



**IN THE MATTER OF**

**FORTISBC INC.**

**CUSTOMER COMPLAINTS REGARDING  
THE NARAMATA SUBSTATION PROJECT**

**DECISION**

**October 12, 2007**

**Before:**

**L.F. Kelsey, Panel Chair and Commissioner  
L.A. O'Hara, Commissioner**

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**COMMISSION ORDER NO. G-124-07**

## **APPENDICIES**

- APPENDIX A LIST OF APPEARANCES
- APPENDIX B LIST OF EXHIBITS

## **1.0 BACKGROUND**

The community of Naramata is located on the east side of Okanagan Lake, adjoining the City of Penticton. This agricultural area is supplied by a single radial 63 kV line from RG Anderson Terminal station in Penticton. The demand for load in Naramata has exceeded the substation capacity and the existing site of the Naramata Substation is not suitable. The 2006/07 winter peak load was 125 percent of the emergency nameplate rating of the existing transformer [4.2 MVA] (Exhibit B-5, BCUC IR 1, p. 1). A rebuild of the substation at another site is required to meet load requirements, improve reliability in the area and ensure employee safety (Exhibit B-1, p. 1).

FortisBC Inc. (“FortisBC” or the “Company”) applied to the British Columbia Utilities Commission (“BCUC” or “Commission”) for approval of the Naramata Substation Project (the “Project”) as part of its 2005 Revenue Requirements, System Development Plan and Resource Plan Application (the “Application”), which included the 2005 Capital Expenditure Plan. Following an oral public hearing to review the Application, the Project was approved by way of Order No. G-52-05 (Exhibit B-2, p. 1). That approval by the Commission acknowledged site relocation but was not site specific.

Subsequent to the Commission issuing Order No. G-52-05, FortisBC, in reliance upon the order, undertook substantial work in furthering the development of a new substation in Naramata. On July 13, 2006 the BCUC requested FortisBC to provide information on the Project in response to comments from a number of area residents opposing the substation site selected by FortisBC. On July 21, 2006, FortisBC responded to the Commission’s request for a report on the status of the Project (the “July 21 Status Report”). This report outlined the regulatory history of the project to date and stated that the Company:

- “Identified approximately 20 properties which were considered as possible sites for the substation, and that seven were further investigated;
- Held discussions with elected community representatives and area residents to identify possible sites;
- Submitted and was denied an application to the Agricultural Land Commission (“ALC”) for non-farm use for a property deemed suitable in terms of terrain and transmission accessibility. There is no appeal process in this matter;

- Acquired and successfully applied to the ALC for non-farm use of the Arawana Road site, and submitted a rezoning application to the Regional District of Similkameen (“RDOS”); and
- Provided artist’s rendering or photographs of the existing substation, the site rejected by the ALC, at the Fire Hall site, and at the Arawana Road site, demonstrating that the visual impact is least at the Arawana Road site” (Exhibit B-2, p. 2).

On August 11, 2006, FortisBC responded to the BCUC’s Information Request No. 1. The responses:

- “Summarized the site-specific factors used to evaluate potential sites and ultimately leading to its preference for the Arawana Road site;
- Explained that expropriation of land for rights of way would allow the present land use to continue with minimal impact, while expropriation of land for a substation site would require a fee-simple land purchase; and
- Described the engineering and operating constraints of the Fire Hall site if the substation were to be constructed there” (Exhibit B-2, p. 3).

In Exhibit B-2 at page 3 FortisBC cites the following chronology of events leading to its decision to confirm the selection of the Arawana Road site for the Project.

On September 15, 2006, the Company provided further engineering and cost information related to the Fire Hall site and indicated that an update would be provided following discussions with the Ministry of Transportation (“MOT”).

On October 26, 2006, FortisBC advised that the RDOS Naramata Advisory Planning Committee (“APC”) had assessed the rezoning application for the Arawana Road site and had voted in favour of changing the zoning to allow the substation to be constructed and operated at the Arawana Road site if the Fire Hall site was determined to be unsuitable.

A Project Update was filed with the Commission on November 16, 2006, identifying a number of issues requiring input from external parties or agencies required to complete its evaluation of the Fire Hall site.

On February 14, 2007, FortisBC confirmed by letter that the technical issues related to constructing the substation at the Fire Hall site could be addressed, and that the Company was assessing the cost impacts of the required modifications. FortisBC stated that, if the cost of construction at the two sites was comparable, and if the substation could be adequately screened, an application to acquire the property would be submitted to the provincial government.

On March 15, 2007, the Company provided information that the design modifications required at the Fire Hall site would increase costs by between \$700,000 and \$1,100,000. FortisBC is of the view that the restricted size of the Fire Hall site also gives rise to a number of operational and safety issues, is limited in its ability for visually screening the substation, and limits the FortisBC's options with regard to meeting future load growth in the area. In consideration of these issues, FortisBC stated its intention to proceed with constructing the substation at the Arawana Road site.

Following the FortisBC decision to proceed with construction of the substation at the Arawana Road site the Commission received a considerable amount of correspondence referencing concerns about FortisBC's decision to proceed at the Arawana Road site and requesting that the Commission require FortisBC to apply for a Certificate of Public Convenience and Necessity ("CPCN") for the Project and hold a public hearing into the matter.

By letter dated April 10, 2007 FortisBC submitted that there is no basis for revisiting Order No. G-52-05 as it included approval for a new substation in Naramata, and that the BCUC should confirm that FortisBC may continue to rely on the existing CPCN for the substation and proceed with the rezoning application process and, if obtained, construction and operation of the new substation. However, in the event the BCUC determines that some form of further review is required relating to the site for the new substation, FortisBC submitted that any further review of the site should not require a further process, such as a CPCN application, as a CPCN has already been granted.

It was FortisBC's view that as site selection is the only issue, the substantial costs of preparing and filing an application such as a CPCN are not justified or necessary. FortisBC further noted that the BCUC has jurisdiction, in these circumstances, under Section 82 of the Utilities Commission Act to inquire into the issue of site selection and, accordingly FortisBC suggested that the BCUC, if felt

necessary, exercise a more limited, cost effective jurisdiction. “Such a process should not include further information requests, and should, at the maximum, consist of oral submissions by interested parties, followed by FortisBC’s written response” (Exhibit B-2, p. 6).

FortisBC notes that on August 11, 2006, in correspondence with Mr. Karow, Mr. Brown, Mrs. and Mr. Stewart, the Commission stated that “the Project was part of an application that was reviewed in an oral public hearing and that FortisBC is deemed to have a CPCN for the Project” (Exhibit B-2, p. 3).

The Commission considered the submissions that it received on the matter and concluded that an oral public hearing into the siting of the substation was required and issued Commission Order No. G-42-07 which contained the following directions:

1. The Commission directs that any construction work on the Project will be suspended immediately in an orderly and safe manner, pending further instructions from the Commission.
2. Pursuant to Section 82 of the Utilities Commission Act (the “Act”), the Commission establishes an oral public hearing into Project siting options and related costs and issues. The Regulatory Timetable, date, time and location of the hearing will be determined in a future Order.
3. The Commission directs FortisBC to file a Report comparing the Arawana and Fire Hall siting alternatives, and such other siting options as FortisBC wishes to include, by Monday, April 30, 2007. The Report will provide the information identified in Appendix A and may include the FortisBC letter dated April 10, 2007 to the Commission.
4. When it files the Report, the Commission requests FortisBC to provide a proposed Regulatory Timetable for the hearing, which includes one set of written Information Requests.
5. FortisBC will publish, by Wednesday, April 25, 2007 or as soon as possible thereafter, in display ad format, the Notice of Oral Public Hearing attached as Appendix B to this Order, in the appropriate sections of local news publications that will properly provide adequate notice to the public in the Naramata area.
6. FortisBC will provide a copy of this Order to all parties that attended the November 1, 2006 public information session or who have otherwise contacted it regarding the Project, to the extent it is possible to do so.
7. Intervenor and Interested Parties are to register with the Commission, in writing, by Monday, May 7, 2007.

Commission Order No. G- 51-07 established the Regulatory Timetable for the review of the Project siting options and related costs and issues. Letter No. L-40-07 sought input on the draft Hearing Issues List for the Oral Public Hearing.

An Oral Public Hearing was held in Penticton on July 24, 2007. At that time the Commission Panel also provided an opportunity for Intervenors who were not represented by Counsel to make a brief oral submission.

The Regulatory Timetable required FortisBC to file Final Argument by July 31, 2007, Final Argument by Intervenors by August 9, 2007 and Reply Argument by FortisBC by August 17, 2007 (Exhibit A-13). By letter dated August 17, 2007 Naramations Against the Fortis Substation (“NAFS”) requested permission to file a reply to certain points made in FortisBC’s Final Argument. By letter dated August 22, 2007 FortisBC indicated it “does not object to the Commission receiving NAFS’ additional submission” (Exhibit B-22, p. 2).

## **2.0 DECISION MAKING PROCESS**

As described in Section 1.0 the Naramata Substation Project (“Project”) was included in the FortisBC 2005 Capital Expenditure Plan that formed part of the 2005 Revenue Requirements, System Development Plan and Resource Plan Application. The Application was reviewed in an oral public hearing and approved by Commission Order No. G-52-05.

Section 45(2) of the Utilities Commission Act (“UCA”) states that a public utility is deemed to have a CPCN to construct and operate extensions to a public utility system or facility that it is operating, unless pursuant to Section 45(5) the Commission orders that Section 45(2) does not apply in respect of the extension. As the Commission did not make an Order requiring a CPCN application for the Project, FortisBC is deemed to have a CPCN for the Project (Exhibit B-2, Appendix B).

In response to public concerns regarding the site selection process, FortisBC pointed out that there has been no application by any interested party to the BCUC for a reconsideration of Order No. G-52-05. Furthermore, submits FortisBC, even if any such application had been made



there was no basis for such reconsideration nor would the tests for reconsideration established by BCUC be met (Exhibit B-2, pp. 1-2).

The Commission Panel confirms that the regulatory process established by Order No. G-42-07, which involved an oral public hearing into Project siting options and related costs and issues, was not a reconsideration of the CPCN deemed to have been granted. Rather, it was an extraordinary process, which is rarely undertaken by the Commission to review the Arawana Road and Fire Hall siting alternatives to address the public concerns.

Usually a public utility is able to address local opposition to the siting of a substation by way of comprehensive due diligence in the site selection/acquisition process, consultation with local government and residents as well as introduction of sufficient mitigation measures. However, Naramata is a very small agricultural, residential and agri-tourism community with a population of approximately 2,000 residents located in the heart of the South Okanagan Valley, on the east side of Lake Okanagan. Its orchards, vineyards and pristine nature appeared to render the siting of the Naramata substation more challenging than sitings in some other communities. Furthermore, in a small community choices are fewer, which means that options pursued can result in a fragmented community spirit.

Prior to issuing Order No. G-42-07 in response to concerns and complaints from local residents, the Commission considered other alternatives such as allowing FortisBC to continue without BCUC intervention, relying on the local zoning authority to gauge the public interest issues and reopening the CPCN process. Because of the characteristics of the Naramata community the Commission found the concerns over the site selection process had escalated to a level where broader public interest issues had to be addressed in a regulatory proceeding. Therefore, the Commission reluctantly decided to proceed with an oral public hearing. However, in recognition of the significant site evaluation work undertaken by FortisBC, as described in Exhibit B-2, Appendix A, the Commission decided to limit the scope of the oral hearing to a review of the two sites and not include in its deliberations, a larger number of alternate sites.

As summarized in the FortisBC's Opening Statement for the Oral Public Hearing:

"The three main options for consideration at this Inquiry are as follows:

- The Fire Hall site;
- The Arawana Road site with an above ground or underground cross-country transmission tie; and
- The Arawana Road site with an above ground or underground transmission tie constructed along Arawana Road.

Not one of these options will attract unanimous agreement of stakeholders and the residents of the Naramata area" (Exhibit B-9, p. 4).

Due to the rather unusual nature of the proceeding, the decision making process and broader public interest issues will be addressed in further detail to set the foundation for this Decision.

## **2.1 Broad Public Interest Issues**

By Order No. G-42-07, as mentioned above, pursuant to Section 82 of the UCA the Commission established an oral public hearing into Project siting options and related costs and issues. Section 82 gives the Commission "Power to inquire without application" as follows:

(1) The commission

- (a) may, on its own motion, and
- (b) must, on the request of the Lieutenant Governor in Council,

inquire into, hear and determine a matter that under this Act it may inquire into, hear or determine on application or complaint.

(2) For the purpose of subsection (1), the commission has the same powers as are vested in it by this Act in respect of an application or complaint.

When the Commission considers evidence before it its primary focus is to determine which project alternative is in the public interest and what constitutes public convenience and necessity. The UCA does not define public interest or public convenience and necessity. However, the Commission has been referred to several court cases in previous proceedings and these cases have been documented in previous Commission Decisions. Some of these cases are referenced from the Vancouver Island Generation Project (“VIGP”) Decision, pp. 74-77 and Vancouver Island Transmission Reinforcement Project (“VITR”), pp. 10-16 as follows:

In the *Memorial Gardens* case, the Supreme Court of Canada stated that it would “... be both impractical and undesirable to attempt a precise definition of general application of what constitutes public convenience and necessity ... the meaning in a given case should be ascertained by reference to the context and to the object and purposes of the statute in which it is found” (para. 8). The Court continued as follows:

“As this Court held in the *Union Gas* case, *supra*, the question whether public convenience and necessity requires a certain action is not one of fact. It is predominantly the formulation of an opinion. Fact must, of course, be established to justify a decision by the Commission but that decision is one which cannot be made without a substantial exercise of administrative discretion. In delegating this administrative discretion to the Commission the Legislature has delegated to that body the responsibility of additional cemetery facilities, and in reaching that decision the degree of need and of desirability is left to the discretion of the Commission.”

In the VIGP Decision the Commission concluded that “... the test of what constitutes public convenience and necessity is a flexible test” (p. 76). In VITR Decision the Commission “... accepted the submissions of BCTC that there is a broad range of interests that should be considered in determining whether an applied-for project is in the public convenience and necessity.” The Commission also ruled that “... because the facilities are high voltage transmission lines and in the backyard of residents, the Commission Panel concludes that private interests should be considered in the circumstances of this Decision, although such interest may not be afforded the same weight as the interests of Vancouver Island customers in receiving adequate and reliable power.”

