-out event is not anticipated. A geotechnical investigation in the lake has not been completed. Maintain at least an appropriate distance between the ground surface and the drill line until reaching the 386.0 m depth contour in the lake. The drill hole would be expected to exit at somewhere around 380 to 383 m lakebed elevation. According to the detailed bathymetric survey completed for the Project, the 380 m depth contour is about 25 m from the highwater mark on the shoreline (defined by MFLNRO as 392.2 m).
- Track sediment exiting from the drill exit in the lake. Shut down drill operations if sediment volume is excessive (as determined by the EM).
- Drilling could result in the creation of an exit hole in an undesirable location (e.g., too shallow or on the shoreline). If such occurs, back out the drill, plug that hole and re-drill at a different trajectory and or depth. Failed holes must be filled and capped as per Groundwater Regulations as specified in the *Water Sustainability Act.*
- Vegetation clearing should not be required for this project. No vegetation can be disturbed without prior approval from the EM. If trees are damaged within 15 m of a surface waterbody, replace with 3 native trees of at least 1.5 m height. If shrubs are damaged, they should be replaced with 2 shrubs of #3 pot size. Tree and shrub roots help to stabilize banks and prevent erosion. Trees and shrubs also provide valuable wildlife and fish habitat.
- The duration of works should be minimized to reduce the amount of time that the soil surface is disturbed.
- Utilize sediment control measures that are capable of continuous operation during both working and non-working hours. Have a containment path in place between the drill site and the marsh, and ultimately Kalamalka Lake, such that any spilled drill mud or pressurized release of drill fluids can be captured before reaching the recently restored riparian area of the lake.

- A pump truck should be onsite during the directional drilling operation so that spills can be removed from the area before they can reach the lake. Dispose of drill mud, cuttings and other waste material to an adequately-sized disposal site at least 150 m away from the lake. Slopes between the drill site and the lake are steep, necessitating extra distance for protection.
- Actively monitor drilling pressure and observed the lake areas above the drill route to check for frac-out events. If an event occurs, the drilling will be halted until a remediation plan is created. A new drill path may be required (see above regarding plugging of failed holes).

Maintenance of sediment control measures is the responsibility of the Contractor. It is expected that the Contractor will also inspect sediment control measures regularly. The EM's role is to oversee the Contractor's program and audit and report on their erosion control measures.

Water Quality

The Contractor will perform construction activities in a manner that prevents degradation of water quality and prevents sediment or sediment laden surface water runoff and debris from entering Kalamalka Lake. Turbidity measurements in Kalamalka Lake will be taken prior to instream activities and will be used as a baseline level for comparison purposes.

Sediment disturbance will be monitored by the EM to verify suitable water quality in the lake near the works. The following table contains guidelines for water quality allowances on aquatic life during instream works.

Table 1: Water Quality Guidelines for Turbidity (BC MOE 2001).

Maximum Induced Turbidity (NTU or % of background)	Maximum Induced Suspended Sediments (mg/L or % of background)
Change from background of 8 NTU at any one time for a duration of 24 hrs in all waters during clear flows or in clear waters	Change from background of 25 mg/L at any one time for a duration of 24 hrs in all waters during clear flows or in clear waters
Change from background of 2 NTU at any one time for a duration of 30 days in all waters during clear flows or in clear waters	Change from background of 5 mg/L at any one time for a duration of 30 days in all waters during clear flows or in clear waters
Change from background of 5 NTU at any time when background is 8 - 50 NTU during high flows or in turbid waters	Change from background of 10 mg/L at any time when background is 25 - 100 mg/L during high flows or in turbid waters
Change from background of 10% when background is >50 NTU at any time during high flows or in turbid waters	Change from background of 10% when background is >100 mg/L at any time during high flows or in turbid waters

Site Restoration and Mitigation Measures

There were no trees or shrubs identified in the trenching alignment on the east side during the site assessments. However, an inventory of riparian vegetation (shrubs within 15 m of the lake) damaged or removed in order to facilitate the works should be conducted by the EM. If regenerating shrubs or trees are discovered, appropriate replacement species will be determined based on the species removed and consideration of site-specific conditions relating to habitat and growth requirements. For replacement of shrubs, two #3 pot-size shrubs should be replanted for every single shrub removed (DFO 2010).

The shallow shelf areas of Kalamalka Lake will be avoided, where possible. Directional drilling is the preferred method. The drilling exit into the lake should be at about 4 m water depth, at low water, to avoid impacts to Kokanee and other sensitive aquatic organisms.

