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File No. 551952/000002

August 10, 2018

Delivered by Email (Commission.Secretary@bcuc.com)

British Columbia Utilities Commission
Suite 410, 900 Howe Street
Vancouver, BC, V6Z 2N3

Attention: Patrick Wruck, Commission Secretary

Dear Sirs/Mesdames:

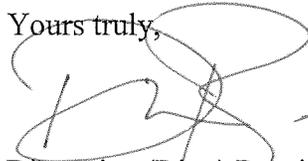
Re: FortisBC Alternative Energy Services Inc. 2018/2019 Revenue Requirements and Cost of Service Rates Application for the Thermal Energy Service to Delta School District No. 37 - Project Number 1598949

Further to the Amended Regulatory Timetable dated June 29, 2018, please find enclosed the following evidence of Delta School District No. 37 (“DSD”) in the above-noted application proceedings:

1. Affidavit #1 of Frank Geyer dated August 10, 2018;
2. Affidavit #1 of Don Poole dated August 2, 2018;
3. Report of ReShape Strategies dated August 10, 2018; and
4. Report of MCW Consultants Ltd. dated August 10, 2018 (except Appendix G). Appendix G of the MCW Report, FEI’s Response to the Commission’s Confidential Information Requested dated January 25, 2012, is being filed under separate cover on a confidential basis.

We trust this is satisfactory. If you have any questions, please contact the undersigned directly.

Yours truly,



Dionysios (Dino) Rossi

This is the 1st Affidavit
of Frank Geyer in this case
and was made on 10th August 2018

IN THE MATTER OF

The *Utilities Commission Act*, RSBC 1996, Chapter 473

and

FortisBC Alternative Energy Services Inc.
Application for Approval of the Fiscal 2018/2019 Revenue Requirements and Cost of Service
Rates for the Thermal Energy Service to Delta School District No. 37

BEFORE:

W. M. Everett, QC, Panel Chair/Commissioner
A. K. Fung, QC, Commissioner
M. Kresivo, QC, Commissioner

AFFIDAVIT

I, FRANK GEYER, with an office at 7811 Granville Avenue, Richmond, British Columbia, V6Y 3E3, SOLEMNLY AFFIRM AND SAY THAT:

1. I am an engineer (P. Eng.) registered and in good standing with the Association of Professional Engineers and Geoscientists of BC.
2. From to January 1, 2003 to February 25, 2018, I was employed as the Director of Facilities & Planning for Delta School District No. 37 (“**DSD**”). In this role, I was responsible for:
 - a. overall stewardship of the physical plant of the DSD buildings, grounds, infrastructure, capital planning and delivery;
 - b. operations and maintenance of DSD facilities;
 - c. energy, emergency and utilities management; and
 - d. information technology.

3. From February 26, 2018 to the present date, I have been employed as the Executive Director of Planning & Development at Richmond School District No. 38.
4. I have personal knowledge of the facts and matters hereinafter deposed, save and except where the same are stated to be based on information and belief, and where so stated, I verily believe them to be true.

I. Initial Project Discussions (June 2008 – January 2011)

5. In or around June of 2008, I attended the annual conference of the School Plant Officials Association of British Columbia in Penticton, British Columbia. During this conference, Tim Mah of Terasen Energy Services Inc. (“**Terasen**”) approached me to discuss the possibility of undertaking a joint energy project between Terasen and DSD to upgrade DSD’s heating systems and reduce its energy costs. At the time, DSD was looking for a way to upgrade its heating systems and reduce its energy costs because DSD’s natural gas heating systems were reliant upon natural gas and DSD expected the price of natural gas to go up. As I believed the joint energy project was worth investigating, I followed up with Mr. Mah after the conference to obtain further details.
6. On July 8, 2008, Mr. Mah sent me an email message with a brief overview of Terasen’s activities and information about two of its thermal energy projects. Attached hereto and marked as Exhibit “A” to this my affidavit is a true copy of the email message from Mr. Mah dated July 8, 2008.
7. For a number of months after July 2008, DSD and Terasen staff met to discuss the details of the proposed energy project. At the time, Terasen was proposing that:
 - a. Terasen would upgrade and/or replace DSD’s energy supply equipment (e.g. its natural gas boilers), own the upgraded or new equipment and sell heat to DSD; and
 - b. DSD would pay Terasen for the energy and would pay for the cost of maintaining and replacing the energy supply equipment as the project proceeded.
8. After some months of discussions, and the completion of preliminary tests at a possible project site (Seaquam Secondary – which was not included in the final project), DSD ended

the discussions with Terasen as DSD was of the view that the costs of the project were prohibitively high.

9. On October 22, 2009, John Turner, the then Director of Customer Management and Sales at Terasen, contacted Dale Saip, a Trustee on DSD's Board of Education (the "**Board of Education**"), in an attempt to re-open discussions with DSD regarding the proposed project. At the time, Mr. Turner advised Mr. Saip that:
 - a. Terasen wished to participate in and contribute to a thermal energy audit for all DSD facilities.
 - b. It was anticipated that the result of this audit would be a portfolio of thermal energy solutions optimized for all DSD facilities. The goal would be to aggregate all capital investment necessary to optimize thermal energy use in the school district, maximize Terasen's capital costs contribution, and determine a single energy rate for all DSD facilities.
10. On or about November 6, 2009, at the request of Mr. Saip, DSD staff re-opened discussions with Terasen staff (specifically, Vlad Koska and Don Bergler) regarding the proposed project. At the time, DSD staff were still concerned that the costs of the proposed project would be prohibitively high. However, we were open to discussing the proposed project as DSD's annual facility grant (worth \$2,800,000) had just been cancelled; DSD still needed to find other ways to upgrade its heating systems and reduce its energy costs; and Terasen had indicated that it would consider different thermal energy project options.
11. Attached hereto and marked as Exhibit "**B**" to this my affidavit are true copies of email messages exchanged by DSD and Terasen between October 22, 2009 and November 6, 2009 regarding the proposed thermal energy project.
12. Between November 6, 2009 and July 14, 2010, Terasen undertook a feasibility assessment of the proposed thermal energy project. DSD staff assisted with the feasibility assessment by providing Terasen staff with information regarding DSD's energy consumption and access to DSD facilities, as requested.

13. On or about July 14, 2010, Terasen staff presented its feasibility assessment (the “**Feasibility Assessment**”) to DSD staff. The Feasibility Assessment recommended that Terasen and DSD undertake a joint energy project at an initial capital cost of \$6,961,321.00 to replace the energy systems at 16 of DSD’s facilities with a combination of geothermal heat pump systems, high efficiency heat pump systems, and high efficiency (Energy Star rated) boilers. Under the terms of the recommended project, either DSD or the British Columbia Ministry of Education would fund \$1,935,415 of the initial capital costs for the project. However, Terasen would own the upgraded energy systems and would sell energy to DSD at an agreed-upon rate.
14. The Feasibility Assessment stated that the recommended project would:
 - a. reduce DSD’s greenhouse gas (GHG) emissions by 61 to 65%;
 - b. reduce DSD’s annual operating and capital costs by \$224,650;
 - c. reduce DSD’s future replacement costs;
 - d. increase the efficiency of DSD’s energy systems;
 - e. protect DSD against energy price volatility; and
 - f. deliver a better and healthier indoor environment to DSD school and facility occupants.
15. Attached hereto and marked as Exhibit “C” to this my affidavit is a true copy of the Feasibility Assessment.
16. DSD staff decided not to present the Feasibility Assessment to the Board of Education as we knew the Board of Education would not agree to make significant financial contributions towards the design and construction of energy systems that would not be owned by DSD. Nonetheless, DSD staff continued discussions with Terasen staff with the hope that the proposed thermal energy project could be revised to make it more palatable to the Board of Education.

17. On or about October 28, 2010, after months of further discussions between DSD staff and Terasen staff, Terasen staff presented a revised feasibility assessment (the “**Revised Feasibility Assessment**”) to DSD. The Revised Feasibility Assessment recommended that DSD and Terasen undertake a joint thermal energy project (the “**Project**”) at an initial capital cost of \$4,942,000 to replace the energy systems at 19 of DSD’s facilities with a combination of geothermal heat pump systems, open loop heat pump systems, air source to water heat pump systems, and high efficiency (Energy Star rated) boilers. Under the terms of the Project, either DSD or the B.C. Ministry of Education would fund approximately \$1,357,000 of the initial capital costs for the project. However, Terasen would own the upgraded energy systems and would sell energy to DSD at an agreed-upon rate.
18. The Revised Feasibility Assessment stated that the Project would:
 - a. reduce DSD’s greenhouse gas (GHG) emissions by 69%;
 - b. reduce DSD’s annual operating and capital costs by \$188,000;
 - c. reduce DSD’s future replacement costs;
 - d. increase the efficiency of DSD’s energy systems;
 - e. protect DSD against energy price volatility; and
 - f. deliver a better and healthier indoor environment to DSD facility occupants.
19. Attached hereto and marked as Exhibit “**D**” to this my affidavit is a true copy of the Revised Feasibility Assessment and a letter dated October 28, 2010 from Mr. Kostka summarizing the Revised Feasibility Assessment.
20. DSD staff believed that the terms of the Revised Feasibility Assessment would be more palatable to the Board of Education than the terms of the Feasibility Assessment, primarily because the required capital cost contributions were lower. However, we were still concerned that the DSD did not have \$1,357,000 to contribute to the initial capital costs for the Project. To address this funding issue, at Terasen’s suggestion, DSD applied to the

Climate Action Secretariat for \$1,357,000 in Public Sector Energy Conservation Agreement (“PSECA”) funding. Terasen supported DSD’s application for PSECA funding and assisted with the application by providing the Climate Action Secretariat with a draft energy study for the Project.

21. Attached hereto and marked as Exhibit “E” to this my affidavit is a true copy of a letter dated January 6, 2011 from myself to the Climate Action Secretariat Director, Debra Larusson, regarding DSD’s application for PSECA funding. The letter accurately summarizes DSD’s understanding of what would be included in the Project and the purpose of the PSECA funding. It provides, in part:

The amended funding request is now \$1,357,000 towards the overall project budget of \$4,892,000. The breakdown of cost sharing and scope of work is listed on the table included as Appendix A. For the smaller projects (i.e. replacement of conventional boilers with high efficiency condensing boilers), Terasen’s contribution through its efficient boiler program is small, with government picking up the majority of costs for the labour to remove, re-pipe and connect to the new boilers. On the larger projects, Terasen will pick up the majority of cost for construction of geexchange fields, wells, heat pumps and associated plant, with the government share limited to the cost to adapt existing piping and replace thermal distribution equipment downstream as necessary to adapt to the new plant. The site with the largest government contribution is South Delta Secondary, where significant cost will be incurred to change a system of over 50 gas-fired rooftop heating systems throughout the facility over to a central ground source heat pump plant distributing heated and chilled water to new coils and fan units at former RTU locations.

22. Attached hereto and marked as Exhibit “F” to this my affidavit is a true copy of the draft energy study Terasen provided to the Climate Action Secretariat to support DSD’s application for PSECA funding. The draft energy study expressly confirmed DSD’s understanding that the Project would be a package project that would meet all of DSD’s energy needs without any further work required from DSD. Neither I nor any other DSD representatives had any experience or expertise regarding the design, construction, installation or operation of thermal energy systems. At all material times, DSD relied upon Terasen, FEI and FAES as thermal energy system providers to provide expertise regarding

the design, construction, installation and operation of the thermal energy systems included in the Project. Indeed, section 2.3 of the Energy System Service Agreement that was negotiated for each of the DSD sites included in the Project expressly acknowledges that DSD did not have any obligation to verify the suitability of the thermal energy systems designed, constructed and installed by FAES for the Project.

23. DSD proceeded with the Project on the understanding that it would achieve the objects set out in the Revised Feasibility Assessment, namely, that it would:
 - a. reduce DSD's greenhouse gas (GHG) emissions by 69%;
 - b. reduce DSD's annual operating and capital costs by \$188,000;
 - c. reduce DSD's future replacement costs;
 - d. increase the efficiency of DSD's energy systems;
 - e. protect DSD against energy price volatility; and
 - f. deliver a better and healthier indoor environment to DSD facility occupants.

24. DSD's funding model with the British Columbia Ministry of Education generally provides all schools with equivalent funding on a per-pupil basis. Given this, it was important to DSD to achieve as much certainty and predictability as possible with respect to its energy costs, and to avoid significant volatility or "rate shock" in any given year. This was because, under its funding model, DSD would not receive any additional funding for increases in energy costs that deviated from that of other school districts.

II. Negotiation of the Project Agreements (February 2011 to September 2011)

25. On or about February 7, 2011, the Climate Action Secretariat approved DSD's application for PSECA funding and DSD entered into a Letter of Agreement with Terasen Gas Inc. "(TGI)". The Letter Agreement provided the basis for the negotiation of:
 - a. an Energy System Rate Development Agreement for all DSD facilities included in the Project; and

- b. an Energy Systems Service Agreement for each of the DSD facilities included in the Project.
26. Attached hereto and marked as Exhibit “G” to this my affidavit is a true copy of the Letter Agreement dated February 7, 2011.
27. Between February 7, 2011 and September 26, 2011, DSD and Terasen (which became FortisBC Energy Inc. or “FEI” during this period) negotiated the Energy System Rate Development Agreement and Energy Systems Service Agreements, which were collectively attached as confidential appendices to FEI’s November 28, 2011 “Application for a Certificate of Public Convenience and Necessity for Approval of Contracts and Rate for Public Utility Service to Provide Thermal Energy Service to Delta School District Number 37” (the “**CPCN Application**”). Email messages exchanged between FEI’s Business Development Manager, Grant Bierlmeier, and myself during this time period show the factual context in which the contract was being negotiated between the parties. As set out in the email messages, one of the objects of the contract was to create a rate structure whereby DSD would only be required to switch from the market rate (the “**Market Rate**”) to the cost-of-service rate (the “**COS Rate**”) if it was in DSD’s best interests to do so. Of note, Mr. Bierlmeier advised me that:
- a. DSD could choose to pay the COS Rate at any time during the term of the Energy System Rate Development Agreement. FEI expected the COS Rate rate to be lower than the Market Rate, however, the choice to switch would be for DSD to make. As set out in an email message from Mr. Bierlmeier to myself dated May 30, 2011:
- You may choose to pay the cost of service rate at any time during the Agreement. We expect this rate to be lower than the market rate, but the choice will be yours to make.
- b. Attached hereto and marked as Exhibit “H” to this my affidavit is a true copy of the email message from Mr. Bierlmeier dated May 30, 2011.

- c. The “Market Rate Rider” would be available as long as DSD was paying the Market Rate for the duration of the Energy System Rate Development Agreement. As set out in an email message from Mr. Bierlmeier to myself dated July 4, 2011:

Of note, the SD37 Market Rate Rider is available as long as you are paying the Market Rate, for the duration of the agreement, which produces a savings guarantee against BAU [Business As Usual] through the entire agreement totaling over \$3.8M if you remain on the Market Rate, not just year one, which is worth \$188K alone. Indexing the Rate Rider will mean that the savings will be more or less than the negotiated amount.

- d. Attached hereto and marked as Exhibit “I” to this my affidavit is a true copy of the email message from Mr. Bierlmeier dated July 4, 2011.
- e. DSD would only be unilaterally switched to the COS Rate if the British Columbia Utilities Commission (the “**Commission**”) determined that switching to the COS Rate was in DSD’s best interests. As set out in an email message from Mr. Bierlmeier to myself dated September 12, 2011:

The market rate is a deviation from the standard cost of service. Albeit a necessary one to provide you, the SD, with the guarantee that you need for your board. The issue we saw was that since only the SD had the choice to switch, it raises the potential that if you (Frank G) are no longer there, and new people who do not understand what the real purpose of the market rate is to begin to administer the contract, then they may not switch to the cost of service even if it makes sense to. So, we put in an election for FEI to switch, subject to BCUC approval. You might say, shouldn’t we need SD agreement? Well, if the SD agrees, then the SD will simply elect to switch. The FEI election is simply to give both FEI and the BCUC an out to move to cost of service. The nuance here is that BCUC approval is required to switch, so, since the BCUC looks after the interests of customers, FEI would need to present a compelling argument that moving to cost of service is in the interest of the SD, even though the SD does not agree. No small task to say the least (not even sure what kind of argument it would have to be at the moment if you know what I mean).

- f. Attached hereto and marked as Exhibit “J” to this my affidavit is a true copy of the email message from Mr. Bierlmeier dated September 12, 2011.
- g. DSD would have the opportunity to ensure that the COS Rate was reasonable before being switched to the COS Rate. As set out in an email message from Mr. Bierlmeier to myself dated September 15, 2011:

However, while I trust you to be reasonable Frank, since I know you understand this deal, I don t know what mindset will prevail at the District in 10 or 15 years from now. As of now, we all want to get to Cost of Service, but you need proof that it will be beneficial, which is what the market rate gives you so that you can get some comfort that COS is going to be reasonable before switching. We would go straight to COS, but this way, with the market rate, you have the chance to watch and ensure that the costs are in line with expectations first. What worries me is in 10 or 15 years from now, if the District is still on the market rate, the people administering the contract may not know what our intent was today and may not elect or agree to go to COS rates, even if there are good reasons to do it. Sometimes it is the reality of bureaucracy.

By giving FEI the ability to ask the BCUC to move the District to COS under the contract, FEI has at least a tiny bit of control over the process. BCUC approval is still necessary, which is to the benefit of the District. If FEI needs District consent to ask the BCUC, then implicitly, the District also wants to move to COS, which does not require BCUC approval. If that is true, then the District will simply elect to pay the COS rate, which means there is no reason to have a clause for FEI to apply to the BCUC to move the District to COS the BCUC will always be the decision maker and the BCUC must consider the District interests.

- h. Attached hereto and marked as Exhibit “K” to this my affidavit is a true copy of the email message from Mr. Bierlmeier dated September 15, 2011.
28. At all material times during the above-noted email exchanges, I understood that FAES could only apply to switch DSD from the Market Rate to the COS Rate if it was in DSD’s best interests (including its best financial interests) to switch.

29. As set out in the above-noted email messages, at no time during these discussions did Mr. Bierlmeier or any other FEI representative state that there would be a 3 to 5 year transition period for switching to the COS Rate. To the contrary, Mr. Bierlmeier repeatedly and expressly stated that DSD could continue to pay the Market Rate for so long as it was in DSD's best interests to do so.

III. The CPCN Application (November 2011 – June 2012)

30. On November 28, 2011, FEI filed the CPCN Application with the Commission.

31. On December 6, 2011, DSD applied to participate as an intervener in the CPCN Application proceedings. Attached hereto and marked as Exhibit "L" to this my affidavit is a true copy of DSD's "Request to Intervene Form" dated December 6, 2011.

32. The only reason DSD applied to participate as an intervener in the CPCN Application proceedings was because Mr. Bierlmeier suggested that DSD do so so that DSD would be seen by the Commission as supporting the Project. Mr. Bierlmeier advised me that DSD did not need to be actively involved in the CPCN Application proceedings and that FEI would "take care of the regulatory process". Mr. Bierlmeier further advised me that the Commission would advocate for and protect the DSD's interests. As a result of these representations by FEI:

a. DSD did not retain legal counsel during the CPCN Application proceedings;

b. DSD did not file any evidence in the CPCN Application proceedings; and

c. DSD did not submit any argument in the CPCN Application proceedings.

33. On January 18, 2012, the Commission sent DSD Commission Information Request No. 1.

34. Attached hereto and marked as Exhibit "M" to this my affidavit is a true copy of Commission Information Request No.1 dated January 18, 2012.

35. On January 24, 2012, DSD filed its Response to Commission Information Request No.1. The Response to Commission Information Request No.1 was prepared predominantly by FEI as DSD did not have the expertise needed to prepare the response.
36. Attached hereto and marked as Exhibit "N" to this my affidavit is a true copy of DSD's Response to Commission Information Request No.1 dated January 24, 2012.
37. On March 9, 2012, the Commission issued its decision regarding the CPCN Application (the "**CPCN Decision**") and Order G-31-12:
- a. granting the CPCN on the condition that the Energy System Rate Development Agreement and Energy Systems Service Agreements be assigned to an affiliate of FEI with proof of the assignments being submitted to the Commission within 30 days of March 9, 2012;
 - b. denying approval of the proposed rate and rate design but indicating that the Commission would accept for filing a rate and rate design based upon a 60/40 debt/equity capital structure containing specified amendments;
 - c. encouraging DSD and FEI to revisit the COS model and consider a pricing model that might better allocate risks between the two parties;
 - d. urging DSD to negotiate a rate with FEI that fit its current budget and did not result in unreasonably deferring costs to the future; and
 - e. providing the parties with 30 days to reconsider their positions, after which time the parties were requested to provide the Commission with an updated rate filing.
38. Between March 12 and 30, 2012, I was away on vacation in the Caribbean. I did not read the CPCN Decision before I left for vacation and, to the best of my knowledge, neither did any other DSD representative.
39. On March 16, 2012:

- a. FEI filed evidence confirming that the Energy System Rate Development Agreement and Energy Systems Service Agreements had been assigned by FEI to an affiliate, FortisBC Alternative Energy Systems Inc. (“FAES”); and
 - b. the Commission issued a CPCN to FAES by Order C-3-12 for the construction and operation of the Project.
40. On March 30, 2012, I returned from my vacation and received an email message from Mr. Bierlmeier advising me that:
 - a. FEI had made all of the adjustments to the rate and rate design needed to obtain the Commission’s approval of the rate and rate design; and
 - b. nothing further was required from DSD in relation to the CPCN Application proceedings.
41. Mr. Bierlmeier did not advise me that the Commission had encouraged the parties to revisit the COS model and consider a pricing model that might better allocate risks between the two parties, or that the Commission had urged DSD to re-negotiate the rate with FEI. As a result, I did not review the CPCN Decision at that time and, to the best of my knowledge, neither did any other DSD representative.
42. On April 3, 2012, FAES filed a letter with the Commission which stated that FAES and DSD had both agreed to revise the rates and rate design as described in Order G-31-12.
43. Attached hereto and marked as Exhibit “O” to this my affidavit is a true copy of the letter dated April 3, 2012.
44. I did not review the CPCN Decision until after FAES filed its April 3, 2012 letter with the Commission.
45. On June 25, 2012, after the receipt of further filings from FAES; the Commission issued Order G-88-12, which approved the rate as described in the CPCN Application and amended by FAES’ filing dated June 11, 2012.

46. Attached hereto and marked as Exhibit “P” to this my affidavit is a true copy of Order G-88-12.

IV. Post-CPCN Concerns About the Project (July 2012 to February 2013)

47. In the summer and fall of 2012, I understand that FEI was undertaking efforts to market the Project to other boards of education. At the time, Darryl McCulley (then the Regional Manager at Smith Energy), Neil Caldwell (an engineer conservation engineer who lived in Delta) and Dr. John Meech (then a Professor of Mining Engineering at the University of British Columbia) raised concerns about the Project. More specifically:

a. Mr. McCulley sent me a number of email messages in which he expressed concerns about the economic feasibility of the Project. Attached hereto and marked as Exhibit “Q” to this my affidavit are true copies of the email messages I received from Mr. McCulley.

b. An article was published in the *South Delta Leader* on October 12, 2012 in which Mr. McCulley and Mr. Caldwell were quoted as saying that the Project was not economically feasible and that the Commission was concerned with the cost risks being assumed by DSD by agreeing to a COS model. Attached hereto and marked as Exhibit “R” to this my affidavit is a true copy of the article published in *South Delta Leader* on October 12, 2012.

c. A letter to the editor was published in the *South Delta Leader* on October 19, 2012 in which Dr. Meech expressed concerns about the economic feasibility of the Project. Attached hereto and marked as Exhibit “S” to this my affidavit is a true copy of the letter to the editor published in *South Delta Leader* on October 19, 2012.

48. As a result of the foregoing, on or about October 3, 2012, I asked Mr. Bierlmeier to provide a response to the concerns raised by Mr. McCulley, Mr. Caldwell and Dr. Meech.

49. On October 3, 2012, Mr. Bierlmeier sent me an email message in which he outlined his responses to the concerns raised by Mr. McCulley, Mr. Caldwell and Dr. Meech. In respect of the issue of cost effectiveness, Mr. Bierlmeier stated as follows:

On the issue of cost effectiveness, the Delta service was designed to offer maximum emission reductions without costing more. It is true that a purely “low-cost” solution could have been implemented instead, but without the huge emission reductions that the service delivers. Given carbon neutrality is the mandate, with an emphasis on real reductions being the priority, we feel strongly that the project best achieves this. The BCUC merely is putting on record that they think there may be cheaper solution, without the green benefits available. Nonetheless, the Ministry supported the project and ultimately the BCUC approved this project, thereby indicating their support for it.

50. In respect of the Commission’s comments in the CPCN Decision regarding the current and future risks of the Project, Mr. Bierlmeier stated as follows:

I actually disagree with the Commission opinion on the current and future risks. The service that was approved by the BCUC has checks and balances on initial and future costs via the prudency reviews that the BCUC has done and will be doing each year on the service. In contrast, a long term investment decision along with firm long term contracts by a school district based solely on forecasts of energy and price savings into the future done at this moment in time exposes future ratepayers to immense risk without any opportunity to represent themselves. In our solution, future ratepayers will have an ongoing opportunity to represent their interests to the BCUC. As such, I believe the quoted BCUC statements on this matter in the Delta decision are incorrect and that the BCUC are becoming more aware of this through the subsequent processes we have been engaged in with them since the Delta Decision. In any event, we must remember that the BCUC approved this rate design and will be reviewing it each year for reasonableness in the interests of customers.

51. Attached hereto and marked as Exhibit “T” to this my affidavit is a true copy of the email message from Mr. Bierlmeier dated October 3, 2012.
52. On or about October 30, 2012, FEI’s Vice President of Energy Solutions & External Relations, Doug Stout, sent me a letter in which he elaborated on Mr. Bierlmeier’s responses to the concerns raised by Mr. McCulley, Mr. Caldwell and Dr. Meech. The letter provides, in part:

While Dr. Meech and Messrs. Caldwell and McCulley are now expressing concerns, they did not participate in the BCUC proceeding despite their knowledge of the BCUC and their respective affiliations with Delta municipal politics, Ameresco (a company which offers energy performance contracts as an alternative to the FortisBC public utility service and who participated in the BCUC regulatory process through its trade association) and Smith Energy (a gas boiler supplier).

In his letter to the editor, Dr. Meech who notes he is a Professor of Mining Engineering, and Director of the UBC Centre for Environmental Research in Minerals, Metals, and Materials put forth a discussion of the relative cost of geothermal energy systems. Unfortunately, his assumptions on scope result in a mischaracterization of not only the cost of the system to the Delta School District but also to the science of the Delta School District project itself.

To clarify, if a retrofit geo-exchange system is considered in isolation, it may be more costly than a conventional energy solution. But contrary to Dr. Meech's assumptions, this is not the solution FortisBC has developed for the Delta School District. Instead, FortisBC developed a 19-building solution for Delta School District which includes different solutions for individual buildings including geo-exchange (not geothermal) systems, high efficiency gas boilers and air source heat pumps in order to arrive at a solution which maximizes greenhouse gas reductions at affordable rates. While the solution is innovative, it has been reviewed in depth by the BCUC and a host of interveners and found to be in the public interest.

Like Dr. Meech's letter and the accounts in the *South Delta Leader* article, Mr. McCulley's email significantly misrepresents the Delta School District project and the thorough public BCUC review process. Key points in this regard are as follows:

1. Mr. McCulley recommends a third party analysis to determine the true business case and states serious concerns have been raised by the BCUC. In fact, the BCUC is the third party of record and has conducted an exhaustive review with the input and evidence of all interveners, and has found the Delta School District project to be in the public interest
2. Mr. McCulley, possibly because he is a boiler supplier, discusses the project and the gas and electric cost implications as though it is entirely a geo-exchange

solution and that FortisBC is somehow ignorant of basic geo-exchange design considerations. In fact, the Delta School project is an optimized combination of gas boilers, geo-exchange and air-source heat pump solutions specific to individual buildings all assessed and designed by technical experts.

3. Mr. McCulley states that FortisBC and the Delta School District make unrealistic assumptions on future gas and electricity costs. In fact, the energy cost forecasts are drawn from publically available forecasts. Regardless of this, the technology mix (both gas and electricity are fuels) dampens the effect of relative changes.
4. Mr. McCulley asserts that FortisBC has guaranteed earnings and that the forecast residual value of \$5.6 million is somehow a Delta School District liability. In fact, Mr. McCulley has this entirely backwards. As clearly outlined in the BCUC proceeding and compliance filing, this residual value is entirely the risk of FortisBC shareholders, not the School District, which has no obligation to renew the agreements or purchase assets whatsoever. Furthermore, while the School District has no obligation to renew, under the Utilities Commission Act FortisBC has the obligation to serve the Delta School District in perpetuity.

53. Attached hereto and marked as Exhibit “U” to this my affidavit is a true copy of the letter from Mr. Stout dated October 30, 2012.

54. On February 19, 2013, DSD’s Energy Specialist, Debra Eng, emailed me a document titled “BC Utilities Commission Order Favours Competition Over Regulation” (the “**AES Inquiry Document**”), which set out Ameresco’s views regarding the Commission’s Alternative Energy Services Inquiry and raised concerns about the Project. I am advised by Ms. Eng and do verily believe that Ameresco emailed the AES Inquiry Document to an employee at Richmond School District No. 38 (Don White) who then emailed the AES Inquiry Document to Ms. Eng. In the AES Inquiry Document, Ameresco detailed its concerns that:

- a. the Project was not properly designed from an engineering perspective; and
- b. the Project exposed DSD to significant and unnecessary financial risks.

55. Attached hereto and marked as Exhibit “V” to this my affidavit is a true copy of the AES Inquiry Document.
56. On February 19, 2013, I forwarded the AES Inquiry Document to Mr. Bierlmeier and asked him to provide a response to the concerns contained within it.
57. On February 20, 2013, Mr. Bierlmeier responded to my email message. In his response, Mr. Bierlmeier did not respond to Ameresco’s concern that the Project was not properly designed from an engineering perspective. However, in response to Ameresco’s concern that the Project exposed exposed DSD to significant and unnecessary financial risks, he stated that:

[Y]ou have a thermal energy rate that you pay in exchange for thermal energy service. We must provide that service until you no longer want it (effectively we are obligated in perpetuity now). We must pay for the costs of providing that service and providing those costs are reasonable, we have a reasonable expectation that we can recover those costs, over time. You have lowered your risks relative to energy input costs in a number of ways. First, your rate is for thermal energy, all-in. Second, the equipment we are using to provide the thermal energy will dramatically reduce energy usage overall thereby reducing the exposure to commodity prices and volumes. Finally, you have direct protection under the UCA guaranteeing you continuous, reliable service at reasonable rates subject to oversight by a panel of experts (and you have already seen the standards they hold us up to). This protection extends to whether we go bankrupt or sell the service – it is much more powerful a protection than any hollow “performance guarantee” that requires you to come up with the investment capital and rely on the price forecasts provided at the time of analysis applied to what are effectively certain energy performance characteristics driven by the nature of the predictability of your need for thermal energy and the design of the systems. Your service provides much more protection and reduction in risk than any other alternative[...]

58. Attached hereto and marked as Exhibit “W” to this my affidavit are true copies of the email messages exchanged between Mr. Bierlmeier and myself on February 19 and 20, 2013.

V. **Switching DSD from the Market Rate to the COS Rate (May 2014 to September 2017)**

A. **The 2014/15 COS Rate Application**

59. On May 13, 2014, FAES filed an Application for Approval of the Fiscal 2014/15 Revenue Requirements and COS Rate for the Thermal Energy Service (the “**2014/15 COS Rate Application**”) with the Commission. After receiving a copy of the 2014/15 COS Rate Application, I sent Mr. Bierlmeier an email message in which I asked him about the practical impact of the 2014/15 COS Rate Application for DSD.

60. On May 14, 2014, Mr. Bierlmeier sent me a response email message in which he commented on the circumstances in which it would be favourable for DSD to switch from the Market Rate to the COS Rate. Specifically, he stated that:

This is quite simple for you. At the moment you are paying the market rate and I would recommend you stay on that for now. This application won't change that at all.

This application is to review and approve the costs and cost of service rate for 2014/15 which is available for you to take if you like. In those numbers, there are two key numbers that really matter when telling the story. They are the Tax losses and the deferral account.

The tax losses by the end of 2014/15 will be over \$2.5M (this will grow to \$3.6M by June 30, 2016). Whereas, the deferral account will be approximately \$1M on June 30, 2015 and rise to \$1.6M by June 30, 2016. The net of these two accounts is a credit to your account of \$1.5M as of June 30, 2015 and \$2.0M by June 30, 2016.

I would predict that around 2016 the number will favour you switching to the cost of service rate based on the relative size of the tax losses compared to the early year deficiencies in revenues. This was what we expected when we set this up was that in the early years, you would want to stay on the market rate and once the tax losses had a chance to show up, then the decision to switch would make sense to you.

61. Based on this email, I continued to understand that FAES would not apply to the Commission for approval to switch DSD to the COS Rate unless it was in DSD's best interests to do so (i.e. unless the COS Rate had dropped below the Market Rate as FEI predicted it would).

B. The 2015/16 COS Rate Application

62. On April 29, 2015, FAES filed an Application for Approval of the Fiscal 2015/16 Revenue Requirements and COS Rate for Thermal Energy Service (the “**2015/16 COS Rate Application**”) with the Commission.