Furthermore, "... the task is not to select the least cost project, but to select the most cost-effective project" (VITR, p. 15).

In the VIGP Decision the Commission Panel listed considerations of "cost effective" as including "... safety, reliability and other impacts are relevant factors, along with the cost to ratepayers and the impact on the financial capability of the utility" (VIGP, p. 77; VITR, p. 14).

In the *Nakina*, the Court found the Railway Transport Committee erred in its failure to consider certain evidence, which the Court considered formed part of the general totality of the general public interest. In the VITR Decision, the Commission noted that the Court went on to state:

"For clarity, however, I would emphasize that the error lies simply in the failure to consider. Clearly the weight to be given to such considerations is a matter for the discretion of the Commission, which may, in the exercise of that discretion, quite properly decide that other considerations are of greater importance. What it could not do was preclude any examination of the evidence and submissions as to the adverse economic impact of the proposed changes on the affected community" (para. 10).

## **2.2 Implications on the Naramata Project**

With respect to the Naramata Project the Commission Panel is dealing with utility interests as well as interests of the Naramata residents which were articulated in the proceeding by two Intervenor groups representing diverse and often conflicting interests. FortisBC provided a comparison of sites based on the criteria suggested by the Commission (Exhibit B-1, p. 6). From the Intervenor perspective the Commission Panel should "... Evaluate options according to cost, minimization of infrastructure footprint, minimization of interference with private property, and minimization of aesthetic impact" (NAFS Argument, p. 25).

Because the Arawana Road option involves construction of a new transmission line extension and distribution feeder line and clearing a new substation site, the Commission Panel must ask some key questions, such as:

- Is the new transmission line utility corridor necessary and/or desirable?
- Is new green field utility infrastructure necessary and/or desirable?

When seeking answers to these questions, the Panel must apply the public interest test.

The Commission Panel notes the witness statements and the petition filed by NAFS (Exhibit C2-6). Similarly, the Commission Panel notes the Intervenor Brief by Ms. Darlene Henley, who represents a number of residents in Naramata, mainly from the vicinity of the Fire Hall (Exhibit C13-2) and the lengthy petition filed by her group. Further, the Commission Panel has also reviewed the Letters of Comment and other expressions of interest or concern. The Parties who appeared before the Commission Panel were mostly giving their opinions on a particular matter. It is common, in fact, for a Commission Panel to be exposed to some type of public opinion during a proceeding and the line between opinion and fact is not easily drawn in BCUC proceedings. It should be emphasized, however, that public interest cannot be directly equated to public opinion. The public opinion will be considered in terms of relevance and weight, and viewed through the lens of public interest. Therefore, the number of petitions received from various interest groups will be given appropriate consideration.

During the proceeding scenarios were also raised for alternative future uses of the Fire Hall site, such as turning it into a community park by way of Arizona style low maintenance landscaping (Exhibits E-16, E-18). The Commission Panel cannot, however, be influenced by speculation regarding what the future holds either for the Fire Hall site or the Arawana Road site. FortisBC testified that "... if the Arawana site is approved we would decommission the infrastructure that is at the Fire Hall site and return that back to Ministry of Transportation" (T1:154). The intentions of the MOT, however, are unknown. Accordingly, the Commission Panel will be making its decision on the balance of evidence before it.

In summary, the Commission Panel will make its determinations on all relevant elements of the Arawana Road site and Fire Hall site options in consideration of the full body of evidence before it, and in accordance with the public interest test.

## 2.3 Other Considerations

When addressing the public interest issues the Commission Panel must also consider the planning horizon and load growth addressed by FortisBC. The Applicant states that from a planning perspective, given a prudent practice of building new substations at sites that can accommodate a 40-50 year planning horizon, selecting the Fire Hall site for the new substation would create a substantial risk of having to repeat the process of this Naramata Inquiry in order to select a site for another substation to either replace or back up a substation at the Fire Hall site (FortisBC Argument, p. 4). FortisBC also testified that from the technical point of view, the Fire Hall site is not a prudent development option in the sense that it will “carry you possibly to the 20-year horizon but certainly not far beyond that” (T1:148).

FortisBC has provided no load growth projections beyond the 20-year planning horizon. Specifically, FortisBC states “[T]his basic configuration will be adequate for the planning horizon and no future expansion is presently envisaged” (Exhibit B-2, Appendix C, BCUC 1.2.2, p. 6).

The Applicant has faced a difficult challenge in planning for the Naramata Project in the absence of an official community plan for Naramata. FortisBC states that any rezoning approvals are unlikely to be obtained until after the RDOS adopts a new Official Community Plan (“OCP”), which is expected in the fall of 2007 (Exhibit B-1, p. 4). Furthermore, it is not evident that even that plan can provide a sufficient foundation for FortisBC to prepare growth projections for Naramata beyond the planning horizon

The Commission Panel also notes the document released by the Provincial Government on February 27, 2007 called “The BC Energy Plan, A Vision for Clean Energy Leadership” (“2007 Energy Plan”). The following Policy Actions are noteworthy:

- Policy Action 1: Set an ambitious conservation target, to acquire 50 per cent of BC Hydro’s incremental resource needs through conservation by 2020.
- Policy Action 3: Encourage utilities to pursue cost effective and competitive demand side management opportunities.

- Policy Action 4: Explore with BC utilities new rate structures that encourage energy efficiency and conservation.
- Policy Action 10: Ensure self-sufficiency to meet electricity needs, including “insurance” by 2016. ([www.energyplan.gov.bc.ca](http://www.energyplan.gov.bc.ca))

It is in this new provincial and local Okanagan environment that the Commission Panel considers the weight given to flexibility for future growth when comparing substation site options.

### **3.0 TECHNICAL DESCRIPTION**

#### **3.1 Substation Sites**

FortisBC proposes two locations for the new Naramata substation. One location is near the intersection of Lower Debeck Road and Naramata Road, near the existing Firehall. This substation location is referred to as the Fire Hall site. The other location is east of and near the intersection of Debeck Road and Arawana Road. This substation location is referred to as the Arawana Road site. The Fire Hall site is within the existing electric utility corridor while the Arawana Road site is approximately one half kilometer away (Exhibit B-5, NAFS IR 1, p. 41; Exhibit B-5, NAFS Appendix A1.1.2).

In regards to the locations in relationship to the geographical load in Naramata, FortisBC states that “regardless of the location of the substation, in terms of the geographic centre of the load it’s not materially different for any of these three sites [includes the existing substation location], essentially because they are close enough in proximity. The distance from -- you can see from the Fire Hall to the Arawana Road site there, as has been filed in our evidence, is only approximately 500 metres. So there’s not any substantial difference” (T1:37).

There is no plan to expand beyond a single transmission line or transformer within the next 25 years. The capacity of a single 6/8/10 MVA transformer is not expected to be exceeded within the next 15 years (Exhibit B-5, BCUC IR 1, p. 17). The projected winter peak of 10.4 MVA, which is of short duration, would be within the emergency rating of this transformer (Exhibit B-5, NAFS IR 1, p. 25).

“The capacity of a single 12/16/20 MVA transformer is not expected to be exceeded within the next 25 year[s]” (Exhibit B-5, BCUC IR 1, p. 18).

A 12/16/20 MVA transformer could be installed within the footprint of the proposed general arrangement for either the Arawana Road or Fire Hall site (Exhibit B-5, BCUC IR 1, p. 18). Two 6/8/10 MVA transformers could be installed in either the Arawana Road or Fire Hall site. Two 12/16/20 MVA transformers could be installed at the Arawana Road site but a second 12/16/20 MVA transformer could not be added at the Fire Hall site (Exhibit B-5, BCUC IR 1, pp. 18-19).

Substation site space requirements are usually selected for a useful life of 40 to 50 years, while the planning and construction requirements are usually only planned for a 20-year horizon (T1:169).

**Table 1 - Space Considerations for Substation Equipment**

Equipment	Space Available for Expandability			
	Fire Hall site		Arawana Road site	
	1 x 6/8/10 MVA Transformer	2 x 6/8/10 MVA Transformers	1 x Transformer (any standard size)	2 x Transformers (any standard size)
4 feeders	Yes	Yes	Yes	Yes
4+ feeders	No	No	Yes	Yes
4800 kVA <sub>r</sub> Capacitor Bank (approx. 5.7Lx2.2Wx4.4H in meters)	Yes	No	Yes	Yes
600 Amp Feeder Reactors (approx. 4.5Lx1.5Wx7.2H in meters)	No	No	Yes	Yes
Source Feeder Voltage Regulation	No	No	Yes	Yes

Source: (Exhibit B-5, p. 25)

The addition of capacitor banks would be required at the proposed Naramata substation within 8 to 12 years but definitely before the end of the approximate 20-year planning horizon. The addition of reactors and other breakers would not likely be required within the approximate 20-year planning horizon (T1:143-145).



### 3.1.1 Fire Hall Substation Site Characteristics and Technical Considerations

The Fire Hall site is near the intersection of Lower Debeck Road and Naramata Road adjacent to the Firehall which serves the local area. Part of the proposed site is currently fenced and equipped by FortisBC to house and connect a mobile transformer as required. The site is sloped upward in a general north west direction from the Lower Debeck Road/Naramata Road intersection towards the Firehall facility, requiring a fairly significant amount of excavation and the construction of retaining walls on the Firehall and Debeck Road sides (Exhibit B-5, NAFS IR 1, p. 5).

The existing site is 13.4 m x 25.9 m and the Fire Hall site including the portion leased by the RDOS from the MOT is 35 m x 45 m or 1,575 m<sup>2</sup>. During the oral hearing, the overall size was confirmed by FortisBC as 2,700 m<sup>2</sup> (T1:79).

FortisBC states that “The size constraints at the Fire Hall site are a concern. Modern substation safety and design standards require a minimal amount of land to place the substation. The Fire Hall site does not allow for the minimal amount of land required, and therefore, although it is technically feasible to place the substation at the Fire Hall site, it is not desirable to do so from an operational point of view” (T1:18).

A second 6/8/10 MVA transformer could be added; however, a second 12/16/20 MVA transformer could not be added at the Fire Hall site (Exhibit B-5, BCUC IR 1, p. 18). The site will accommodate up to four feeders, two more than are presently in use. The requirement for oil containment, breakers, switches and additional structures would leave insufficient space for vehicle access within the substation (Exhibit B-5, BCUC IR 1, pp.18-19). FortisBC is of the view “that [from] a technical point of view, it’s not a prudent development option in the sense that the Fire Hall site will only carry you possibly to the 20-year horizon but certainly no far beyond that” (T1:148-149).

The screening and transmission/distribution line options for the Fire Hall site are described in detail in sections 3.2.1 and 3.2.2 below. The screening options are chain-link fence with privacy slats [or] a concrete aesthetic wall (T1:136).

In terms of transmission and distribution line accessibility, the Fire Hall site is directly below the Line 45 and distribution line connections are directly available.

### 3.1.2 Arawana Road Substation Site Characteristics and Technical Considerations

The Arawana Road site is 80 m x 155 m or 12,400 m<sup>2</sup> (Exhibit B-5, BCUC IR 1, Appendix C, p. 6). The area required for the substation including the required perimeter safety zone is 40 m x 50 m or 2000 m<sup>2</sup> (Exhibit B-5, BCUC IR 1, Appendix C, p. 6). During the oral hearing the size of the substation was stated at 40 m x 65 m and with a two metre safety buffer would be 44 m x 69 m or 3036 m<sup>2</sup> (T1:139). The area used and required to be used for the substation site is approximately 3036 m<sup>2</sup> not including the access road and berming. Considering the site is approximately 12,400 m<sup>2</sup> and “[w]e [FortisBC] will utilize approximately 900[0] square metres all told, affected by construction including the cut/fill area and road access roughly one quarter of the site would not currently be used and required to be used to provide service to the ratepayers within the 40 to 50 year useable life of the site” (T1: 140). The Arawana Road site would be suitable beyond the approximate 20-year planning horizon because of its size.

A part of, or the entire substation would be visible depending on the observer’s viewpoints and final topography (T1:120-128). The base mitigative screening measures that would be contained within the current cost estimate are the current allowances for site preparation, as well as the privacy slats within the chain-link fence. An aesthetic wall is an option and would be at an additional cost (T1:162). The vegetative screening measures would be shielding by natural topography, berming the corners, maximizing the mature trees by shifting the location of the substation and by preserving as many of the mature tree along Arawana Road going south as possible (T1:128-132).

Transmission and distribution line accessibility requires new infrastructure and there are several options for this which are described in detail in sections 3.2.3 through 3.2.10 below.

### 3.2 Transmission and Distribution Power Line Corridors

The following table is a summary of the various options of transmission (63kV) and distribution line interconnections available for both the Fire Hall and Arawana Road substations. An explanation of these various options in this table is provided below (Exhibit B-5, BCUC IR 1, pp.7-8; Exhibit B-12, p. 6).

The description of each option which follows the table, repeats the detail for each option for ease of comparison.

**Table 2 Transmission and Distribution Power Line Options**

	i.	ii.	iii.	iv.	v.	vi.	vii.	viii.	ix.	x.
Appendix A6.1 Reference			Option C			Option A	Option B	Option D	Option E	Option F
Substation Site	Fire Hall	Fire Hall	Arawana	Arawana	Arawana	Arawana	Arawana	Arawana	Arawana	Arawana
Substation Screening		Aesthetic wall		Vegetation	Aesthetic wall					
Transmission Line			Direct O/H	Direct O/H	Direct O/H	Direct U/G	Arawana Rd U/G	Arawana Rd O/H	Arawana Rd Self Supporting	Arawana Rd O/H
Distribution Line 1			Underbuild	Underbuild	Underbuild	Direct U/G	Arawana Rd U/G	Arawana Rd Underbuild	Arawana Rd Underbuild	Underground express
Distribution Line 2			Arawana Rd O/H	Arawana Rd O/H	Arawana Rd O/H	Arawana Rd O/H	Arawana Rd O/H	Arawana Rd U/G	Arawana Rd U/G	Underground with service connections
Total Costs Incurred to Date	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450	2,450
Substation Total	3,850	3,990	2,650	2,800	2,730	2,850	2,650	2,650	2,650	2,650
Transmission Line	50	50	250	250	250	800**	1,100	300	730	175
Distribution Line	50	50	100	100	100	100***	100***	150 <sup>+</sup>	150 <sup>+</sup>	150 <sup>+</sup> (express u/g) 175 (u/g with connections)
Acquisition of Fire Hall Site	400	400	0	0	0	0	0	0	0	0
Disposal of Arawana Road Site	(500)	(500)	0	0	0	0	0	0	0	0
Lines rights of way	-	-	300	300	300	300	100 <sup>++</sup>	100 <sup>++</sup>	0	100 <sup>++</sup>
Regulatory Costs	200	200	200	200	200	200	200	200	200	200
AFUDC	772	772	339	339*	339*	339*	339*	339	339	339
Forecast Total	7,272	7,362	6,289	6,439	6,369	6,839	6,939	6,189	6,519	6,239

\* AFUDC is assumed to be equal for the purposes of comparison.