Trenching at the east shore must be completed in isolation to the main body of the lake by isolating the work area with an effectively-installed silt curtain. If fish salvage is required, the appropriate permit will be obtained before commencing salvage activities.

A silt fence may be required between drill sites and the lake. Often drillers will build temporary berms and drain pits. Regardless of the measures used, turbid water cannot be allowed to reach the lake.

An inventory of the selected trench alignment on the east side was recommended and conducted during Kokanee spawning to confirm that the area was not used by spawning Kokanee during fall 2019. Kokanee generally spawn along the shoreline of Kalamalka Lake between the middle of October and early November (J. Webster, personal communication, 10 October 2019). An inventory was conducted during 18 and 23 October 2019. Kokanee were not observed in the proposed trenching area on the east shore. Kokanee were observed in the nearshore area of the Kekuli Bay boat launch on both survey dates, indicating that the spawning survey was timed appropriately.

Regardless of the spawning survey results, the trenched area will be returned to natural conditions when it is back filled. Clean gravel will be placed over the concrete pads that will be placed to protect the HDPE conduits. Kokanee may spawn in the area in the future.

6.0 CONCLUSIONS

The EMP provides schedules, procedures, and mitigation measures to systematically manage the environmental priorities, responsibilities, and risks associated with the Project, including directional drilling and powerline installation in Kalamalka Lake. The primary risk associated with the Project is the potential for damaging aquatic species and habitat within and near Kalamalka Lake. However, if the Contractor adheres to the BMP's and mitigation measures provided in this Report (and that provided by the Habitat Officer), the Project can be completed with minimal adverse effects and no serious harm to aquatic species and habitat along the alignment.

7.0 REFERENCES

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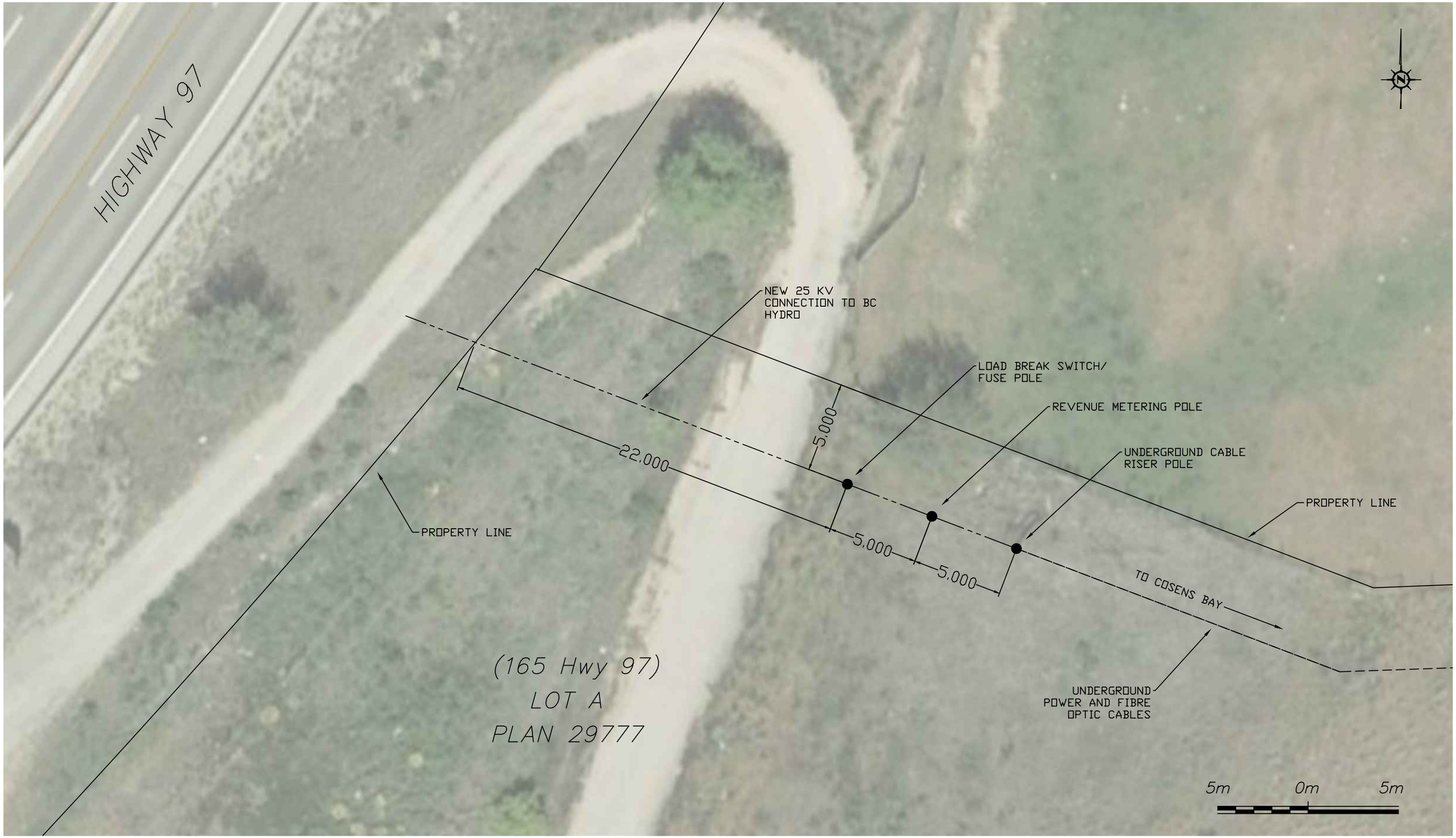
Regional District Central Okanagan (RDCO). Interactive web map viewing tool http://www.regionaldistrict.com, accessed 10 January 2019.