63. On May 27, 2015, a Commission employee, Yolanda Domingo, telephoned me regarding the 2015/16 COS Rate Application. During the telephone call, Ms. Domingo:

- a. expressed concerns about the growing District Deferral Account (“**DDA**”) balance that the Commission believed would eventually have to be paid by DSD regardless of whether DSD paid the Market Rate or COS Rate; and
- b. encouraged DSD to seek further understanding and guidance on the matter and to apply to participate as an intervener in the 2015/16 COS Rate Application.

64. After I received this telephone call on May 27, 2015, I sent an email message to Mr. Bierlmeier in which I summarized my telephone call with Ms. Domingo and stated, in part:

I re-read the RDA and am still under the belief that as long as we stay on the market rate (indexed), the deferral account will not be a factor to to [sic] the District. Once the COS rate drops at or below the Market Rate and we elect to change, only then would the deferral account affect the District (as part of the COS rate in the form of an amount necessary to amortize the deferral account balance).

Please tell me that I’m correct and that I didn’t get duped...

65. On May 27, 2015, Mr. Bierlmeier sent me an email message in which he expressly confirmed that my understanding regarding responsibility for the DDA balance and a potential switch to the COS Rate (as outlined above) was correct. In his email message, Mr. Bierlmeier specifically stated that:

Your understanding is absolutely correct Frank. You pay the market rate until you elect to switch to the COS rate exactly as you describe below.

66. Attached hereto and marked as Exhibit “X” to this my affidavit are true copies of the email messages exchanged between Mr. Bierlmeier and myself on May 27, 2015.
67. On May 27, 2015, I sent the Commission Secretary an email message requesting that DSD be permitted to participate as an intervener in the 2015/16 COS Rate Application.
68. Attached hereto and marked as Exhibit “Y” to this my affidavit is a true copy of my email message to the Commission Secretary dated May 27, 2015.
69. On May 29, 2015, DSD’s then Secretary Treasurer, Joe Strain, and myself met with FAES to discuss the growing DDA balance. During this meeting, FAES again advised Mr. Strain and myself that FAES would not apply to the Commission for approval to switch DSD to the COS Rate unless it was in DSD’s best interests to do so (i.e. unless the COS Rate had dropped below the Market Rate as FEI predicted it would).
70. Attached hereto and marked as Exhibit “Z” to this my affidavit is a true copy of my handwritten notes from the meeting with FAES on May 29, 2015.
71. On June 2, 2015, DSD and the Commission each submitted Information Request No. 1 to FAES.
72. Attached hereto and marked as Exhibit “AA” to this my affidavit is a true copy of DSD Information Request No. 1 dated June 2, 2015.
73. Attached hereto and marked as Exhibit “BB” to this my affidavit is a true copy of Commission Information Request No. 1 dated June 2, 2015.
74. On June 23, 2015, FAES filed a Response to DSD Information Request No. 1 and a Response to Commission Information Request No. 1.
75. In the Response to DSD Information Request No. 1, FAES stated, in part:
 - 1.0 During the FortisBC Energy Inc. (FEI) Application for a Certificate 1 of Public Convenience and Necessity for Approval of Contracts and Rate for Public Utility Service to Provide Thermal Energy Service (TES) to Delta School District No. 37 (SD) regulatory review process, IR 1.2.2 asked “In the event that some of FEI’s

investment to serve the SD, or to develop TES in general, becomes impossible to recover from the SD or other TES customers, who will bear the financial loss? Are there any possible circumstances in which FEI will apply to have its other ratepayers share in the loss?"

Response:

Under the agreement, any deferral account balance that remains at the end of the initial term will only be recoverable from the Delta SD if the Delta SD renews its agreement with FAES.

76. Attached hereto and marked as Exhibit "CC" to this my affidavit is a true copy of the Response to DSD Information Request No. 1 dated June 23, 2015.
77. In the Response to Commission Information Request No. 1, FAES stated, in part:

2.5 Please clarify which party holds the ultimate responsibility of this deferral account balance. If there is a clause in the service agreements to support this understanding then please provide the excerpt.

Response

FAES holds the ultimate responsibility for the risk of non-recovery of the SD37 Deferral Account if there is a balance in the deferral account at the end of the term, and the Delta SD does not renew the service.

2.6 If the market rate continues to widely differ from the calculated cost of service rate, please discuss what decision making criteria will be relevant for FAES I in determining the level of and timing of the recovery of this deferral balance.

Response

...

Ultimately, now that the systems are built and operating, the terms of the contract along with the actuals will determine the ultimate costs of thermal energy and market rates for thermal energy, as well as the deferral account balance that FAES bears the risk for.

...

- 2.8 What is FAES' interpretation of the Commission's jurisdiction on the enforcement of rates? Could the Commission direct FAES to commence charging of the cost of service rates at any time in order to reduce the balance in the deferral account?

Response

...

The Delta SD's IR No. 1 to FAES highlights the two areas of concern to the Delta SD. First, the Delta SD wants confirmation that the financial risk associated with potential non-recovery of the balance in the deferral account will be borne by FAES' shareholders, and not the Delta SD. Second, the Delta SD wants confirmation that FAES is not seeking approval from the Commission to convert the Thermal Energy Rate from the Market Rate to the Cost of Service Rate now and that FAES will only make such an application if it can clearly demonstrate that it is in the best interest of the Delta SD to switch to the Cost of Service Rate.

In response to the Delta SD IRs, FAES confirmed that the statements are correct.

Therefore, if the Commission were to direct FAES to commence charging the Cost of Service Rates "at any time in order to reduce the balance in the deferral account", the Delta SD would likely be very concerned to start having to pay the Cost of Service Rate with the sole objective to reduce the balance in the deferral account, the non-recovery of which FAES confirmed is at the risk of its shareholder.

78. Attached hereto and marked as Exhibit "DD" to this my affidavit is a true copy of the Response to Commission Information Request No. 1 dated June 23, 2015.
79. On July 6, 2015, DSD submitted Information Request No. 2 to FAES to the Commission.
80. Attached hereto and marked as Exhibit "EE" to this my affidavit is a true copy of the Information Request No. 2 to FAES dated July 6, 2015.

81. On July 16, 2015, FAES filed a Response to DSD Information Request No. 2. In the Response to DSD Information Request No. 2 FAES stated:

1.0 In the FAES response to the Delta School District IR 1.1.0, 1 which asked “With the Delta School District Deferral Account currently projected to be at \$1,408,000 by 30 June 2016, the Delta School District would like FAES to confirm that the financial risk associated with potential non-recovery of this amount will be borne by FAES shareholders, and not the Delta School District”, FAES stated:

“Under the agreement, any deferral account balance that remains at the end of the initial term will only be recoverable from the Delta SD if the Delta SD renews its agreement with FAES.”

The Delta School District would like FAES to confirm that any recovery of any balance remaining in the Deferral Account, should the District renew its agreement with FAES after the initial term, would be by way of the Annual Cost of Service Rate, should such rate have been switched to from the Market Rate as the effective Thermal Energy Rate. This confirmation is sought to clear up any uncertainty on the public record as to whether the recovery would be by this method as opposed to a lump sum payment.

Response:

Confirmed.

2.0 In the FAES response to the Delta School District IR 1.2.0, which asked “*With the gap between the Cost of Service Rate and Market Rate currently projected to reach \$0.097/kWh by 30 June 2016, the Delta School District would like FAES to confirm that it is not seeking approval from the BCUC to convert the Thermal Energy Rate from the Market Rate to the Cost of Service Rate now and that FAES will only make such an application if it can clearly demonstrate that it is in the best interest of the Delta School District to switch to the Cost of Service Rate*”, FAES stated:

“FAES confirms that it is not seeking approval from the BCUC to convert the Thermal 28 Energy Rate from the Market Rate to the Cost of Service Rate in this Application.

The agreement between FAES and the Delta SD sets out a process and conditions for FAES to seek approval from the BCUC if and when the change of the Cost of Service Rate is contemplated. FAES will comply with the agreement provisions if and when it contemplates such an application. FAES will endeavor to work with the Delta SD to achieve a mutually desirable approach.”

The Delta School District would like FAES to confirm on public record, in keeping with prior correspondence between the parties, that:

- The District will only move to the Annual Cost of Service Rates if there are demonstrably clear benefits to the District for the switch.
- At the present time, the District should not consider the switch because the Cost of Service Rate is much higher than the Market Rates and the thermal energy systems are not yet running as efficiently as both parties expect they will shortly.
- If there are demonstrably clear benefits to the District to switch to the Cost of Service Rate switch, but the District does not agree to make the switch and any other mutually desirable approach cannot be achieved, only then will FAES consider at least raising the question of whether the switch should occur with the BCUC for its consideration.

Response:

FAES confirms that:

1. FAES understands that the District intends to make its election to switch to the Cost of Service Rates only if there are demonstrably clear benefits to the District to make the switch;
2. FAES understands that the District currently is not considering the Cost of Service switch on the basis that the Cost of Service Rates are much higher than the Market

Rates and that the thermal energy systems are not yet running as efficiently as both parties expect they will; and

3. If FAES believes that the District should switch to Cost of Service rates, then prior to raising the issue with the Commission for its consideration, FAES will endeavor to work with Delta SD to achieve a mutually desirable approach with the District. For additional clarity, in a situation where FAES felt that there were demonstrably clear benefits to the District to switch to Cost of Service rates, and the DSD did not agree to the switch, FAES would consider raising the issue to the Commission in accordance with the provisions of the agreement between the parties.

82. Attached hereto and marked as Exhibit “FF” to this my affidavit is a true copy of the Response to Information Request No. 2 to FAES dated July 16, 2015.

83. In or about August of 2015, DSD retained legal counsel (Borden Ladner Gervais) in respect of the 2015/16 COS Rate Application.

84. On August 4, 2015, DSD filed submissions in the 2015/16 COS Rate Application in which DSD clarified its position regarding a number of issues that had arisen in the 2015/16 COS Rate Application. The submissions provided, in part:

Specifically, DSD confirms its position that:

- (a) DSD is not contractually obligated to switch from a "market rate" to a "cost of service rate" (as those terms are defined in the Rate Agreement) in respect of the thermal energy services provided to it by F AES unless and until DSD determines that such an election would be in its own best interest;
- (b) F AES may only apply to the Commission for approval to charge DSD the cost of service rate if there are clear and demonstrable benefits to DSD in doing so; and
- (c) in the event that DSD does not switch from the market rate to the cost of service rate during the term of the Rate Agreement, and DSD elects not to renew the Rate Agreement, F AES shareholders will be solely responsible for any and all amounts that have accrued in the Deferral Account during the term of the Rate Agreement.

85. Attached hereto and marked as Exhibit “GG” to this my affidavit is a true copy of the submissions dated August 4, 2015.

86. On or about August 7, 2015, at DSD’s request, DSD’s legal counsel sent an email message to FAES’ legal counsel (Fasken Martineau) asking FAES to clarify its statements in the Response to DSD Information Request No. 2 FAES. In this email message, DSD’s legal counsel stated, in part:

DSD is in receipt of FAES’ most recent reply submissions before the Commission, dated August 7, 2015. DSD remains very concerned that FAES may be interpreting the Rate Agreement to state that FAES is contractually entitled to apply to the Commission to compel DSD to switch from the market rate to the cost of service rate absent any demonstrable benefits to DSD in doing so. As set out in its final submissions dated August 4, 2015, DSD maintains that under the terms of the Rate Agreement, FAES cannot compel DSD to make the switch in these circumstances. Moreover, I understand that FAES representatives have repeatedly confirmed this to their DSD counterparts on a number of occasions. Given this, DSD is understandably apprehensive about what appears to be FAES’ about-face (or, at the very least, silence) on this key issue.

DSD’s main concern is that in a scenario where the cost of service never drops below the market rate during the term of the agreement, and the amounts in the Deferral Account continue to accrue, FAES will apply to the Commission to switch DSD to the cost of service rate. This, of course, will result in DSD being obligated to pay all of the accrued amounts in the Deferral Account, with interest, either on a lump-sum basis or over the remaining term of the agreement. The further along in the term of the agreement that this occurs, the more serious the financial repercussions will be for DSD. Accordingly, DSD requires clarification on FAES’ position on this point forthwith.

Does FAES maintain that it can compel DSD to switch to the cost of service rate in the above-noted scenario?

87. On August 10, 2015, FAES’ legal counsel sent an email message to DSD’s legal counsel requesting a meeting between FAES and DSD to discuss the concerns raised in the email message of August 7, 2015.

88. Attached hereto and marked as Exhibit “**HH**” to this my affidavit are true copies of the email messages exchanged by the parties’ legal counsel between August 7 and August 10, 2015.
89. On September 10, 2015, FAES and DSD met to discuss the concerns raised in the email message of August 7, 2015. During this meeting, Mr. Strain stated that DSD was now in an awkward position because FAES had recently changed its position regarding the circumstances in which FAES would apply to the Commission for approval to switch DSD to the COS Rate. Whereas on prior occasions FAES had repeatedly confirmed (including as recently as May 29, 2015) to DSD that FAES would only apply to the Commission for approval to switch DSD to the COS Rate if DSD believed it was in DSD’s best interests to do so, FAES representatives appeared to now be taking the position that FAES would consider applying to the Commission for approval to switch DSD to the COS Rate even if the COS Rate had not dropped below the Market Rate, as FEI originally projected.
90. Attached hereto and marked as Exhibit “**II**” to this my affidavit is a true copy of my handwritten notes from the meeting with FAES on September 10, 2015.

C. The Pre-Application Discussions

91. Between April 26, 2017 and September 11, 2017, Mr. Strain and myself met with FAES to discuss the parties’ ongoing concerns regarding the growing DDA balance, and to determine whether a mutually beneficial agreement could be reached regarding the DDA balance. In the end, the parties were unable to reach such an agreement as the only solutions proposed by FAES required DSD to pay the entire DDA balance and accept all risks and liabilities in relation to same.
92. On or about 15 September 2017, Mr. Slater sent a letter to Mr. Strain providing notice of FAES’ desire to apply to the Commission for approval to switch the DSD from the Market Rate to the COS Rate under section 1.1(rr) of the Energy System Rate Development Agreement.
93. Attached hereto and marked as Exhibit “**JJ**” to this my affidavit is a true copy of the letter from Mr. Slater dated September 15, 2017.

94. In the event that FAES is granted the relief it is seeking in these application proceedings, it is evident that DSD will experience rate shock which will frustrate one of the key objects of the Project, which was to protect DSD from energy price volatility. Moreover, because DSD is prohibited by law from running a deficit, funding for existing school programs may have to be reduced to pay for such additional energy costs. Given the magnitude of the proposed increase in the energy rate paid by DSD, these funding reductions may be significant.

SOLEMNLY AFFIRMED BEFORE ME)
at Vancouver, British Columbia, on 10th)
August 2018.)
)
Erika Lambert-Shirzad)
A commissioner for taking affidavits for)
British Columbia)



FRANK GEYER

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48600, Vancouver, Canada V7X 1T2
604-632-3461

Exhibit A

This is Exhibit " A " referred to in the affidavit of FRANK GEYER made before me on AUGUST 10 18 Eric Lambert
A Commissioner for taking Affidavits for British Columbia

From: Mah, Tim
To: Frank Geyer
Cc: Joe Strain
Subject: Terasen Energy Services, for your retrofits and new commissions.
Date: July-08-08 9:23:54 AM
Attachments: 07-179 Waterstone_email.pdf
07-179 Pomaria_email.pdf

Hello Frank,

Thank you for getting back to me. Please find below a brief overview of our activities at Terasen Energy Services Inc. I've also attached files outlining two of our projects. Please advise if you have any problems opening the attachments.

After you have had a chance to review the information, I'd like to arrange a meeting to discuss how our services can help you in future retrofits, and new commissions. Please advise when would be a good time to call. (I'll be away starting tomorrow, July 9, for 2 weeks.)

Terasen Energy Services (TES), a sister company to Terasen Gas, is investing in sustainable thermal energy solutions. We provide solutions that maximize the energy potential from the surrounding environment. In regards to heating and cooling solutions, TES employs renewable energy sources such as geo-exchange, biomass, waste heat capture, and solar.

In addition to design-and-build services, TES provides **financing options** to help reduce, or eliminate, the capital cost that sometimes prevents customers from choosing the alternative energy approach. How it works is TES invests in your energy system: We own it, while you, the customer, pay a monthly fee for operating and maintenance.

In this way, you get all of the benefits of a traditional utility - reliable energy at competitive rates, trouble-free service, and 24/7 support for the life of the system without having to tie up budgets with a large capital outlay. To date, TES has invested in several alternative energy projects in BC including,

- The district energy system at Dockside Green,
- Stand-alone developments at the Pomaria building in downtown Vancouver, and
- The Waterstone Pier development in Steveston, BC.

To find out more about these projects, please review the two files I've attached to this e-mail. Or, visit our website at www.terasenenergyservices.com. Then, let's meet by phone, or in person, and discuss what opportunities you foresee where TES can help.

Thank you.

Truly,
Tim

Timothy Mah, P.Eng., MBA
Business Development

Terasen Energy Services

3700 - 2nd Avenue, Burnaby BC, V5C 6S4
Tel 604-293-8527 Em tim.mah@terasen.com
www.terasenenergyservices.com

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From: Mah, Tim
To: [Frank Geyer](#)
Cc: [Joe Strain](#)
Subject: Terasen Energy Services, for your retrofits and new commissions.
Date: July-08-08 9:23:54 AM
Attachments: [07-179 Waterstone_email.pdf](#)
[07-179 Pomaria_email.pdf](#)

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To find out more about these projects, please review the two files I've attached to this e-mail. Or, visit our website at www.terasenenergyservices.com. Then, let's meet by phone, or in person, and discuss what opportunities you foresee where TES can help.

Thank you.

Truly,
Tim

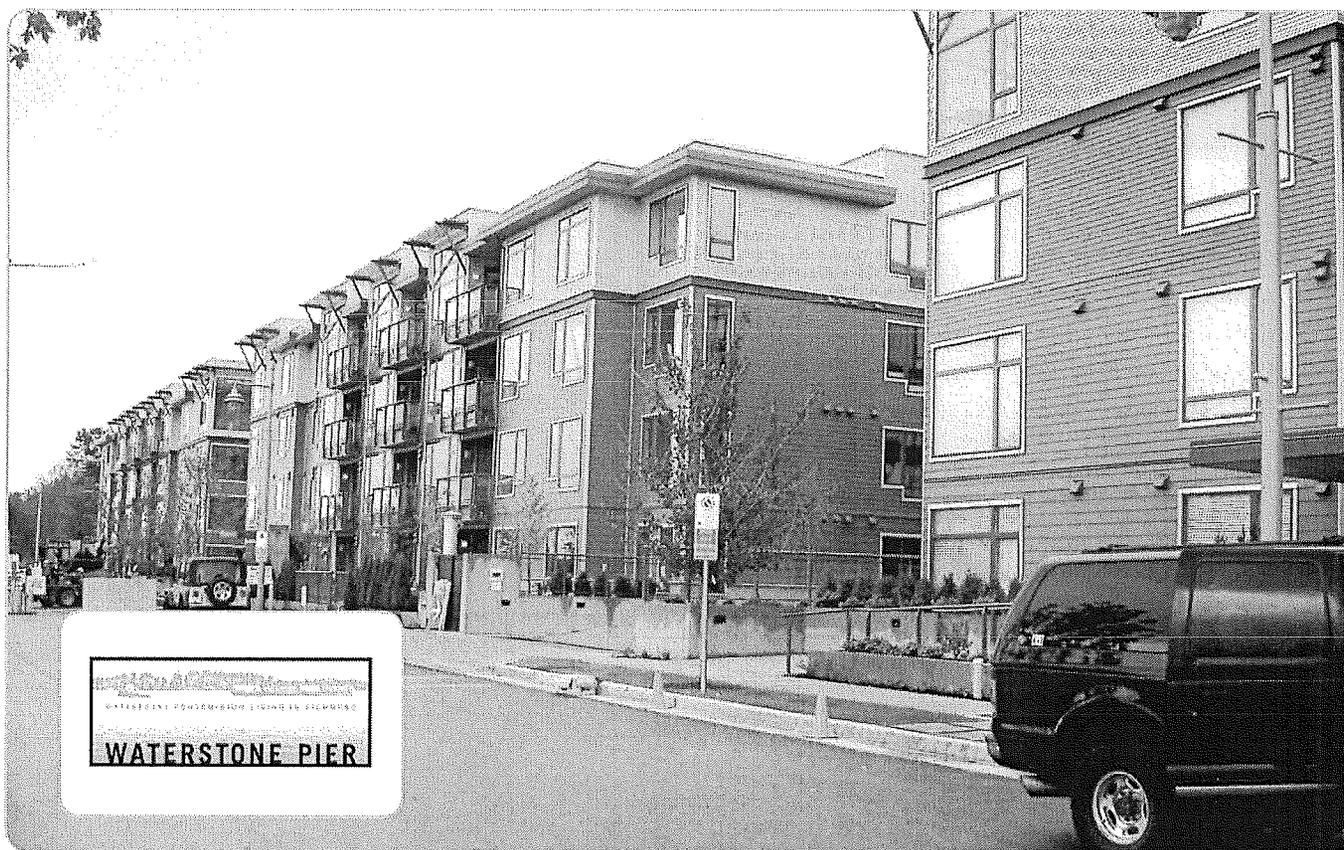
Timothy Mah, P.Eng., MBA
Business Development

Terasen Energy Services

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Tel 604-293-8527 Em tim.mah@terasen.com
www.terasenenergyservices.com

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Developer warms up to earth-friendly systems



When Riverport developer Brent Kerr first considered adding residential development to his East Richmond entertainment complex, environmental sustainability wasn't top of mind for new home purchasers.

In fact, Kerr's decision to install a high-end geothermal system for heating and cooling the project's three-building, 140-unit first phase, Waterstone Pier, was met with a lukewarm public response.

In 2004 anyway, location and lifestyle still trumped sustainability. But in three years, there's been a marked change in attitude. Concerns about global warming mean geothermal systems are now recognized for being easy on the planet. And developers, such as Kerr, who've invested in them are reaping the marketing rewards.

"Geothermal wasn't fully appreciated by home purchasers at the time," said Kerr. "Now homebuyers are asking more questions related to sustainability and we are definitely ahead of the curve."

In fact, Kerr's decision to install the geothermal heating and cooling system in this suburban condo complex marked the first time such a system was available to home purchasers outside of the downtown Vancouver core.

Kerr's geothermal investment at Waterstone Pier cost about \$1 million more than the conventional system operated by electricity or natural gas. But, he said, the system is worth the additional cost. "In the long run, the payoff for the environment and the end user is economically sound."

Terasen Energy Services (TES) has been involved in Waterstone Pier since its inception. The Burnaby-based company not only helped plan, but also continues to own and operate Waterstone Pier's stand-alone geothermal loop field systems.

TES does what many other traditional utility companies do. But rather than manage traditional energy assets, TES provides alternative energy solutions for developments ranging in size from large condominium buildings to complete district energy systems.

At Waterstone Pier, for instance, TES oversees the geothermal loop field system, then provides the development's strata council access for a monthly fee. Unlike other heating methods, the TES geothermal loop field system at Waterstone Pier helps produce energy that's truly sustainable.

According to TES vice president Gareth Jones, a geothermal system typically uses only a third to a quarter of the natural gas or electricity typically required by conventional heating and cooling systems. As a result, energy bills resulting from a geothermal system are well insulated from the price volatility of conventional energy markets.

"This means Waterstone Pier's strata – which we bill monthly for the use of the TES loop field system – will not get any energy billing surprises," Jones said. "We're able to give the strata cost certainty over the life of their geothermal contract with us."

Kerr and Terasen Energy Services are now working together on another project at the Waterstone Pier site – a residential rental complex. It, too, will be

serviced by a geothermal heating system. For landlords or those who invest in rental building stock, Kerr said using geothermal lowers the monthly energy costs of owning and managing a large rental complex.

But geothermal heating and cooling systems are still the exception, especially at suburban construction sites. Most developments continue to rely on conventional forms of heating and cooling that are cheaper for developers to install.

Kerr, however, is convinced marketplace demand for geothermal heating and cooling systems will continue to grow.

Excerpted from Richmond News, June 2007

Interested in learning more?

TES ownership of alternative energy systems is growing. Based on our experience, we can identify the right system for your development. Contact us for a free preliminary assessment to find out how your development can reduce its environmental footprint.

Terasen Energy Services

3700 2nd Avenue
Burnaby, BC V5C 6S4
Tel: 604-592-7969
Toll free: 1-866-792-7969
www.terasenenergyservices.com

Terasen Energy Services Inc. is an indirect wholly owned subsidiary of Huls Inc. - uses the Terasen Energy Services name and logo under license from Terasen Inc.

Pomaria's geexchange system heats and cools from the ground up

As far as downtown developments go, Pomaria is a clear example of the movement to green building technology. Located in Vancouver's Yaletown neighbourhood, Pomaria was designed to leave a smaller environmental footprint than similar developments of comparable size.

Amongst its many green features, this exceptional 30 storey development includes a geexchange loop field, owned and maintained by Terasen Energy Services (TES). The highly efficient geexchange system provides heating, cooling and domestic hot water for Pomaria residents, while achieving one of Pomaria's key sustainability goals: energy conservation.

How geexchange works

A geexchange system uses the solar heat stored in the earth from a ground or water source, to heat and/or cool a building. In colder months, the heat pump draws heat from the earth to warm the building, while in warmer months, the system uses the earth as a "heat sink" to cool the building. The size of the system required is determined by the amount of energy needed in the building, and a variety of options can be installed from radiant floor heating to fan coil air conditioning.

To collect earth energy at Pomaria, 56 vertical boreholes were drilled 350 feet into the ground to create a closed ground loop system. In a closed loop system, fluid circulates through polyethylene piping inserted in the boreholes, transferring heat from the earth to ground source heat pumps. As it's extracted,

the heat is upgraded by the heat pump and transferred to either a hydronic or forced air distribution system to provide a comfortable room temperature. To provide cooling in summer months, the heat pump system reverses the process, extracting heat from the air and transferring it to the ground via the loop.

Geexchange heat pumps have been available for many years and are used Canada-wide. Currently there are over 33,000 earth energy systems being used in Canada's residential, commercial and institutional sectors, and sales are increasing by about 13 per cent annually.

Saving energy

The chief benefit of geexchange is the high level of efficiency achieved, which is typically measured as a Coefficient of Performance (CoP). The CoP of a heat pump is the ratio of the output heat to energy input. The CoP of a geexchange system ranges from 3 to 4, meaning that for every kilowatt of electricity needed to operate the system, the heat pump provides 3 to 4 kilowatts of heat energy.

Using energy from the earth displaces the need for conventional fuels, which when burned, produce greenhouse gases and contribute to global warming. The geexchange system at Pomaria results in energy savings of 1,000 MWh of energy per year and greenhouse gas emission reductions of 190 tonnes. These energy savings also





reduce the need to import electricity from out of province, thereby increasing energy self-sufficiency.

In addition, TES provides a stable rate for the system's ownership and operation, which provides peace of mind that the system will be maintained to utility standards at a reasonable cost.

Helping developers go green

Not only are green buildings good for the environment, they meet the emerging demand by purchasers who are increasingly aware of their ability to reduce their environmental footprint. They also satisfy owners and operators seeking lower long term operating costs and improved productivity resulting from a more comfortable indoor environment.

TES helps developers go green in two key ways: we absorb the capital cost of the geexchange system and we provide long term ownership and utility management. TES ownership alleviates a developer's energy system installation costs and provides occupants with greater peace of mind, knowing that their heating and cooling loads will be delivered as and when needed.

Learn more

TES ownership of alternative energy systems is growing. We can identify the right system for your development. Contact us for a free preliminary assessment to find out how your development can reduce its environmental footprint.

Terasen Energy Services

3700 2nd Avenue
Burnaby, BC V5C 6S4
Tel: 604-592-7969
Toll free: 1-866-792-7969
www.terasenenergyservices.com

Exhibit B

This is Exhibit " B " referred to in the
affidavit of FRANK GEYER
made before me on AUGUST 10, 2018
Erica Campbell
A Commissioner for taking Affidavits
for British Columbia

[Handwritten mark]
11

From: Dale Saip
To: Steve Cardwell; Frank Geyer
Subject: Fwd: Delta SD Thermal Energy Optimization Project
Date: November-02-09 2:03:04 PM

Steve, Frank,
let's chat!

----- Forwarded message -----

From: **Turner, John** <John.Turner@terasengas.com>

Date: Thu, Oct 22, 2009 at 3:57 PM

Subject: Delta SD Thermal Energy Optimization Project

To: "dsaip@vancouvergiants.com" <dsaip@vancouvergiants.com>

Hi Dale,

As we discussed today Terasen would like to participate in, and contribute to, a thermal energy audit for all schools and related facilities in the Delta SD. It is anticipated that the result of this audit would be a portfolio of energy solutions optimized for the entire SD. The goal would be to aggregate all capital investment necessary to optimize thermal energy use in the SD, maximize Terasen's contribution, and determine one rate for all facilities. This approach would benefit the SD by offsetting your energy efficiency investments with Terasen's in both Energy Efficiency and Alternative Energy opportunities throughout the entire SD while reducing GHG's to minimum economically viable levels (and cost). We would welcome the opportunity to continue our work with the Delta SD, and believe this approach could lead to improvements at every facility at one reasonable rate. Please let me know if this approach interests you, and when we can discuss this further with you and your staff.

Best regards...

JT

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Dale Saip
Vice President
Business Development
Vancouver Giants WHL
office (604) 718-7466
cellular (604) 789-6490
2007 Memorial Cup Champions!

--
Dale Saip
Vice President
Business Development
Vancouver Giants WHL
office (604) 718-7466
cellular (604) 789-6490
2007 Memorial Cup Champions!

From: Jim White
To: fgeyer@deltasd.bc.ca
Cc: [John Vantol](mailto:John.Vantol)
Subject: Re: Fw: Fwd(2): Follow-up meeting - Delta School district
Date: November-09-09 12:06:48 PM

Frank;
During the Energy Managers conference call last week I mentioned that terasen were approaching the District to do "Energy Study Audits", A couple of districts have had them do a couple of Audits & found the information very basic & not value for money.

Jim White
Energy Manager

fgeyer@deltasd.bc.ca writes:
Hi guys,

We have no choice on this one. I'll speak with Vlad and arrange a meeting with them and us shortly.

Frank

Sent from my BlackBerry device on the Rogers Wireless Network

From: "Steve Cardwell" <scardwell@deltasd.bc.ca>
Date: Mon, 09 Nov 2009 00:12:10 -0800
To: <fgeyer@rogers.blackberry.net>; Frank Geyer <fgeyer@deltasd.bc.ca>
Cc: <gjayres@deltasd.bc.ca>; <dturner@deltasd.bc.ca>; <jstrain@deltasd.bc.ca>; <mamiller@deltasd.bc.ca>; <tnelson@deltasd.bc.ca>
Subject: Fwd(2): Follow-up meeting - Delta School district

Hi Frank,

Over to you to start this going...

Happy face!!

tx,

Steve.

----- Original Message -----

14

From: Dale Saip <dsaip@vanouvergiant.com> November 8, 2009
12:45:37 PM
Subject: Fwd: Follow-up meeting - Delta School district
To: Steve Cardwell kay thody <kay.thody@gmail.com>
Attachments: Attach0.html 3K

----- Forwarded message -----

From: Turner, John <John.Turner@terasengas.com>
Date: Fri, Nov 6, 2009 at 2:16 PM
Subject: Follow-up meeting - Delta School district
To: Dale Saip <dsaip@vanouvergiant.com>

Hi Dale,

Our team is ready to work with your team to crack this energy efficiency/GHG/capital/operating costs nut at the Delta School district. Vlad Koska and Don Bergler will be involved from our side - Don is the technical expert assigned to this task. I'd like to suggest a meeting of team leads to explain what we would like to look at, get internal buy in, and to get started. I can have one of our admin support staff help to arrange a meeting if you like, if you provide the appropriate names.

Best regards...

John L. Turner
Director, Customer Management and Sales

604-576-7227 office
778-888-8337 cell
604-801-3341 pager

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Dale Saip
Vice President
Business Development
Vancouver Giants WHL
office (604) 718-7466
cellular (604) 789-6490
2007 Memorial Cup Champions!