\*\* Transmission route includes one distribution feeder.

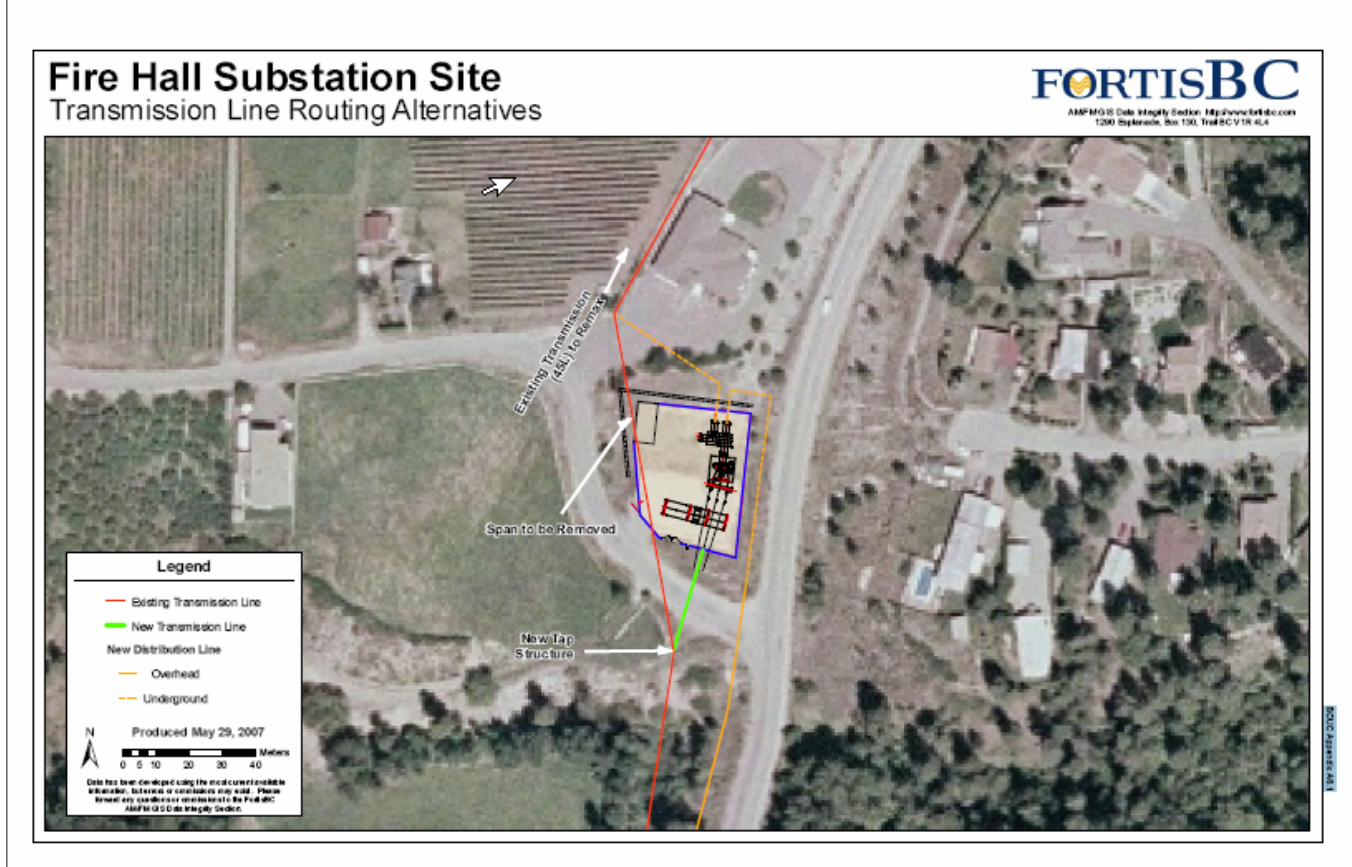
\*\*\* Includes the cost to upgrade the existing distribution on Arawana Road.

+ Allows for underground distribution feeder.

++ Costs estimated are to allow for acquiring anchoring easements where required.

(Source: Exhibit B-12, p.7)

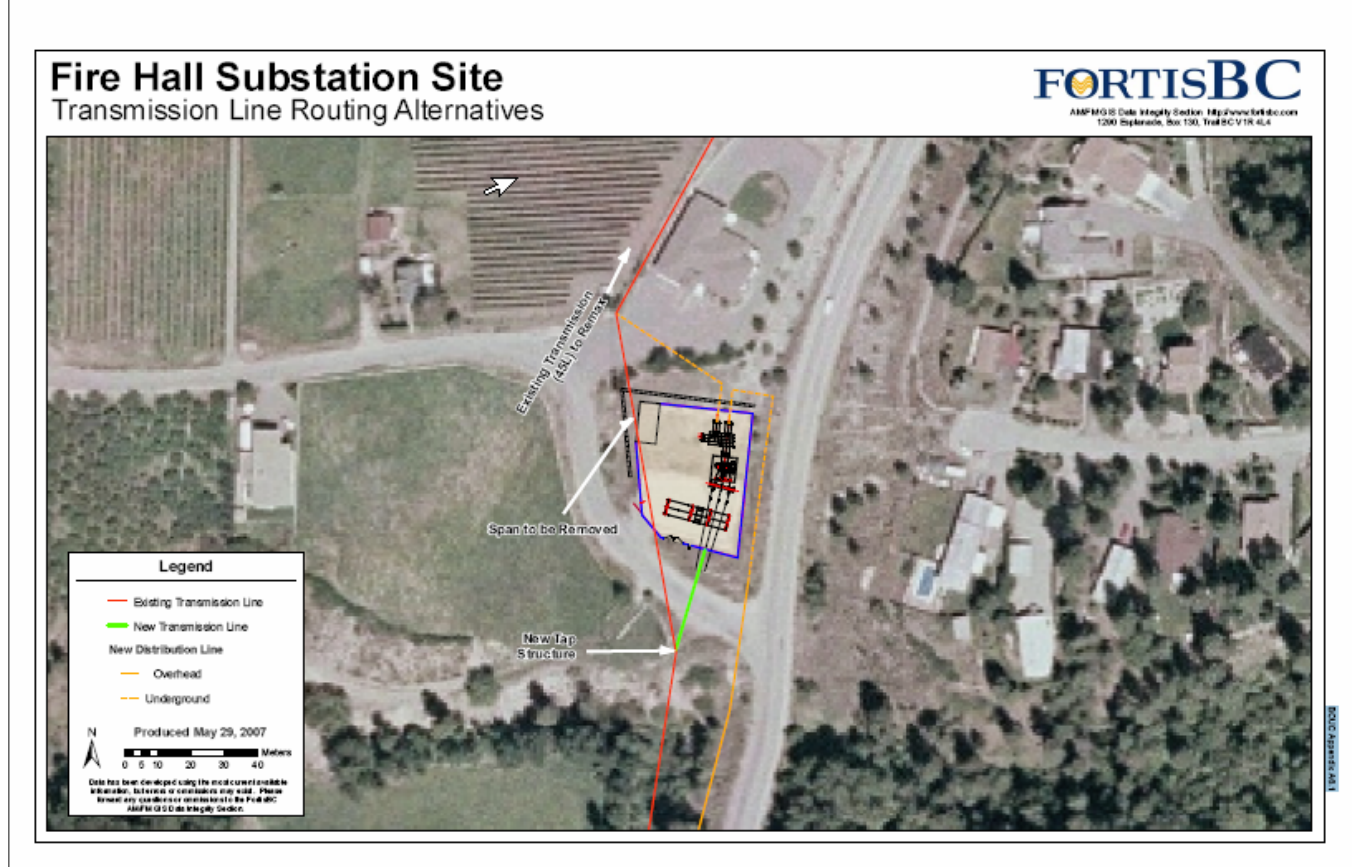
### 3.2.1 Fire Hall Site – Base Case, Column (i)



For substation screening, FortisBC would install privacy slats in the perimeter chain-link fence.

Both distribution feeders and the 45 Line transmission source are immediately adjacent to the Fire Hall site and in the existing utility corridor. The distribution would be split into two separate feeder circuits, one to the north and the other to the south. The wire size may need to be increased for a short underground section, required to safely egress the substation that is then connected to the nearby overhead distribution system. A new overhead connection to the transmission line from a new tap structure would be made to the substation. The existing span over the substation site would have to be removed. The existing 45 Line transmission to the north of the Fire Hall substation site would remain (Exhibit B-2, Appendix C, BCUC IR 1, p. 12; Exhibit B-5, BCUC IR 1, Appendix A6.1).

### 3.2.2 Fire Hall – Aesthetic Concrete Wall, Column (ii)



Substation screening would consist of a solid visual screen along all four sides of the substation at the Fire Hall site.

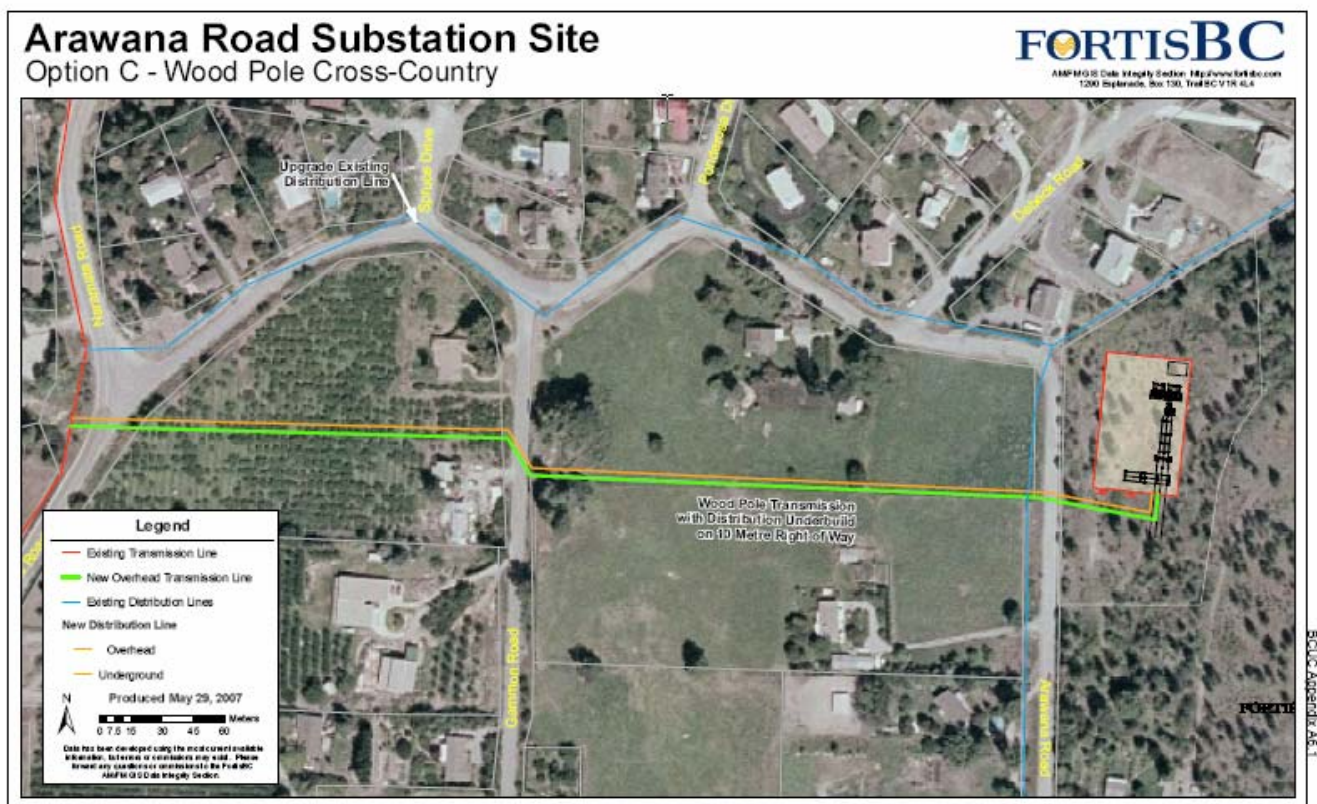
“From an aesthetic perspective, the Fire Hall site is prominently located along the major thoroughfare to Naramata and is insufficient in size to permit screening of the substation by natural means. If required, an effective means of minimizing the substation’s visual impact at this site would be to construct a ten-foot high solid wall that would screen most of the substation equipment, but which in itself may create an aesthetic concern” (Exhibit B-1, p. 10).

Both distribution feeders and the 45 Line transmission source are immediately adjacent to the Fire Hall site and in the existing utility corridor. The distribution would be split into two separate feeder circuits, one to the north and the other to the south. The wire size may need to be increased for a short underground section, required to safely egress the substation that is then connected to the



nearby overhead distribution system. A new overhead connection to the transmission line from a new tap structure would be made to the substation. The existing span over the substation site would have to be removed. The existing 45 Line transmission to the north of the Fire Hall substation site would remain (Exhibit B-2, Appendix C, BCUC IR 1, p. 12; Exhibit B-5, BCUC IR 1, Appendix A6.1).

### 3.2.3 Arawana – Base Case - Wood Pole Construction – “Direct Cross Country Route”, Column (iii) or Option C



For substation screening, FortisBC would install privacy slats in the perimeter chain-link fence, consider placement, siting and elevation issues, utilize as much as possible the existing berming, and maintain the existing vegetation where possible.

The overhead transmission line with one underbuilt distribution line would be constructed on wooden poles directly from Naramata Road to the Arawana Road site and routed using the greenway corridor. The existing overhead distribution line on Arawana Road would be upgraded to current day standards (Exhibit B-5, BCUC IR 1, pp. 7-8; Exhibit B-5, BCUC IR 1, Appendix A6.1).