Attachment 28.1.1

BC Hydro Point of Connection



NOTES:
1. ALL EQUIPMENT LOCATIONS ARE PRELIMINARY AND SUBJECT TO TECHNICAL REVIEW AND REGULATORY APPROVAL.
2. PROPERTY LINES ARE APPROXIMATE AND SUBJECT TO CONFIRMATION AND LEGAL SURVEY
3. ESTIMATED DEMAND LOAD FOR THE PROJECT CONNECTION IS 300 KVA WITH POTENTIAL GROWTH TO 700KVA.

PINTERCO

PINTER ELECTRICAL CONSULTING INC.

REV	M	D	Y	REVISION DESCRIPTION	DES	DRW	APP
A	09	25	19	ISSUED FOR PERMITTING	JRP	JRP	---

NOT FOR CONSTRUCTION

PERMIT

DRAFT

ENGINEERS STAMP

CB POWERLINE LTD.
COSENS BAY POWER PROJECT

TITLE
WEST KALAMALKA LAKE
POINT OF CONNECTION (2C)
SITE LAYOUT

DATE 9/10/19

SCALE NTS

DWG. NO. 300-2

REV. A

Attachment 32.1

Revenue Meters

CENTRON® C12.19, C1SD, C1ST, C1SL

The CENTRON meter is a solid-state, single-phase residential electricity meter that provides utilities with unparalleled digital accuracy, reliability, serviceability and cost-effectiveness. The CENTRON meter is one of the most adaptable meters on the residential market, providing an array of communications and application options to meet current and future business needs.

With this solid-state meter, Itron presents a platform for residential metering with the flexibility to adapt as your needs expand and change.

This residential meter is available with interchangeable personality modules that snap into the standard CENTRON metrology base. The three multifunction modules available utilize the ANSI Tables protocol in a demand module (C1SD), a time-of-use (TOU) module with demand (C1ST), and a load profile modules with TOU and demand (C1SL).

FEATURES

All programming, register, demand, TOU, and load profile data are stored in electrically erasable programmable read-only memory (EEPROM) during a power outage. A battery maintains only the clock circuitry during a power outage.

Time of Use

This meter with optional I/O capability can be used in TOU residential applications where dual heating systems, such as electricity and a furnace, are present. When temperatures or peak load fall below a given threshold, the heating will automatically switch from an electric to a combustible or a water-heating source.

Typically, utilities offer different electricity rates for energy consumption based on the exterior temperature or peak load in the hopes of decreasing energy demand during cold peak periods. The rate switch in the meter is triggered by an external pulse input.

Non-Volatile Memory

All programming, register, TOU and load profile data are stored in the EEPROM during a power outage. A battery maintains only the clock circuitry during a power outage (except C1SD).

Optical Port Communication

Each module can be programmed to communicate at 28800, 19200, 14400 or 9600 baud through the optical tower.