Exhibit C

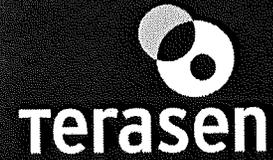
This is Exhibit " C " referred to in the affidavit of FRANK GEYER



made before me on AUGUST 10 2010

Erin Campbell-Shirazi

A Commissioner for taking Affidavits
for British Columbia



**Review of The Feasibility Assessment
of a District-wide Alternative Energy System Upgrade Strategy**

**School District No. 37
Delta**

July 14th 2010

Vladimir Kostka

Agenda



- Review the results of the study
- Summarize the findings
- Move forward

Summary of the existing situation



- Total number of schools 32 - 16 upgraded, 16 not upgraded
- Natural gas based heating and DHW systems in all schools
 - Combination of AHU, gas boilers and furnaces
- Several schools with the equipment at **the end of its life cycle**
 - Replacement needed in the near future
- No air conditioning

Electricity		Natural Gas		GHG emissions		Annualized OM&R	Subtotal of costs	AES charge	operating cost
MWh	\$	GJ	\$	tCO2e	\$	\$	\$	\$	\$
9,572	623,700	78,477	852,300	4,120	181,400	105,050	1,762,450		1,762,450

Existing HVAC System – list of schools



School	Proposed Upgrade	Existing HVAC system		
		Elec2 MWh	Gas GJ	GHG tCO2e
South Park	OLS	185	1,258	68
South Delta Sec.	OLS	1,084	4,433	244
Seaquam Sec1	OLS	1,084	4,433	244
Richardson	OLS	189	1,815	96
Pinewood	OLS	148	1,115	60
North Delta Sec.	OLS	1,039	6,017	320
Nelson Grove	GES	150	1,079	56
Ladner E	GES	227	1,531	80
English Bluff	OLS	166	1,213	64
Delview Sec	OLS	566	2,677	144
Delta Sec	GES	1,303	9,725	512
Delta Manor	GES	246	1,812	96
Cougar	OLS	245	1,565	84
Cliff Drive	GES	236	996	56
Chalmers	OLS	231	1,002	56
Beach Grove	N/A	N/A	N/A	N/A
Annieville	OLS	144	2,218	112
16 already retrofitted	ASHP	2,327	21,544	1,124

The study



Meet the SD's objectives :

- **reduce GHG emissions**
- **save on operating budget**

Today's Decision will have Long Term impact on the Cost and the Environment

Proposal



- Replacement of the existing systems with
 - a **Geo-exchange Energy System (GES)** that will provide both *heating and cooling*
 - *High efficiency heat pumps*
 - *High efficiency (Energy Star rated) boilers*

Analysis	# GES units	# OLS units	# A2WHP units	# Hi-Effic Boiler units
Business As Usual	-	-	-	10
I. Minimize emissions	5	11	0	0
III. Hi-Eff Boiler option included	1	8	0	7

Proposal for the New Systems



- Lower GHG emissions (61 - 65%)
 - Compared to present situation
- Savings
 - Saving in operations
 - Increased efficiency
 - Protection against price volatility
- Lower operating and replacement cost in the future

- Set proper example for the kids
- Healthier indoor environment

Proposal for the New Systems



Analysis	# GES units	# OLS units	# A2WHP units	# Hi-Effic Boiler units	# past retrofits	Emissions saved tCO ₂ e	Project cost \$	SD investment \$	EEC Funding \$	TGI investment \$	NPV of OMR & yr-1 SD cost (current \$)
Business As Usual	-	-	-	-	16	0	\$1.8 M replace boilers	\$1.8 M	-	-	\$42.9 M
I. Minimize emissions	5	11	0	0	16	1,980	\$8.9 M	\$4.9 M	\$0.5 M	\$3.5 M	\$40.2 M
II. Maximize benefits using AES options	3	11	2	0	16	1,900	\$8.6 M	\$4.9 M	\$0.5 M	\$3.2 M	\$40.2 M
III. As 'II' w/ Hi-Eff Boiler option included	1	8	0	7	16	1,820	\$6.9 M	\$4.1 M	\$0.5 M	\$2.3 M	\$38.0 M

Assumptions



Table 1: Summary of input values for the 'base case'

	Base case
Gas price per GJ:	\$10.86
Electricity price per kWh:	\$0.065
Estimated annual gas rate increase:	5.50%
Estimated annual electricity rate increase:	6.30%
Carbon Tax 2010 per tCO₂e:	\$20
Carbon Offset Purchase 2010 per tCO₂e:	\$25
Estimated annual Carbon cost increase:	10.0%
GHG intensity for Gas (tonnes/GJ):	0.05
GHG intensity for electricity (tonnes/MWh):	0.02
SD factor' is the SD's investment level:	100%
TG utility rate escalation (per yr):	3.0%
TG Discount rate:	5.5%
Deferral Account Cost of Capital	4.3%
Inflation rate on O&M	2.0%

Estimated Investments and charges – Option No. 1



SD funds 100% of the “indoor cost”

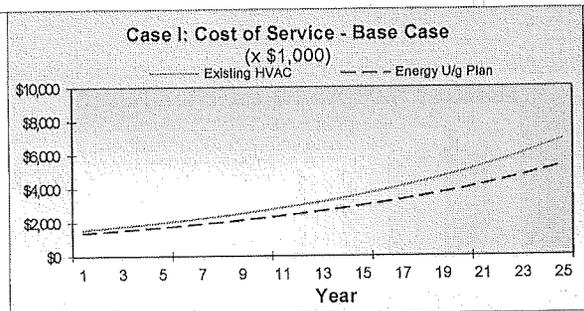
YEAR ONE COSTS FOR THE SCHOOL DISTRICT

	Electricity		Natural Gas		GHG emissions		Annualized OM&R	Subtotal of costs	Annual AES charge	Total Yr 1 operating cost	NPV of OM&R over 25 yrs
	MWh	\$	GJ	\$	tCO2e	\$					
1. Present operations	9,572	623,700	78,477	852,300	4,120	181,400	105,050	1,762,450		1,762,450	48,040,000
2. 'Business As Usual'	9,572	623,700	64,433	699,700	3,410	149,700	105,050	1,578,150		1,578,150	42,856,000
3. Upgrade Strategy	10,770	701,800	24,593	267,100	1,440	60,700	0	1,029,600	365,000	1,394,600	35,482,000
Change from 'present'	1,199	78,100	(53,884)	(585,200)	(2,630)	(120,700)	(105,050)	(732,850)	365,000	(367,850)	(12,558,000)
Change from 'BAU'	1,199	78,100	(39,840)	(432,600)	(1,970)	(89,000)	(105,050)	(548,550)	365,000	(183,550)	(7,374,000)

PROJECT COST BREAKDOWN

	Total cost of upgrade	From SD or Ministry	Amount from EEC	TGI Capex
	\$	\$	\$	\$
Upgrade Strategy	8,928,040	(4,884,291)	533,200	3,510,548

Years to Deferral Account reconciliation ('N/A' = over 25 yrs):



Estimated Investments and charges – Option No. III



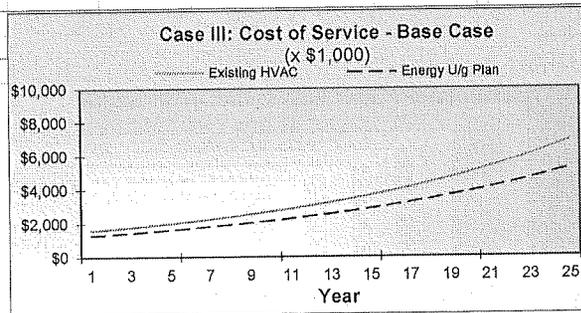
SD funds 100% of the “indoor cost”

YEAR ONE COSTS FOR THE SCHOOL DISTRICT

	Electricity		Natural Gas		GHG emissions		Annualized OM&R	Subtotal of costs	Annual AES charge	Total Yr 1 operating cost	NPV of OM&R over 25 yrs
	MWh	\$	GJ	\$	tCO2e	\$	\$	\$	\$	\$	\$
1. Present operations	9,572	623,700	78,477	852,300	4,120	181,400	105,050	1,762,450		1,762,450	48,040,000
2. 'Business As Usual'	9,572	623,700	64,433	699,700	3,410	149,700	105,050	1,578,150		1,578,150	42,856,000
3. Upgrade Strategy	10,509	684,800	27,902	303,000	1,600	68,000	0	1,055,800	248,000	1,303,800	34,002,000
Change from 'present'	938	61,100	(50,574)	(549,300)	(2,520)	(113,400)	(105,050)	(706,650)	248,000	(458,650)	(14,038,000)
Change from 'BAU'	938	61,100	(36,531)	(396,700)	(1,810)	(81,700)	(105,050)	(522,350)	248,000	(274,350)	(8,854,000)

PROJECT COST BREAKDOWN

	Total cost of upgrade \$	From SD of Ministry \$	Amount from EEC \$	TGI Capex \$
Upgrade Strategy	6,961,321	4,110,053	509,900	2,341,368
Years to Deferral Account reconciliation ('N/A' = over 25 yrs):				1



Estimated Investments and charges – Option No. 1



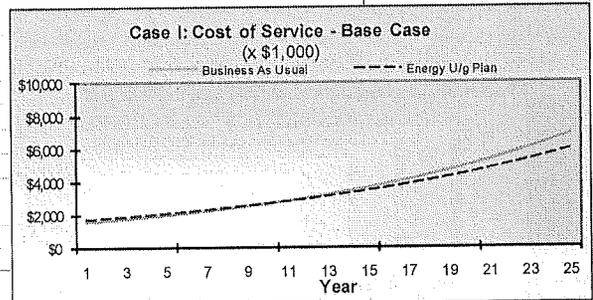
SD invest appr. the same amount as BAU (50% of the “indoor cost”)

YEAR ONE COSTS FOR THE SCHOOL DISTRICT

	Electricity		Natural Gas		GHG emissions		Annualized OM&R	Subtotal of costs	Annual AES charge	Total Yr 1 operating cost	NPV of OM&R over 25 yrs
	MWh	\$	GJ	\$	tCO2e	\$	\$	\$	\$	\$	\$
1. Present operations	9,572	623,700	78,477	852,300	4,120	181,400	105,050	1,762,450		1,762,450	48,040,000
2. 'Business As Usual'	9,572	623,700	64,433	699,700	3,410	149,700	105,050	1,578,150		1,578,150	42,856,000
3. Upgrade Strategy	10,770	701,800	24,593	267,100	1,440	60,700	0	1,029,600	681,000	1,710,600	41,495,000
Change from 'present'	1,199	78,100	(53,884)	(585,200)	(2,680)	(120,700)	(105,050)	(732,850)	681,000	(51,850)	(6,545,000)
Change from 'BAU'	1,199	78,100	(39,840)	(432,600)	(1,970)	(89,000)	(105,050)	(548,550)	681,000	132,450	(1,361,000)

PROJECT COST BREAKDOWN

	Total cost of upgrade	From SD o Ministry	Amount from EEC	TGI Capex
	\$	\$	\$	\$
Upgrade Strategy	8,928,040	(1,885,617)	533,200	6,509,223
Years to Deferral Account reconciliation ('N/A' = over 25 yrs):				18



Estimated Investments and charges – Option No. III



SD invest appr. the same amount as BAU (50% of the “indoor cost”)

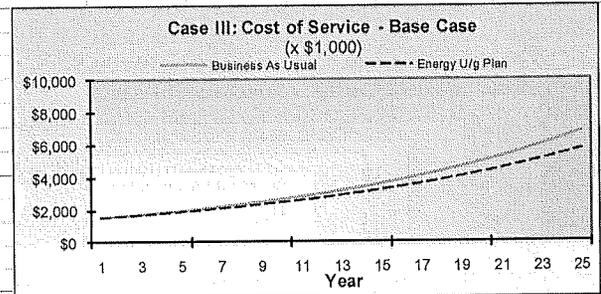
YEAR ONE COSTS FOR THE SCHOOL DISTRICT

	Electricity		Natural Gas		GHG emissions		Annualized OM&R	Subtotal of costs	Annual AES charge	Total Yr 1 operating cost	NPV of OM&R over 25 yrs
	MWh	\$	GJ	\$	tCO2e	\$					
							\$	\$	\$	\$	\$
1. Present operations	9,572	623,700	78,477	852,300	4,120	181,400	105,050	1,762,450		1,762,450	48,040,000
2. 'Business As Usual'	9,572	623,700	84,433	699,700	3,410	149,700	105,050	1,578,150		1,578,150	42,856,000
3. Upgrade Strategy	10,509	684,800	27,902	303,000	1,600	68,000	0	1,055,800	482,000	1,537,800	38,455,000
Change from 'present'	938	61,100	(50,574)	(549,300)	(2,520)	(113,400)	(105,050)	(706,650)	482,000	(224,650)	(9,585,000)
Change from 'BAU'	938	61,100	(36,531)	(396,700)	(1,810)	(81,700)	(105,050)	(522,350)	482,000	(40,350)	(4,401,000)

PROJECT COST BREAKDOWN

	Total cost of upgrade	From SD or Ministry	Amount from EEC	TGI Capex
	\$	\$	\$	\$
Upgrade Strategy	6,961,321	1,935,415	509,900	4,516,005

Years to Deferral Account reconciliation (N/A = over 25 yrs): 1



Retrofit costs by school



School	Total cost of upgrade	From SD or Ministry	Amount from EEC	TGI Capex	AES Charge	NPV (in current \$)	
	\$	\$	\$	\$	Estimated \$	O&M for Existing	O&M for Case III
South Park	\$ 78,571	\$ 66,271	\$ 12,300	\$ -	\$ -		
South Delta Sec.	\$ 1,341,281	\$ 974,770	\$ -	\$ 366,510	\$ 37,000		
Seaquam Sec1	\$ 1,857,217	\$ 1,481,754	\$ -	\$ 375,463	\$ 38,000		
Richardson	\$ 148,055	\$ -	\$ 41,000	\$ 107,055	\$ 11,000		
Pinewood	\$ 337,922	\$ 210,990	\$ -	\$ 126,932	\$ 13,000		
North Delta Sec.	\$ 436,758	\$ -	\$ 134,700	\$ 302,058	\$ 30,000		
Neilson Grove	\$ 108,000	\$ 90,400	\$ 17,600	\$ -	\$ -		
Ladner E	\$ 78,571	\$ 66,271	\$ 12,300	\$ -	\$ -		
English Bluff	\$ 78,571	\$ 66,271	\$ 12,300	\$ -	\$ -		
Delview Sec	\$ 457,144	\$ 207,834	\$ -	\$ 249,310	\$ 25,000		
Delta Sec.	\$ 779,776	\$ -	\$ 244,000	\$ 535,776	\$ 54,000		
Delta Manor	\$ 78,571	\$ 66,271	\$ 12,300	\$ -	\$ -		
Cougar	\$ 636,963	\$ 489,831	\$ -	\$ 147,132	\$ 15,000		
Cliff Drive	\$ 75,000	\$ 63,900	\$ 11,100	\$ -	\$ -		
Chalmers	\$ 78,571	\$ 66,271	\$ 12,300	\$ -	\$ -		
Beach Grove	N/A	N/A	N/A	N/A	N/A		
Annieville	\$ 390,348	\$ 259,216	\$ -	\$ 131,132	\$ 13,000		

Summary



Recommendation

Focus on the Option III with the SD co-investment in approximately the same amount as in BAU case

- lower NPV
- greater savings in GHG (61% compare to 17 %)
- immediate (and higher) savings in operational budget (\$ 224,650 compare to \$ 184,300)

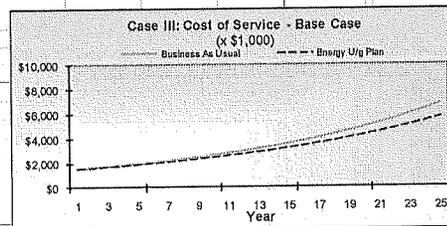
YEAR ONE COSTS FOR THE SCHOOL DISTRICT

	Electricity		Natural Gas		GHG emissions		Annualized OM&R	Subtotal of costs	Annual AES	Total Yr 1 operating cost	NPV of OM&R over 25 yrs
	MWh	\$	GJ	\$	(CO2e)	\$	\$	\$	\$	\$	\$
1. Present operations	9,572	623,700	78,477	852,300	4,120	181,400	105,050	1,762,450		1,762,450	48,040,000
2. 'Business As Usual'	9,572	623,700	64,433	699,700	3,410	149,700	105,050	1,578,150		1,578,150	42,856,000
3. Upgrade Strategy	10,509	684,800	27,902	303,000	1,600	68,000	0	1,055,800	482,000	1,537,800	38,455,000
Change from 'present'	938	61,100	(50,574)	(549,300)	(2,520)	(113,400)	(105,050)	(706,650)	482,000	(224,650)	(6,585,000)
Change from 'BAU'	938	61,100	(36,531)	(396,700)	(1,810)	(81,700)	(105,050)	(522,350)	482,000	(40,350)	(4,401,000)

PROJECT COST BREAKDOWN

	Total cost of upgrade	From SD or Ministry	Amount from EEC	TGI Capex
	\$	\$	\$	\$
Upgrade Strategy	6,961,321	1,935,415	509,900	4,516,005

Years to Deferral Account reconciliation (N/A) = over 25 yrs):



Summary



Co-operation with Terasen will:

Deliver financial savings

Deliver **GHG reduction** (61%)

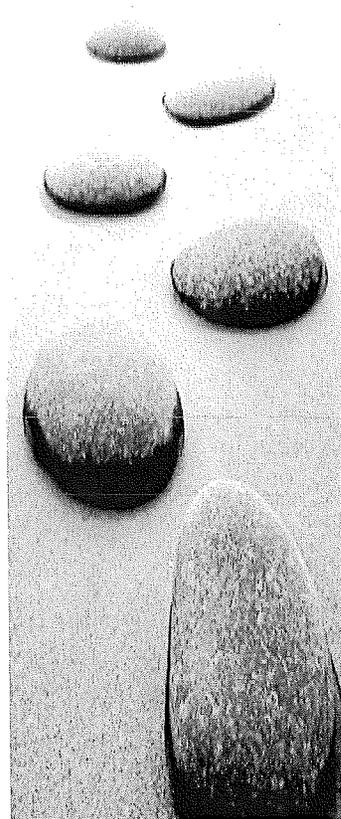
Deliver **Stable** financial environment

Deliver **Better and healthier environment** to work and learn

Next Steps



- Further verification of the numbers and the results
- Prepare final version to be able to submit request for PSECA funding and to the MoE



Sustainable Energy Systems...



From Concept to Reliable Operation



Thank you!

Contact Information:

Vladimir Kostka
T: 604-833-3182
www.terasen.com

Exhibit D



This is Exhibit "D" referred to in the affidavit of FRANK GEYER made before me on AUGUST 10 20 18
Erin Campbell-Strzed
A Commissioner for taking Affidavits for British Columbia

16705 Fraser Highway
Surrey, BC V4N 0E8
Tel: 604-592-7967
Fax: 604-576-7122
www.terasen.com

October 28, 2010

Mr. Frank Geyer
Director, Facilities and Planning

Delta SD 37
4585 Harvest Drive
Delta, BC

Re: Terasen Proposal to deliver thermal energy to Delta SD 37

Dear Frank,

Following on our discussion on Monday, October 25th please find attached an outline of Terasen's proposal to the Delta School District. I will be more than happy to provide you with additional information if needed. You can reach me at my cell number, 608- 833-3182.

Best Regards

Vladimir Kostka
Community Energy Solutions Manager

Next Steps

If Delta SD sees there is value in Terasen's proposal, the next step is to enter into a Letter of Intent ("LOI"). This will allow Terasen to begin developing the contractual agreements, finalizing the business model and preparation for a BC Utilities application.

Terasen is asking the Delta SD Board for approval of the proposal in order to proceed to the next steps.

Findings

Figures presented below are estimates only.

The findings of the high level study indicate the following:

- Total cost of the proposed project approx. \$5 mil CAD
- SD participation in the amount of approx. \$1.4 mil CAD
 - Compared to \$ 1.6 mil CAD (savings of \$ 200,000 CAD)
- Approx. 70 % reduction of GHG emissions
 - Compared to 15 % reduction
- Approx. \$ 190,000 CAD in energy savings
 - Compare to \$ 130,000 CAD
- 55 % reduction of energy consumption
 - Compared to 11 % reduction

The request for PSECA 3 funding – K12 HVAC retrofit

School District 37 (SD37) is seeking PSECA funding in the amount of \$ 1,400,000. These funds will allow SD to enter in to the agreement with Terasen to provide 19 buildings with clean thermal energy for heating and cooling using upgraded thermal plants within the SD.

The business model involves the packaging of 19 sites, eight receiving replacement of their conventional boilers with high efficiency, condensing boilers and 11 converted to state-of-the-art geo-exchange systems, with the project estimated to cost approx. \$5 Million of which Terasen will be able to pay the balance of the project cost in the amount of \$ 3,6 Million.

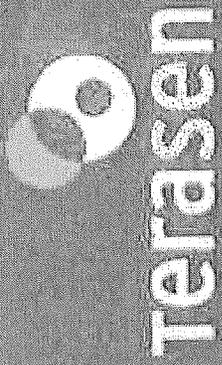
Terasen would own, operate and maintain all of the new heat generation equipment and would charge the District a "tariff rate" approved by the BC Utilities Commission, for thermal energy delivery. Thus, instead of the District paying utility companies for the fuel to run its thermal energy generation equipment, the District would pay for the thermal energy already generated by Terasen.

The benefits to the District for the initial 19 sites are:

- 45 % reduction in energy consumption (35,440 gigajoules).
- 69 % reduction in greenhouse gases (2,000 tonnes of CO2e) and corresponding carbon offsets purchase.
- Calculated annual energy savings of over \$180,000 in the first year after completion.
- Shift of onus for the reliable delivery of thermal energy generation to Terasen, meaning SDs meager maintenance budget for mechanical systems could be deployed on other critical parts of occupant comfort previously neglected due to underfunding.
- More money being made available out of the MoE Annual Facilities Grant for upgrade of other building systems (i.e. interior and exterior finishes).
- Stability when it comes to annual budgeting for utilities pertaining to thermal energy.

School District 37 (SD37) has been proactive in reducing its thermal energy consumption and has, in the past 2 years, retrofitted HVAC system in 16 out of the 32 schools in the district. In order to continue this proactive approach, it has entered into an agreement with Terasen Gas Inc. (TGI) to review rest of the of its buildings and to evaluate opportunities for improving the overall energy efficiency and environmental footprint of the School District by looking at its inventory of schools and other facilities as a whole.

Of the 19 buildings reviewed, 10 have aging heating systems that are ready for immediate replacement. Eight schools have central boilers that are more than 20 years old. Two schools are heated and ventilated by roof-top air-handling units that are more



**Feasibility Assessment
District-wide Energy System Upgrade**

School District No. 37 Delta

October 2010

Vladimir Kostka

Summary of the existing situation



- 34 schools, 2 office buildings – 16 upgraded partially or fully, 19 requiring further upgrades
 - Including South Delta Secondary school
- Natural gas based heating and DHW systems in all schools
 - Combination of AHU, gas boilers and furnaces
- Several schools with equipment at the end of their life cycle
 - Replacement needed in the near future
- No air conditioning

Electricity		Natural Gas		Emissions		YR1	
MWh	\$	GJ	\$	tCO2e	\$	Operating Cost	
6,800	\$	445,800	55,000	\$	2,900	\$	1,191,000
			597,700	\$	72,100	\$	

Assumptions



Table 1: Summary of input values for the 'base case'

Gas price per GJ (12% HST in):	\$10.86
Estimated annual gas rate increase:	6%
GHG intensity for Gas (tonnes/GJ):	0.05
Electricity price per kWh (12% HST in):	\$0.07
Estimated annual electricity rate increase:	6%
GHG intensity for electricity (tonnes/MWh):	0.02
Carbon Tax 2010 per tCO ₂ e:	\$20
Carbon Offset Purchase 2010 per tCO ₂ e:	\$25
Estimated annual Carbon cost increase:	10%
TG utility rate escalation (per yr):	3.0%
Discount rate	6%
TG rate for a Deferral Account	4%
Escalation rate on O&M	2%

Proposal



terasen

- Replacing the existing systems with:
 - High efficiency (Energy Star rated) Boilers (BUG)
 - Geo-exchange Energy System (GES) that will provide both heating and cooling
 - Open Loop Exchange System (OLS)
 - High efficiency Airsource to Water Heat Pumps (A2WHP)

District-wide Energy System Upgrade Strategy:

BUG	GES	OLS	A2WHP
8	3	8	0

Energy and GHG savings



SD funds 27% of the "total cost" (equal to 65% of "inside costs")

- Existing / Historical Business As Usual (BAU)
- △ BAU from Existing Proposed DWESU
- △ DWESU from Existing

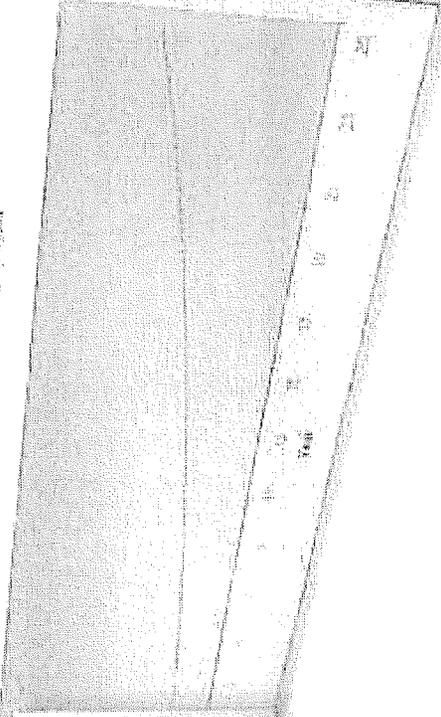
YR1 Oper8g Cost net of boiler replcmt	NPV of OM w/o std boiler replacmt cost	Total Project Cost	SD / MOE Investmt	EEC or other	TGI capex
\$ 1,191,000	\$ 32,660,000	\$ 1,582,000	\$ 1,582,000	\$ -	\$ -
\$ 1,059,000	\$ 29,511,000	\$ 1,582,000	\$ 1,582,000	\$ -	\$ -
\$ -132,000	\$ -3,145,000	\$ -	\$ -	\$ -	\$ -
\$ 1,003,000	\$ 26,715,000	\$ 4,942,000	\$ 1,355,000	\$ 797,000	\$ 2,790,000
\$ -188,000	\$ -5,945,000	\$ 3,360,000	\$ 327,000	\$ 797,000	\$ 2,790,000

PROJECT COST BREAKDOWN

Total Project Cost	SD / MOE Investmt	EEC	TGI Investment	TGI Combined
\$ 4,942,000	\$ 1,355,000	\$ 797,000	\$ 2,790,000	\$ 3,587,000

Annual Total Costs - Base Case

--- Existing
--- Construction Phase



Next Steps



- Present proposal to SD's board for approval
- Implement retrofits
 - Timeframe
 - plan of implementation
 - agreement
- Present to the MoE to find additional funds if necessary/ available

Exhibit E



Administration Building
4585 Harvest Drive
Delta, B.C. V4K 5B4
Tel. (604) 946-4101

06 January 2011

Climate Action Secretariat
Public Sector Energy Conservation Agreement
Second Floor, 395 Waterfront Crescent
Victoria, BC
V8T 5K7

Attention: Debra Larusson, Director

Dear Ms. Larusson:

RE: REQUEST FOR PSECA 3 FUNDING – THERMAL ENERGY RETROFIT PROGRAM

Further to my letter of 15 November 2010 and our telephone conversation of earlier today, this is to confirm the Delta Board of Education's commitment to the subject project and its application for funding consideration from the PSECA program.

The amended funding request is now \$1,357,000 towards the overall project budget of \$4,892,000. The breakdown of cost sharing and scope of work is listed on the table included as Appendix A. For the smaller projects (i.e. replacement of conventional boilers with high efficiency condensing boilers), Terasen's contribution through its efficient boiler program is small, with government picking up the majority of costs for the labour to remove, re-pipe and connect to the new boilers. On the larger projects, Terasen will pick up the majority of cost for construction of geoexchange fields, wells, heat pumps and associated plant, with the government share limited to the cost to adapt existing piping and replace thermal distribution equipment downstream as necessary to adapt to the new plant. The site with the largest government contribution is South Delta Secondary, where significant cost will be incurred to change a system of over 50 gas-fired rooftop heating systems throughout the facility over to a central ground source heat pump plant distributing heated and chilled water to new coils and fan units at former RTU locations.

If the project is approved for funding by PSECA, the rough timeline would be to commence detailed design by March 2011, commence construction on a staggered basis by June 2011 and complete all installations within 18 months. This schedule is subject to change as we refine the scope and obtain necessary government approvals.

I have also attached as Appendix B two tables indicating existing energy consumption and associated cost and carbon footprint data for the 19 locations, as well as the estimated data after all installations are completed and operational, and the net reductions.

This is Exhibit " E " referred to in the affidavit of FRANK BEYER made before me on AUGUST 10 20 18
Erika Lambert-Prizad
A Commissioner for taking Affidavits for British Columbia

J.

- 2 -

Please contact the undersigned at tel. 604-952-5336 or email fgeyer@deltasd.bc.ca if you have any questions or concerns, or require additional information.

Yours truly,

A handwritten signature in black ink, appearing to be 'F. Geyer', written in a cursive style.

Frank Geyer, PEng, FMA
Director of Facilities & Planning

Attach.

c.c. J. Vantol, Manager, Maintenance Services
J. White, Energy Manager
V. Kostka, Terasen Gas, Inc

Appendix A - List of Delta School District Facilities Proposed for District-Wide Thermal Energy System Upgrade

Table 1 - Scope and Estimated Cost of Work

No.	Facility Name	Civic Address	Existing Plant	Proposed Plant	Scope of Work			Funding Split		
					Loopfields & Wells	Mechanical Equipment	Total	Terasen Capex	Terasen EEC	Government
1	ANNIEVILLE Elementary	9240 112 Street	CB/UV	BUG	\$ -	\$ 71	\$ 71	\$ -	\$ 12	\$ 59
2	BEACH GROVE Elementary	5955 17A Avenue	CB/UV	BUG	\$ -	\$ 58	\$ 58	\$ -	\$ 12	\$ 46
3	CHALMERS Elementary	11315 75 Avenue	CB/UV	BUG	\$ -	\$ 79	\$ 79	\$ -	\$ 12	\$ 67
4	CLIFF DRIVE Elementary	5025 12 Avenue	CB/UV	BUG	\$ -	\$ 75	\$ 75	\$ -	\$ 11	\$ 64
5	DELTA Secondary	4629 51 Street	CB/AHU	OLS	\$ 181	\$ 392	\$ 573	\$ 329	\$ 244	\$ -
6	DELVIEW Secondary	9111 116 Street	CB/AHU	OLS	\$ 141	\$ 216	\$ 357	\$ 252	\$ 105	\$ -
7	ENGLISH BLUFF Elementary	402 48 Street	CB/UV	OLS	\$ 63	\$ 358	\$ 419	\$ 234	\$ 25	\$ 160
8	HEATH Elementary	11364 72 Avenue	CB/UV	BUG	\$ -	\$ 79	\$ 79	\$ -	\$ 12	\$ 67
9	HOLLY Elementary	4630 61 Street	CB/UV	BUG	\$ -	\$ 79	\$ 79	\$ -	\$ 12	\$ 67
10	LAONER Elementary	5016 44 Avenue	CB/UV	BUG	\$ -	\$ 79	\$ 79	\$ -	\$ 12	\$ 67
11	NEILSON GROVE Elementary	5500 Admiral Boulevard	CB/AHU	GES	\$ 148	\$ 268	\$ 412	\$ 285	\$ 21	\$ 105
12	NORTH DELTA Secondary	9270 114 Street	CB/AHU	OLS	\$ 154	\$ 221	\$ 375	\$ 240	\$ 135	\$ -
13	PINEWOOD Elementary	11777 Pinewood Drive	CB/UV	OLS	\$ 67	\$ 267	\$ 334	\$ 208	\$ -	\$ 126
14	RICHARDSON Elementary	11338 84th Avenue	CB/UV	OLS	\$ 67	\$ 89	\$ 156	\$ 115	\$ 41	\$ -
15	SOUTH DELTA Secondary	750 53 Street	RTU	OLS	\$ 163	\$ 924	\$ 1,087	\$ 580	\$ 105	\$ 402
16	SOUTH PARK Elementary	735 Gilchrist Drive	CB/AHU	OLS	\$ 119	\$ 154	\$ 273	\$ 220	\$ 28	\$ 27
17	Delta Manor Education Centre	4750 57 Street	CB/UV	GES	\$ 63	\$ 66	\$ 149	\$ 135	\$ -	\$ 14
18	District Operations Centre	7186 Brown Street	CB/AHU	BUG	\$ -	\$ 79	\$ 79	\$ -	\$ 12	\$ 67
19	School Board Office	4585 Harvest Drive	CB/AHU	GES	\$ 86	\$ 72	\$ 158	\$ 139	\$ -	\$ 19
					\$ 1,270	\$ 3,622	\$ 4,892	\$ 2,738	\$ 797	\$ 1,367

CB = Conventional Boiler UV = Unit Ventilators AHU = Central Air Handling Unit RTU = Gas-fired Rooftop Units | BUG = Boiler Upgrade GES = Closed Loop Geooexchange Upgrade OLS = Open Loop Geooexchange Upgrade
 Loopfields & Wells = exterior work in support of Geooexchange Technology (funded 100% by Terasen)
 Mechanical Equipment = Interior work (new heating and hot water plant to be operated by Terasen, and re-configuration of piping, ductwork, downstream fan systems, controls, etc. to connect to the new plant by School District)

Appendix B - List of Delta School District Facilities Proposed for District-Wide Thermal Energy System Upgrade
Data from Torason Gas, Inc.