#### 3.2.4 Arawana – Vegetative Screening Along North and West Side of Substation, Column (iv)

For substation screening, FortisBC would install privacy slats in the perimeter chain-link fence, consider placement, siting and elevation issues, utilize as much as possible the existing berming, and maintain the existing vegetation where possible. In addition to the base substation screening, a vegetative screen of a suitable species would be provided to act as a visual obstruction to the substation. To accomplish this on the Arawana Road site, a retaining wall would need to be constructed on the east side to move the footprint of the substation further east and therefore provide a level area to plant vegetation along the fence line. This would provide better screening than if the vegetation was planted along the toe of the cut slope (along the road) (Exhibit B-5, BCUC IR 1, p. 7).

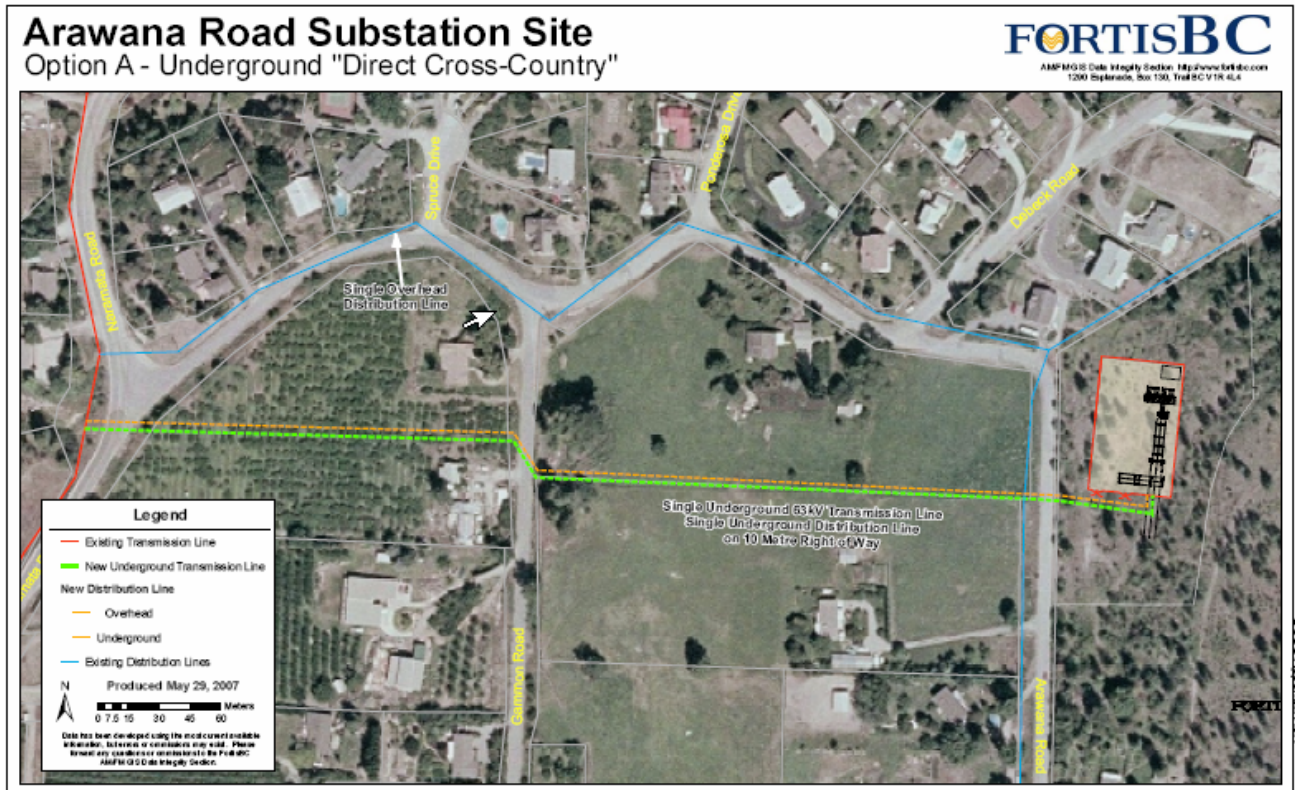
The overhead transmission line with one underbuilt distribution line would be constructed on wooden poles directly from Naramata Road to the Arawana Road site and routed using the greenway corridor. The existing overhead distribution line on Arawana Road would be upgraded to current day standards (Exhibit B-5, BCUC IR 1, pp. 7-8; Exhibit B-5, BCUC Appendix A6.1).

#### 3.2.5 Arawana - Aesthetic Concrete Wall, Column (v)

“A solid concrete barrier along the west and north sides of the substation would be constructed to provide visual screening” for the Arawana Road substation (Exhibit B-5, BCUC IR 1, p. 7).

The overhead transmission line with one underbuilt distribution line would be constructed on wooden poles directly from Naramata Road to the Arawana Road site and routed using the greenway corridor. The existing overhead distribution line on Arawana Road would be upgraded to current day standards (Exhibit B-5, BCUC IR 1, pp. 7-8; Exhibit B-5, BCUC Appendix A6.1).

### 3.2.6 Arawana - Underground – “Direct Cross Country Route”, Column (vi) or Option A

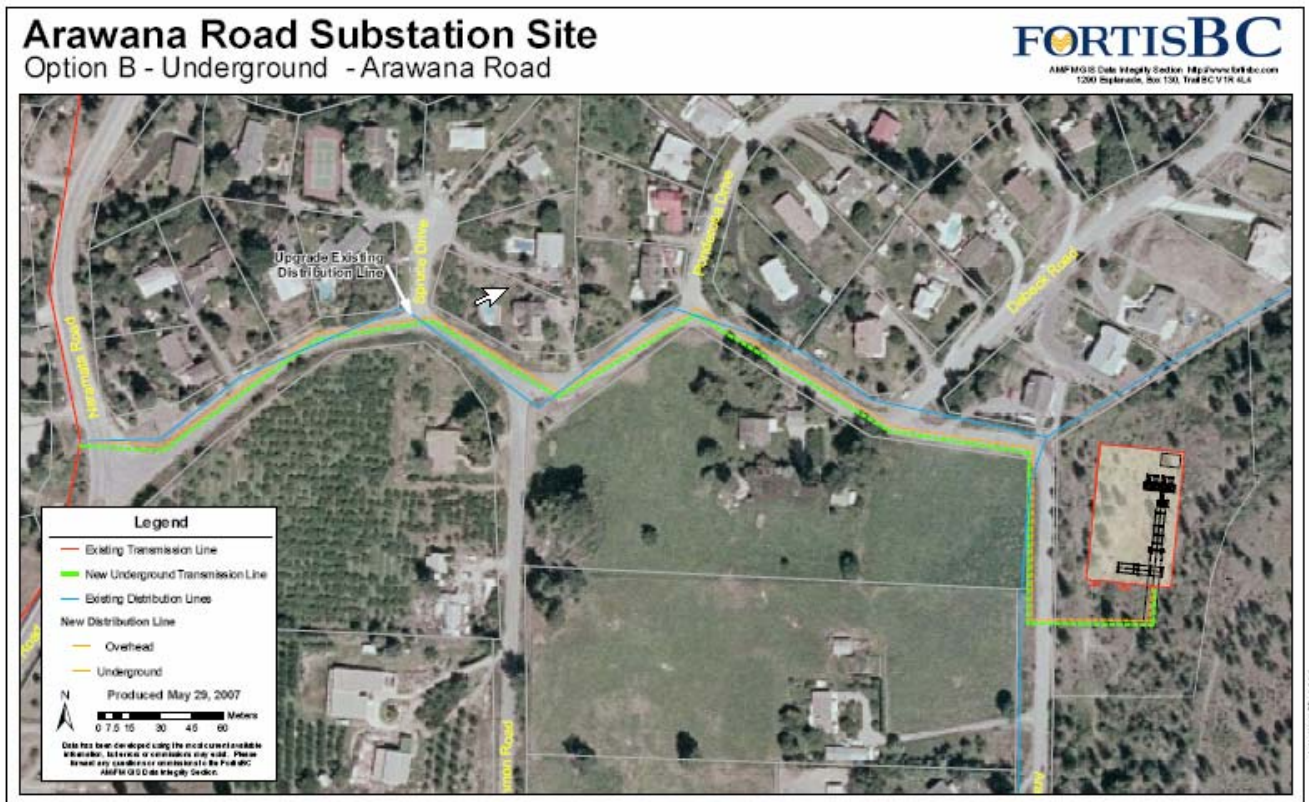


For substation screening, FortisBC would install privacy slats in the perimeter chain-link fence, consider placement, siting and elevation issues, utilize as much as possible the existing berming, and maintain the existing vegetation where possible.

The transmission and one of the distribution lines would be constructed underground using the greenway corridor from Naramata Road to the Arawana Road substation site. The existing overhead distribution line along Arawana Road would be upgraded to a new overhead distribution line along Arawana Road conforming to current day standards (Exhibit B-5, BCUC IR 1, pp. 7-8; Exhibit B-5, BCUC IR 1, Appendix A6.1). “The impact of undergrounding in the greenway corridor would likely be more damaging to the orchard because we would have to excavate the area of the right of way...” (T1:181). “So it’s much more intrusive from a long-term maintenance and from an installation perspective really to go underground through the orchard” (T1:182).



### 3.2.7 Arawana - Underground – Arawana Road, Column (vii) or Option B

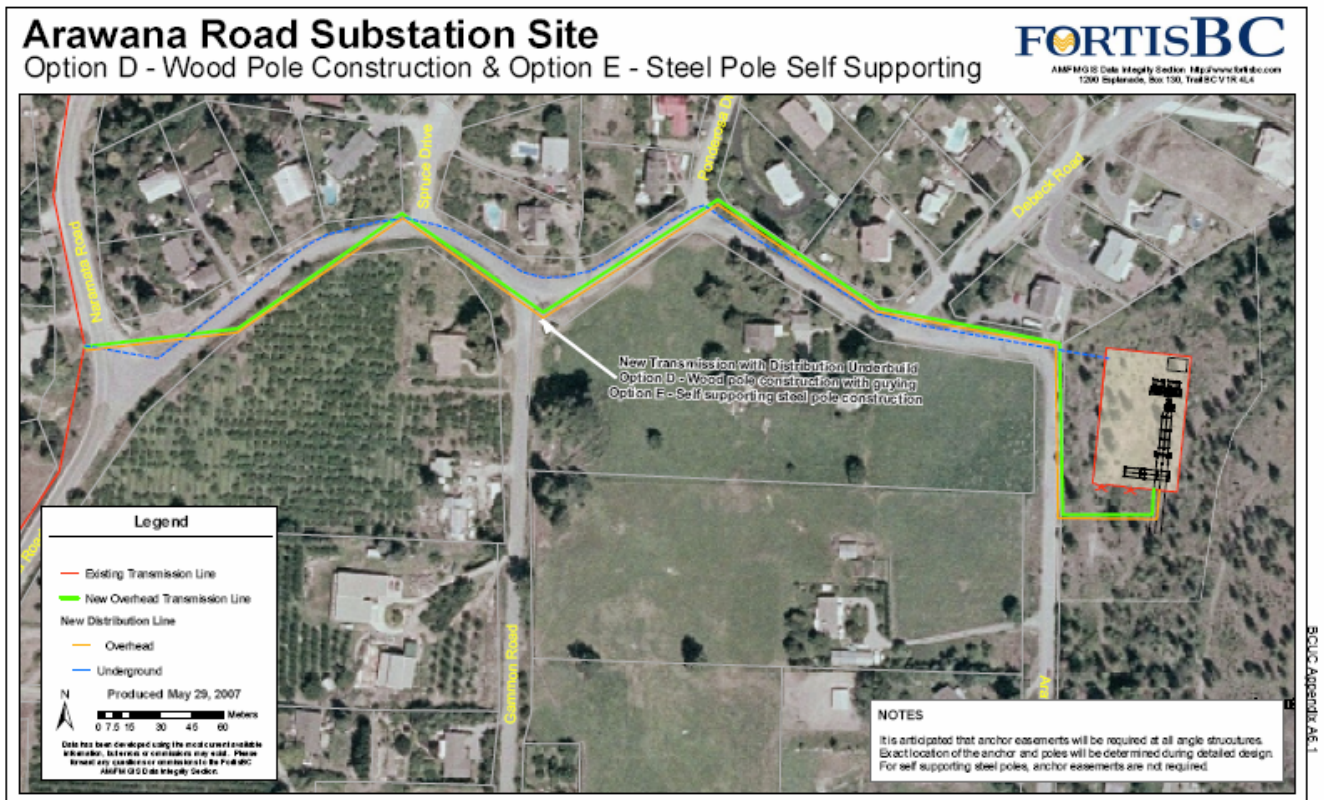


For substation screening, FortisBC would install privacy slats in the perimeter chain-link fence, consider placement, siting and elevation issues, utilize as much as possible the existing berming, and maintain the existing vegetation where possible.

The transmission (45 Line) and Distribution Line 1 would be constructed underground using the Arawana corridor from Naramata Road to the Arawana Road substation site. The existing overhead Distribution Line 2 on Arawana Road would be upgraded to current day standards. This option would require more splice boxes due to the nature of the Arawana Road alignment, and would have potentially more underground interferences (Exhibit B-5, BCUC IR 1, pp. 7-8; Exhibit B-5, BCUC Appendix A6.1).