Energy RF Transmission

- Optional R300 RF module available with 2 ERT or 3 ERT
- Each RF transmission contains the unit ID number, unit type, energy usage and tamper status, as well as the cyclic redundancy check (CRC) to ensure message integrity
- Transmit frequency: spread spectrum 910-920 Mhz
- Compatible with all Itron 900 MHz handheld, mobile and fixed network

data collection solutions, including ChoiceConnect™, Itron's premier automated meter reading (AMR) data collection suite

» Offers up to +20 dBm of output power

Self-Read Capability

» All meters are equipped with two self-read registers

» The C1ST and C1SL modules can be programmed to automatically store up to 12 additional self-read registers. Billing data can be stored automatically, at programmable times, to be read later

Load Profile

The C1SL module provides 144K RAM for up to eight channels of load profile data.

Bidirectional Metering

All three multifunction modules are capable of measuring and displaying delivered, received, net and unidirectional energy (kWh).

Expansion Capability

An expansion port is available for future I/O or communication functions.

Real Time Pricing Capability for C1STI/C1SLI

The TOU rate changes from its configured (default) rate to a new configured rate when the pulse state signal is active on the I/O board. When the pulse state signal becomes inactive, the rate will switch back to the default TOU configured rate

» Rate changes are configurable through PC-PRO+ ® Advanced software version 9.6 or later. No time synchronization is attempted using the pulse state rate change

» The rate change caused by the transition of the pulse state input is logged as a TOU rate change event in the event log. The number of transitions will be limited to not overflow the event log

Standard Features

» Electronic LCD Display

» Polycarbonate cover

» Demand reset

» Optical tower

» Test Mode push button

» Test LED

Features for C1STI/C1SLI

» >> 24V Pulse Input Board

Product Availability Technical Data

Meets applicable standards:

» ANSI C12.1 – 2008

» ANSI C12.10 – 2004

» ANSI C12.20 (Class 0.5) – 2010

» ANSI C12.1 – 2008

» ANSI C12.18 – 2006

» ANSI C12.19 – 2008

» IEC 61000-4-4 (2004)

» IEC 61000-4-2 (2001)

» FCC Part 15 Class B

Product Approval

» Measurement Canada Approval: AE-0920

Reference Information

» CENTRON Technical Reference Guide

» CENTRON C1S Specification Sheet

» Hardware Specification Form

Product Availablity

Meter Version	Class	Volts	Wire	Form	
C1SD	100	120	2	1S	G980850
C1SD	200	240	3	2S	G980852
C1SD	320	240	3	2S	G980854
C1SD	20	120	2	3S	G980855
C1SD	20	240	2	3S	G980856
C1SD	20	240	3	4S	G980860
CN1SD	200	120	3	12S	G980860
C1ST	100	120	2	1S	G980385
C1ST	200	240	3	2S	G980204
C1ST	320	240	3	2S	G980389
C1ST	20	120	2	3S	G980390
C1ST	20	240	2	3S	G980391
C1ST	20	240	3	4S	G980394
CN1ST	200	120	3	12S	G980394
C1SL	100	120	2	1S	G980397
C1SL	200	240	3	2S	G980182
C1SL	320	240	3	2S	G980400
C1SL	20	120	2	3S	G980404
C1SL	20	240	2	3S	G980405
C1SL	20	240	3	4S	G980407
CN1SL	200	120	3	12S	G980408
C1STI	200	240	3	2S	
C1SLI	200	240	3	2S	

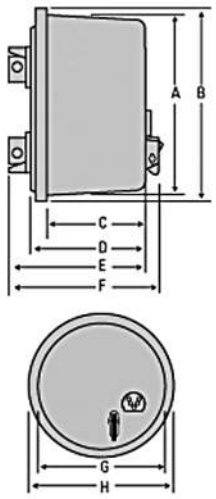
SPECIFICATIONS

Dimensions – Polycarbonate

A	B	C	D	E	F	G	H
6.29”	6.95”	2.7”	3.16”	4.53”	4.98”	6.29”	6.95”
16 cm	17.7 cm	6.9 cm	8 cm	11.5 cm	12.7 cm	16 cm	17.7 cm