Table 1 - Energy Reductions

No.	Facility Name	Civic Address	Existing Conditions				After Proposed Retrofits				Net Reduction (Increase)					
			Mechanical Plant	Annual Consumption (GJ)			Annual GHG (tCO2e)	Mechanical Plant	Annual Consumption (GJ)			Annual GHG (tCO2e)	Annual Consumption (GJ)			Annual GHG (tCO2e)
				Natural Gas	Electricity*	Total			Natural Gas	Electricity*	Total		Natural Gas	Electricity*	Total	
1	ANNIEVILLE Elementary	9240 112 Street	CB/UV	2,218	517	2,735	117	BUG	1,219	517	1,736	65	899	-	999	52
2	BEACH GROVE Elementary	5955 17A Avenue	CB/UV	1,245	609	1,854	67	BUG	719	609	1,328	40	528	-	528	27
3	CHALMERS Elementary	11315 75 Avenue	CB/UV	1,824	833	2,657	98	BUG	1,063	833	1,896	59	761	-	761	39
4	CLIFF DRIVE Elementary	5025 12 Avenue	CB/UV	1,812	850	2,662	98	BUG	996	850	1,846	56	816	-	816	42
5	DELTA Secondary	4629 51 Street	CB/AHU	9,725	4,692	14,417	526	OLS	1,228	6,422	7,650	102	8,497	(1,730)	6,767	424
6	DELVIEW Secondary	9111 116 Street	CB/AHU	4,871	2,039	6,910	261	OLS	552	3,192	3,744	48	4,319	(1,153)	3,166	213
7	ENGLISH BLUFF Elementary	402 48 Street	CB/UV	2,208	597	2,805	116	OLS	408	1,173	1,581	28	1,800	(576)	1,224	88
8	HEATH Elementary	11384 72 Avenue	CB/UV	1,641	621	2,262	88	BUG	934	621	1,555	52	707	-	707	36
9	HOLLY Elementary	4630 61 Street	CB/UV	1,585	597	2,182	85	BUG	944	597	1,541	52	641	-	641	33
10	LADNER Elementary	5016 44 Avenue	CB/UV	1,531	819	2,349	83	BUG	875	818	1,693	50	658	-	658	33
11	NEILSON GROVE Elementary	5500 Admiral Boulevard	CB/AHU	1,079	541	1,620	58	GES*	211	935	1,146	16	868	(394)	474	42
12	NORTH DELTA Secondary	8270 114 Street	CB/AHU	6,017	3,741	9,758	330	OLS	1,122	4,894	6,016	87	4,895	(1,153)	3,742	243
13	PINEWOOD Elementary	11777 Pinewood Drive	CB/UV	2,029	534	2,563	107	OLS	368	1,111	1,479	26	1,561	(577)	1,084	81
14	RICHARDSON Elementary	11338 84th Avenue	CB/UV	1,815	881	2,496	97	OLS	333	1,257	1,590	25	1,482	(576)	906	72
15	SOUTH DELTA Secondary	750 53 Street	RTU	8,068	3,902	11,970	436	OLS	889	6,055	6,944	76	7,179	(1,153)	6,026	360
16	SOUTH PARK Elementary	735 Glichrist Drive	CB/AHU	2,289	665	2,954	121	OLS	368	1,242	1,610	41	1,631	(577)	1,054	80
17	Delta Manor Education Centre	4760 57 Street	CB/UV	1,812	885	2,697	99	GES	284	1,482	1,766	24	1,528	(607)	921	74
18	District Operations Centre	7186 Brown Street	CB/AHU	1,647	674	2,321	99	BUG	1,015	674	1,689	56	832	-	832	43
19	School Board Office	4585 Harvest Drive	CB/AHU	1,424	841	2,265	78	GES	298	1,236	1,534	23	1,126	(395)	731	65
				56,040	24,837	79,877	2,983		14,116	33,628	47,644	926	40,924	(8,891)	32,033	2,037

CB = Conventional Boiler UV = Unit Ventilators AHU = Central Air Handling Unit RTU = Gas-fired Rooftop Units | BUG = Boiler Upgrade GES = Closed Loop Geoechange Upgrade OLS = Open Loop Geoechange Upgrade

* - includes lighting

Table 2 - Energy Cost Reductions

No.	Facility Name	Civic Address	Existing Conditions				After Proposed Retrofits				Net Reduction (Increase)						
			Mechanical Plant	Annual Energy Cost (\$)			Ann. Carbon Taxes** (\$)	Mechanical Plant	Annual Energy Cost (\$)			Ann. Carbon Taxes** (\$)	Annual Energy Cost (\$)			Ann. Carbon Taxes** (\$)	Annual Total (\$)
				Natural Gas	Electricity	Total			Natural Gas	Electricity	Total		Natural Gas	Electricity	Total		
1	ANNIEVILLE Elementary	9240 112 Street	CB/UV	24,087	9,337	33,425	5,850	BUG	13,239	9,337	22,576	3,250	10,849	-	10,849	2,600	24,298
2	BEACH GROVE Elementary	5955 17A Avenue	CB/UV	13,521	10,999	24,519	3,350	BUG	7,808	10,999	18,807	2,000	5,712	-	5,712	1,360	12,775
3	CHALMERS Elementary	11315 75 Avenue	CB/UV	19,809	16,044	34,853	4,500	BUG	11,544	16,044	26,588	2,950	8,264	-	8,264	1,850	18,479
4	CLIFF DRIVE Elementary	5025 12 Avenue	CB/UV	19,678	15,351	35,029	4,500	BUG	10,817	15,351	26,168	2,800	8,862	-	8,862	2,100	19,824
5	DELTA Secondary	4629 51 Street	CB/AHU	105,614	84,739	190,353	26,300	OLS	13,336	115,981	129,317	5,100	92,277	(31,244)	61,034	21,200	143,267
6	DELVIEW Secondary	9111 116 Street	CB/AHU	52,899	36,824	89,723	13,050	OLS	5,995	57,648	63,642	2,400	48,504	(20,823)	28,681	10,650	62,812
7	ENGLISH BLUFF Elementary	402 48 Street	CB/UV	23,979	10,782	34,761	5,800	OLS	4,431	21,184	25,615	1,400	18,548	(10,403)	8,145	4,400	22,661
8	HEATH Elementary	11384 72 Avenue	CB/UV	17,821	11,215	29,037	4,400	BUG	10,143	11,215	21,359	2,600	7,678	-	7,678	1,800	17,156
9	HOLLY Elementary	4630 61 Street	CB/UV	17,213	10,782	27,995	4,250	BUG	10,252	10,782	21,034	2,600	6,961	-	6,961	1,650	15,573
10	LADNER Elementary	5016 44 Avenue	CB/UV	16,827	14,773	31,400	4,150	BUG	9,503	14,773	24,276	2,500	7,124	-	7,124	1,850	15,896
11	NEILSON GROVE Elementary	5500 Admiral Boulevard	CB/AHU	11,718	9,770	21,488	2,900	GES	2,291	16,886	19,178	800	9,426	(7,116)	2,311	2,100	6,722
12	NORTH DELTA Secondary	8270 114 Street	CB/AHU	65,345	67,562	132,907	16,500	OLS	12,185	88,386	100,571	4,350	53,160	(20,823)	32,337	12,150	76,823
13	PINEWOOD Elementary	11777 Pinewood Drive	CB/UV	22,035	9,644	31,679	5,350	OLS	3,996	20,955	24,951	1,300	18,038	(10,421)	7,618	4,050	19,286
14	RICHARDSON Elementary	11338 84th Avenue	CB/UV	19,711	12,299	32,010	4,650	OLS	3,616	22,701	26,318	1,250	16,095	(10,403)	5,692	3,600	14,984
15	SOUTH DELTA Secondary	750 53 Street	RTU	87,616	70,470	158,089	21,800	OLS	9,655	91,293	100,948	3,800	77,964	(20,823)	57,141	18,000	132,282
16	SOUTH PARK Elementary	735 Glichrist Drive	CB/AHU	24,859	12,010	36,868	5,050	OLS	7,146	22,431	29,578	2,050	17,713	(10,421)	7,292	4,000	18,584
17	Delta Manor Education Centre	4760 57 Street	CB/UV	19,678	15,983	35,661	4,900	GES	3,084	25,948	30,030	1,200	16,594	(10,962)	5,632	3,700	14,963
18	District Operations Centre	7186 Brown Street	CB/AHU	20,058	12,172	32,231	4,950	BUG	11,023	12,172	23,195	2,800	9,036	-	9,036	2,150	20,221
19	School Board Office	4585 Harvest Drive	CB/AHU	15,465	15,188	30,653	3,900	GES	3,238	22,322	25,560	1,150	12,228	(7,134)	5,095	2,750	12,939
				\$ 597,734	\$ 444,944	\$ 1,042,679	\$ 148,160		\$ 163,300	\$ 605,616	\$ 768,816	\$ 46,300	\$ 444,435	\$ (180,671)	\$ 263,863	\$ 101,860	\$ 689,678

** - Carbon Tax + Carbon Offsets

Exhibit F

This is Exhibit "F" referred to in the
affidavit of FRANK GIBER
made before me on AUGUST 10 20 18
Engel Campbell-Hirzad
A Commissioner for taking Affidavits
for British Columbia

DRAFT

Energy Study
Supporting
Delta School District No. 37
Request for
PSECA Funds

January 4th, 2011

1.0 Executive Summary 1

1.1 Our DeltaGreen Strategy Aligns with the Goals of PSECA..... 1

1.2 TG Will Complete Our Thermal Energy Transformation 1

1.3 We Will Achieve Our Climate Action Goals..... 1

1.4 We Request \$1.4 Million from PSECA..... 1

2.0 Delta School District No. 37 2

2.1 Our DeltaGreen Facilities Team..... 2

2.2 Building on Our Success 2

3.0 Our Thermal Energy and Emissions Challenge 3

3.1 Aging Boilers Deliver Thermal Energy to 19 Buildings..... 3

3.2 Reduce from 59,000 GJ and 3,000 Tonnes of CO₂..... 3

4.0 Thermal Energy Systems that Reduce Energy and Emissions 4

4.1 Pumping Renewable Energy from the Natural Environment..... 5

4.2 Recovering More of the Energy from Natural Gas 7

5.0 We Will Purchase Thermal Energy from TG..... 9

5.1 TG’s Project Solution Bundles the Costs and Benefits for Us..... 9

5.2 We Will Connect to the TG Thermal Energy Systems 10

5.3 This Project Eliminates Over 30,000 GJ and 2,000 Tonnes of CO₂ 11

6.0 Conclusion 12

Appendix A Existing Mechanical Drawings

Appendix B Alternative Mechanical Drawings

Appendix C Heating and Cooling with a Heat Pump

1.0 Executive Summary

At Delta School District No. 37 (SD37), we are subject to the Greenhouse Gas Reduction Targets Act (GGRTA) requiring us to become carbon neutral by 2010. We also signed the Climate Action Charter (CAC) supporting this legislation. According to the GGRTA, we must first reduce carbon emissions and second we must purchase carbon offsets from the Pacific Carbon Trust (PCT) for any remaining carbon emissions. In addition, each year, the GGRTA requires us to publish a report of the carbon emissions and the activities that it has undertaken to reduce those emissions.

We have been proactive in reducing our thermal energy consumption and carbon footprint by implementing air-source heat pumps at 15 of the 34 buildings in SD37. Each year, the remaining 19 buildings consume approximately 55,000 GJ of natural gas and 1,000 MWh of electricity for thermal energy. The annual carbon emissions related to this amount of energy consumption are almost 3,000 tonnes.

1.1 Our DeltaGreen Strategy Aligns with the Goals of PSECA

DeltaGreen is the strategy that our School District is developing and will follow to bring us to sustainable excellence. Through this strategy we intend to continue building on our successes in reducing greenhouse gas emissions and generating energy savings in a cost effective manner.

1.2 TG Will Complete Our Thermal Energy Transformation

Terasen Gas (TG) will install and operate energy systems at the remaining 19 buildings in our School District. Doing business with TG will enable us to utilize the scale of our remaining buildings to develop a comprehensive solution to complete the transformation of our thermal energy delivery systems at all of our buildings.

1.3 We Will Achieve Our Climate Action Goals

By selecting the appropriate energy system technology for each site, with an eye towards the overall School District impact, TG estimates that we can reduce energy inputs by over 30,000 GJ each year and achieve a subsequent reduction of 2,000 tonnes of CO₂ emissions.

1.4 We Request \$1.4 Million from PSECA

In order to implement this project and realize the benefits, while keeping costs below the current levels, TG will require a capital contribution of \$1.4M from us. Accordingly, we request \$1.4M of funds from you to use as a contribution towards this significant initiative.

2.0 Delta School District No. 37

Delta School District 37 serves the communities of North Delta, Ladner, Tsawwassen and Westham Island and covers an area of 183.7 square kilometres. We provide a comprehensive education program to 16,000+ students from kindergarten to Grade 12 at 24 elementary schools, and 7 secondary schools. The District also operates 68 modular classrooms, District Administration Building, Delta Manor Education Centre, 2 Adult Learning Centres, District Maintenance Centre and various satellite sites, leased facilities and undeveloped sites. In total there are 42 sites, 2,289 District staff, consisting of 202,400 square metres of permanent and modular buildings situated on 141 hectares.

Our mailing address is:

Delta School District
4585 Harvest Drive
Delta, B.C. V4K 5B4

2.1 Our DeltaGreen Facilities Team

Leading our team is our Director of Facilities & Planning, F.J. (Frank) Geyer, PEng, FMA. In addition, we have a full time Energy Manager, Jim White and a full time Energy Specialist, Richard Tse.

Organizationally, we have in place a District Sustainability Committee (DeltaGreen Advisory Committee) to manage the District Sustainability goals and to ensure that we are able to deliver on these goals in accordance to our District Policy. We are in the process of establishing Green Teams at our schools and we have a facilities team that is actively engaged in supporting the District sustainability goals.

2.2 Building on Our Success

As part of our DeltaGreen objective to minimize carbon emissions in a sustainable manner, we have already retrofitted 15 buildings with air source heat pumps. This initiative has reduced natural gas consumption across our School District by approximately 13,000 GJ, while electricity consumption increased from 211 MWh to 900 MWh. However, carbon emissions have been reduced by about 470 tCO₂e as a result of this initiative.

Our success to date leads us to believe that as we approach the remainder of our buildings, some of which are much larger, we can achieve dramatic results.

3.0 Our Thermal Energy and Emissions Challenge

Thermal energy production at our building sites generates the majority of the carbon emissions in our School District. Our early success in reducing emissions and energy inputs through the use of air source heat pumps gives us optimism that we can achieve significant emission reductions by focussing our efforts on the thermal energy production systems at the remaining 19 buildings.

3.1 Aging Boilers Deliver Thermal Energy to 19 Buildings

Of these 19 buildings, 10 have aging heating systems that are ready for immediate replacement. Eight schools have central boilers that are more than 20 years old. Two schools have roof-top air-handling units that are more than 20 years old. Five other schools have heating systems that will reach the end of their life cycle within the next 5 to 10 years.

Appendix A provides mechanical drawings of each of the buildings in this analysis.

3.2 Reduce from 59,000 GJ and 3,000 Tonnes of CO₂

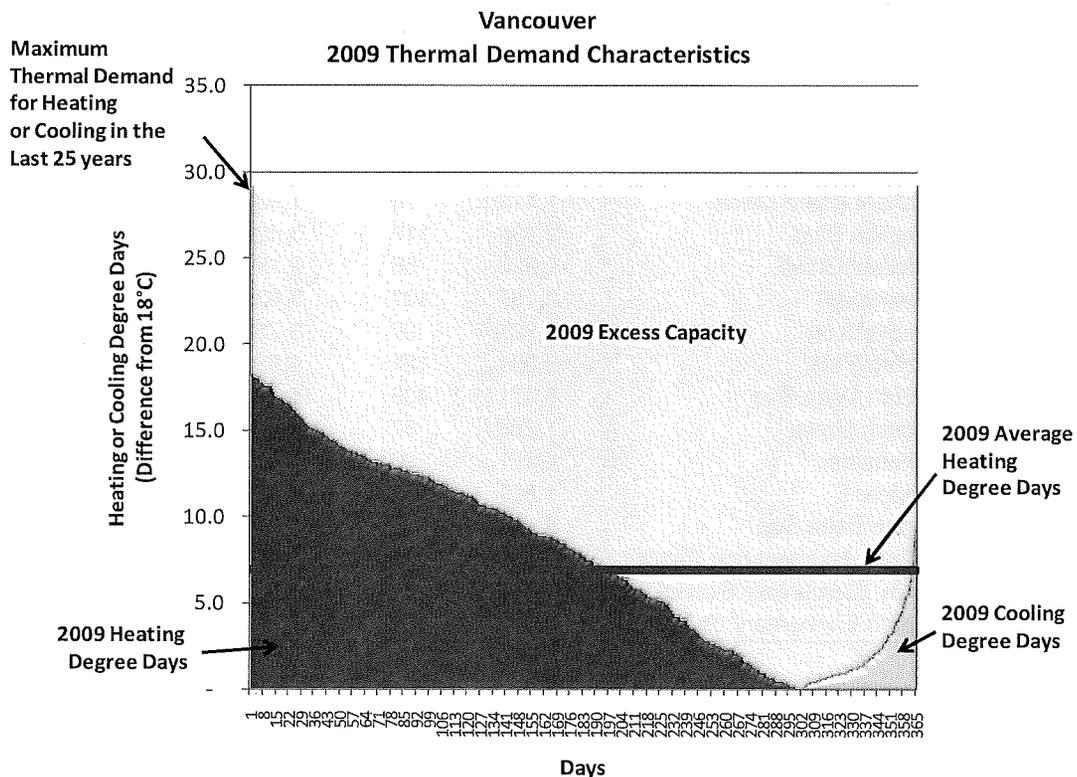
Using actual consumption from each of these buildings over the past three years, we use on average 59,000 GJ of natural gas and electricity to produce thermal energy at these buildings.

School	annual		area [m ²]	BEPI MJ/m ² .year
	total [GJ]	annual tCO ₂ e		
Delta Sec.	10,310	526	18,754	769
Delview Sec	5,435	261	10,490	659
Annieville	2,299	117	4,011	682
Cliff Drive	1,955	98	4,192	635
Delta Manor	1,944	98	4,333	623
School Board Office	1,413	78	1,930	1,174
English Bluff	2,436	116	3,408	823
Neilson Grove	1,229	58	2,191	739
Pinewood	2,197	107	3,635	705
Richardson	1,921	97	3,759	664
South Park	2,361	121	4,039	572
South Delta Sec.	8,171	436	16,475	727
Beach Grove	1,286	67	3,008	616
Chalmers	2,271	98	4,459	596
Ladner E	1,611	83	4,313	545
North Delta Sec.	6,473	330	15,494	630
Tilbury Maintenance Facility	2,039	99	2,376	1,061
Holly Elementary School	1,595	85	3,975	552
Heath Elementary School	1,661	88	4,035	542
total	58,606	2963		

4.0 Thermal Energy Systems that Reduce Energy and Emissions

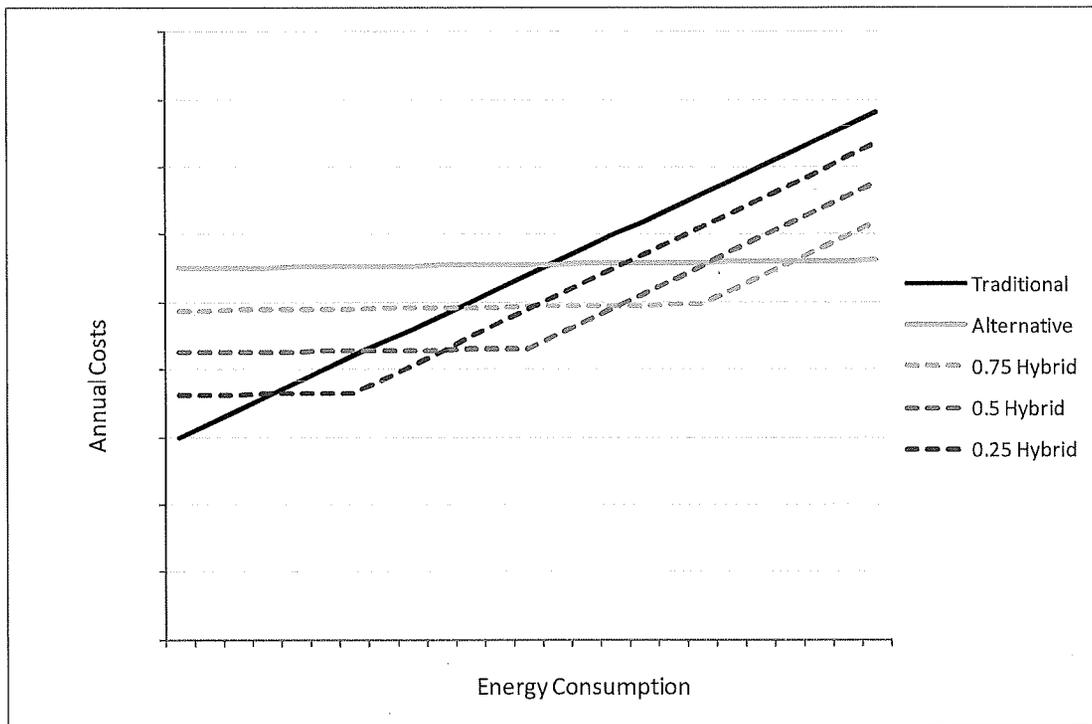
There are a variety of energy system alternatives available for us to utilize for delivery of thermal energy. Each energy system has specific attributes that determine the feasibility of installation at a particular location. Irrespective of how a system generates thermal energy, thermal energy demands for any building are primarily dependent upon the outside temperature. While thermal energy retention also plays a significant role in the equation for thermal energy demand, we are focussing this discussion on the systems that produce thermal energy and emissions.

Energy systems must have the capacity to deliver the maximum demand in total that each of our buildings may require at any time. In practice, this maximum demand will occur when the outside temperature is either coldest or hottest for our climate, which was -11.2°C in 1989. This is much colder than the coldest day in most years. For instance, the lowest daily average temperature in Vancouver in 2009 was 0°C , while the average temperature for that year was 11.0°C . This means that thermal energy systems throughout the region had excess capacity throughout the year. It also means that regardless of the thermal energy production system selection, capacity utilization will depend on weather conditions and building thermal energy retention.



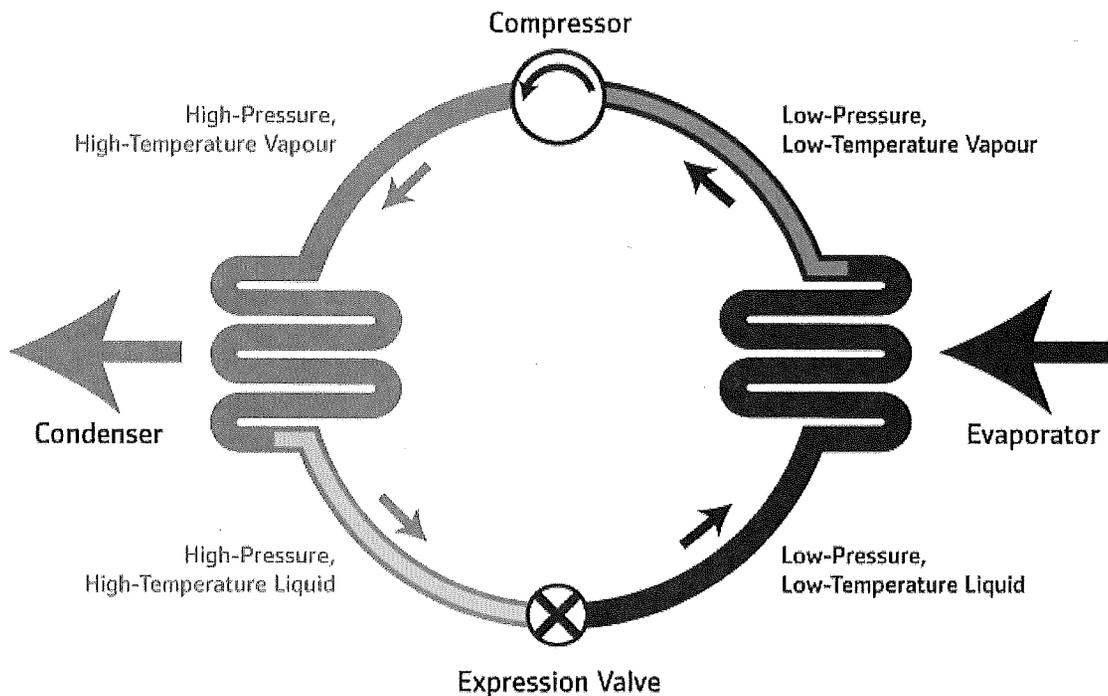
There are two basic ways to reduce the GHG emissions and energy inputs to deliver thermal energy. The first is to utilize free renewable energy from the surrounding natural environment. The second is to eliminate or reduce any waste in the conversion and delivery process.

It is noteworthy that very little of the annual thermal energy demand occurs during the peak day. Since carbon emissions are a direct result of energy production, this means that very little of the annual carbon emissions occur during the peak day. The importance of this is that by combining energy systems to deliver peak demand, significant reductions in emissions may be possible even if the system meets peak demands using higher emission fuels. These hybrid systems using alternative energy supply and natural gas can provide an optimal balance between costs and emissions, depending on the energy demand characteristics of the buildings.



4.1 Pumping Renewable Energy from the Natural Environment

Many energy systems use a pump to transfer heat from an accessible, renewable energy source, such as ground, water or air. These heat pump systems rely on the law of physics that states when pressure increases, so does temperature and vice versa. Your refrigerator is a heat pump that transfers heat from inside the unit into the ambient air surrounding it by applying this law. Heat pump systems can operate to pump heat into or out of buildings, providing heating and cooling in a single system.



Heat pump energy systems utilize electricity to run the pumps that transfer thermal energy. Since there must be a heat source to transfer the energy from, technically, heat pumps do require more energy in total than they produce. However, the crucial point is that the heat pump can transfer energy from or to sources such as the ambient air, ground water, lakes, oceans, rivers or simply the earth itself. Since those energy sources are renewable, we only need to count the amount of electricity that drives the pumps, which is much less than the thermal energy the pumps deliver into or out of the buildings. This is why heat pumps have efficiency ratings higher than 100%, even though that would break the laws of conservation of energy.

Since the renewable energy sources for heat pumps do not generate carbon emissions, heat pumps do not generate any carbon emissions on site. The amount of carbon emissions depends on the type of electricity generation the heat pump is using.

Air source heat pumps transfer heat to or from ambient air. Since air source heat pumps are also reliant on the ambient temperature as both renewable energy source as well as the primary driver for thermal demand, during the extreme climate conditions, the efficiency of the air source heat pump is also the lowest. This means that an air source heat pump requires a significant back-up thermal energy production system to supplement thermal energy demand during peak day demand conditions. While this means that the heat pump will not deliver a small portion of annual demand, it does mean that the capital costs of a backup system are necessary to meet the demand for thermal energy on the peak day. In practice, these systems have a balance point at which the operation of the system is either primarily the heat pump, or primarily the backup system.

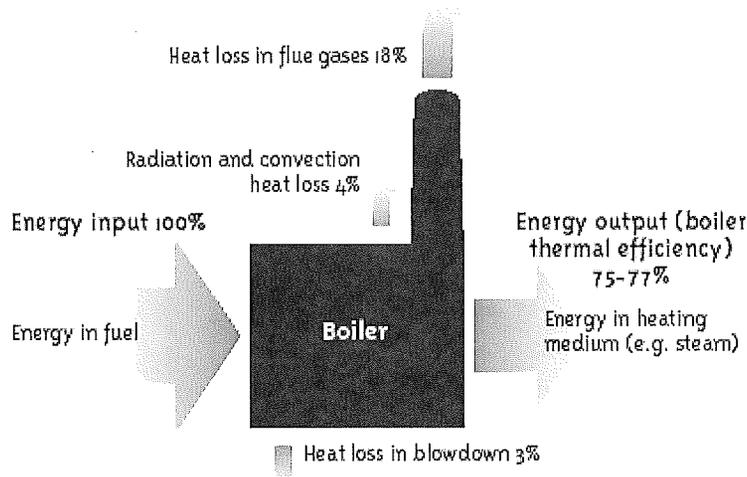
Alternatively, ground source heat pumps use a renewable source of energy that is much more stable. At the depth of 100m, the ground in the Vancouver area is approximately 10°C regardless of the ambient temperature. This enables ground source heat pumps to operate at higher efficiency levels even during peak demand periods. Similarly, ground water from aquifers typically has a temperature of approximately 10°C year-round.

The relative stability of the temperatures at these depths means that vertical bore-hole, closed loop fields and central ground source heat pump(s) can provide high efficiency space heating and cooling. While these systems can deliver all of the peak day demands, use of a supplementary natural gas boiler helps to minimize the capital costs, without adding significantly to the emissions footprint of the systems.

Appendix C provides a technical publication from Natural Resources Canada respecting heating and cooling with a heat pump.

4.2 Recovering More of the Energy from Natural Gas

Older natural gas boilers may recover less than 60% of the energy in the natural gas that they consume. This is because of the design of the older boilers, the age and condition of the boilers and the operation of the boilers. Direct losses occur in the form of flue gases and radiation and convection heat losses primarily. However, scale build-up that reduces the efficient transfer of heat from within the boiler can become significant over time. Finally, the accuracy of the control system that calls for thermal energy may play a role in the efficient matching of thermal demand to supply.



High-efficiency condensing boilers can dramatically reduce the losses of energy in flue gases. By reducing the flue gas temperatures below the condensing point, condensing boilers recover both the sensible and latent heat within the flue gases. This can increase boiler efficiency in dramatic ways and alone can increase efficiency by as much as 20%.

Over years, scale can build up in the boilers as well. This mineral deposit inside the boiler tubes acts as an insulating layer that reduces heat transfer and therefore efficiency. Tests show that 1mm of mineral deposit can reduce boiler efficiency by as much as 10%.

More efficient controls at the burner tip also enable better efficiency through better matching the oxygen requirements for proper combustion. While the benefits of this are not as large as those achievable through condensing flue gases and achieving proper heat transfer within the unit, over time, more efficient matching of fuel and oxygen produces significant gains in efficiency. Together, practical efficiencies in excess of 90% are achievable with new condensing boilers and control systems.

5.0 We Will Purchase Thermal Energy from TG

TG has approximately 1 million customers and has over \$3B of investments in energy delivery infrastructure in the province of British Columbia. TG has expertise in both conventional and alternative energy systems and is capable of customizing thermal energy solutions for customers with a focus on sustainability. TG energy systems range from heat pumps to waste water and biomass as well as more traditional energy systems such as natural gas. TG owns, and operates these systems and enables connection via a fee for the service.

By connecting our buildings to TG energy systems, we are able to manage both the initial and ongoing costs of delivering thermal energy to our buildings while achieving significant reductions in carbon emissions. This approach to purchasing thermal energy pools the costs and benefits of each building in a manner that enables us to maximize the environmental benefits of employing alternative technologies while managing the capital and operating costs within our existing constraints.

This simple business arrangement relieves us from many of the practical realities of retrofitting our buildings with new energy systems in an environment filled with constraints. Instead, this model establishes an elegant and enduring business relationship between TG and us that delivers exceptional value in terms of environmental benefits, reliability and cost effectiveness across our School District.

5.1 TG's Project Solution Bundles the Costs and Benefits for Us

TG will design a set of energy systems for these buildings using an approach that balances the total benefits to us against the costs. By taking this approach TG, enables us to unlock the benefits such as any available Energy Efficiency and Conservation (EEC) funds, variations in capital costs for different combinations of equipment and sites as well as the carbon footprint reductions that can occur across our School District. Taking this broader perspective enables TG to develop an optimum solution for us overall.

The traditional approach has been to analyze each energy system as a building retrofit on an independent basis. This Achilles heel of this approach has been to trap any costs and benefits to the single building, despite the fact that we are responsible for the entire school district. In this way, excess benefits at a single site have not been available to apply against the costs at another site, producing a less than optimal solution overall for us at a district level.

This new approach emulates the business model that TG uses to provide natural gas delivery service. TG pools the costs and benefits across the entire natural gas distribution network in British Columbia and provides the service to all customers at a single rate. Similarly, TG will analyze and select the appropriate energy system, subject to our approval and input, for each site in our School

District and develop a single rate to charge us for thermal energy. This rate will be competitive with our existing operating costs, including maintenance of equipment.

Total costs of the project will be approximately \$4.9M, of which, TG estimates that \$0.8M of EEC funding will be available. The estimate of energy reductions and carbon emissions reductions are 32,000 GJ of energy and 2,000 tonnes of CO₂. However, in order to minimize the annual costs within our constraints, TG requires an additional contribution from us of \$1.4M.

5.2 We Will Connect to the TG Thermal Energy Systems

TG will install and operate energy systems at each of our buildings that meet our requirements overall. We will provide space for the TG energy systems at each facility and we will then connect to those systems to receive thermal energy.

This model also emulates the current business relationship between customers and utilities throughout the world. This simplifies the relationship and provides the entire service to us in a trouble free, predictable and reliable manner.

Appendix B provides schematics of the energy system alternatives available for each of our buildings in the Project. At this point, using information from both TG and ourselves, the analysis indicates that the following systems and costs represent the optimal solution of energy systems throughout the School District.