### 3.2.8 Arawana - Wood Pole Construction – Arawana Road, Column (viii) or Option D

1



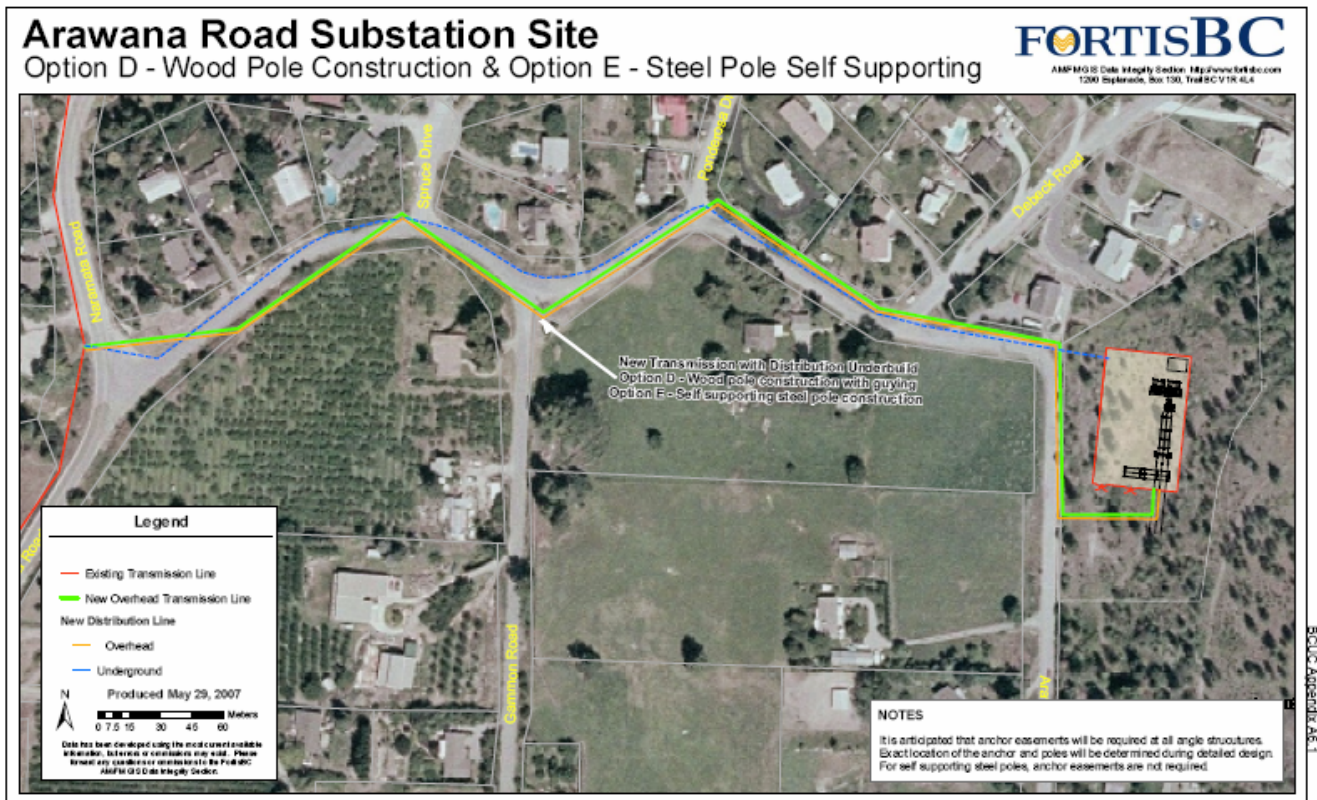
For substation screening, FortisBC would install privacy slats in the perimeter chain-link fence, consider placement, siting and elevation issues, utilize as much as possible the existing berming, and maintain the existing vegetation where possible.

The overhead transmission line (45 Line) with one underbuilt overhead Distribution Line 1 would be constructed using wooden poles along the Arawana corridor. A Distribution Line 2 would be constructed underground along the Arawana corridor from the Arawana Road substation site to Naramata Road. This option presents anchoring challenges due to the large line angles and limited space, and potential underground interferences with existing utilities (Exhibit B-5, BCUC IR 1, pp. 7-8; Exhibit B-5, BCUC IR 1, Appendix A6.1).



### 3.2.9 Arawana - Steel Self Supporting, Column (ix) or Option E

1



For substation screening, FortisBC would install privacy slats in the perimeter chain-link fence, consider placement, siting and elevation issues, utilize as much as possible the existing berming, and maintain the existing vegetation where possible.

The overhead transmission line (45 Line) with one underbuilt overhead Distribution Line 1 would be constructed along the Arawana corridor. The overhead lines would be constructed on self supporting steel poles that would negate the need for anchoring. A Distribution Line 2 would be constructed along the Arawana corridor underground from the Arawana Road substation site to Naramata Road along the Arawana corridor (Exhibit B-5, BCUC IR 1, pp. 7-8; Exhibit B-5, BCUC IR 1, Appendix A6.1).

### 3.2.10 Arawana Road, Column (ix) or Option F

For substation screening, FortisBC would install privacy slats in the perimeter chain-link fence, consider placement, siting and elevation issues, utilize as much as possible the existing berming, and maintain the existing vegetation where possible.

The existing overhead distribution feeder up Arawana Road would be removed and a single circuit 63 kV overhead transmission line would be constructed within the along the Arawana corridor. A single express (no service connections) distribution circuit would be constructed underground from the Arawana Road site to Naramata Road along the Arawana corridor, and a second underground circuit would be constructed with service connections to the existing homes and feeds along the along the Arawana corridor (Exhibit B-12, p. 6).

## **3.3 Commission Determination on Substations (exclusive of Transmission and Distribution Requirements)**

Prior to making a decision on the substation site the Commission Panel must determine if both sites are technically and operationally viable in their own right and worthy of broader consideration. This Section is purposefully narrow and restricted to site and technical considerations to determine if, in the view of the Commission Panel, each site, everything else being equal, meets this test.

### 3.3.1 Arawana Road Site

The Arawana Road Substation site characteristics and technical considerations are described in Section 3.1.2 above. FortisBC states “The Arawana Road site is a good site for a substation” (FortisBC Argument, p. 3). “The land acquired by FortisBC for a new substation at the Arawana Road site is of adequate size for a substation to serve the demand for load in the area within the present planning horizon and would allow for expansion beyond that planning horizon to serve future increased demand for service in the Naramata area” (FortisBC Argument, p. 3). In cross-examination FortisBC describes variables in the “cut/fill balance”, berm around corners and relocating the site from “one spot to another” to mitigate aesthetic concerns (T1:131-132).

FortisBC testified at transcript page 167 that it was not aware of any difficulties to be encountered in the construction of the substation at this site not described in the evidence. FortisBC states there are no technical or operational challenges arising from the Arawana site and states the site also presents a substantial opportunity for vegetative or other screening measures (FortisBC Argument, p. 3).

NAFS argues that in terms of minimization of new infrastructure footprint, the Arawana Road site would require a much larger increase in infrastructure footprint than would the Fire Hall site. “[T]he Arawana Road substation site is 12,500 square metres” [a]nd that compares to a footprint of 2,700 square metres at the Fire Hall site” (NAFS Argument, p. 27).

In terms of the need for future expansion, FortisBC states that no future expansion beyond the planning horizon (twenty years) “is presently envisaged” (Exhibit B-2, Appendix C, A2.2, p.6).

### 3.3.2 Fire Hall Site

The Fire Hall Substation site characteristics and technical considerations are described in Section 3.1.1 above. FortisBC states:

“The Fire Hall site is a poor site for a substation for a number of reasons including:

- (i) It is too small for reasonable flexibility to accommodate growth and increased load in the future;
- (ii) It does not present good opportunities for visual screening; and
- (iii) Its constrained size and configuration gives rise to increased construction costs and operational limitations” (FortisBC Argument, p. 2).

FortisBC testified “In our opinion the Fire Hall site is adequate from a planning point of view out to the 20-year horizon, but what we need to keep in mind is what we construct in terms of the substation facilities is built for approximately a 20-year horizon. But what we’d like to do, and generally do for all of our other substation construction projects, is we allow for more like a 40 or 50 year planning horizon in terms of the allowable space for future growth. So as I talked about

previously, yes, the Fire Hall site may carry us out to the 20-year horizon, but beyond that, there's all indications that once the load exceeds a 10 MVA criteria, we will be back to the same process, because we will need to find another site for a larger substation. So in terms of a longer scale planning horizon out to 40 or 50 years, which is typical for the substations that we have recently constructed, the Fire Hall site is not suitable from that point of view" (T1:169).

FortisBC confirms in Reply at page 4 "The Fire Hall site is of sufficient size to accommodate demand within the present (20-year) planning horizon, however, as stated in FortisBC's Argument (page 4, paragraph 16), the space available is likely not adequate to accommodate demand arising in a 40-50 year planning horizon, a more suitable period of time to consider in the selection of a site for a new substation, particularly in a developing area".

NAFS is of the view that demand arising over a planning horizon beyond 20-years could be accommodated at the Fire Hall site, stating "FortisBC conspicuously fails to address expansion of capacity at the Fire Hall by the use of a larger transformer as opposed to adding a second, 10 MVA transformer" (NAFS Argument, p. 17). NAFS also raises the possibility of a second substation location, referencing to FortisBC's evidence "It is the Company's opinion that either the advancement of load growth, or a shift in the location of growth, may result in a future need to relocate or even add a second substation to meet Naramata's requirements"(Exhibit B-2, Appendix H, p. 5).

FortisBC states "The general arrangement of the substation has been modified to fit the reduced land area available and meets minimum safety standards and clearances for operation. It should be noted that this general arrangement, although in compliance with minimum safety standards does not conform to FortisBC standard construction" (Exhibit B-5, BCUC IR 1, A4.1.3).

### 3.3.3 Commission Determination

FortisBC makes a convincing case that the Arawana site is very suitable for the substation in terms of the long term development flexibility afforded by its size, some degree of flexibility in the siting of the substation equipment on the larger site to take advantage of natural screening opportunities

and the operational advantages. The Commission Panel notes that the construction estimates do not appear to have been refined to take into account the variables that could occur in the selection of preferred siting on a slope described as being “a little more challenging but there are ways to do that” (T1:132).

On the other hand, the Fire Hall site is of sufficient size to accommodate demand within the present planning horizon (FortisBC Argument, p. 4). FortisBC also states that the Fire Hall site is a technically feasible site, but is not a desirable site (FortisBC Reply, p. 9). The construction challenges and costs presented by FortisBC for this site are noted. However, the evidence provided by Mr. Andrew with respect to the Fire Hall site (T1:193-201) was given some weight by the Commission Panel, both in terms of construction process and cost estimates. The Commission Panel notes FortisBC’s confirmation that a substation can be designed for the site which will be in compliance with minimum safety standards.

FortisBC states that it likes to allow for more like a 40 or 50 year planning horizon in terms of allowable space for future growth. Under ideal circumstances and with the firm prospect of future growth the Commission Panel agrees that this is desirable. However in this case, FortisBC states that no future expansion beyond the planning horizon (twenty years) “is presently envisaged” (Exhibit B-2, Appendix C, BCUC 1.2.2, p. 6). In addition, in the absence of evidence of a formal community plan it is difficult to determine where development of load growth might occur making the need to relocate or even add a second substation, as mentioned above, to meet Naramata’s electric power requirements a possibility. This serves as a caution against over building the new Naramata Substation.

From an operational perspective, the Commission Panel acknowledges the benefit of vehicle access to the substation site; however, with the frequency of maintenance being low the Commission Panel did not give this matter substantial weight.

**Accordingly, the Commission Panel determines that both the Arawana Road and Fire Hall sites are suitable for the substation although the Arawana Road site does offer operational advantages and has greater potential for future development.**

#### 4.0. CRITERIA FOR COMPARISON

This Section first summarizes the criteria for comparison used by FortisBC in accordance with Commission Order No. G-43-07. It then refines the comparison by introducing the various transmission and distribution line options to be linked to the Arawana Road site and narrows the comparison to one specific option.

After this determination the Commission Panel conducts a more specific “Sites and Wires” Options Analysis by addressing cost estimates for the two identified options, issues of significance to the Decision and other issues considered.

Finally, this Section outlines the significance of the utility corridor concept.

#### 4.1 FortisBC Criteria for Comparison

Commission Order No. G-42-07 directed FortisBC to file a report comparing the Arawana Road and Fire Hall siting alternatives and to provide the information identified in Appendix A to that Order. The information requested in Appendix A is shown below.

**Table 3**

	Criterion	Weighting Factors	Arawana Road		Fire Hall	
			Rank	Weighted Rank	Rank	Weighted Rank
1.	Reliability	10	3	30	3	30
2.	Operations & Safety	15	5	75	2	30
3.	Public Health	15	5	75	5	75
4.	Risk of Delay	10	4	40	1	10
5.	First Nations	10	5	50	5	50
6.	Terrestrial Habitat	5	3	15	5	25
7.	Parks & Recreation	5	5	25	5	25
8.	Aesthetics	5	3	15	2	10
9.	Property Values	5	5	25	5	25
10.	EMF	5	5	25	5	25
11.	Effects during Construction	5	4	20	2	10
12.	Flexibility for Future Growth	10	4	40	2	20
<b>13.</b>	<b>Totals</b>	<b>100</b>		<b>435</b>		<b>335</b>

(Source: Exhibit B-1, p. 7)



## DEFINITIONS

1. Reliability - a measure of availability of electrical supply on the new transmission, distribution and substation facilities. Also considers potential for exposure to damage and resulting service outages due to external hazards.
2. Operations and Safety
  - (a) Operations - considers accessibility and operability of the facilities by FortisBC employees and contractors working on system repairs or performing routine maintenance. An example is the degree of difficulty of access to a substation with heavy equipment.
  - (b) Safety - considers exposure to injury for persons working on or near line or station facilities including the general public, FortisBC employees, and contractors. Considerations include limits of approach to energized equipment, lines and buswork and safe clearance for vehicles and service equipment.
3. Public Health - applies to health and environmental issues posed by the transmission, distribution and substation facilities, which may include but may not be limited to, accidental release of controlled materials, oil spills, and any other such events. FortisBC designs, constructs and operates these facilities to ensure that probability of such events are mitigated.
4. Risk of Delay - considers the risk of significant delay to the final in service date of the proposed facilities. Delays can stem from regulatory process, permitting, zoning applications and procurement schedules. There is a high risk of the existing Naramata Substation transformer emergency capacity being exceeded within the next peak load cycle.
5. First Nations - considers the effect of the project on the cultural values, economic well being and quality of life of First Nations citizens.
6. Terrestrial Habitat - considers potential effects on the natural habitats of both aquatic and land dwelling plants and animals including rare and endangered species.
7. Parks and Recreation - considers the potential impact of the project on the capability of the parks and recreation areas to continue to provide a quality experience for existing and future users.
8. Aesthetics - considers visual effects of the proposed facilities that may be observed by residents and visitors in the project area.
9. Property Values - considers the potential effects of the proposed project on the market value of real estate in the project area.
10. EMF – considers project compliance with the World Health Organization (“WHO”) and International Commission on Non-Ionizing Radiation Protection (“ICNIRP”) guidelines.

11. Effects during Construction - considers the temporary disruption to residents, property owners and services near the project area. Disruptions may include service interruptions, land use, traffic detours and delays, noise and dust.
12. Flexibility for Future Growth - considers the scalability of the project for future growth and distribution network flexibility.