Specifications

Power Requirements	Voltage rating: 120 V, 240 V Frequency: 60Hz (50Hz) Cell Relay Battery Voltage: 3.6V nominal Carryover: 10-12 year continuous usage or 15 year shelf-life Operating voltage: ±20% (60 Hz); ±10% (50 Hz) Operating range: ± 3 Hz Register Battery Operating Range: 3.4 V – 3.8 V External input signal: 24 VAC or ±12 VDC
Operating Environment	Temperature: -40ºC to +85ºC Humidity: 0% to 95% non-condensing
Transient / Surge Suppression	IEC 61000-4-4 ANSI C62.45-1992
Accuracy	ANSI C12.20 0.5 Accuracy Class
General	Demand interval lengths: Programmable from 1 to 60 minutes Demand calculation: Present, previous, cumulative, continuous cumulative, projected, 5 highest, peak demand
Time	Line sync: Power line frequency Crystal sync: ±0.01% @ 25° C; ±0.025% over full temperature range Battery: ±0.003% @ 25° C; ±0.02% over full temperature range Display: Nine-digit liquid crystal display Six-digit data height: 0.4” Three-digit code number height: 0.24” Annunciator height: 0.088” Display duration: 1-15 seconds Three-segment electronic load indicator
Characteristic Data	Starting watts: 5 watts
Burden Data	Voltage circuit: 1.35 W (Form 1S, 2S) 1.55 W (Form 3S, 4S, 12S, 25S, 2S CL320)
Current Coil	<0.5 VA (all forms)



Dimensions

Shipping Weights – Polycarbonate

Meter Per Carton	Box Weight (Approx.)
4	10 lbs / 4.54 kg
Meter Per Pallet	**Pallet Weight (Approx.)**
20	291 lbs / 132 kg

Attachment 33.2

Permits and Approvals Tracker

Permits and Approvals

Red text denotes revisions from previous version

Permit / Approval		Responsible Agency	Start or Application Date	Anticipated Approval Date	Requirement		Status
					Const	Ops	
Municipal							
M-001	Okanagan Rail Trail Crossing Agreement	**RDNO**	Nov 2019	Feb 2020	✓		• Motion of council issued • Attended meeting with RDNO staff to review requirements • Filed an information package with the RDNO on November 27,2019
Provincial Permits							
P-001	Road Use Agreement	**MOTI**	Nov 2019	Feb 2020	✓		• Attended meeting with MOTI staff to review requirements • Site meeting required with MOTI staff to review preliminary design • Attended site meeting with MOTI staff on October 24, 2019 • Submitted Road Use Agreement application on December 13, 2019
P-002	Water Sustainability Act (WSA)	**FrontCounter BC**	Nov 2019	Apr 2020	✓		• Target to submit by Oct 30, 2019 • Submitted Change Approval application on November 18, 2019
P-003	Crown Land Tenure for Kalamalka Lake crossing	**FrontCounter BC**	Nov 2019	Oct 2020	✓		• Target to submit by Oct 30, 2019 • Submitted Land Tenure application on November 18, 2019
P-004	Crown Land Tenure for KPE to Cosens Bay	**FrontCounter BC**	Jan 2020	Oct 2020	✓		• Submitted Land Tenure application on January 6, 2020
P-005	Road Use KAP68177 Agreement	**BC Parks**	May 2019	Sep 2019	✓		• Not Applicable
P-006	Connection Agreement	**BC Hydro**	July 2019	Sep 2020		✓	• Primary Service application filed July 22, 2019 • Change of location to POC notice provided to BCH Oct 3, 2019

Permit / Approval		Responsible Agency	Start or Application Date	Anticipated Approval Date	Requirement		Status
					Const	Ops	
P-007	Exemption From Part 3 of the UCA	**BCUC**	June 2019	Feb 2020	✓	✓	• BCUC application submitted June 13, 2019 • BCUC IR No. 1 received July 8, 2019 • CBP responses to BCUC IR No. 1 filed Oct 3, 2019 • BCUC IR 2 received December 19, 2019 • CBP responses to BCUC IR 2 filed January 16, 2020
P-008	Work in ALR Permit	**ALC**	Oct 2019	Mar 2020	✓		• Finalizing application for submittal • Application filed with the ALC on December 12, 2019
Federal Permits							
F-001	Self Assessment / Letter of Advice	**Fisheries and Oceans Canada (DFO)**	Jan 2020	Apr 2020	✓		• Submit in parallel with the WSA application • Letter of advice filed Jan 15, 2020
F-002	Navigable Waters	**Transport Canada**	Jan 2020	Feb 2020	✓		• No permit is required • Arsenault to provide written confirmation
F-003	Revenue Metering	**Measurement Canada**	Jan 2020	Aug 2020		✓	Activity not yet initiated
Other							
O-001	Private landowners Stat Right-of-Way Agreement	**CB Powerline**	June 2019	Mar 2020	✓	✓	• Option agreements signed by all west Kalamalka Lake land owners, formal agreements are being negotiated • Kalamalka Park Estates letter of support received. • Agreement executed with west Kal landowner • Review with KPE completed • Draft stat r/w agreements being prepared for west Kal landowner and KPE

Attachment 35.3

Newsletter #3

Cosens Bay Community Power Project

Project Update

The project has been moving forward with all aspects of project development including regulatory permits and approvals and engineering. Below is a summary of recent key activities.