The TG proposal for each building and the associated capital costs in thousands of dollars are below. The abbreviations are as follows:

Boiler Upgrade	-BUG
Ground Sources Heat Pump	-LFS
Ground Water Heat Pump	-OLS

Building	Address	Energy System	Loopfields & Wells	Mechanical Equipment	Total
Annieville Elementary	9240 - 112 nd Street	BUG		\$71	\$71
Beach Grove Elementary	5955 - 17A Avenue	BUG		\$58	\$58
Chalmers Elementary	11315 - 75 th Avenue	BUG		\$79	\$79
Cliff Drive elementary	5025 - 12 th Avenue	BUG		\$75	\$75
Heath Elementary	11364 - 72 nd Avenue	BUG		\$79	\$79
Holly Elementary	4630 - 61 st Street	BUG		\$79	\$79
Ladner Elementary	5016 - 44 th Avenue	BUG		\$79	\$79
District Operations Centre	7186 - Brown Street	BUG		\$79	\$79
Neilson Grove	5500 - Admiral Boulevard	LFS	\$146	\$266	\$412
School Board Office	4585 - Harvest Drive	LFS	\$86	\$72	\$157
Delta Manor Ed Centre	4750 - 57 th Street	LFS	\$83	\$66	\$149

South Delta Secondary	750 - 53 rd Street	OLS	\$163	\$924	\$1,087
South Park Elementary	735 - Gilcrest Drive	OLS	\$119	\$154	\$273
Delta Secondary	4629 - 51 st Street	OLS	\$181	\$392	\$573
Deltaview Secondary	9111 - 116 th Street	OLS	\$141	\$216	\$357
English Bluff Elementary	402 - 48 th Street	OLS	\$63	\$356	\$419
Pinewood Elementary	11777 Pinewood Drive	OLS	\$67	\$267	\$335
Richardson Elementary	11339 - 83 rd Avenue	OLS	\$67	\$89	\$156
North Delta Secondary	11447 - 82 nd Avenue	OLS	\$154	\$221	\$375
Total			\$1,271	\$3,620	\$4,890
SD37 Contribution					(1,355)
EEC Funding					(797)
TGI					\$2,738

5.3 This Project Eliminates Over 30,000 GJ and 2,000 Tonnes of CO₂

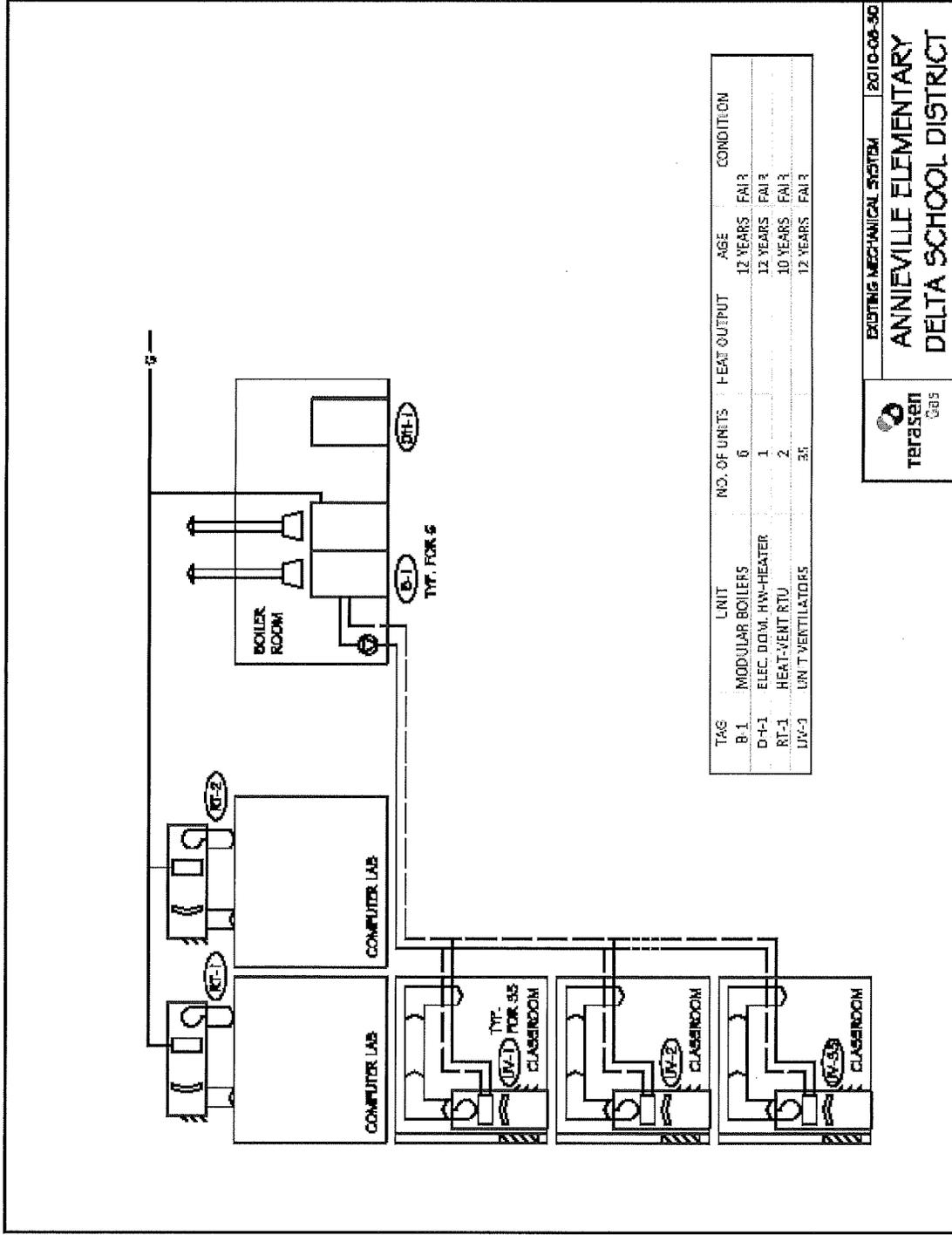
TG estimates that the package of energy systems will dramatically lower the energy input requirements and carbon emissions throughout our School District as follows:

School	Before		After	
	annual total [GJ]	annual tCO ₂ e	annual total [GJ]	annual tCO ₂ e
Delta Sec.	10,310	526	3,543	102
Delview Sec	5,435	261	2,269	48
Annieville	2,299	117	1,219	65
Cliff Drive	1,955	98	996	56
Delta Manor	1,944	98	1,023	24
School Board Office	1,413	78	682	23
English Bluff	2,436	116	1,212	28
Neilson Grove	1,229	58	756	16
Pinewood	2,197	107	1,113	26
Richardson	1,921	97	1,016	25
South Park	2,361	121	1,306	41
South Delta Sec.	8,171	436	2,146	76
Beach Grove	1,286	67	719	40
Chalmers	2,271	98	1,063	59
Ladner E	1,611	83	875	50
North Delta Sec.	6,473	330	2,731	87
Tilbury Maintenance Facility	2,039	99	1,015	56
Holly Elementary School	1,595	85	944	52
Heath Elementary School	1,661	88	934	52
total	58,606	2963	25,560	926

6.0 Conclusion

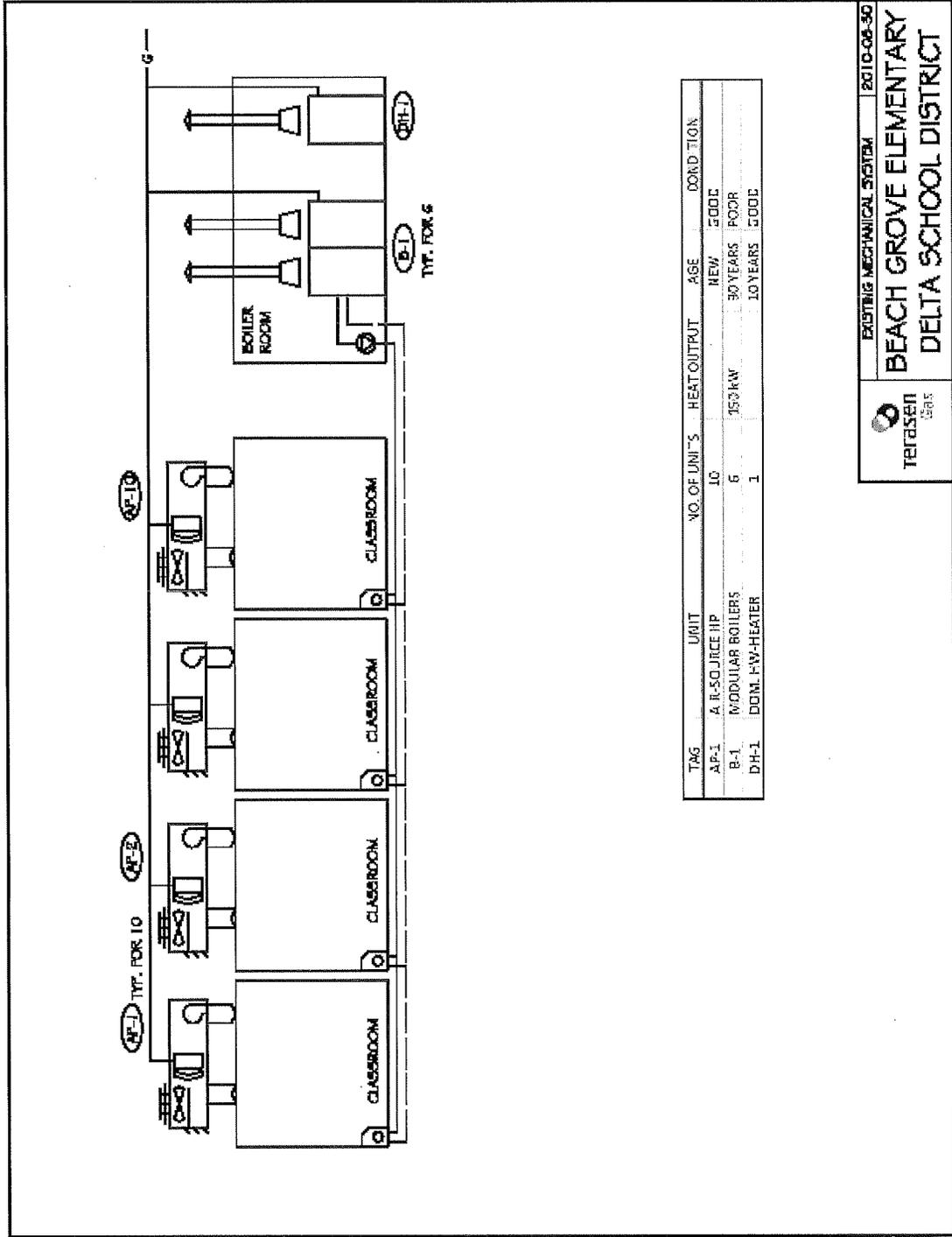
As part of our DeltaGreen strategy to pursue sustainable excellence, we are continuing to develop innovative solutions to become carbon neutral, while operating within our budgetary constraints. We are requesting \$1.4 million from you to use as a capital contribution towards a package project by TG to provide thermal energy to us using high efficiency condensing boilers and ground source heat pumps at 19 of our buildings. Your participation in this project will enable us to complete the transformation of our thermal energy delivery systems and achieve both of our common goals with respect to energy consumption, carbon emissions and operating expenses. We believe this project will provide other public sector organizations with a concrete example of a realistic solution to reduce emissions.