## **4.2 Refining the Comparisons**

Having determined that both sites are suitable for the substation and prior to considering a comparison between the Fire Hall and Arawana Road site alternatives, the Commission Panel considered the transmission and distribution line routing alternatives presented by FortisBC for each site. This first step was taken because the Commission Panel considered that the issues to be considered in making a final selection of the site for the substation should include, in each of the two choices, the total installation. In support of this view, FortisBC states “The major consideration arising in regard to the Arawana Road site is the transmission tie to a substation at the Arawana Road site” (FortisBC Argument, p. 2). NAFS states “It would be unfair to all those who would suffer particular harm from the Arawana Road TL/DL options if the Panel were to isolate the Arawana Road substation site from its TL/DL implications in making the comparison with the Fire Hall site” (NAFS Argument, p. 26).

The Fire Hall site is located on the existing utility corridor and does not offer or require alternatives with respect to transmission line access and connection to existing distribution lines. “Both the distribution feeder system and the 45 Line transmission source are immediately adjacent to the Fire Hall site” (Exhibit B-2, Appendix C, p. 12; Exhibit B5, Appendix A6.1). FortisBC states “For the Fire Hall site, no additional transmission lines would be necessary as the Fire Hall site is adjacent to the existing transmission line. It would be necessary to tap into the transmission line to feed a substation at the Fire Hall site, however, this could be accomplished without difficulty. There are no issues arising in regard to distribution line routing if the substation was constructed at the Fire Hall site” (FortisBC Argument, p. 5).

FortisBC presents six alternatives for the required new transmission line routing in combination with the routing of a new distribution line and an existing distribution line which currently follows Arawana Road (Exhibit B-12, p. 7). The six alternatives may first be broken down into two corridors. One corridor alternative is referred to by FortisBC as the Direct Cross Country Route (“Direct Route”). This route is also referred to as the Greenway Corridor. The Direct Route is shown generally in Exhibit B-5, BCUC Appendix A6.1, as joining Line 45 just south of the corner of Naramata Road and Arawana Road and traversing agricultural/residential property in an easterly direction, terminating at the proposed Arawana Road substation. The transmission line is proposed to be either overhead or underground and similar alternatives of overhead (underbuild) and underground installation of a second and new distribution line are proposed within the Direct Route corridor. The other (existing) distribution line would remain in its current alignment on Arawana Road.

The second corridor alternative follows Arawana Road (“Road”). The Road corridor is shown generally in Exhibit B-5, BCUC Appendix A6.1, as joining Line 45 at the existing distribution line turning point at the corner of Naramata Road and Arawana Road and follows Arawana Road east and south, terminating at the proposed Arawana Road substation. FortisBC proposes four alternatives of overhead and underground configurations for the transmission line and distribution lines for the Road corridor.

FortisBC states “There was evidence at the Hearing that a cross-country [Direct Route] overhead transmission line with distribution underbuild would have a direct impact upon three parcels of property – the Wright property, the Andrew property and the Thompson property. The owners of these properties oppose the cross-country [Direct Route] route” (FortisBC Argument, p. 6). Similarly, FortisBC states “Construction of underground transmission and distribution lines along the [D]irect [R]oute from the existing transmission line to the Arawana Road site across the Wright, Andrew and Thompson properties would have a temporary impact to those properties during construction due to the trenching that would be necessary”.

NAFS states that the “present and existing land use (agricultural)” (Exhibit B-2, Appendix C, A.3.4, p. 9) description of the properties made by FortisBC “is an entirely incorrect characterization of the nature of the properties that would be affected by expropriation of a right of way for the direct cross country route” (NAFS Argument, p. 7).

The Commission Panel, based on the considerable evidence before it, is inclined to agree with this view expressed by NAFS.

The Road corridor serves as a route for an existing distribution line as described above. It follows Arawana Road, a well travelled roadway and appears, from the evidence provided in Exhibit B-5, BCUC Appendix A6.1, to benefit from some screening from foliage along the sides of the corridor.

NAFS states, “In the hypothetical event that the Panel chooses the Arawana Road site, NAFS would respectfully submit that TL/DL route options should be evaluated according to cost, minimization of infrastructure footprint, minimization of interference with private property, and minimization of aesthetic impact” (NAFS Argument, p. 25).

The Commission Panel applied these criteria to the Arawana Road site transmission/distribution alternatives. In terms of cost, Option D was lowest cost and Option F second lowest. In terms of minimization of infrastructure footprint, Options B, D, E and F offer the least infrastructure footprint as they use only the Road corridor while the footprint for Option A and C covers both the Road and Direct Route corridors. Options B, D, E and F minimize the interference with private property in that they do not employ the Direct Route corridor which is almost entirely on private property. FortisBC states, with respect to the Direct Route, “It is likely that expropriation of land rights for the transmission circuit may be required” (Exhibit B-2, Appendix C, A5.1, p.13). In terms of Aesthetic impact, FortisBC is of the view that for the Direct Route, “Aesthetics are improved due to the straight alignment” (Exhibit B-2, Appendix C, A5.3, p. 14). While this may be true in terms of straight is more pleasing to the eye than crooked, it ignores the fact that the Direct Route is across a panoramic view (D. Andrews Argument) and will still require use of the Road corridor for a distribution line.

The Commission Panel is of the view that the Road corridor is a less intrusive corridor and within the Road corridor, the trade off of between the minimal cost difference between Option D and Option F and aesthetic impact favours Option F, which proposes the Transmission line overhead (essentially following the alignment of the existing distribution line) and distribution lines 1 and 2 underground.

**The Commission Panel determines that the comparison to be made is between the Fire Hall site and the Arawana Road site with Option F for transmission and distribution.**

### **4.3 “Sites and Wires” Options Analysis**

#### 4.3.1 Cost Estimates for the Fire Hall Site and Arawana Road Site, Option F

The purpose of this Section is to determine whether purely from a cost perspective there is a significant difference between the two options; although the Commission Panel’s task is not to select the least cost project, but to select the most cost-effective project that is in the public interest. The evidence includes voluminous evidence of cost projections for both alternatives, which can be summarized, based on the information derived from Exhibit B-12, page 7, in the following table:

**Table 4**

	<b>Arawana Road Option F \$ Millions</b>	<b>Fire Hall \$ Millions</b>	<b>Difference %</b>
Sunk Costs	2.450	2.450	-
Projected Future Costs	3.450	4.050	17.4
AFUDC	339	772	127.7
Total, including AFUDC	6.239	7.272	16.6
Total, excluding AFUDC	5.900	6.500	10.2
One-time equivalent Rate Impact	.16%	.17%	

While the sunk costs are not relevant in the comparison they are of magnitude that gives the Commission Panel some concern. The \$ 1.1 Million spent to date on planning, engineering, land, project management and regulatory process, as shown in Exhibit B-12, page 5, on a small substation project in the Community of Naramata is significant for these activities even given the difficulties experienced by FortisBC.

One Intervenor, Mr. D. Andrew, took issue with FortisBC's cost estimates for site levelling, material disposal, traffic control, retaining wall and other Fire Hall site preparation estimates which also included an unspecified cost amount of \$ 70,000. To challenge the Applicant's projection of \$ 650,000, Mr. Andrew, who has some experience in earth moving and equipment operation (T1:194-201), provided his own, detailed layman's estimate of \$ 221,000 (Exhibit C3-7). FortisBC witnesses were cross-examined regarding this issue by counsel for NAFS. Similarly, Mr. Andrew, who testified to defend his cost estimates, was cross-examined by counsel for FortisBC. While not accepting the absolute numbers of Mr. Andrew, the Commission Panel is persuaded by the message he attempted to convey, which implied that FortisBC had not done a very detailed assessment of site preparation costs and accordingly had submitted an extremely conservative cost estimate.

The cross-examination of the FortisBC Witness Panel by counsel for NAFS pointed out that more detailed cost estimates had been prepared for the Arawana site and, accordingly, more cost allowances were required for the Fire Hall site option. This was confirmed in a response to a Commission Panel question by FortisBC as follows:

"I believe what we are referencing is the comments around the transmission line, but also with respect to the site preparation. The fact remains that at the Fire Hall site we were required to make a few more allowances, if you will. And what we mean by that is we recognize that there's work to be done, but without the detailed design, we can't quantify it to the level you might have on a construction tender. We've provided some shoring work that may be required, would have an allowance associated with it, whereas at Arawana Road, those numbers of unknowns aren't as many, so we don't have to make as many allowances per se ..." (T1: 176).

FortisBC also corrected its response to BCUC IR 1.2.3 (Exhibit B-5, p. 2), which stated that “the current cost estimate is based on detailed engineering and current (2007) construction dollars”. The response should read “estimate is based on *a more detailed review of the project requirements* and current (2007) construction dollars” (Exhibit B-11).

Regardless, FortisBC confirms that the confidence level of the cost estimates for the two sites is still plus or minus ten percent (T1:177).

As seen in the above Table 4, the cost estimate for the Fire Hall site, excluding AFUDC, is 10.2 percent higher than the cost estimate for the Arawana Road site, Option F.

Excluding the sunk costs, which are the same for each alternative and the AFUDC, the absolute dollar difference between the two options is \$ 600,000. Both options have their construction challenges: those at Arawana Road primarily linked to the transmission and distribution lines and those at Fire Hall linked to the small footprint of the site. The cost estimates provided by FortisBC for both options are not based on detailed engineering and according to FortisBC have a +/- 10 percent confidence level. The monetized value of the confidence level is approximately equal to the estimated dollar difference between the two options.

The cost difference of the two options, including AFUDC, is 16.6 percent. Because the AFUDC has such a remarkable impact on the cost comparison that cost component must also be addressed. In project evaluation, a rate payer impact analysis considers cash flows from the perspective of the rate payer. As seen in the above Table, the one-time equivalent rate impacts on the Arawana Road and Fire Hall options are .16 percent and .17 percent, respectively. Because of the many variables involved in the calculation that results in those percentages, it would be very difficult to identify each key driver. Nevertheless, the following observations of the Commission Panel are noteworthy:

- Rate payer impact of the Fire Hall option is mitigated to some degree by the fact that the projected in-service date for the Fire Hall site project is one year later than the in-service date for the Arawana Road site project.
- The considerable sum of sunk costs of \$2,450,000 is having a compounding impact on the Fire Hall site AFUDC due to the later project implementation date.

- The AFUDC must still be depreciated over the project life and the un-depreciated balance is earning a regulated return. Because there is a difference between the discount rate used for the NPV calculations and the allowed regulated return, the NPV of revenue requirements cannot, by definition, totally eliminate the impact of AFUDC.

In summary, the Commission Panel views the AFUDC differential primarily from the rate payer analysis perspective and does not consider the .01 percent difference in the rate impact to be determinative on its own for the purposes of the “Sites and Wires” Options analysis.

#### 4.3.2 Issues of Significance to the Decision

The Commission Panel considered all the issues raised and determined the issues of greatest significance to this decision. Those issues are:

1. Project Cost Estimates
2. Established Transmission Corridor
3. Need for new Greenfield Utility Infrastructure
4. Operations and Safety
5. Risk of Delay, In-Service Date
6. Aesthetics/Opportunity for Screening
7. Effects During Construction
8. Flexibility for future Growth

The eight issues of significance were weighted and ranked for each of the two siting alternatives, Arawana Road and Fire Hall. Rankings determined by the Commission Panel ranged from 1 being worst to 5 which is best. The Commission Panel placed greatest weight on Factor 8, Flexibility for Future Growth; however, for the reasons explained in Section 2.3 considered the ranking of the two siting alternatives in the context of FortisBC’s 20-year planning horizon. Arawana Road out scored Fire Hall but the difference was small. Next highest weighting was placed on Factors 2, 3 and 6. When applying a ranking, Fire Hall outscored Arawana Road by a considerable margin on Factors 2 and 3 while on Factor 6, Aesthetics/Opportunity for Screening, the reverse occurred but to a much



lesser degree when taking into account the totality of each alternative. Project Cost Estimates, Operations and Safety and Risk of Delay, In Service Date, Factors 1, 4 and 5, because they are manageable, were given approximately the same weighting but a lesser weighting than the previous factors. In each case, Arawana Road scored somewhat higher than Fire Hall. The lowest weighting was given to Factor 7, Effects During Construction where Arawana Road was ahead of Fire Hall. The lowest weighting awarded was because although the effects must be considered they are short term in nature and manageable.

The result of this comparison was inconclusive, even after reconsideration of the weightings and rankings by the Commission Panel.

#### 4.3.3 Other Issues Considered

Among the other issues considered were EMF, Effect on Property Values, First Nations and Terrestrial Habitat.

FortisBC ranks the EMF, property values and First Nations Issues as equal for each alternative (Exhibit B-1, p. 7). FortisBC provided evidence on the EMF profile related to the Project in Exhibit B-5, BCUC Appendix A4.4.7 and states “All facilities proposed as part of this project will be compliant with the exposure guidelines of the WHO and the ICNIRP” (Exhibit B-5, Karow, p. 1). In view of this evidence, the Commission Panel did not consider this issue further.

Property Values considers the potential effects of the proposed project on the market value of real estate in the project area (Exhibit B-1, p. 9). Any effect on property values must be considered in the context of the project alternatives selected by the Commission Panel, the Fire Hall site and the Arawana Road site with Option F for transmission and distribution. FortisBC states “For either site, there will be no impairment of land use as a result of the Project.” “The Company has not seen any credible evidence that facilities such as these will materially affect values of property near or adjacent to the site” (Exhibit B-5, BCUC 4.4.1). Although this reference is to just the substation sites, for the Arawana Road site Option F replaces a distribution line with transmission line on an

existing alignment, the Commission Panel accepts FortisBC's view with respect to the affect of either option on property values.

First Nations criterion "considers the effect of the project on the cultural values, economic well being and quality of life of First Nations citizens" (Exhibit B-1, p. 8). FortisBC suggests a similar weighted rank for each of the two alternatives (Exhibit B-1, p. 7). The Commission Panel accepts this position.

In terms of Terrestrial Habitat, "[T]he Fire Hall site is viewed as superior in this category as the opportunity for environmental impact is lower than at the Arawana Road site. This is primarily due to the extent that the site has already been disturbed and is bordered by roads on two sides. The Arawana Road site is less developed (Exhibit B-5, 4.3.1). The Commission Panel accepts this view.