British Columbia Utilities Commission (BCUC)

- The project team completed and filed responses to 30 pages of information requests (IR's) posed by the BCUC.
- The BCUC has now engaged BC Hydro with IR's.
- The project will receive a second set of IR's from the BCUC and interveners on December 16 with response due to the commission on January 19, 2020.
- Final arguments are due to the commission by February 13, 2020, with a decision to follow.

FrontCounter BC

The two permit applications listed below were filed with FrontCounter BC in November, the final approvals under these submittals is expected in Q2-Q4, 2020.

- Change Approval and Notification (Changes In and About a Stream); this permit is required for works on the foreshore of Kalamalka Lake.
- Crown Land Tenure Application; this is an application for a Statutory Right-of-Way across the bottom of Kalamalka Lake.

Okanagan Rail Trail

- A project information package was submitted to the RDNO that will lead to the execution of a crossing agreement; this will allow the project power cables to cross under the rail trail and into Kalamalka Lake. The project expects to have the agreement in place by Q1, 2020.

Ministry of Transportation and Infrastructure (MOTI)

- A permit application has been submitted to MOTI to allow for the installation of project infrastructure within the MOTI road right-of-way. The project anticipates receiving the MOTI permit in Q2, 2020.

Agricultural Land Commission (ALC)

- An application has been submitted to the ALC to allow project infrastructure to be installed on ALR lands on the west side of Kalamalka Lake. The project anticipates receiving the ALC permit in Q2, 2020.

BC Hydro

- The project re-submitted the Primary Service Connection application based on the most current point of connection.
- BC Hydro is currently working to secure land rights for their required line extension.
- BC Hydro will supply a cost estimate to connect after they have fixed a route for their line extension.

Engineering

- Preliminary locations have been selected for all equipment including the Low Profile Transformers (LPT) which will supply the individual lots with electricity.
- An electrical computer model has been created for the project. Preliminary load flow studies completed demonstrate that the electrical system will deliver acceptable power quality to all customers in the community under existing and future load demands.
- Electrical layout drawings for the community and interconnection have been created along with detail drawings including cable trenches and LPT locations.
- A detailed bathymetric survey of the lake bottom along the cable route has been completed.
- Investigations regarding requirements related to un-exploded ordinances is ongoing.

Construction

The construction of the project consists of three key components:

- West Kalamalka Lake: Interconnection to BC Hydro, installation of underground powerline, directional drilling under the Okanagan Rail Trail and into Kalamalka Lake.
- Kalamalka Lake: Installation of submarine cables across the lake and landed on-shore.
- Distribution System: Installation of underground cables and above ground low profile transformers.

The current construction schedule for the project is August 2020 through December 2020 and will be dependent on the project obtaining the necessary approvals and permits to proceed as outlined above.

The installation of the underground cables within the travelled roads of the community will likely require 8am – 4pm daily closures of certain road sections, as such full scale construction within the Cosens Bay community and Kalamalka Park Estates is not anticipated to commence until after the 2020 labour day long weekend.

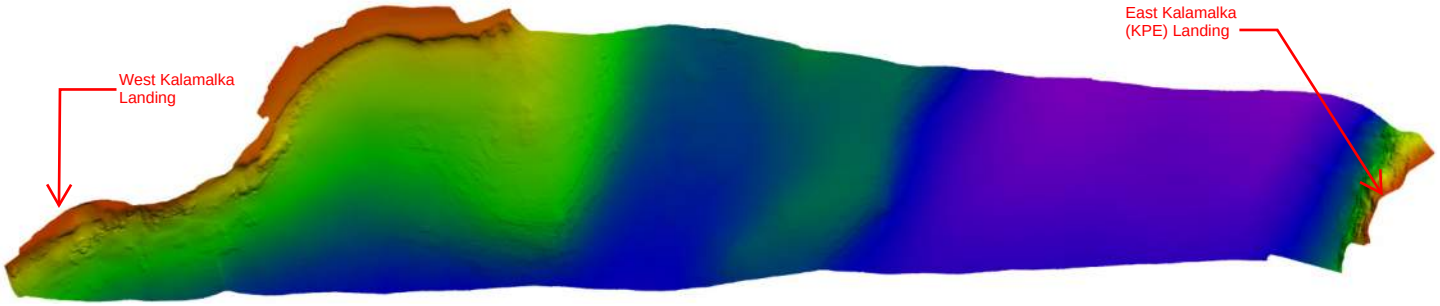
Project Feature - Bathymetry

The project has now completed the underwater survey of Kalamalka Lake for the submarine cable route, highlights include:

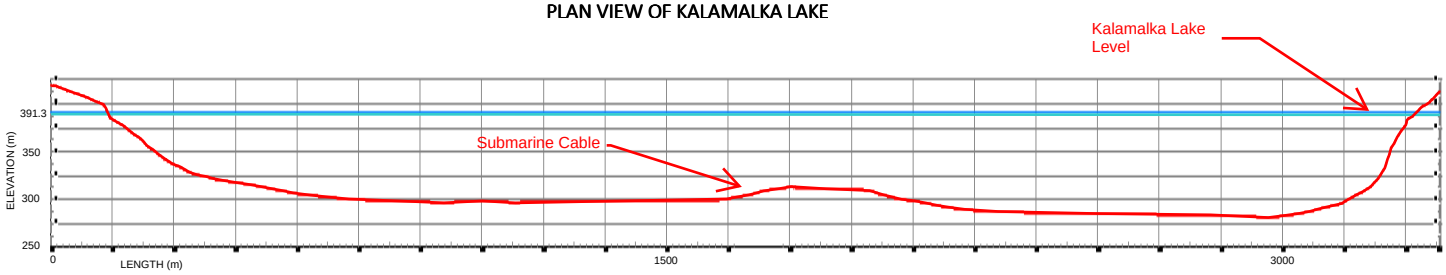
- A multibeam sonar survey which provided lake contours and the image below.
- A side-scan sonar survey which provided digital imagery of lake bottom features.
- Digital path files to be used by the submarine cable installation contractor.

From the bathymetry data, we have now determined the length of the submarine cable route to be approximately 3400 meters, with the deepest point on the route being 110 meters below lake level.

Based on the results of the underwater survey, the preliminary route was updated to avoid near shore features and mid lake steep grades. Below is a plan view of the lake bottom followed by a profile of the cable route.



PLAN VIEW OF KALAMALKA LAKE



PROFILE OF SUBMARINE CABLE ROUTE

Project Contacts:

Engineer and Project Managers:
Pinter Electrical Consulting Inc.
Jim Pinter
jim@pinterco.ca
403-701-1563

Owners' Representative:
Dave Ethier
CB Powerline Ltd.
David.m.ethier2@gmail.com
250-371-7831

Attachment 36.1

Construction Budget Rationale

Powerline Project Construction Budget - Route Alternative 2B

Item	Description	Prior Actuals	Total	Basis / Rational
1.0	**BC Hydro Point of Connection (POC)**			
1.1	POC Connection Equipment and Installation		$15,000	BC Hydro verbal quote with escalation
	TOTAL 1.0:		**$15,000**	
2.0	**POC to Submarine Cable Connection**			
2.1	Poles and Equipment		$37,500	ICI Engineering cost estimate increased to 3 phase [1]
2.2	Underground Power and Fibre Cable		$54,600	ICI Engineering cost estimate increased to 3 phase [1]
2.3	Splice - Underground Cable to Submarine Cable		$5,000	PEC cost estimate
2.4	Trenching, Cable Installation, Backfill and Remediation		$28,750	PEC cost estimate
	TOTAL 2.0:		**$125,850**	
3.0	**Submarine Cable Supply and Installation**			
3.1	Submarine Power and Fibre Cables Supply and Installation		$553,800	ITB Subsea budget pricing and ZTT cable quote
3.2	Barge, Support Boats, Divers		$25,000	Burton Marine budget pricing
3.3	Crane and Ground Support Equipment		$25,000	PEC cost estimate
3.4	Horizontal Directional Drill Kekuli Bay and Trenching Cosens Bay		$50,000	Ironman Drilling budget pricing
	TOTAL 3.0:		**$653,800**	
4.0	**Cosens Bay Electrical Distribution**			
4.1	Underground Power and Fibre Cable Supply		$123,200	ICI Engineering cost estimate [2]
4.2	Power and Fibre Cable Installation		$240,000	PEC cost estimate
4.3	Power and Fibre Equipment Supply and Installation		$366,750	PEC cost estimate
4.4	Secondary Cable Supply and Installation		$167,775	ICI Engineering cost estimate [2]
4.5	Civil Works		$52,000	PEC cost estimate
4.6	Testing and Commissioning		$25,000	PEC cost estimate
4.7	Rock & Earth Removal and Project Restoration		$75,000	PEC cost estimate
	TOTAL 4.0:		**$1,049,725**	
	Total Construction Costs			
	Construction TOTAL		**$1,844,375**	
5.0	**Non Construction Costs**			
5.1	Owner Insurance		$46,000	BFL Canada budget pricing
5.2	Engineering, Project and Construction Management	88,700	$196,300	PEC cost estimate
5.3	Regulatory - BCUC, BC Front Counter, MOTI, BC Hydro, RDNO	14,500	$105,000	PEC cost estimate
5.4	Legal		$75,000	CBP estimate
5.5	Land Agreements	15,000	$50,000	CBP estimate
5.6	Working Capital Reserve Fund		$200,000	CBP estimate
5.7	Construction Contigency at 10% Install		$58,678	CBP estimate
5.8	Surveying	12,700	$12,700	Actuals
5.9	Bank Charges	400	$400	Actuals
	TOTAL 5.0:	**131,300**	**$744,078**	
	TOTAL CAPEX		**$2,588,453**	