APPENDIX A - Existing Mechanical Systems





EXISTING MECHANICAL SYSTEM 2010-08-30
ANNIEVILLE ELEMENTARY
DELTA SCHOOL DISTRICT

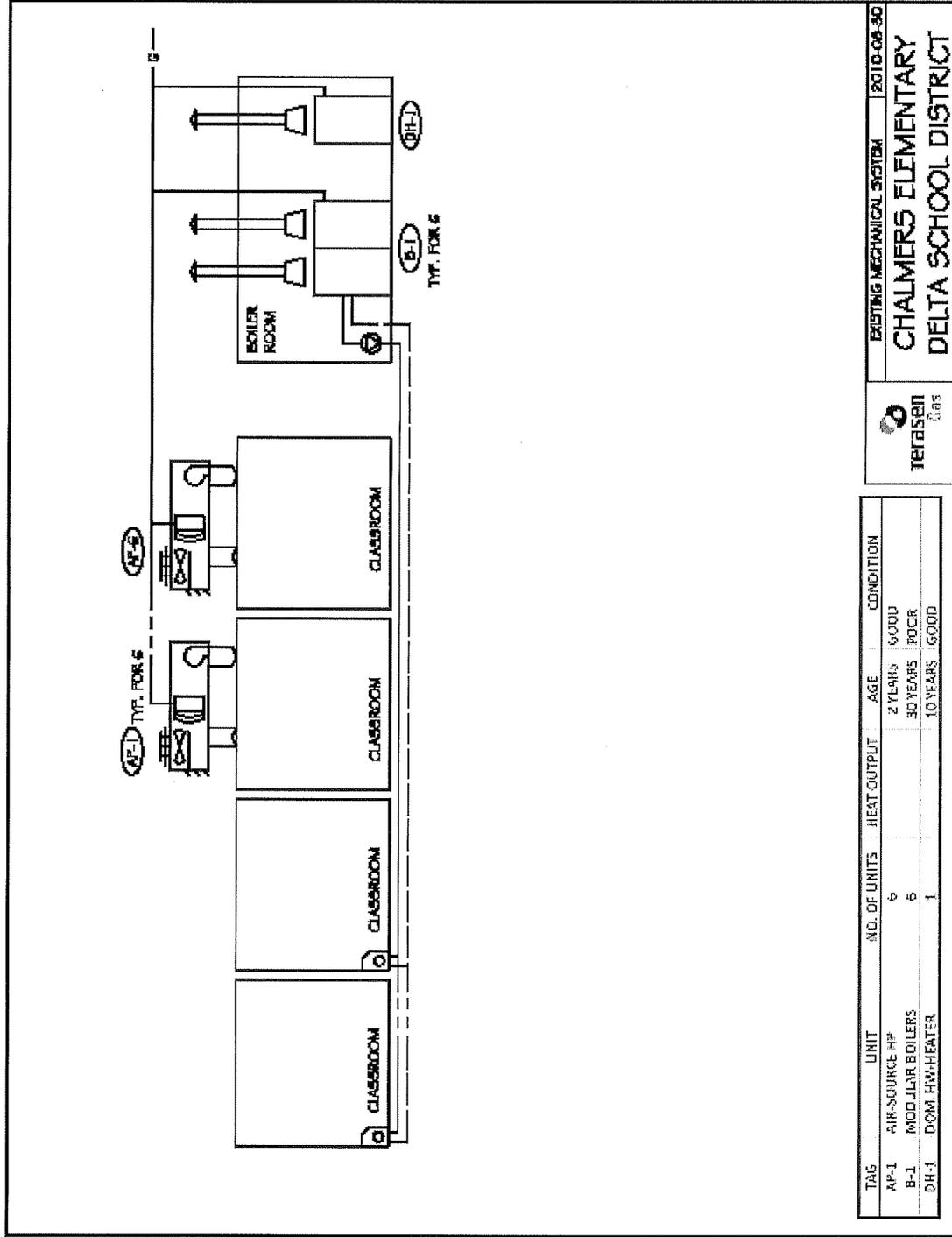




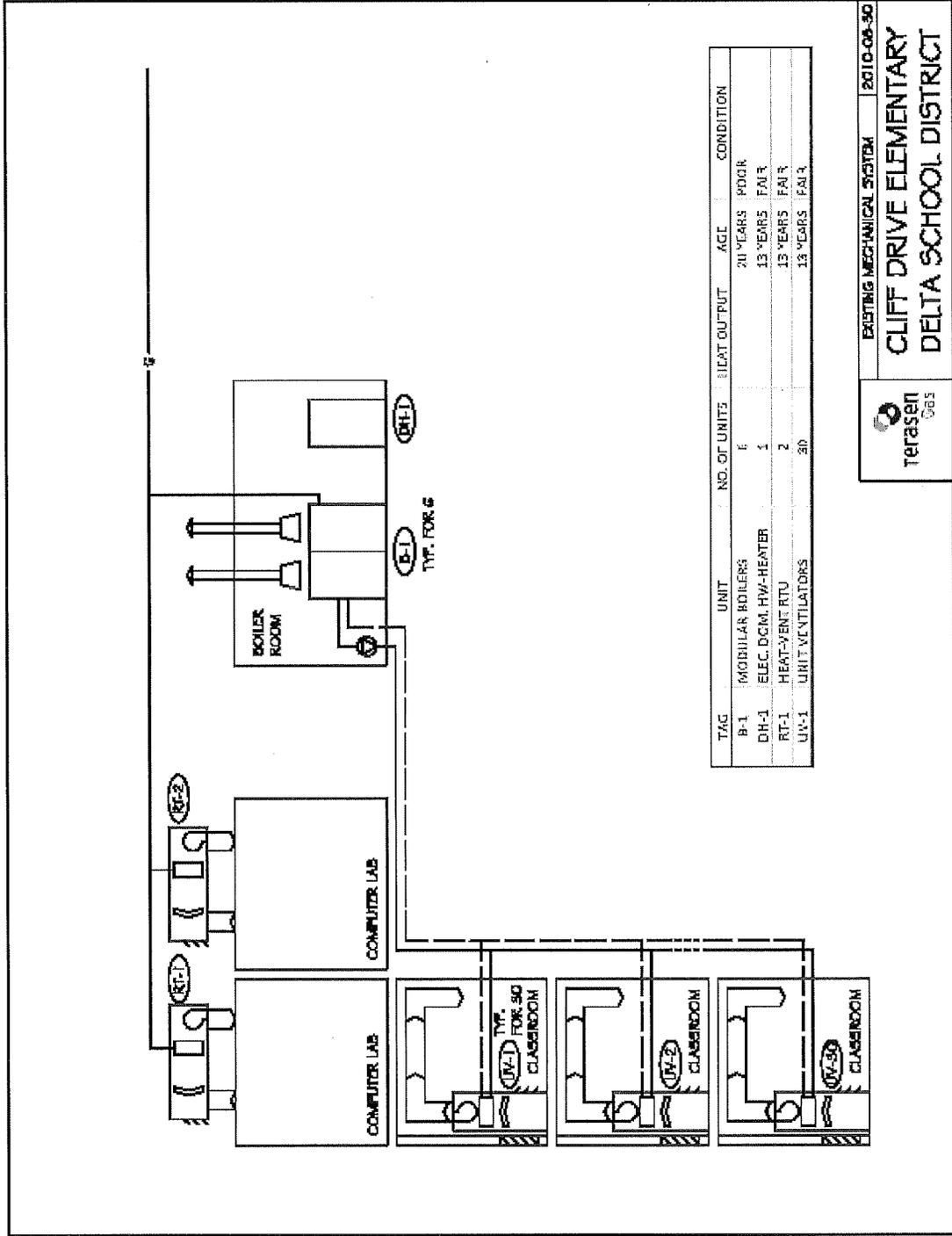
TERASEN

Gas

EXISTING MECHANICAL SYSTEM 2010-06-30
BEACH GROVE ELEMENTARY
DELTA SCHOOL DISTRICT

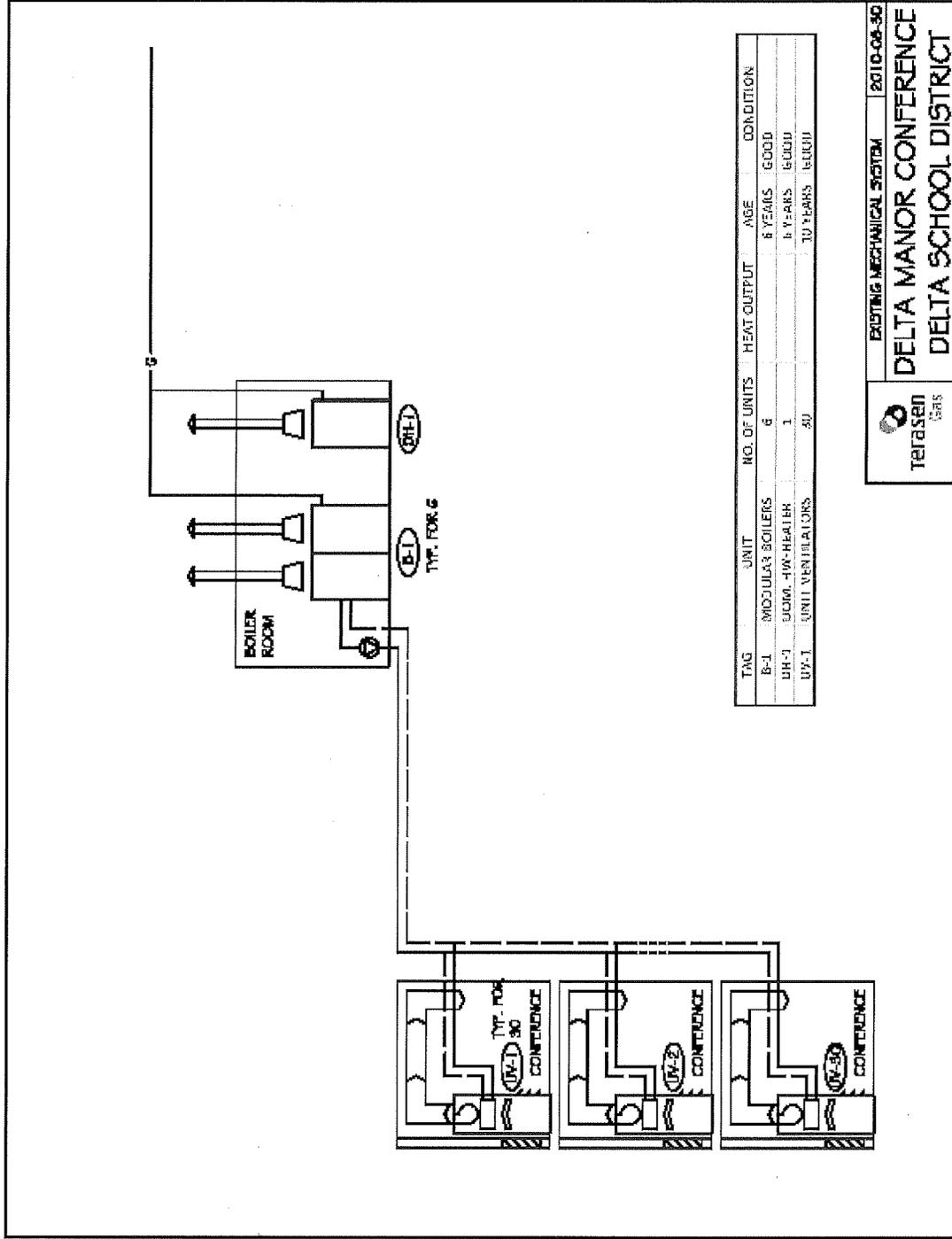


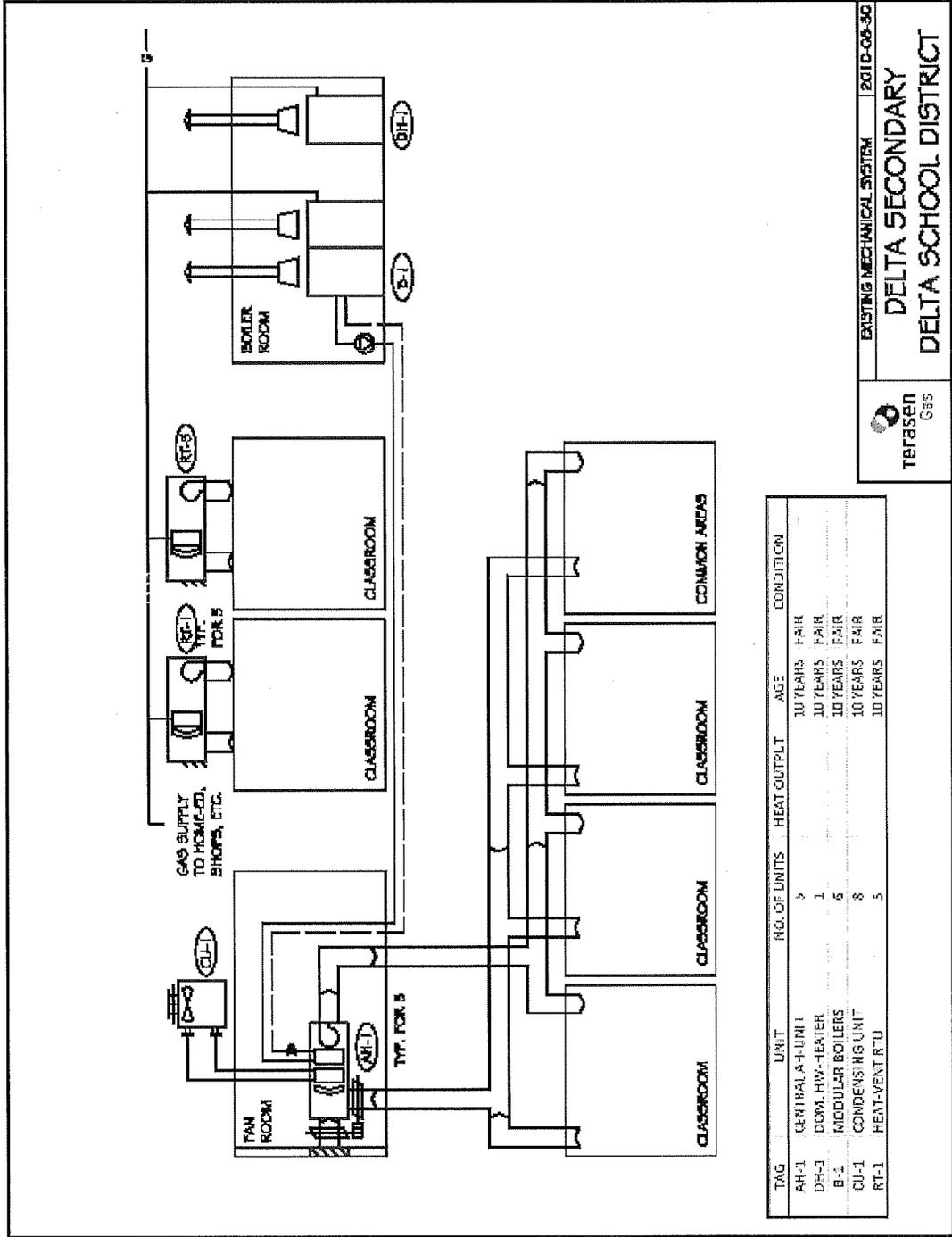

EXISTING MECHANICAL SYSTEM | 2010-08-30
CHALMERS ELEMENTARY
DELTA SCHOOL DISTRICT

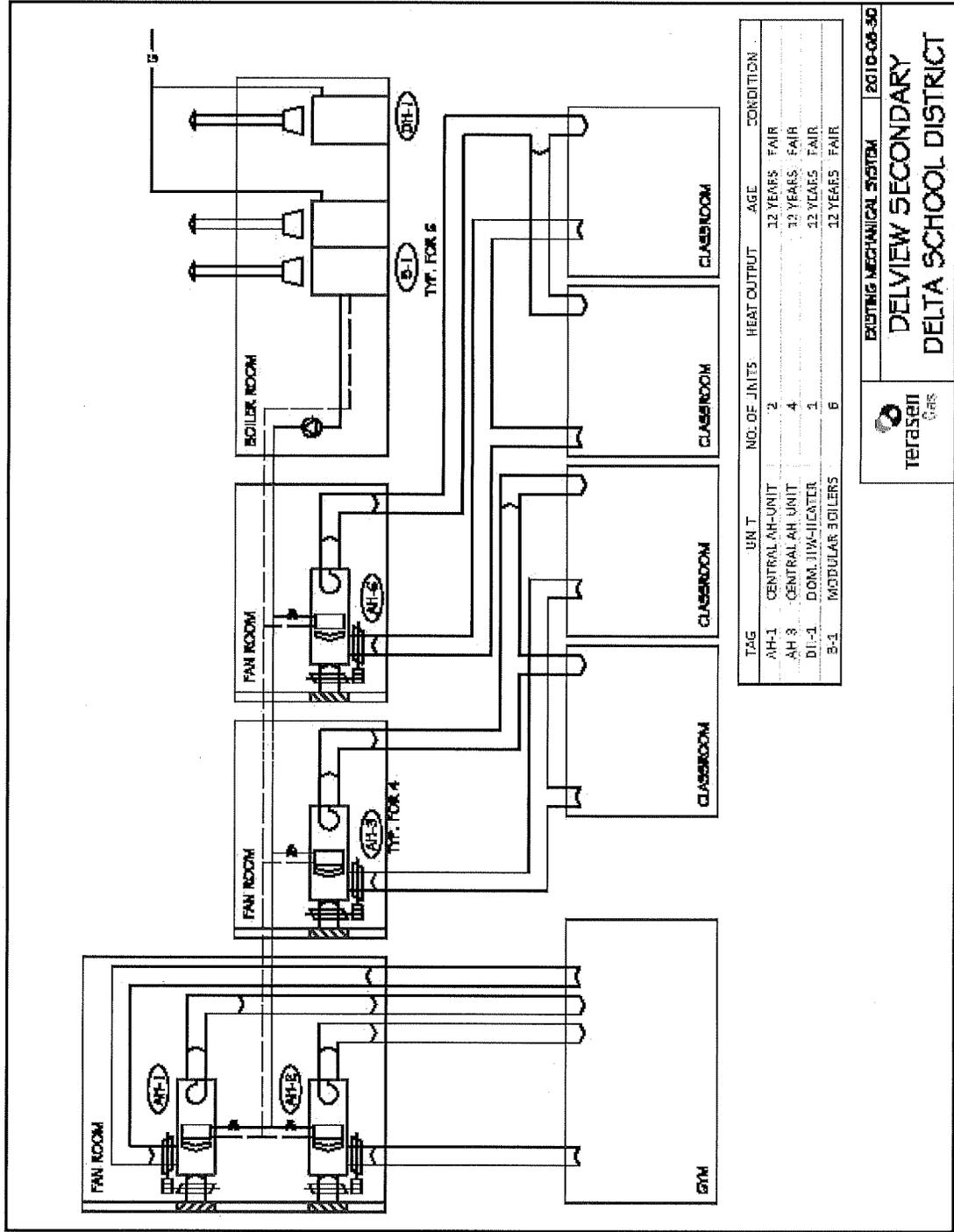



065

EXISTING MECHANICAL SYSTEM 2010-08-30
CLIFF DRIVE ELEMENTARY
DELTA SCHOOL DISTRICT

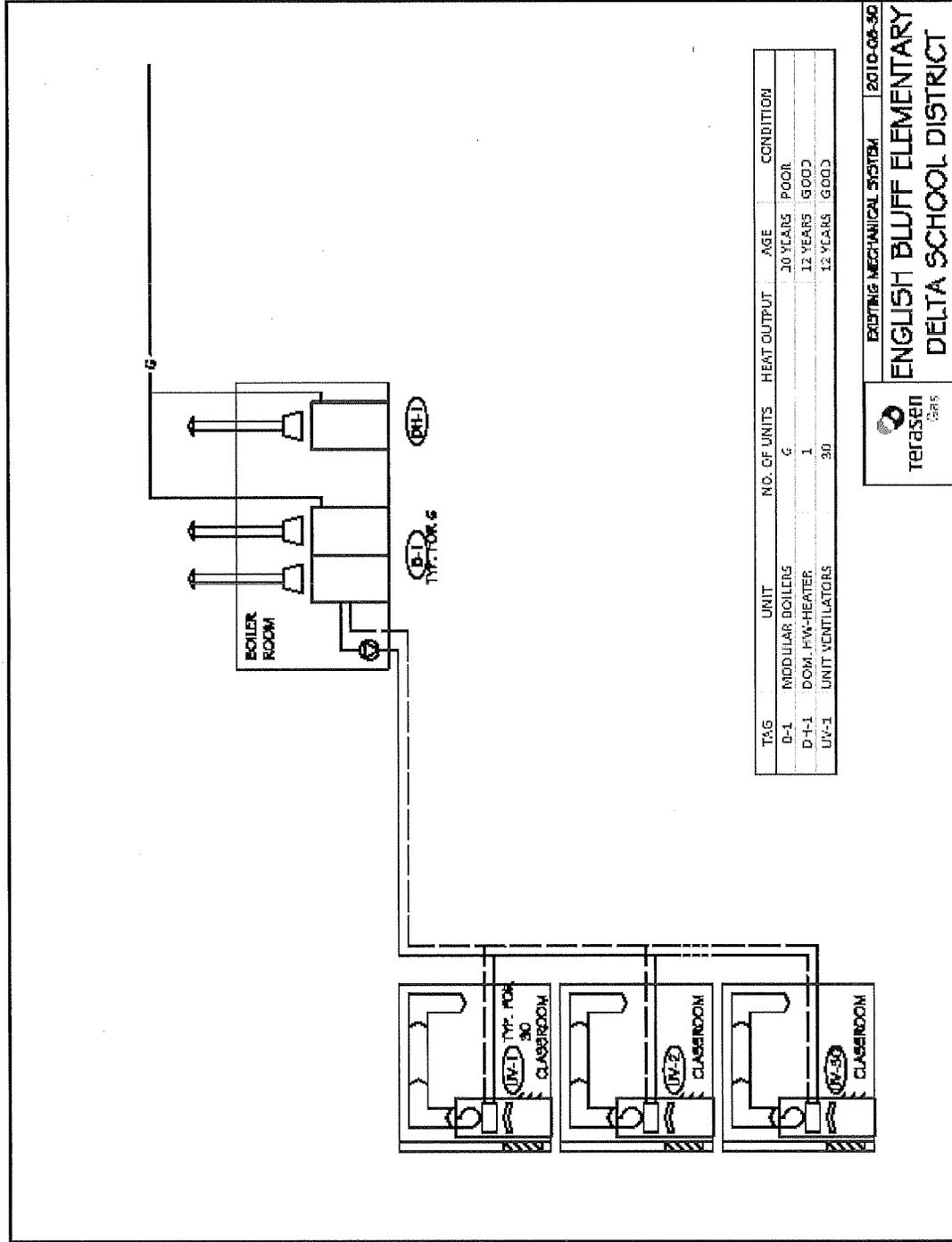


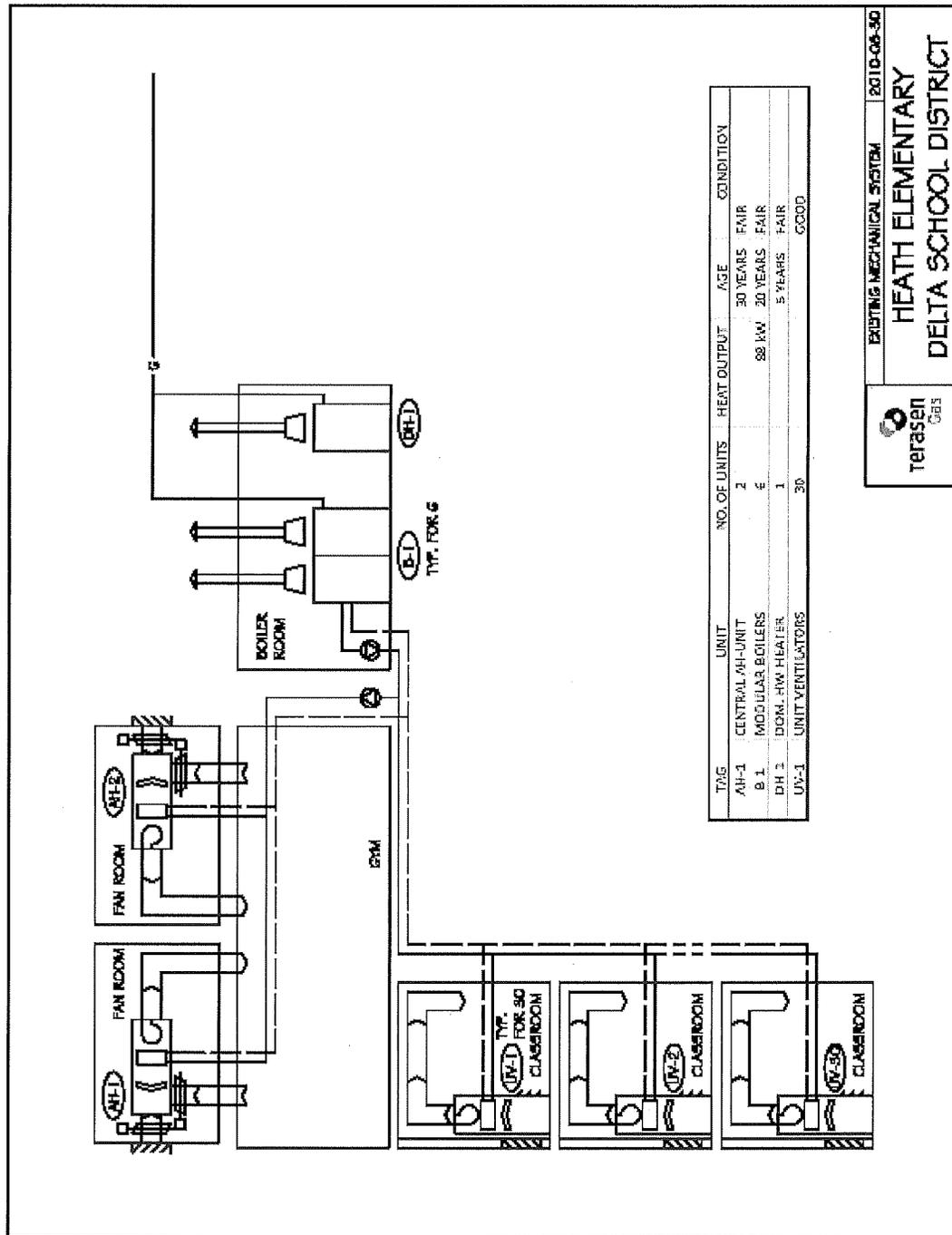


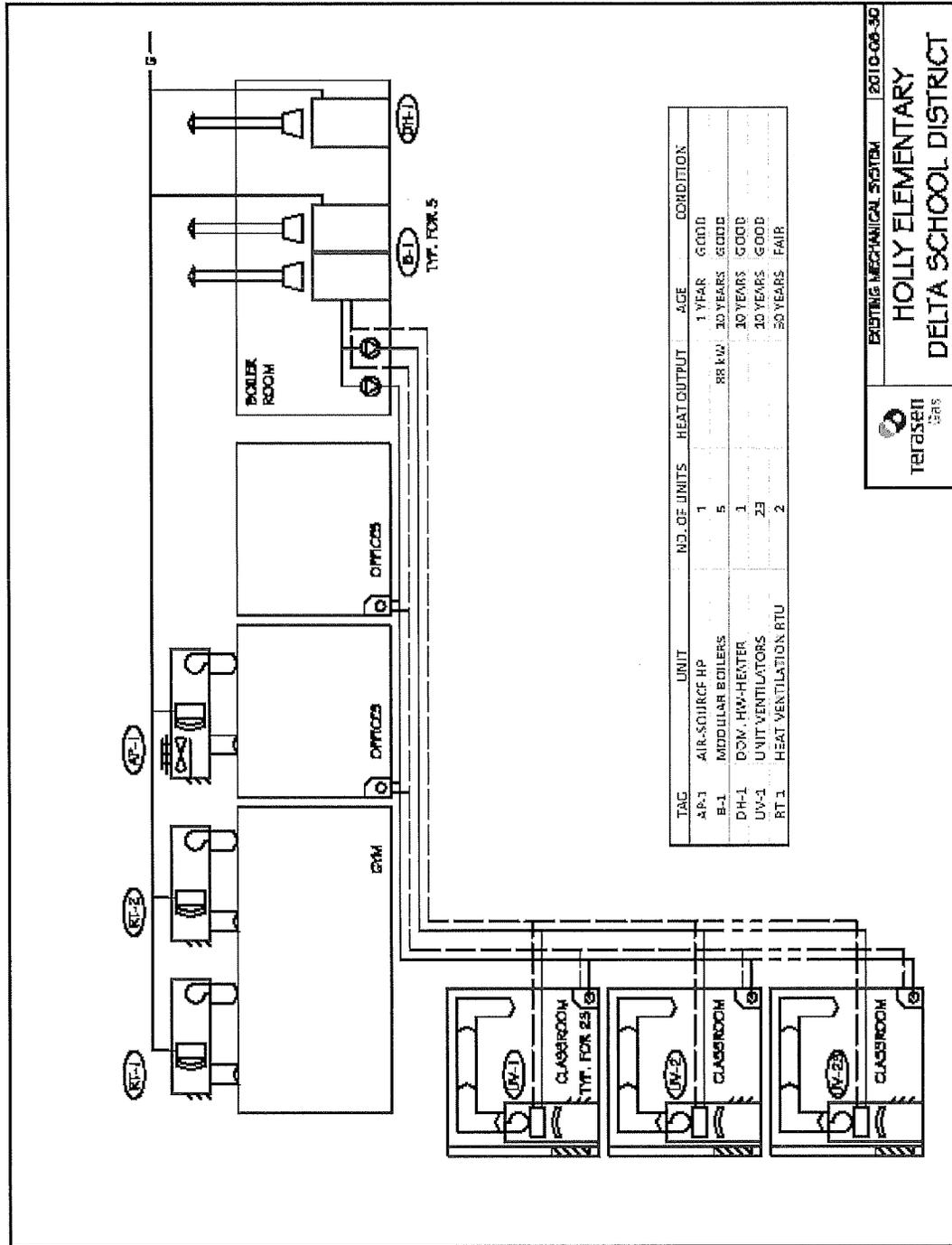


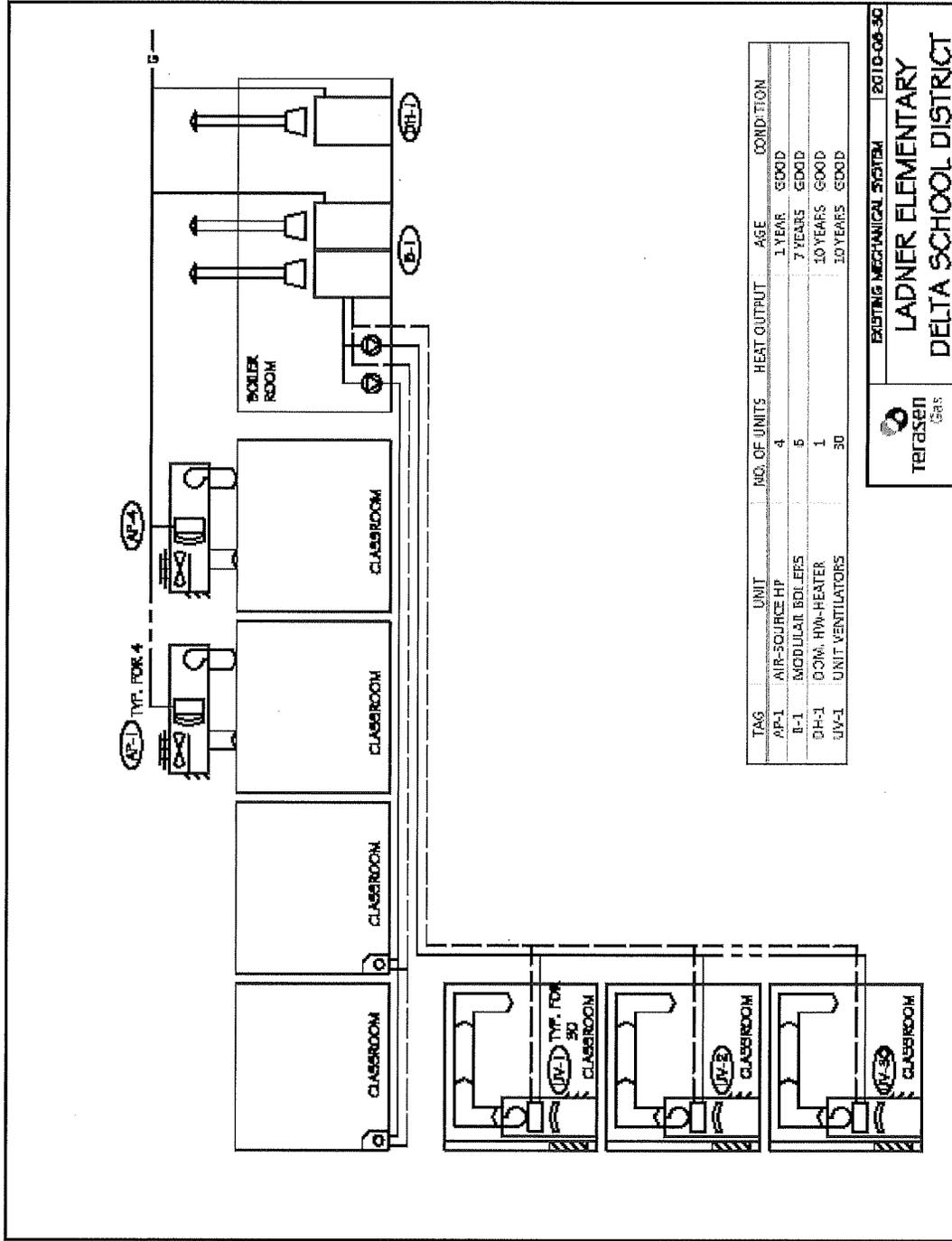

TERASEN
 Gas

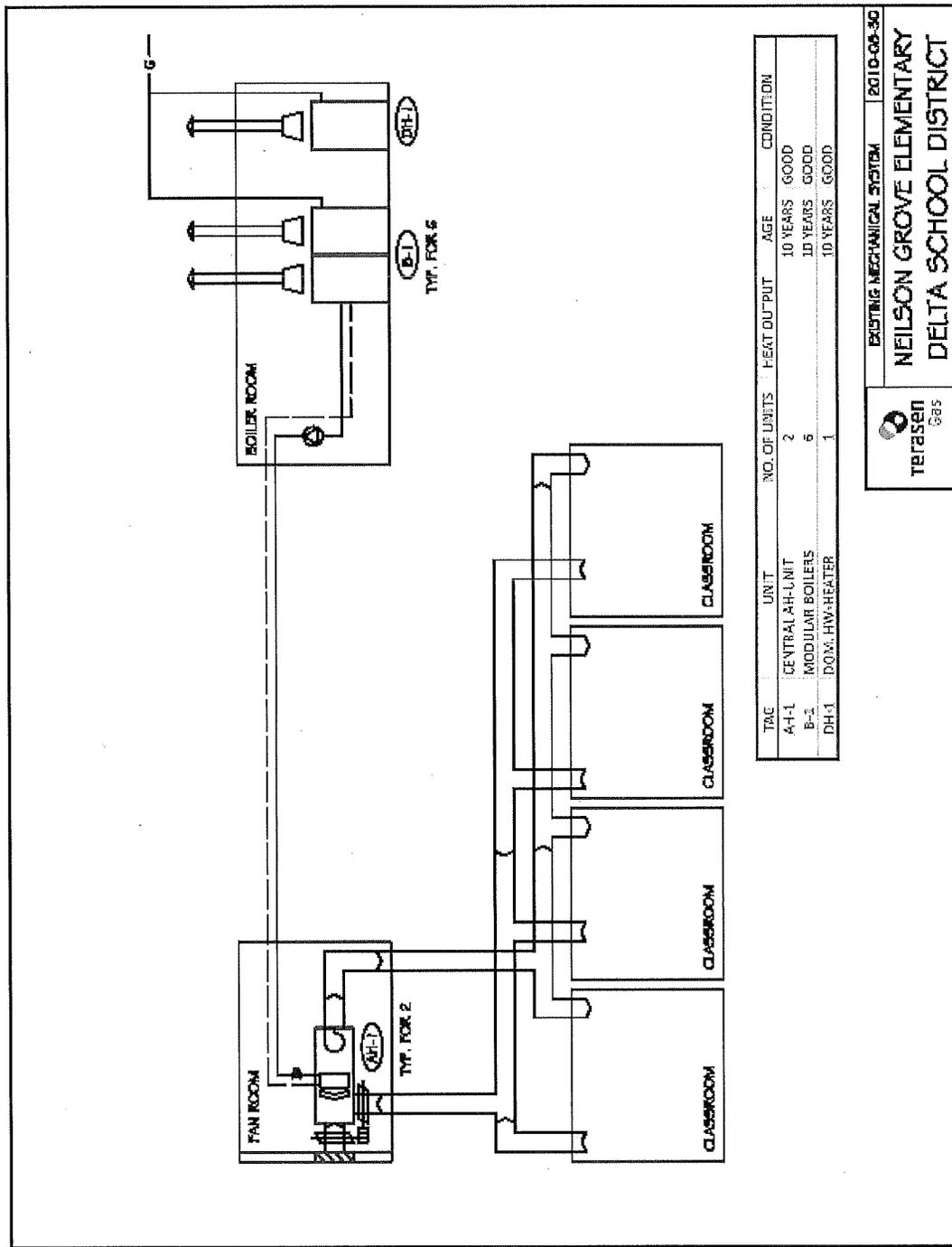
EXISTING MECHANICAL SYSTEM 2010-08-30
DELVIEW SECONDARY
DELTA SCHOOL DISTRICT

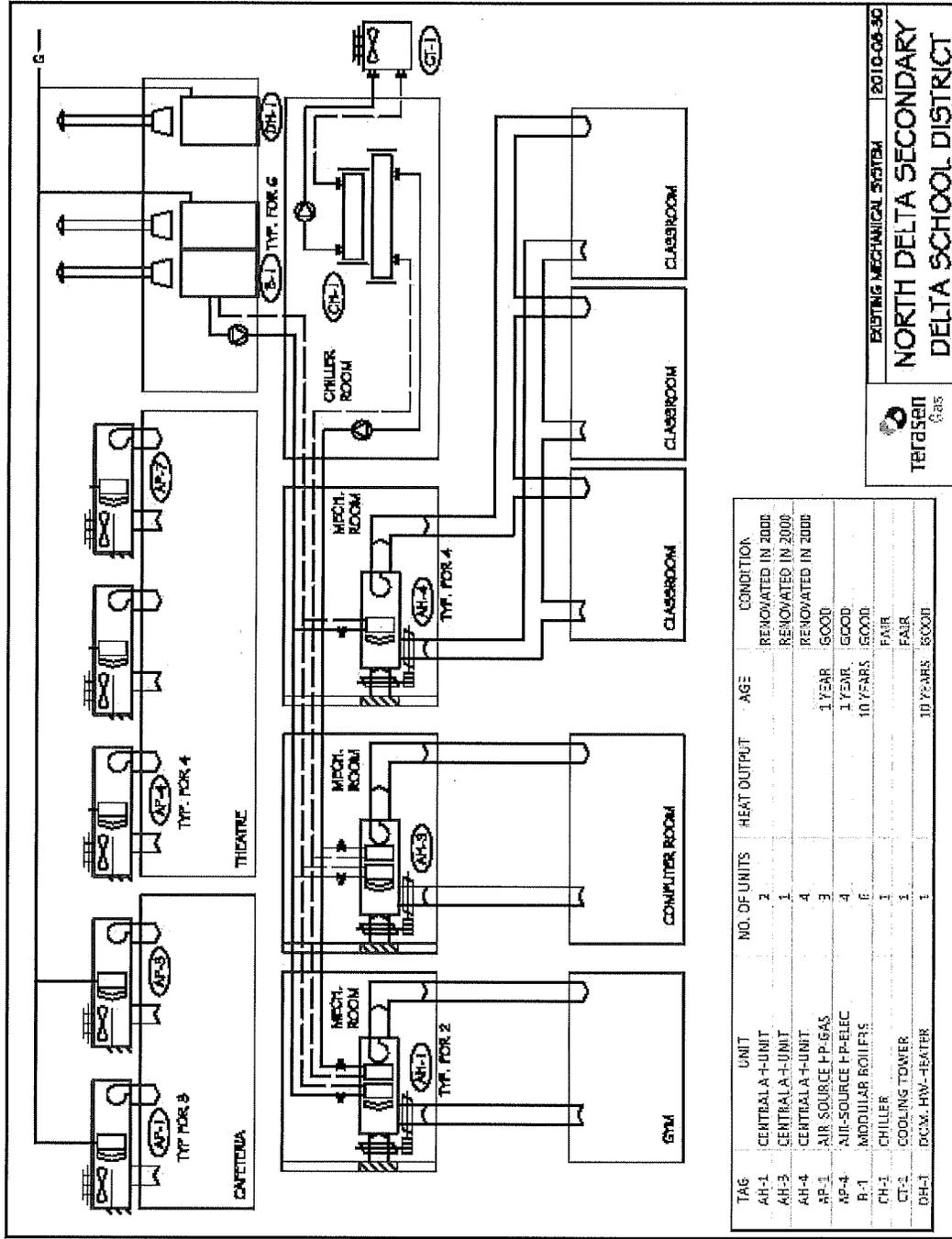




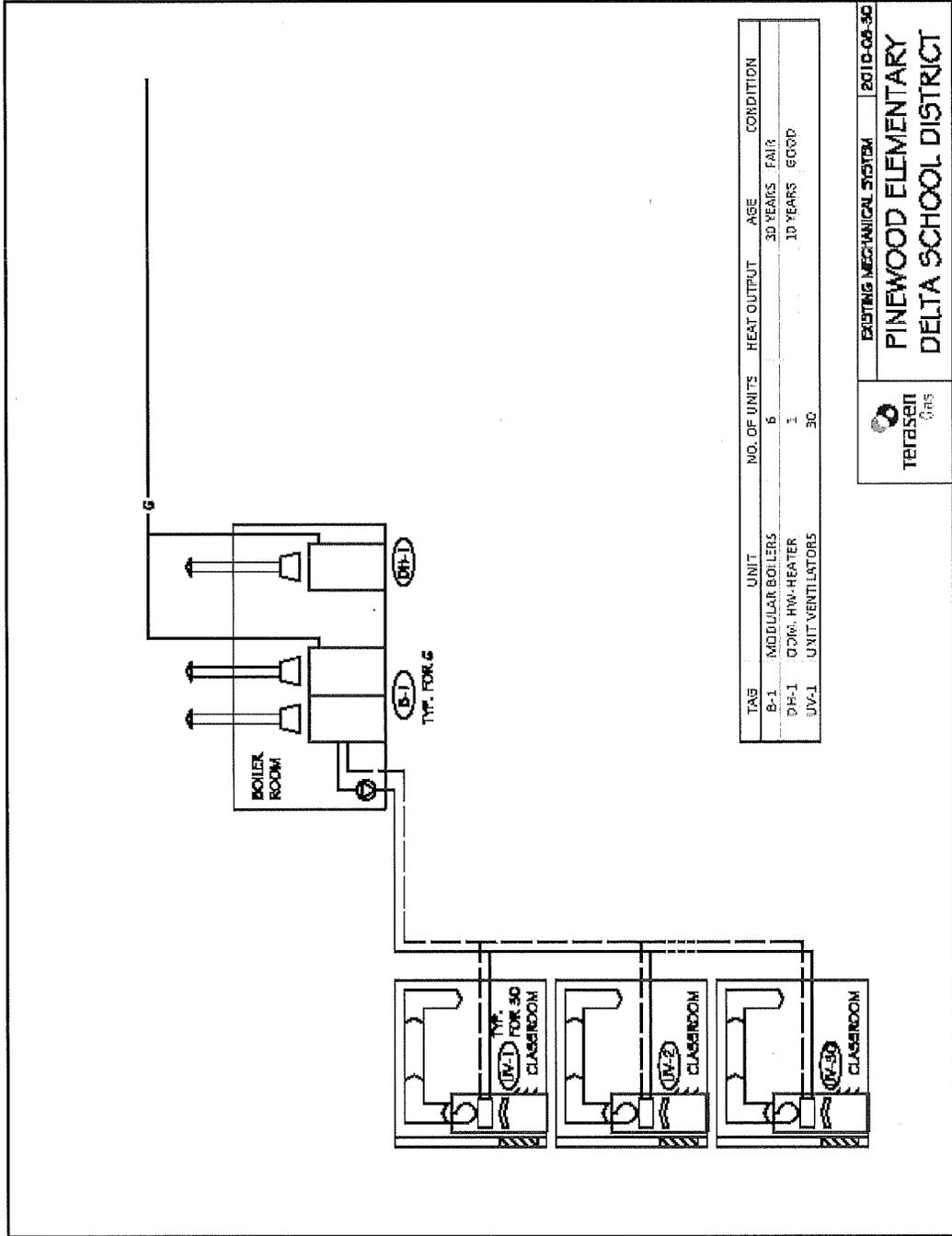


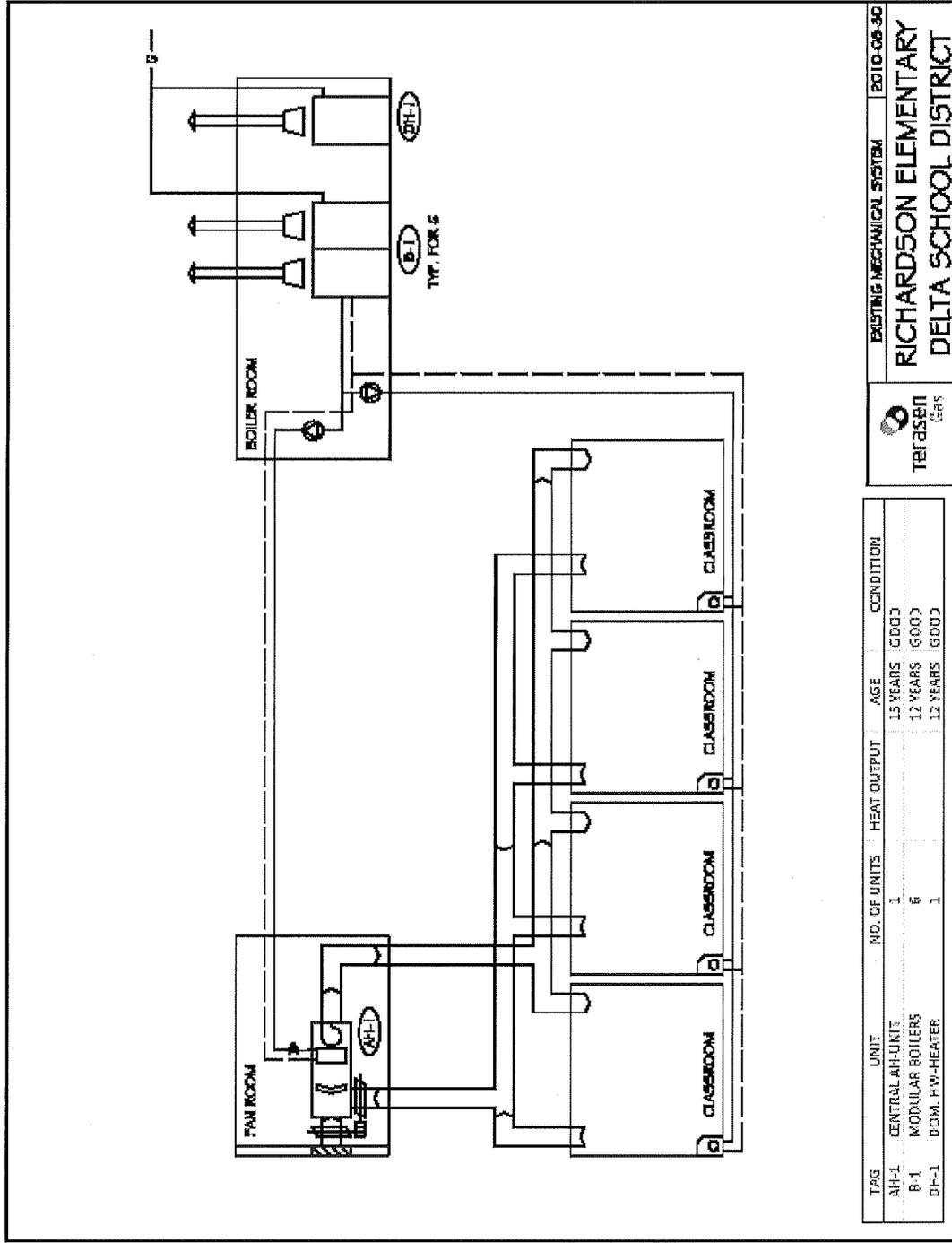


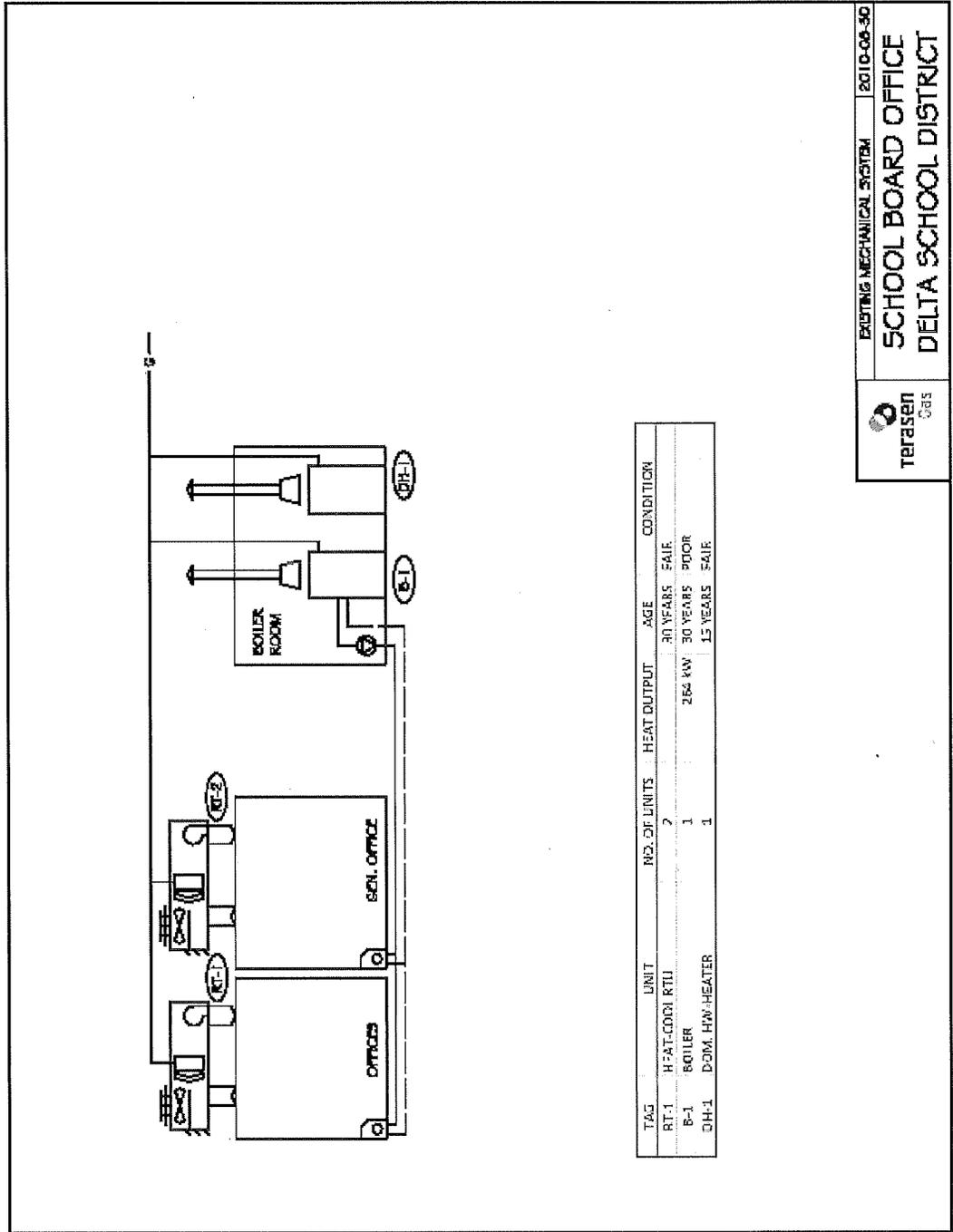





EXISTING MECHANICAL SYSTEM 2010-05-30
NORTH DELTA SECONDARY
DELTA SCHOOL DISTRICT

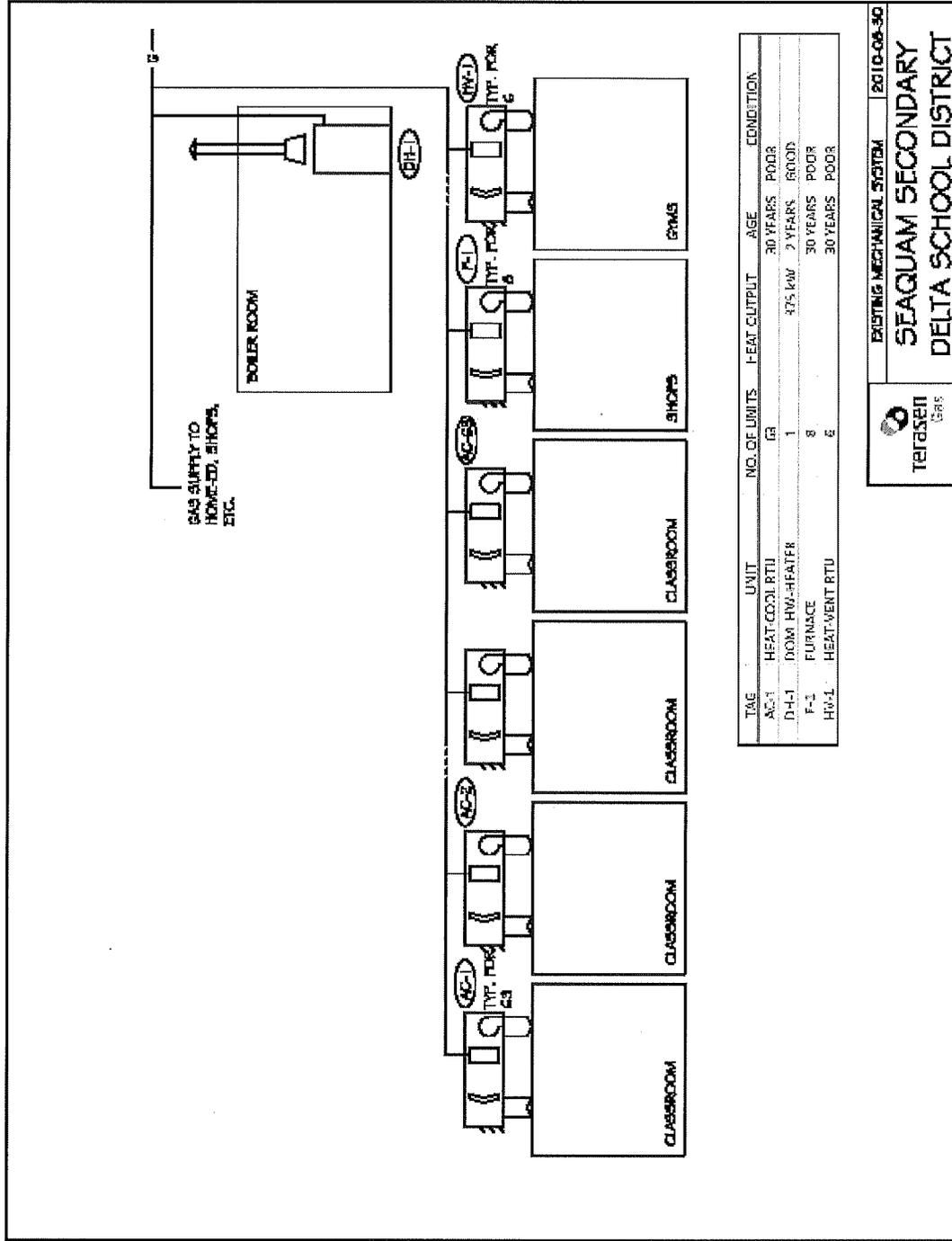








 EXISTING MECHANICAL SYSTEM | 2010-05-30
SCHOOL BOARD OFFICE
DELTA SCHOOL DISTRICT



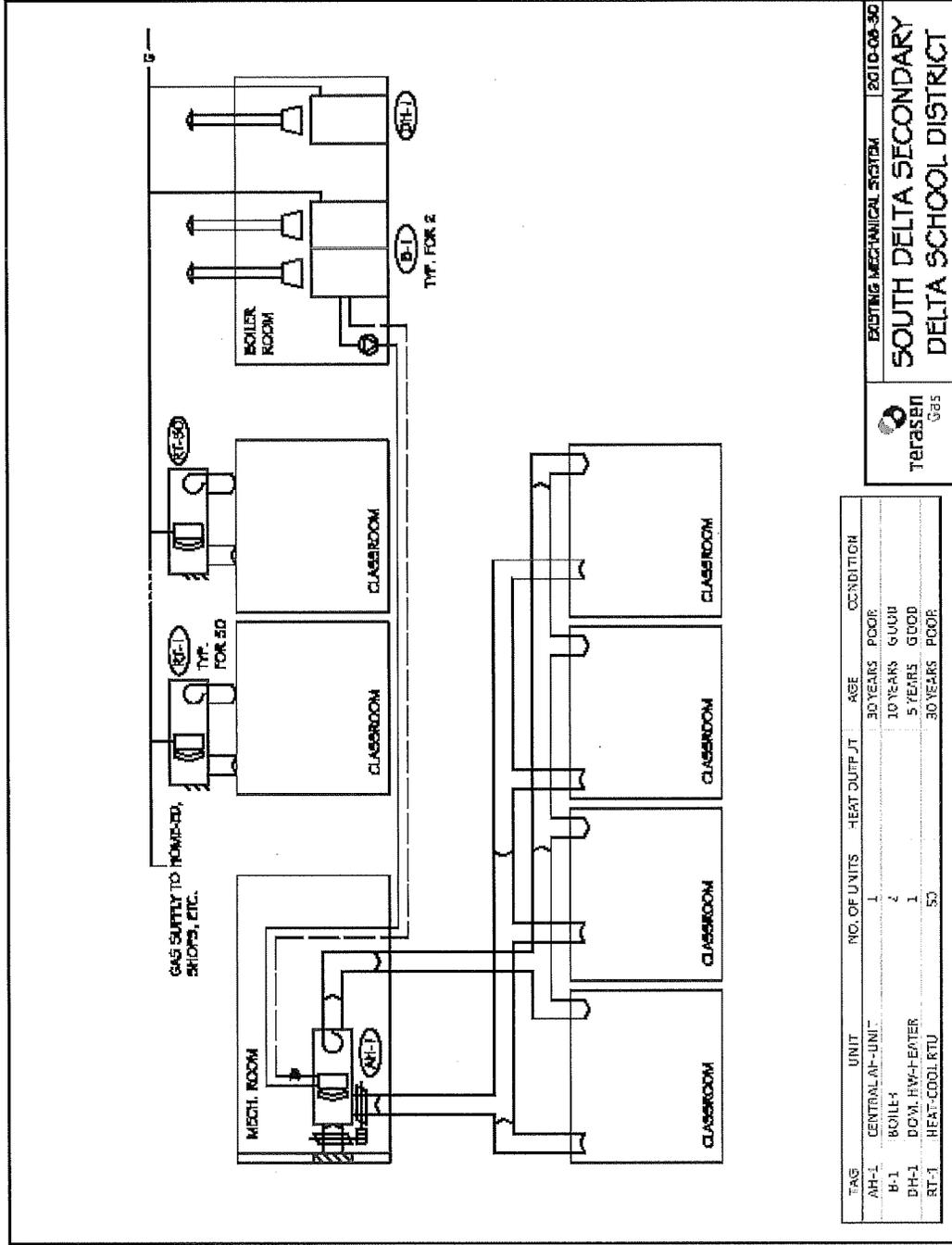
TAG	UNIT	NO. OF LIMITS	F-EAT OUTPUT	AGE	CONDITION
AC-1	HEAT-COOL RTU	GR		30 YEARS	POOR
D-4-1	DOMM HW-HEATER	1	375 KW	7 YEARS	GOOD
F-1	FURNACE	8		30 YEARS	POOR
HW-1	HEAT-VENT RTU	6		30 YEARS	POOR