A review of EMF, Effect on Property Values, First Nations and Terrestrial Habitat did not tip the balance in a significant way in favour of one alternative over the other.

#### **4.4 Utility Corridor Concept**

The utility corridor concept was defined by FortisBC as follows:

"FortisBC's approach to utility corridors is effectively cooperation amongst utilities, whether it be gas, whether it be communication, effectively to try and use common corridors to put all the utilities in the same corridor to minimize disruption effectively and to minimize overall costs for all the customers that receive those services from their respective utilities" (T1:28).

Counsel for NAFS cross-examined FortisBC on the utility corridor topic. FortisBC testified that it could not confirm that Naramata Road and Line 45 has been designated officially as a utility corridor; however, it does meet the description of a utility corridor and there are power, communications and some natural gas utilities in the corridor. FortisBC also agreed in principle that a utility corridor is desirable but cautioned that in some cases it may not be practical or financially acceptable (T1:28-29).

In response to a question from the Commission Panel, FortisBC outlined its policy perspective regarding location and construction of new transmission lines. For siting of a new transmission line, options provided for comparison were:

- Option A: an existing right-of-way
- Option B: a new right-of-way
  - B-1: non-residential area
  - B-2: residential area
  - B-3: agricultural area
  - B-4: utility corridor

FortisBC responded,

“... For all these options I will assume that the financial implications of all the options are relatively the same, because clearly they all have different financial implications.

And so obviously our first position is to take Option A, which is obviously we like to utilize the existing rights-of-way as much as possible. So that would be our first option. If we look at distribution lines, we try to double circuit them to take advantage of the existing rights-of-way. So that would be our first preferred planning criterion.

If we look at if we need a new right-of-way, going with the same assumption, we would look for if there is a defined utility corridor. As I mentioned before, we work as hard as we can with other utilities to take advantage of common utility corridors. It's good for stakeholders and it's good for costs. And so that would be our next option.

The non-residential and the agricultural would be somewhere number three. And non-residential, if we looked at sort of what we would call Crown land or things like that, if we're referring to non-residential, some of those Crown lands have tenure holders. So there's a different group of stakeholders for some of those lands, whether it be forestry or mining or some of those things. So not knowing any specifics, I would put non-residential somewhat similar to the agricultural. In some cases our rights-of-way on Crown land have more of an impact than agricultural because they take lumber actually out of the ongoing sustainability of the forest industry.

And then obviously the least preferable would be from a residential perspective and going through a residential area” (T1:172-173).

In the Vancouver Island Transmission Reinforcement Project (“VITR”) case, a significant controversy arose because of a proposal to construct a new high voltage transmission line crossing residential areas from the Lower Main Land to Vancouver Island.

In its Decision, the Commission Panel stated the following:

“In view of all quantitative and qualitative aspects concerning route selection, locating high voltage transmission lines in infrastructure corridors away from residential areas is a preference but not essential. Consistent with this principle, the Commission Panel agrees with BCTC that in the case of a new transmission line on a new ROW, a non-residential route would be, in most circumstances, preferred to a residential route. In the case of an existing ROW, a significant effort should be made to find a cost-effective route away from residential neighbourhoods. If no cost-effective solution is found, then it is reasonable for an existing ROW to be used for both new and existing lines” (VITR Decision, pp. 87-88).

To put the VITR case in context when assessing the Naramata “Sites and Wires” Options analysis, it should be noted that in South Delta and on Gulf Islands an existing transmission line already traverses thorough residential areas whereas in Naramata the existing transmission line is located in a utility infrastructure corridor.

It is noticeable in the evidence, that although there are residences in the proximity of the Fire Hall site, those residents previously have chosen to live in a mixed agricultural/commercial utility infrastructure corridor. In the vicinity of Fire Hall site, there already is the Fire Hall itself, the FortisBC mobile transformer site, and the Water Purification Plant (Exhibit E-11).

## **5.0 COMMISSION DETERMINATION**

In considering the two alternatives and the evidence before it the Commission Panel is aware of the importance of this matter to the residents of Naramata and the strongly held views of many of the residents who contributed to the evidentiary record in one way or another. FortisBC in argument states “The evidence at the Hearing clearly showed that there is divided opinion within the Naramata community as to which site is preferable. There are petitions in evidence against both sites”.

Unfortunately, an issue of this nature can be divisive in the absence of a community plan which has been developed and is being implemented by the local jurisdiction after broad public consultation. This situation places a utility in a difficult position relative to opposing points of view on how and where the utility should develop facilities to meet its obligation to provide service.

Section 2 of this Decision describes the decision making process, background to the public interest test the other considerations the Commission Panel employed in reaching its decision on this matter. The Commission Panel was not persuaded by the technical and qualitative evidence that one site was the obvious choice over the other. Certainly, when one factor at a time was considered, one site or the other was favourable but on balance and taking all factors into account the choice was not a clear one.

Section 2.2 identifies two questions which the Commission Panel considers to be of significance:

- Is the new transmission line utility corridor necessary?
- Is the new green field utility infrastructure necessary?

### **5.1 Is the New Transmission Line Utility Corridor Necessary?**

In Section 4.1 of this Decision the transmission line corridor selected for the Arawana Road comparison with the Fire Hall site was identified as Option F. Option F, for the most part, utilizes an existing distribution line alignment to install a new transmission line and locates the existing, and a new distribution line underground in the same general alignment. In effect this will begin the

establishment of a new transmission utility corridor. While the Road route was considered by the Commission Panel to be preferable over the Direct Route, establishing a new corridor on either route is contrary to the principle of maximum utilization of common utility corridors. The Commission Panel is reluctant to establish a new utility corridor when an existing and well established corridor can be utilized. NAFS agrees with the need for a new Naramata substation, and believes the substation can, and therefore should, be sited within the existing utility corridor (NAFS Argument, p. 18).

## **5.2 Is the New Green Field Utility Infrastructure Necessary?**

This question refers to the Arawana Road site as the location for the required new substation.

The Commission Panel has already determined in Section 3.3.3 that although the Arawana Road site has operational advantages over the Fire Hall site and has greater potential for future development, both the Arawana Road and Fire Hall sites are suitable for the substation. The Commission Panel is not persuaded that development of the Arawana Road site, or the green field site, for the substation is necessary.

## **5.3 Commission Decision**

**The Commission Panel determines that the new Naramata substation is to be located at the Fire Hall site. FortisBC is directed to:**

- **Proceed immediately in an orderly and safe manner with the actions necessary to implement this determination.**
- **Prepare and submit a project schedule and revised project budget based on firm cost estimates.**
- **Provide quarterly project reports to the Commission following established procedures and format.**

- **Consult with local residents on alternatives for substation screening and select an option which is cost effective and sensitive to local concerns. The details of the consultation and substation screening are to be included in the quarterly project reports.**

**DATED** at the City of Vancouver, in the Province of British Columbia, this 12<sup>th</sup> day of October 2007.

*Original signed by:*

---

L.F. Kelsey  
Panel Chair and Commissioner

*Original signed by:*

---

L.A. O'Hara  
Commissioner

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**BRITISH COLUMBIA  
UTILITIES COMMISSION**

**ORDER  
NUMBER** G-124-07

TELEPHONE: (604) 660-4700  
BC TOLL FREE: 1-800-663-1385  
FACSIMILE: (604) 660-1102

**IN THE MATTER OF  
the Utilities Commission Act, R.S.B.C. 1996, Chapter 473**

**and**

**FortisBC Inc.  
and Customer Complaints regarding the Naramata Substation Project**

**BEFORE:** L.F. Kelsey, Panel Chair and Commissioner  
L.A. O'Hara, Commissioner October 12, 2007

**O R D E R**

**WHEREAS:**

- A. The Naramata Substation Project to rebuild the Naramata substation at a different site (the "Project") was included in the FortisBC Inc. ("FortisBC") 2005 Capital Expenditure Plan that formed part of the 2005 Revenue Requirements, System Development Plan and Resource Plan Application; and
- B. After the 2005 Capital Expenditure Plan was reviewed in an oral public hearing the Commission, by Order No. G-52-05, approved all capital projects in the 2005 Capital Expenditure Plan except for four projects, for which FortisBC was directed to submit Certificate of Public Convenience and Necessity Applications. The Project was not one of these four projects; and
- C. On April 12, 2007 the Commission Panel, by Order No. G-42-07, directed that any construction work on the Project be suspended immediately in an orderly and safe manner, pending further instructions from the Commission and established an Oral Public Hearing into Project siting options and related costs and issues; and
- D. By Order No. G-51-07 and Letter No. L-40-07, the Commission Panel set down a regulatory timetable including details of the Oral Public Hearing which was held on July 24, 2007 in Penticton, B.C.



**BRITISH COLUMBIA  
UTILITIES COMMISSION**

**ORDER  
NUMBER** G-124-07

2

**NOW THEREFORE** the Commission orders as follows:

1. All directions given in the attached Decision shall be followed by FortisBC.
2. Construction of the Naramata Substation at the Fire Hall site as set out in the attached Decision.
3. Construction work on the Project suspended by Commission Order No. G-42-07 may recommence.

**DATED** at the City of Vancouver, in the Province of British Columbia, this 12<sup>th</sup> day of October 2007.

BY ORDER

*Original signed by:*

L.F. Kelsey  
Panel Chair and Commissioner

**LIST OF APPEARANCES**

P. MILLER	Commission Counsel
R. McDONELL J. MARTIN	FortisBC inc.
W.J. ANDREWS	Naramations Against the FortisBC Substation (As Proposed)
D. HENLEY	Self
T. HOENISCH	Self
H. McCLELLAND	Self

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D. Flintoff J.B. Williston	Commission Staff
Allwest Court Reporting Ltd.	Court Reporters

IN THE MATTER OF  
the Utilities Commission Act, R.S.B.C. 1996, Chapter 473

and

FortisBC Inc.  
Certificate of Public Convenience and Necessity  
for the Naramata Substation Project

**EXHIBIT LIST**

<b>Exhibit No.</b>	<b>Description</b>
--------------------	--------------------

*COMMISSION DOCUMENTS*

- |      |   |
|------|---|
| A-1  | Letter dated April 17, 2007 issuing Order No. G-42-07 establishing an Oral Public Hearing into the Naramata Substation Project  |
| A-2  | Letter dated April 27, 2007 issuing response to Hans Karow's request for all previous customer complaints to be entered into evidence (Exhibit C1-2)                                  |
| A-3  | Letter dated May 9, 2007 and Order No. G-51-07 issuing the Regulatory Timetable   |
| A-4  | Letter dated May 14, 2007 issuing Commission Information Request No. 1  |
| A-5  | Letter dated May 29, 2007 requesting FortisBC Inc. respond to NAFS (Exhibit C2-4)   |
| A-6  | Letter No. L-40-0-7 dated June 1, 2007 establishing the location and time of the Public Hearing and issue Hearing Issues List   |
| A-7  | Letter dated June 7, 2007 approving FortisBC's request for an extension to the filing date of its Information Requests Responses and the filing of Intervenor Evidence (Exhibit B-4)  |
| A-8  | Letter dated June 21, 2007 establishing Hearing Issues List   |
| A-9  | Letter dated June 29, 2007 providing the participants with information to assist them by explaining the hearing process and what to expect at the Oral Public Hearing                 |
| A-10 | Letter dated July 9, 2007, clarifying the focus of the Oral Hearing, request to participants to notify Counsel if making an oral presentation, and confirmation of an evening session |

<b>Exhibit No.</b>	<b>Description</b>
A-11	Letter dated July 13, 2007 notifying FortisBC and Intervenor of the Commission Panel's intention to view the two site options for the Project
A-12	Letter dated July 19, 2007 responding to request for the questionnaires as additional evidence in the Oral Public Hearing
A-13	Letter dated August 7, 2007 issuing L-65-07 amending the Regulatory Timetable's dates for Intervenor's Final Arguments
A-14	Letter dated August 20, 2007 requesting FortisBC and Intervenor to file written comments on NAFS request for permission to file a reply to certain points made in FortisBC's Reply Argument
A-15	Letter dated August 27, 2007 accepting the NAFS Reply to FortisBC's Reply Argument

#### *APPLICANT DOCUMENTS*

B-1	Letter dated April 30, 2007 filing FortisBC's Siting Alternatives for the Naramata Substation Project Report (Exhibit A-1/Order G-42-07)
B-2	Letter dated April 10, 2007 filing FortisBC's submission regarding the Naramata Substation Project
B-3	Letter dated May 10, 2007 filing an Affidavit of Publication of the Notice of Oral Public Hearing
B-4	Letter dated June 6, 2007 requesting an extension to the filing date for FortisBC's responses to Information Requests from June 6, 2007 to June 7, 2007
B-5	Letter dated June 7, 2007 with Responses to Commission and Intervenor Information Requests
B-6	Letter dated June 15, 2007 from Robert J. McDonell, Farris Vaughan, legal counsel, filing comments on the Draft Hearing Issues List
B-7	Letter dated July 16, 2007, filing notice of the new WHO/ICNIRP guidelines, comments on EMF standards and impact on site selection
B-8	Letter dated July 16, 2007 filing responses to Intervenor's Information Request No. 2

Exhibit No.	Description
B-9	Letter dated July 17, 2007 filing FortisBC's Opening Statement for the oral public hearing
B-10	Letter dated July 20, 2007 filing FortisBC's Witness Panel Curriculum Vitae for Doyle Sam, Ian Finke and Paul Chernikhowsky
B-11	Letter dated July 20, 2007 filing Errata to B-2, B-6 and B-8
B-12	Letter dated July 31, 2007 filing Undertaking at Volume 1, Page 86, 105, 119, 120, 142, 154, 155, 167, and 178 response to various Intervenor's questions
B-13	Letter dated August 21, 2007 filing Undertaking #9, at Volume 1, page 86 response to Commission Counsels' questions
B-14	Letter dated August 22, 2007 filing comments in regards to NAFS' request to file additional reply argument

#### *INTERVENOR DOCUMENTS*

C1-1	<b>COALITION TO REDUCE ELECTROPOLLUTION (CORE)</b> – Letter dated April 19, 2007 from Hans Karow, filing request for Registered Intervenor and filing Information Request No. 1 to FortisBC with enclosures
C1-2	E-mail dated April 26, 2007 requesting all correspondence regarding FortisBC Naramata Project be posted on the Commission website
C1-3	Letter dated May 2, 2007 filing letter to Commission, with press release regarding the Naramata Balloon launch with attached picture
C1-4	E-mail dated May 8, 2007 from Mr. Karow filing his Submission
C1-5	Letter dated May 23, 2007 filing Information Request No. 2 to FortisBC
C1-6	E-mail dated May 24, 2007 from Mr. Karow regarding Electrical Pollution Facts
C1-7	Letter dated May 24, 2007 from Mr. Karow filing Evidence2A and Evidence 2B regarding Drs Carpenter, Bell, Rabinowitz, Baum, and Gerber Testimony and Supplemental Testimony