1. Project connection changed from single phase to 3 phase as requested by BCH.
2. ICI Engineering was previously engaged with the Project to review feasibility.

Powerline Project Construction Budget - Route Alternative 2C

Item	Description	Prior Actuals	Total	Basis / Rational
1.0	**BC Hydro Point of Connection (POC)**			
1.1	POC Connection Equipment and Installation		$45,000	PEC cost estimate
	TOTAL 1.0:		**$45,000**	
2.0	**POC to Submarine Cable Connection**			
2.1	Poles and Equipment		$37,500	ICI Engineering cost estimate increased to 3 phase[1]
2.2	Underground Power and Fibre Cable		$18,991	ICI Engineering cost estimate increased to 3 phase[1]
2.3	Splice - Underground Cable to Submarine Cable		$5,000	PEC cost estimate
2.4	Trenching, Cable Installation, Backfill and Remediation		$30,000	PEC cost estimate
	TOTAL 2.0:		**$91,491**	
3.0	**Submarine Cable Supply and Installation**			
3.1	Submarine Power and Fibre Cables Supply and Installation		$596,100	ITB Subsea budget pricing and ZTT cable quote
3.2	Barge, Support Boats, Divers		$25,000	Burton Marine budget pricing
3.3	Crane and Ground Support Equipment		$25,000	PEC cost estimate
3.4	Horizontal Directional Drill Kekuli Bay and Trenching Cosens Bay		$50,000	Ironman Drilling budget pricing
	TOTAL 3.0:		**$696,100**	
4.0	**Cosens Bay Electrical Distribution**			
4.1	Underground Power and Fibre Cable Supply		$123,200	ICI Engineering cost estimate[2]
4.2	Power and Fibre Cable Installation		$240,000	PEC cost estimate
4.3	Power and Fibre Equipment Supply and Installation		$366,750	PEC cost estimate
4.4	Secondary Cable Supply and Installation		$167,775	ICI Engineering cost estimate [2]
4.5	Civil Works		$52,000	PEC cost estimate
4.6	Testing and Commissioning		$25,000	PEC cost estimate
4.7	Rock & Earth Removal and Project Restoration		$75,000	PEC cost estimate
	TOTAL 4.0:		**$1,049,725**	
	Total Construction Costs			
	Construction TOTAL		**$1,882,316**	
5.0	**Non Construction Costs**			
5.1	Owner Insurance		$46,000	BFL Canada budget pricing
5.2	Engineering, Project and Construction Management	88,700	$196,300	PEC cost estimate
5.3	Permitting - BCUC, BC Front Counter, MOTI, BC Hydro, RDNO	14,500	$105,000	PEC cost estimate
5.4	Legal		$75,000	CBP estimate
5.5	Land Agreements	15,000	$15,000	CBP estimate
5.6	Working Capital Reserve Fund		$200,000	CBP estimate
5.7	Construction Contigency at 10% Install		$58,920	CBP estimate
5.8	Surveying	12,700	$12,700	Actuals
5.9	Bank Charges	400	$400	Actuals
	TOTAL 5.0:	**131,300**	**$709,320**	
	TOTAL CAPEX		**$2,591,636**	

1. Project connection changed from single phase to 3 phase as requested by BCH.
2. ICI Engineering was previously engaged with the Project to review feasibility.