EXISTING MECHANICAL SYSTEM

2010-08-30

SEQUAM SECONDARY

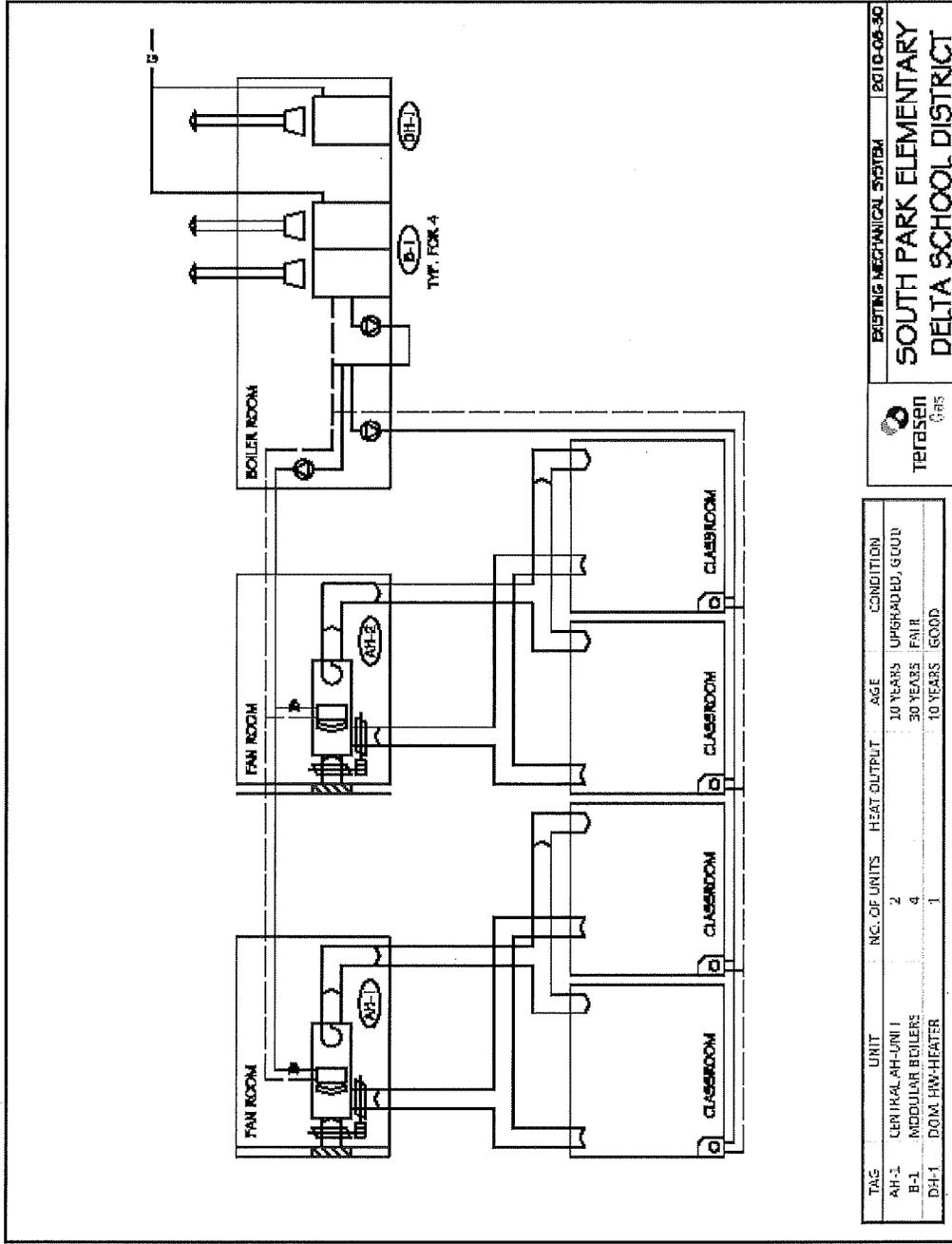
DELTA SCHOOL DISTRICT



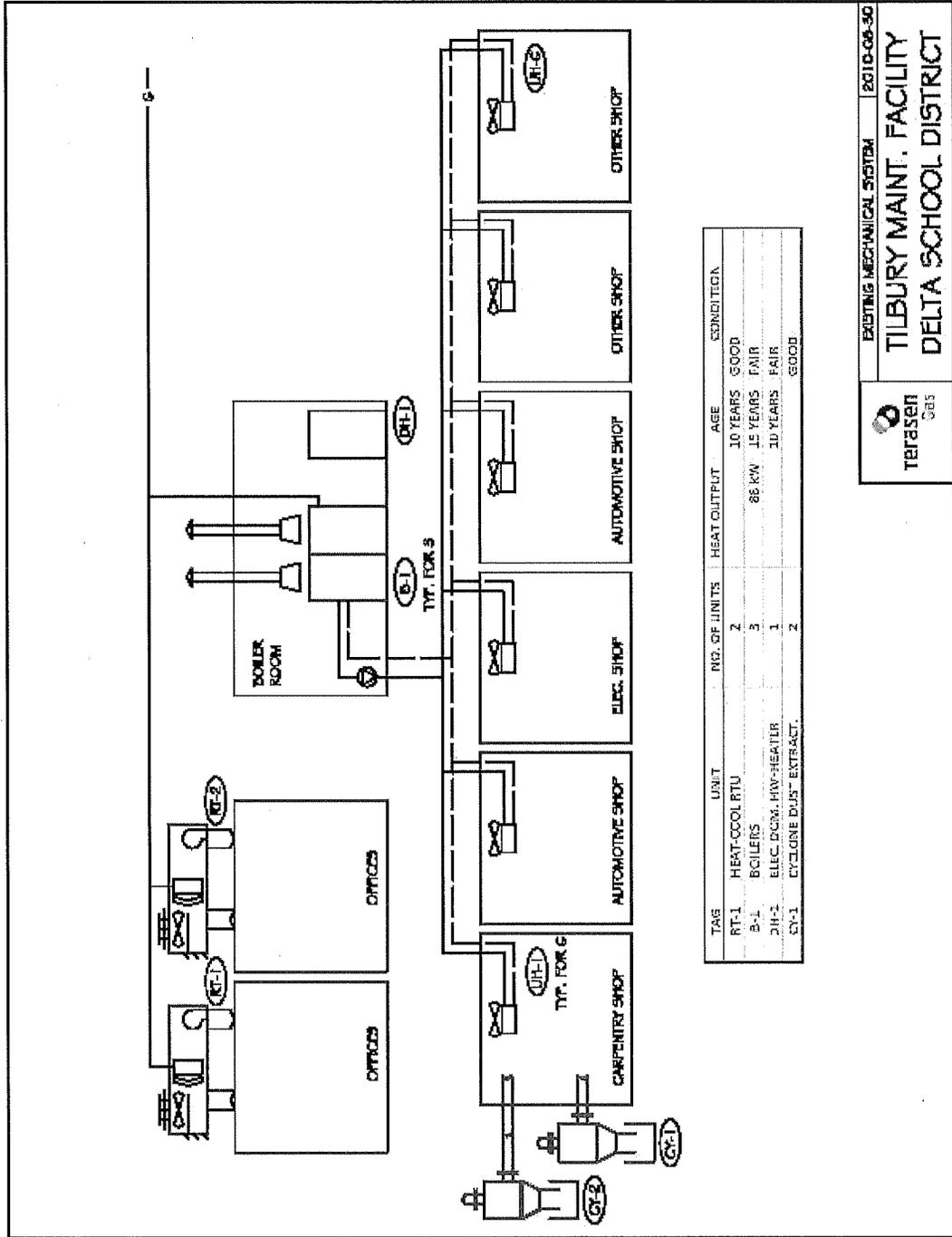
TAG	UNIT	NO. OF UNITS	HEAT OUTPUT	AGE	CONDITION
AH-1	CENTRAL AIR UNIT	1		30 YEARS	POOR
B-1	BOILER	2		10 YEARS	GOOD
DH-1	DOWNFLOW HEATER	1		5 YEARS	GOOD
RT-1	HEAT-COOL RTU	50		30 YEARS	POOR



EXISTING MECHANICAL SYSTEM 2010-08-30
SOUTH DELTA SECONDARY
DELTA SCHOOL DISTRICT



 **TETRASEN**
 CONSULTANTS
 EXISTING MECHANICAL SYSTEM | 2010-08-30
SOUTH PARK ELEMENTARY
DELTA SCHOOL DISTRICT

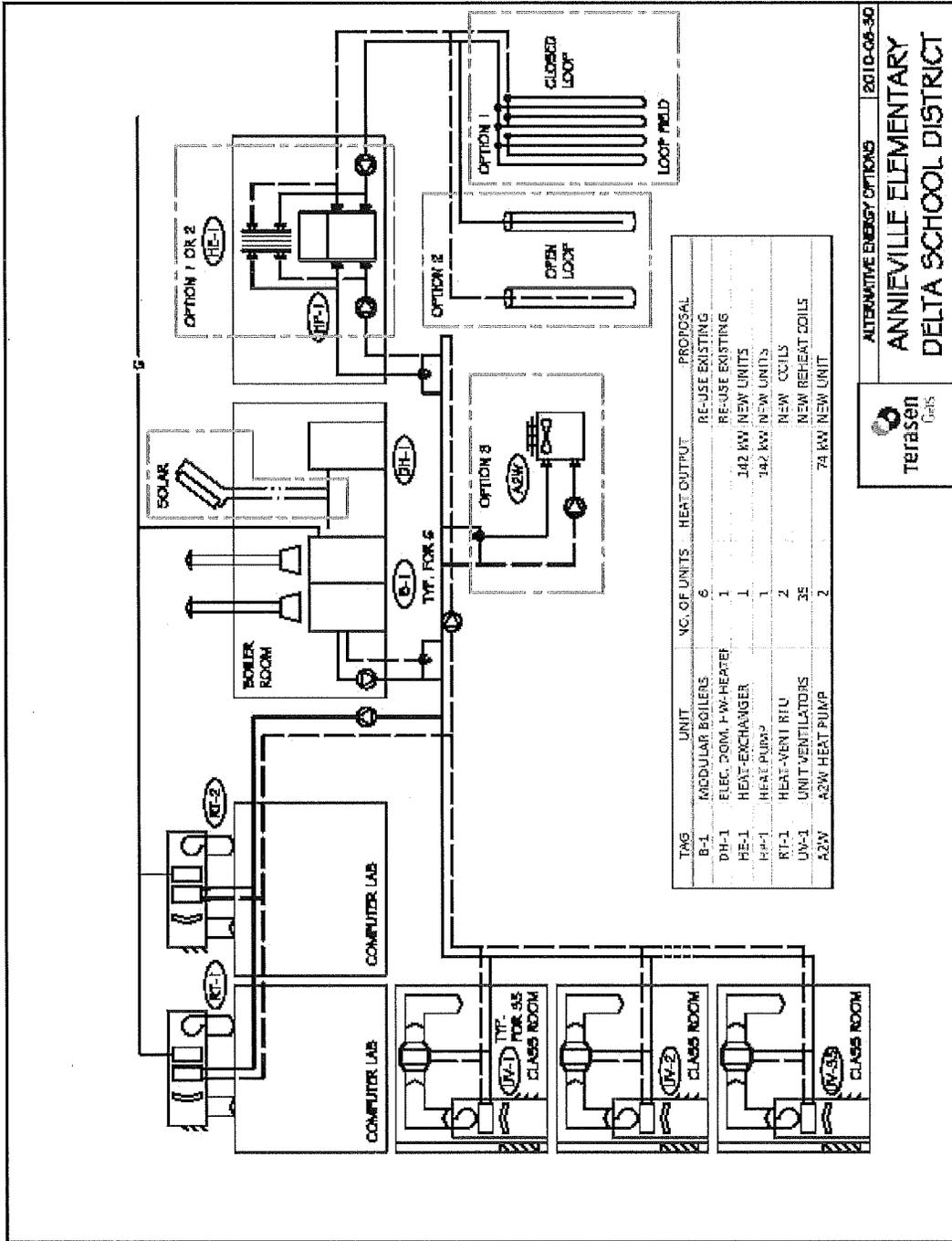


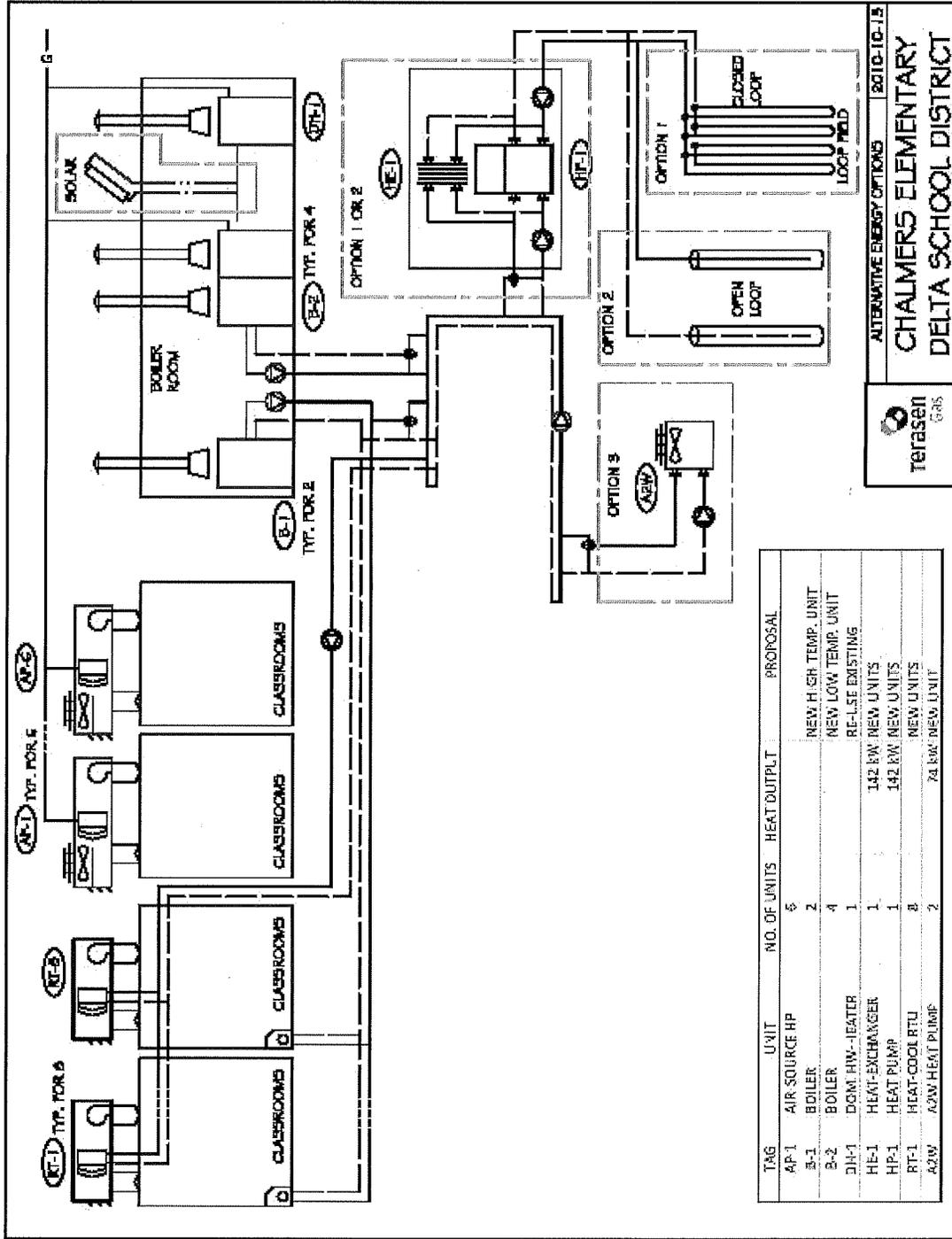


TILBURY MAINT. FACILITY
DELTA SCHOOL DISTRICT

EXISTING MECHANICAL SYSTEM 2010-06-30

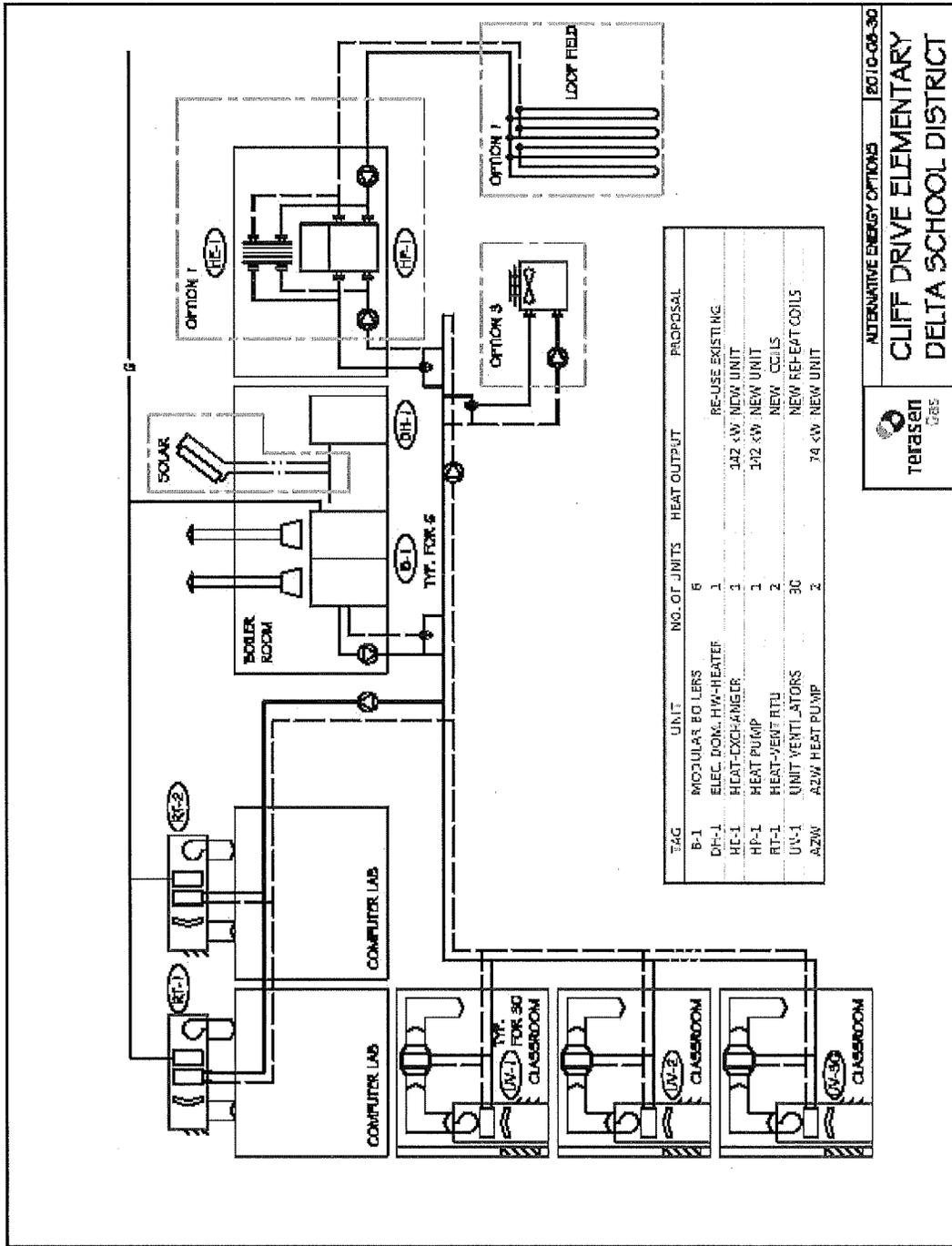
APPENDIX B – Alternative Mechanical Systems





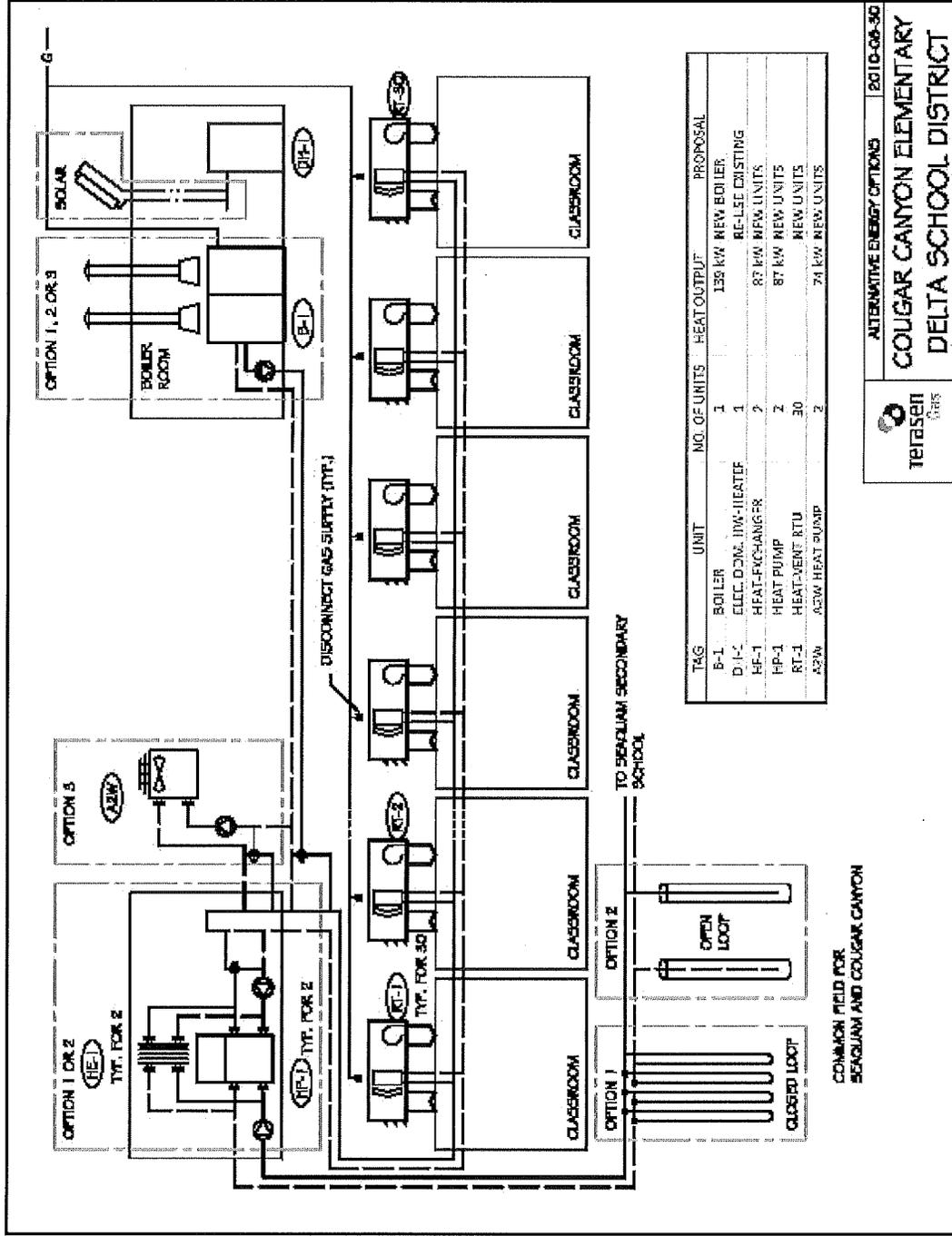
TAG	UNIT	NO. OF UNITS	HEAT OUTPUT	PROPOSAL
AP-1	AIR SOURCE HP	6		NEW HIGH TEMP. UNIT
B-1	BOILER	2		NEW LOW TEMP. UNIT
B-2	BOILER	4		RE-USE EXISTING
DH-1	DGM: HW- HEATER	1		
HE-1	HEAT-EXCHANGER	1	142 KW	NEW UNITS
HP-1	HEAT PUMP	1	142 KW	NEW UNITS
RT-1	HEAT-COOL RTU	8		NEW UNITS
A2W	A2W HEAT PUMP	2	74 KW	NEW UNIT