<b>Exhibit No.</b>	<b>Description</b>
C1-8	Letter dated May 29, 2007 filing Evidence 3, report on electromagnetic fields from high voltage power lines from Dr. Neil Cherry
C1-9	Letter dated May 29, 2007 filing Evidence 4a, report on Genotoxic electromagnetic radiation and Evidence 4b, part of Reflex study from Dr. Neil Cherry
C1-10	Letter dated May 30, 2007 filing Evidence 5, submission and comments from Dr. Gerald Bohemier on EMF exposure
C1-11	Letter dated May 30, 2007 filing Evidence 6, study on new methodology on ELF-EMF article from Robert J. Mairs
C1-12	Letter dated May 31, 2007 filing Evidence 7, Micro Wave News article from web
C1-13	Letter dated June 2, 2007 filing Evidence 8a and 8b with regards to EMF
C1-14	Letter dated June 6, 2007 filing Evidence 9 regarding power lines effecting property value
C1-15	Letter dated June 6, 2007 filing Evidence 10 regarding EMF damage
C1-16	Letter dated June 6, 2007 filing Evidence 11 regarding property devaluation
C1-17	Letter dated June 6, 2007 filing Evidence 12 regarding the City of CAMAS EMF Ordinance
C1-18	Letter dated June 6, 2007 filing Evidence 13 regarding Russian national standards on EMF
C1-19	Letter dated June 7, 2007 filing Evidence 14 regarding Properties Near Power Lines and Valuation Issues
C1-20	Letter dated June 7, 2007 filing Evidence 15 for future reference and information of innocent intervenors
C1-21	Letter dated June 7, 2007 filing Evidence 16 regarding Dr. Blanks previous testimony's
C1-22	Letter dated June 8, 2007 filing Evidence 17, regarding report from Eric Hachulla, Marie-Therese Caulier-Leleu, Odile Fontaine, Lofti Mehianoui, and Paul Pelerin

<b>Exhibit No.</b>	<b>Description</b>
C1-23	Letter dated June 9, 2007 filing Evidence 18, regarding testimony and CV of Dr. Carpenter
C1-24	Letter dated June 9, 2007 filing Evidence 19, regarding article from Dr. Louis Slesin
C1-25	Letter dated June 11, 2007 filing Evidence 20, regarding correspondence from Dr. Nam to Mr. Doyle
C1-26	Email dated June 10, 2007 filing Evidence 21, regarding evidence from Professor Olle Johansson
C1-27	Email dated June 11, 2007 filing Evidence 22, response from Professor Ahlbom
C1-28	Letter dated June 11, 2007 filing Evidence 23, regarding testimony and CV of Dr. Miller
C1-29	Letter dated June 11, 2007 filing Evidence 24, regarding comments on ELF and EMF from John W. Gofman
C1-30	Letter dated June 11, 2007 filing Evidence 25, regarding report from Don Maisch
C1-31	Letter dated June 11, 2007 filing Evidence 26, regarding Don Maisch's WHO/ICNIRP Report
C1-32	Letter dated June 12, 2007 filing Evidence 27, regarding article "A Lethal Subtle Energy" by E. Stanton Maxey, MD
C1-33	Letter dated June 12, 2007 filing Evidence 28, regarding article entitled "BEMS, WHO and the Precautionary Principle" by Martin Blank & Reba Goodman
C1-34	Letter dated June 12, 2007 filing Evidence 29, regarding EMF Ordinance from the Whatcom County
C1-35	Letter dated June 12, 2007 filing Evidence 30, regarding report from the Canadian Cancer Society on EMF concern
C1-36	Letter dated June 12, 2007 filing Evidence 31, regarding article on Electrohypersensitivity by Professor Olle Johansson
C1-37	Letter dated June 15, 2007 filing request to allow the EMF issues

Exhibit No.	Description
C1-38	Letter dated June 18, 2007 filing Evidence 32, EMF presentation slides
C1-39	Letter dated June 18, 2007 filing Evidence 33, regarding statement by Don Maisch on power frequency magnetic fields
C1-40	Letter dated June 18, 2007, filing copy of correspondence to World Health Organization (WHO) requesting EMF guidelines
C1-41	Letter dated June 18, 2007, filing Evidence 35, copy of response correspondence from World Health Organization (WHO)
C1-42	Letter dated June 18, filing Evidence 35, regarding Stakeholder Advisory Group on ELF EMFs (SAGE) Report on Precautionary approaches to ELF EMFs
C1-43	Letter dated July 11, 2007 filing comments and intention to make submission at the hearing regarding the WHO's EMF new exposure guidelines
C1-44	Letter dated July 19, 2007, filing objection of the Commissions intended two site option viewing and comments
C1-45	Letter dated July 22, 2007 requesting the Commission to postpone hearing
C1-46	E-mail dated July 23, 2007 and Petition in support of Exhibit C1-45
C1-47	E-mail dated July 23, 2007 submitting a July 18, 2007 article by James Randerson, Science Correspondent, entitled "Ban New Homes Near Power Lines, say MPs"
C1-48	<b>SUBMITTED AT HEARING</b> – Transcript Volume 1, Page 13, line 3 to 12 - Letter dated July 23, 2007, filing notice that he will not be attending the Hearing
C1-49	Letter dated August 9, 2007, filing Notice of no final argument being submitted and comments
C2-1	<b>NARAMATIONS AGAINST THE FORTIS SUBSTATION (NAFS)</b> – Letter dated April 22, 2007 from June Stewart and Kevin Brown, filing request for Registered Intervenor
C2-2	Letter dated May 4, 2007 filing notice of legal counsel from William J. Andrews and additional comments



<b>Exhibit No.</b>	<b>Description</b>
C2-3	Letter dated May 23, 2007 filing Information Request No. 1 to FortisBC
C2-4	Letter dated May 25, 2007 filing additional questions to Information Request No. 1 to FortisBC
C2-5	Letter dated June 15, 2007 filing comments on the proceeding and notification of additional Information Requests
C2-6	Letter dated June 18, 2007 from William Andrews, legal counsel, filing Evidence
C2-7	Letter dated June 18, 2007 from William Andrews, legal counsel, filing additional Evidence
C2-8	Letter dated June 18, 2007 from William Andrews, legal counsel, filing comments on Draft Hearing Issues List
C2-9	Letter dated June 21, 2007 from William Andrews, legal counsel, filing additional Evidence and Errata to NAFS' main evidence (Exhibit C2-6)
C2-10	Letter dated July 3, 2007 from William Andrews, legal counsel, filing an Errata to NAFS' witness statement from Anne Reid (Exhibit C2-6)
C2-11	Letter dated July 18, 2007 from William Andrews, filing request to the Commission for an Order to direct Fortis to provide requested questionnaires, information and cost estimates, and notice to file evidence
C2-12	Letter dated July 19, 2007 from William Andrews, legal counsel, filing an Errata to his letter of July 18, 2007 (Exhibit C2-11)
C2-13	Exhibit Withdrawn – Exhibit posted should be C3-7
C2-14	Letter dated July 22, 2007 filing the NAFS Opening Statement from William Andrews, legal counsel
C2-15	Undertaking at Transcript Volume 1, page 217, 218 and 220, filing responses to the Commission's information requests at hearing
C2-16	Letter dated August 22, 2007 filing response and comments to FortisBC's counsels letter (Exhibit B-14)

Exhibit No.	Description
C3-1	<b>ANDREW, DAVID</b> – Letter dated April 24, 2007, filing comments and request for Registered Intervenor
C3-2	Letter dated May 22, 2007 filing Information Request No. 1 to FortisBC
C3-3	Letter dated May 23, 2007 filing Information Request No. 2 to FortisBC
C3-4	Received June 15, 2007 filing Evidence on Transmission Line-Distribution Line Options
C3-5	Email dated June 18, 2007 filing Information Request No. 2 to FortisBC
C3-6	Letter dated July 18, 2007 filing letter of comment
C3-7	Letter dated July 19, 2007, filing Rebuttal to FortisBC Answer A2.5.1 to Question 2.5.1
C4-1	<b>COTON, MICHAEL</b> - Letter dated April 22, 2007 request for Registered Intervenor status
C5-1	<b>REID, ANNE</b> - Letter dated April 26, 2007 request for Registered Intervenor status
C6-1	<b>THOMPSON, BLISS &amp; HELLEN</b> - Letter dated April 27, 2007 filing comments and request for Registered Intervenor status
C7-1	<b>FOCKEN, FRANK</b> - Letter faxed April 30, 2007 request for Registered Intervenor status
C8-1	<b>REYNOLDS, JEFFREY</b> - Letter dated May 4, 2007 filing comments and request for Registered Intervenor status
C9-1	<b>MCLEAN, EDWARD</b> - Email dated May 6, 2007 filing request for Registered Intervenor status
C10-1	<b>SCHNITZER, JOE &amp; GAYLE</b> - Letter dated May 6, 2007 filing comments and request for Registered Intervenor status
C11-1	<b>WRIGHT, HOWARD</b> - Email dated May 5, 2007 filing comments and request for Registered Intervenor status
C12-1	<b>PEDERSEN, ERIK &amp; SUSANNE</b> – Email dated May 7, 2007 filing comments and requesting registered Intervenor Status

Exhibit No.	Description
C13-1	<b>HENLEY, DARLENE</b> - Letter dated July 13, 2007 representing Judy Kingston request for Intervenor Status
C13-2	Letter dated July 19, 2007 from Darlene Henley, filing Intervenor Brief on behalf of various Naramata residents on the fire hall substation
C13-3	<b>SUBMITTED AT HEARING</b> – Petition filed at Public Hearing
C14-1	<b>MCLELLAND, HUGH – SUBMITTED AT HEARING</b> – Undertaking at Volume 1, Page 229, Lines 10, filing comments and request for Registered Intervenor Status
C14-2	Undertaking at Volume 1, Page 229, Lines 10, filing comments and request for Registered Intervenor Status

#### *INTERESTED PARTY DOCUMENTS*

D-1	<b>DOYLE, EVELYN</b> - Letter dated April 23, 2007 filing request for Interested Party status
D-1-2	Letter dated April 30, 2007 filing comments and request for information on public hearing
D-2	<b>NARAMATA ADVISORY PLANNING COMMISSION</b> - Letter dated May 1, 2007 from Phil & Georgeen Janzen filing request for information on Naramata Project
D-3	<b>MARSHALL, MICHAEL J.</b> – Online web registration dated May 1, 2007 requesting Interested Party status
D-3-1	Email received May 2, 2007 filing correspondence from Kevin Brown dated August 8, 2006
D-4	<b>DOIT, CLAUDE &amp; MERLE</b> - Letter dated April 28, 2007 filing request for Interested Party status with comments and photos
D-5	<b>RULE, GEORGE &amp; IRENE</b> – Letter dated May 3, 2007 requesting Interested Party status
D-6	<b>FYFE, GAIL</b> - Online web registration dated May 4, 2007 requesting Interested Party status
D-7	<b>KING, CAROLYN</b> - Email dated May 4, 2007 requesting Interested Party status

<b>Exhibit No.</b>	<b>Description</b>
D-8	<b>WELDER, RICHARD &amp; MARCHAND-WELDER, CHRISTINE</b> - Online web registration dated May 7, 2007 requesting Interested Party status
D-9	<b>BATEMAN, VELMA</b> - Online web registration dated May 4, 2007 requesting Interested Party status
D-10	<b>TROTZUK, J. &amp; SANDY</b> – Letter dated May 4, 2007 requesting Interested Party status
D-11	<b>MARCHAND, DAVID</b> – Online web registration dated May 7, 2007 requesting Interested Party status
D-12	<b>MARCHAND, LISA</b> – Online web registration dated May 7, 2007 requesting Interested Party status
D-13	<b>MARCHAND, RAYMOND &amp; PAT</b> – Online web registration dated May 7, 2007 requesting Interested Party status
D-14	<b>COWDELL, ROGER &amp; HELEN</b> – Letter dated May 3, 2007 requesting Interested Party status

*LETTERS OF COMMENT*

E-1	Letter of Comment dated April 12, 2007 from Jeffrey Reynolds
E-2	Letter of Comment dated April 16, 2007 from Bliss & Hellen Thompson
E-3	Letter of Comment dated April 17, 2007 from David Andrew
E-4	Letter of Comment dated April 23, 2007 from Ruth and Christopher Hunter, United Kingdom
E-5	Letter of Comment dated April 30, 2007 from Janette Currie, Naramata, BC
E-6	Letter of Comment dated May 2, 2007 from Len Farrant, Naramata, BC
E-7	Letter of Comment dated May 2, 2007 from Julie Hawes, Naramata, BC
E-8	Letter of Comment dated May 4, 2007 from David & Donna Andrew, Naramata, BC
E-9	Letter of Comment dated May 23, 2007 from Geof Thompson, President, Paradise Climate Controls Inc.

<b>Exhibit No.</b>	<b>Description</b>
E-10	Letter of Comment dated May 30, 2007 from Karl S. and Dudrun Martin, Naramata, BC
E-11	Letter of Comment dated May 31, 2007 from Beatrice and Ralph Suremann, Naramata, BC
E-12	Letter of Comment dated June 21, 2007 from Eberhard von Ketelhodt, Naramata, BC
E-13	Letter of Comment dated June 30, 2007 from Arno & Florence Grimm
E-14	Letter of Commend dated July 5, 2007 from Marcus Ansems
E-15	Letter of Comment dated July 5, 2007 from Paul Paxon
E-16	Letter of Comment dated July 4, 2007 from Maria Gammer
E-16-1	Revised Letter of Comment dated July 17, 2007 from Maria Gammer
E-17	Letter of Comment dated July 4, 2007 from Benoit C. Martel, Naramata
E-18	Letter of Comment dated July 4, 2007 from Marleen Wethrup, Naramata
E-19	Letter of Comment dated July 4, 2007 from Tom Moloney, Naramata
E-20	Letter of Comment dated July 4, 2007 from Karen Simmerling, Naramata