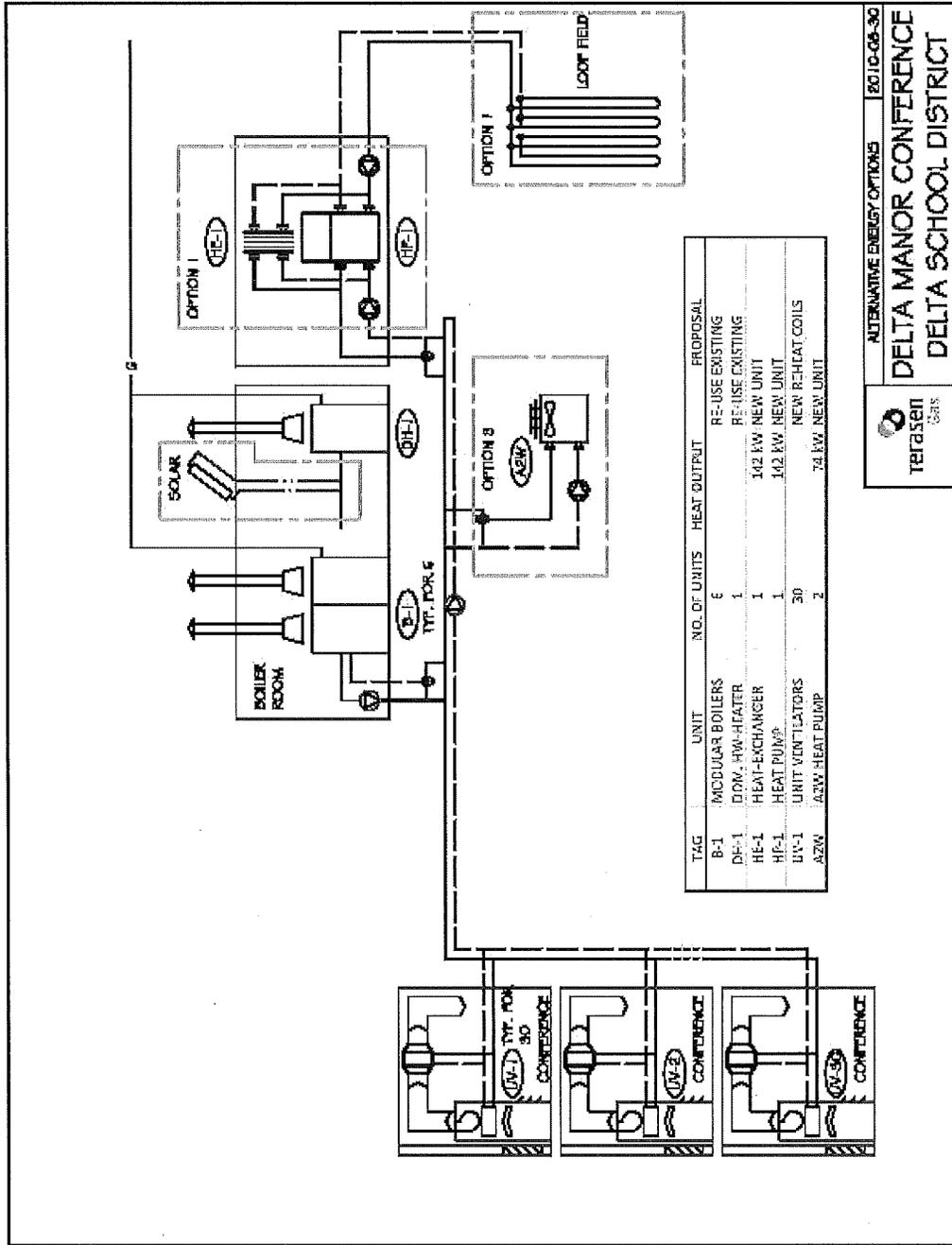

ALTERNATIVE ENERGY OPTIONS **BC10-10-13**
CHALMERS ELEMENTARY
DELTA SCHOOL DISTRICT

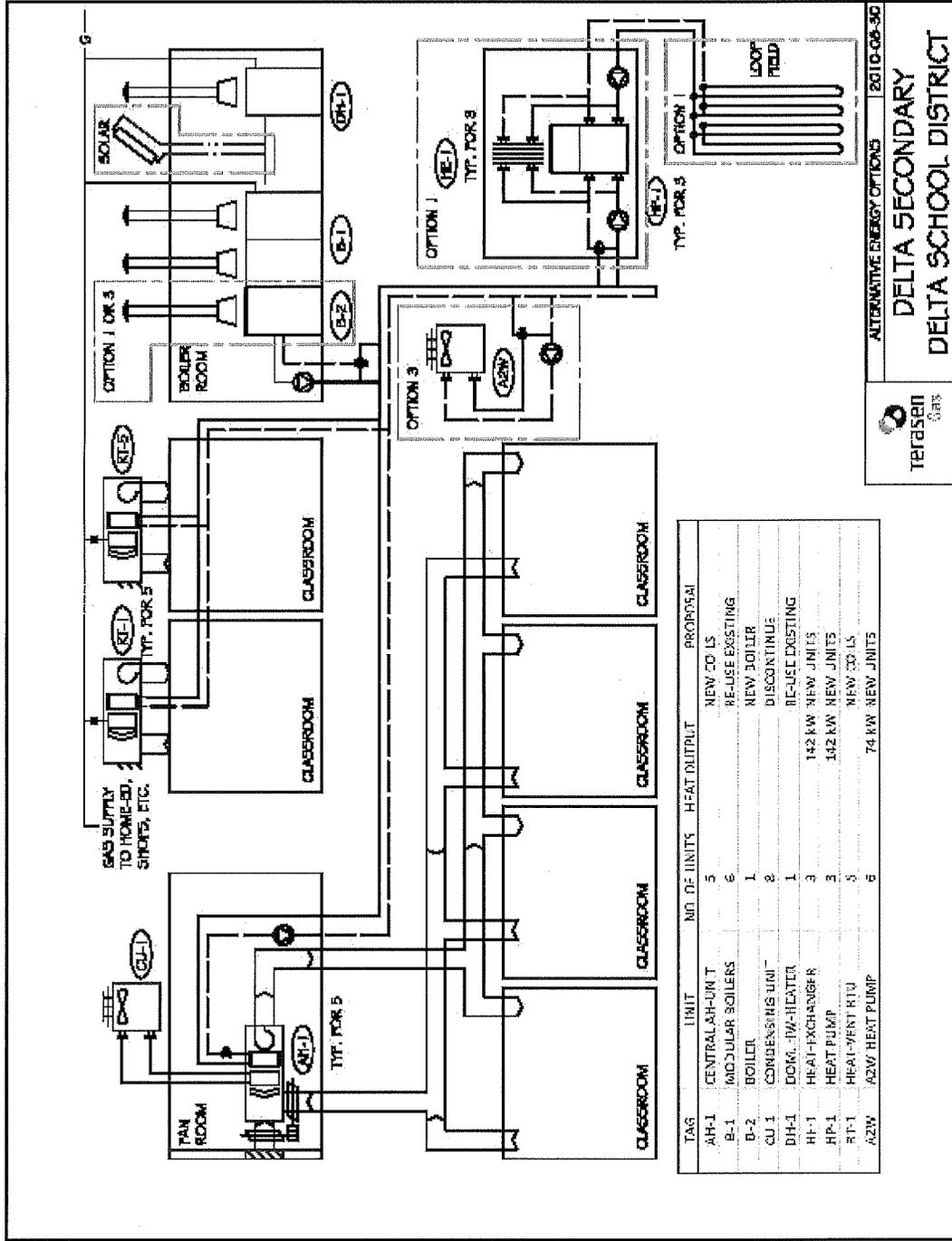



TERNASEN
 GRS

ALTERNATIVE ENERGY OPTIONS | 2010-08-30
CLIFF DRIVE ELEMENTARY
DELTA SCHOOL DISTRICT



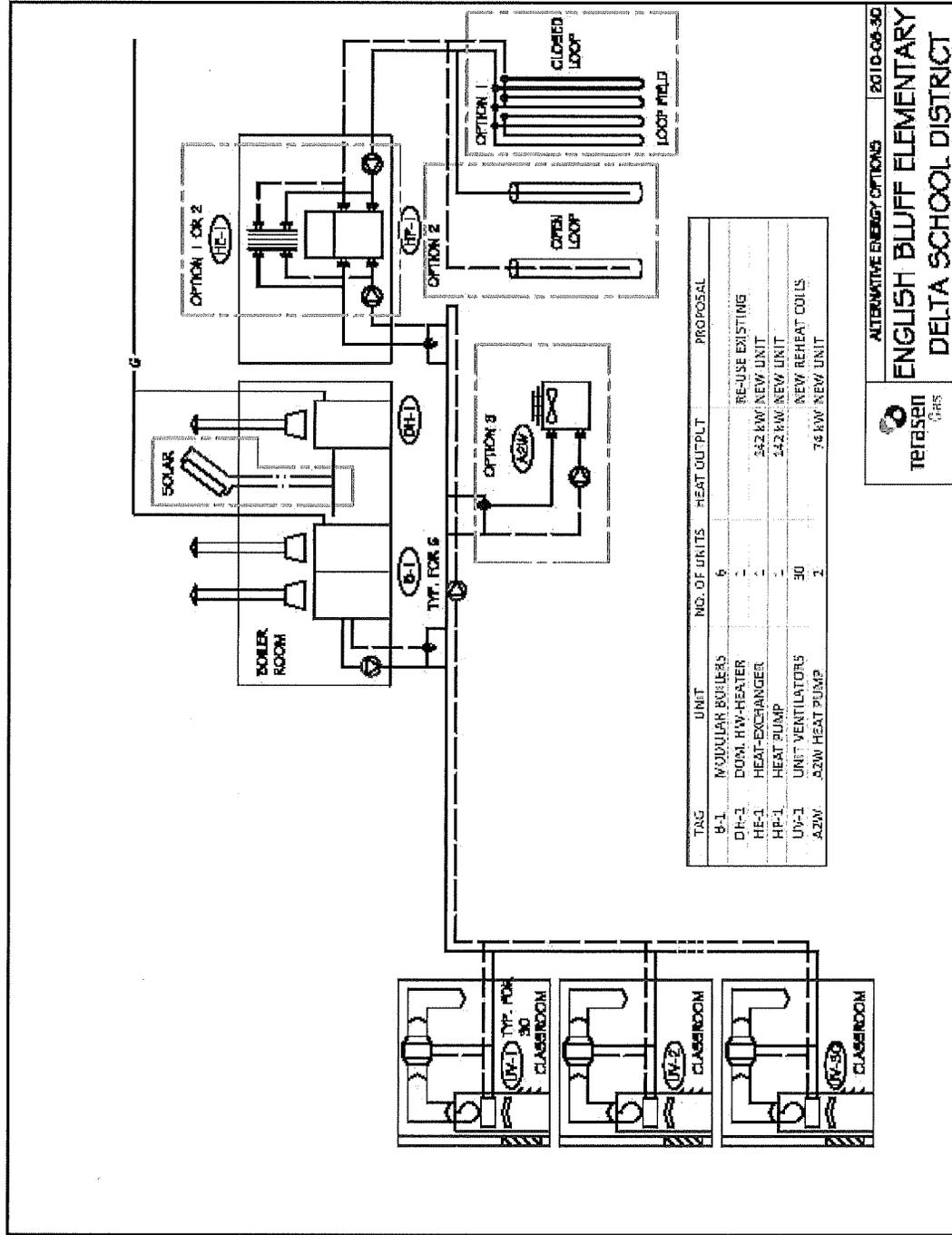


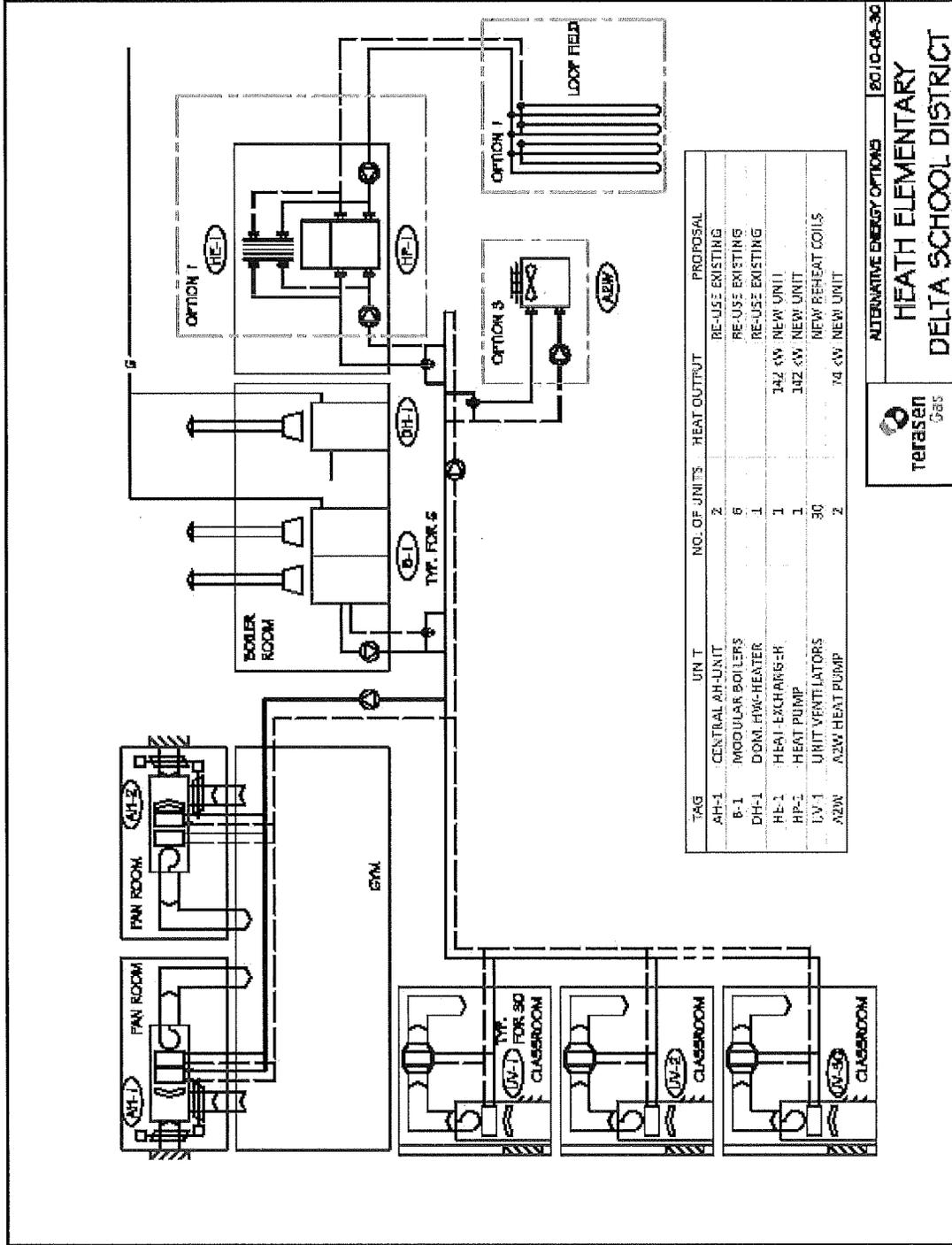


ALTERNATIVE ENERGY OPTIONS 2010-08-30

DELTA SECONDARY
DELTA SCHOOL DISTRICT

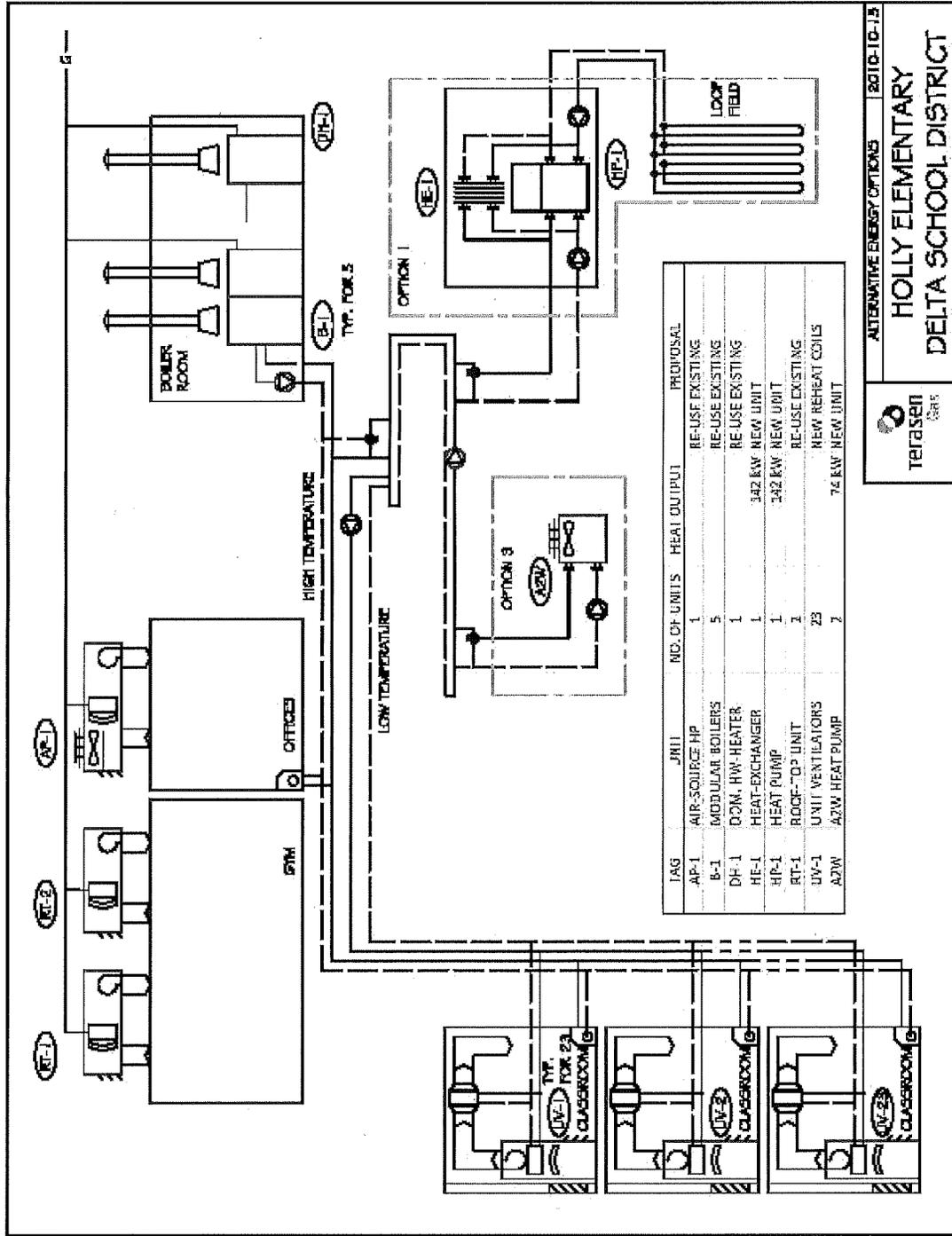
TERASER
CONSULTANTS



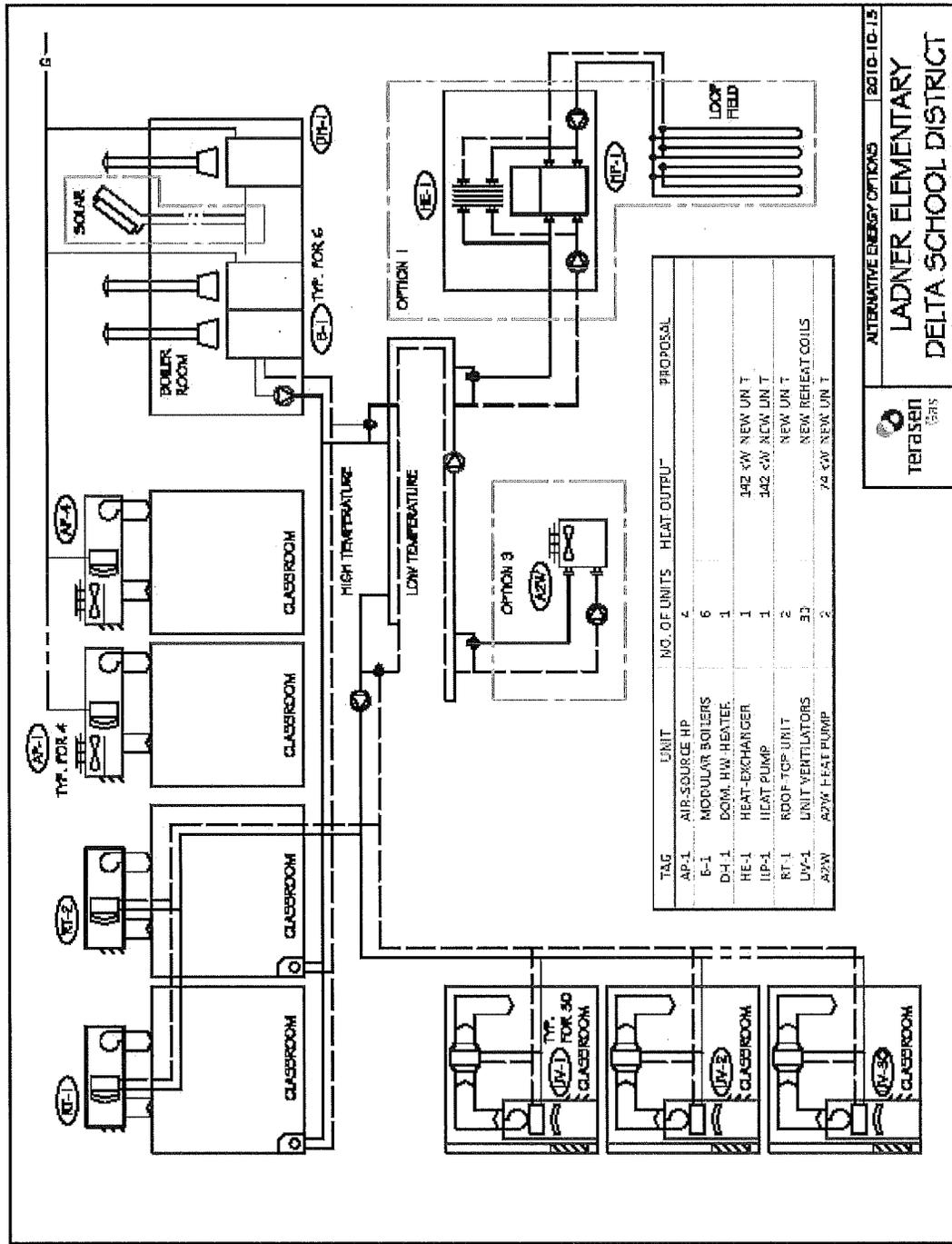


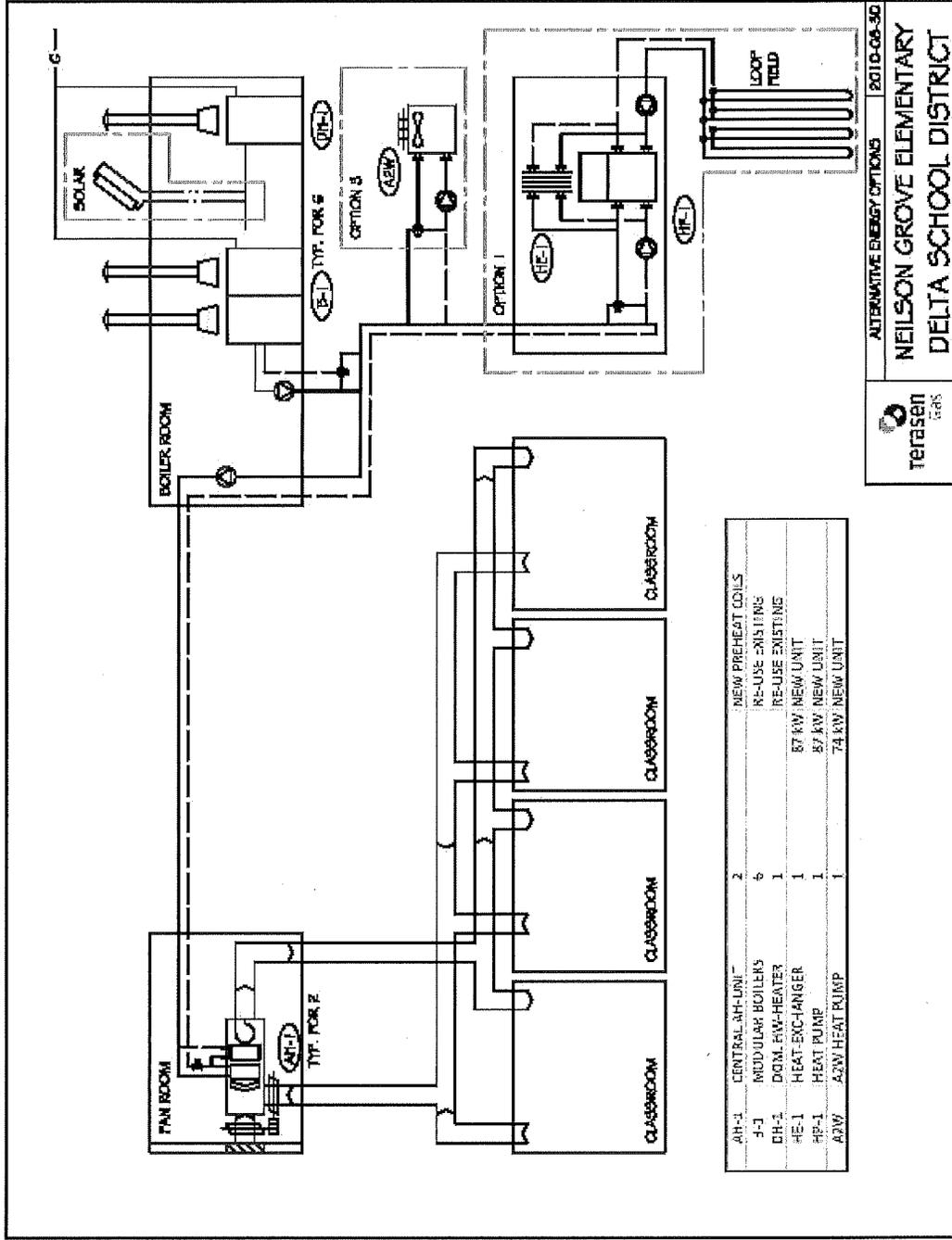

TERASEN GAS

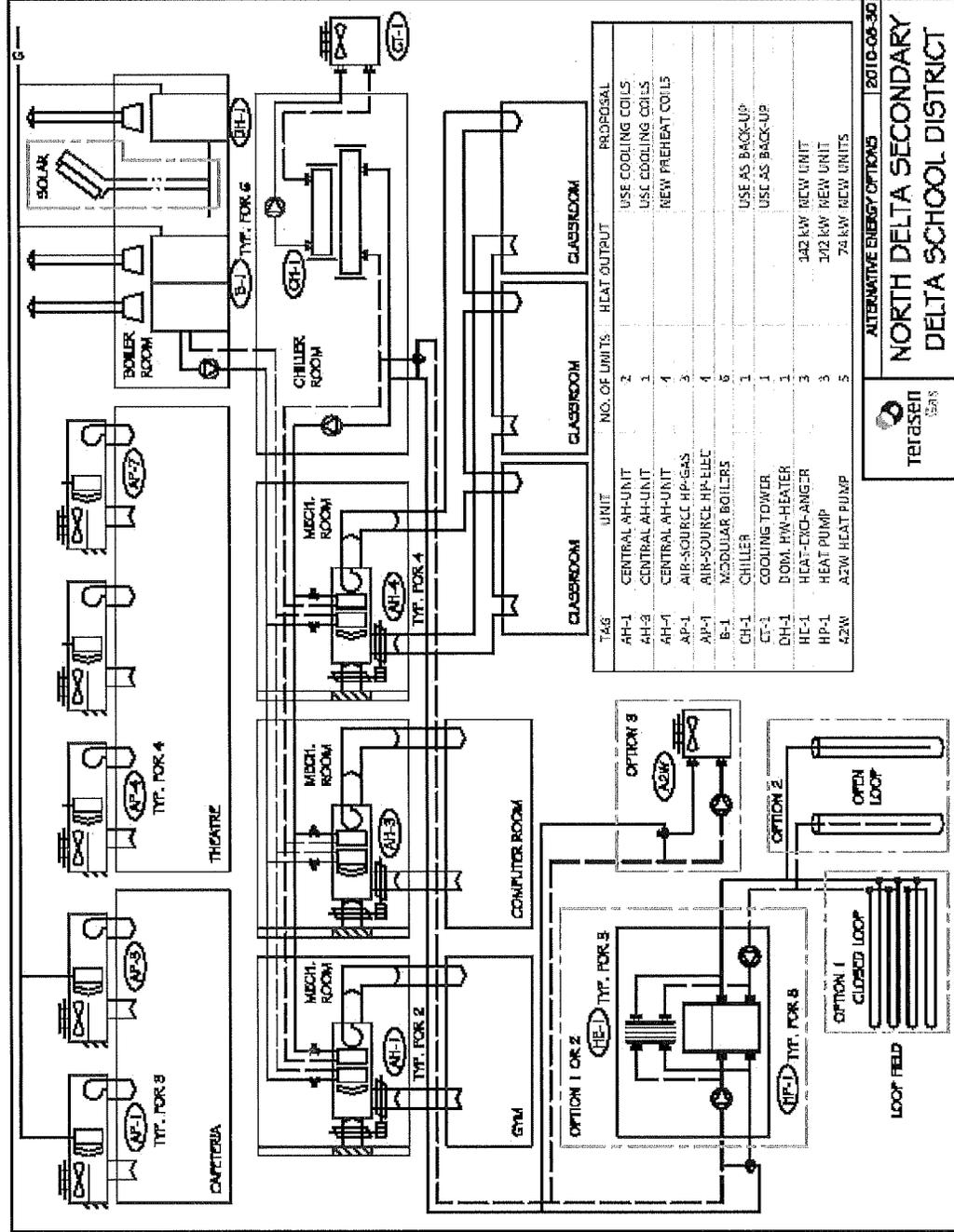
ALTERNATIVE ENERGY OPTIONS **8010-08-30**
HEATH ELEMENTARY
DELTA SCHOOL DISTRICT

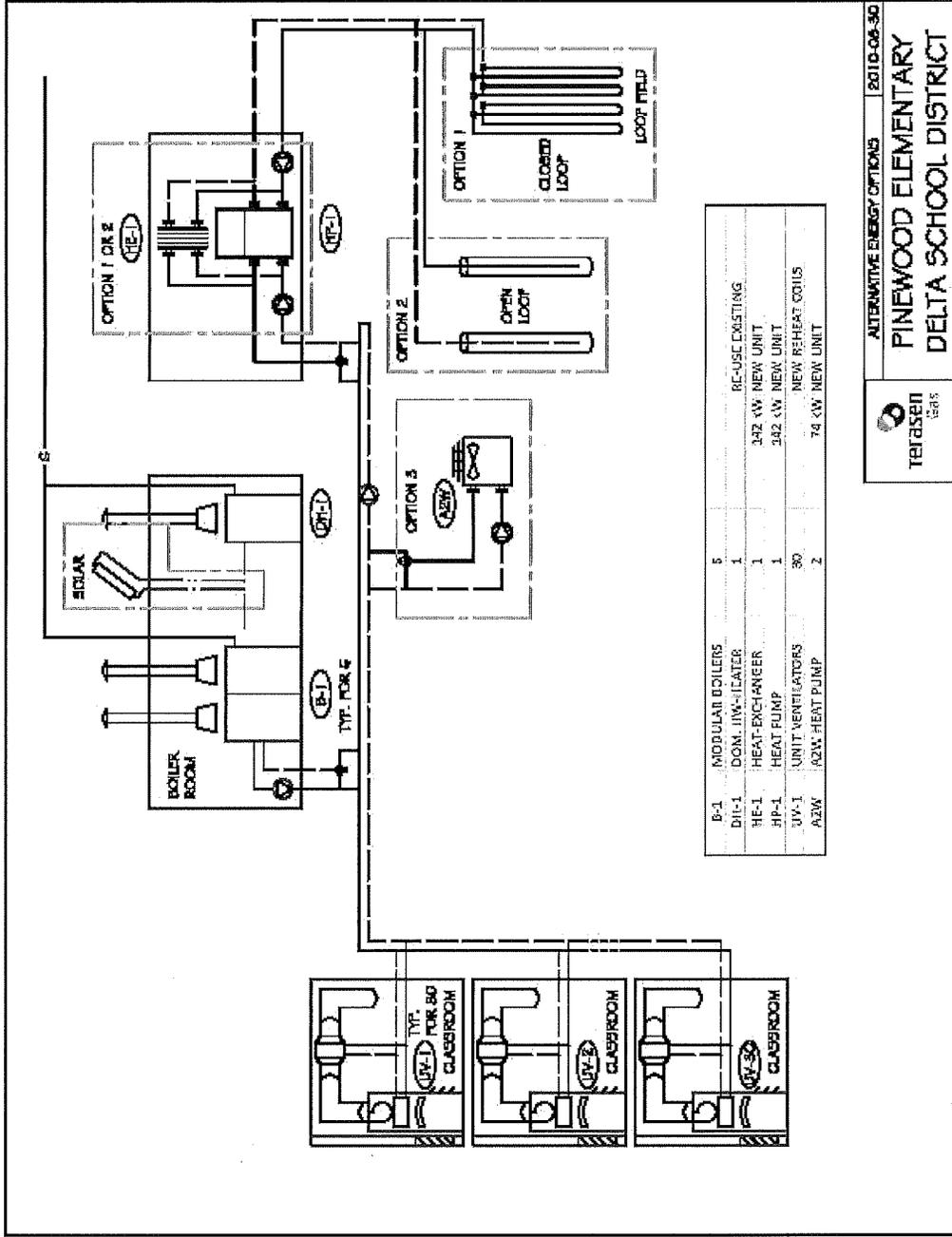


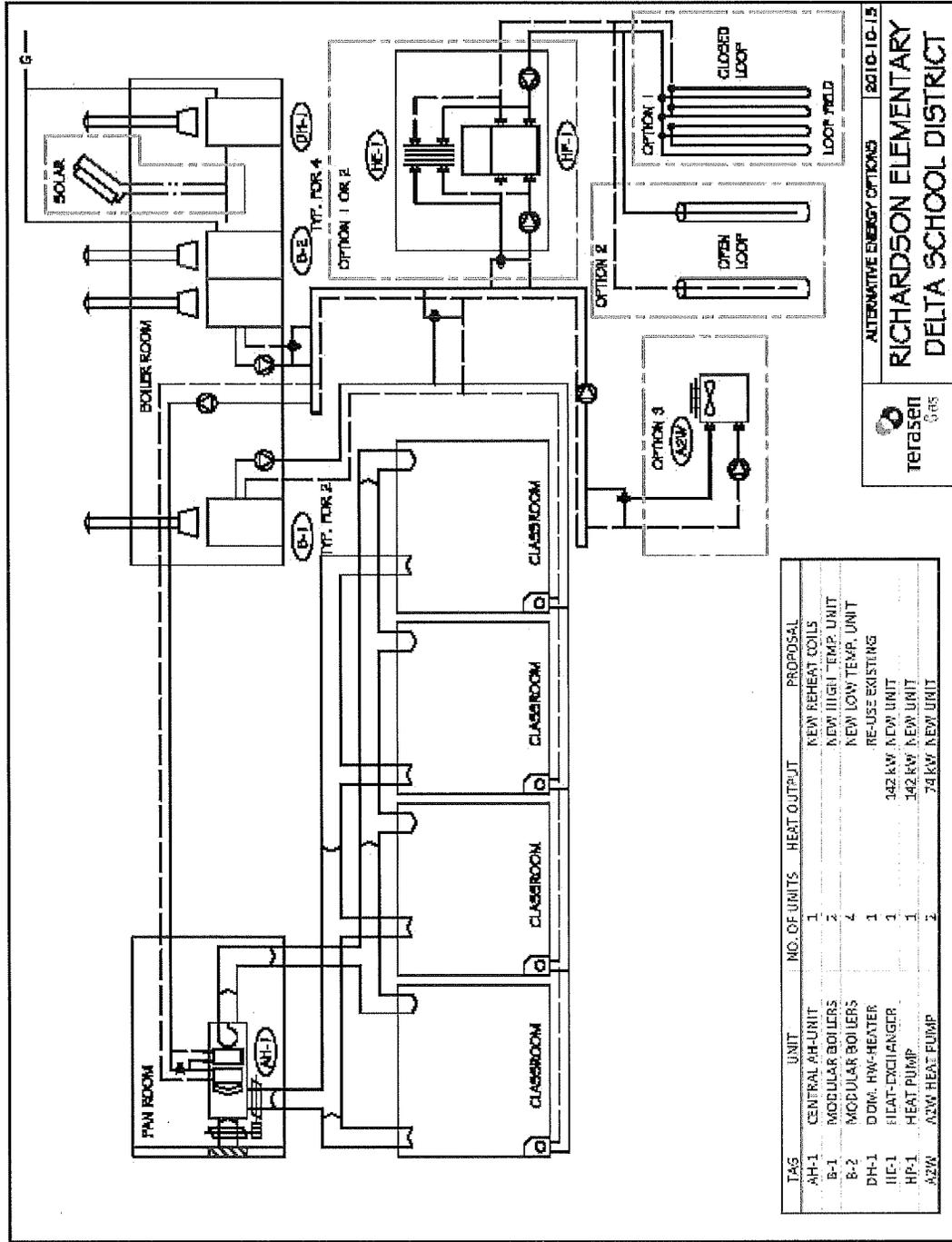

ALTERNATIVE ENERGY OPTIONS | 2010-10-13
HOLLY ELEMENTARY
DELTA SCHOOL DISTRICT





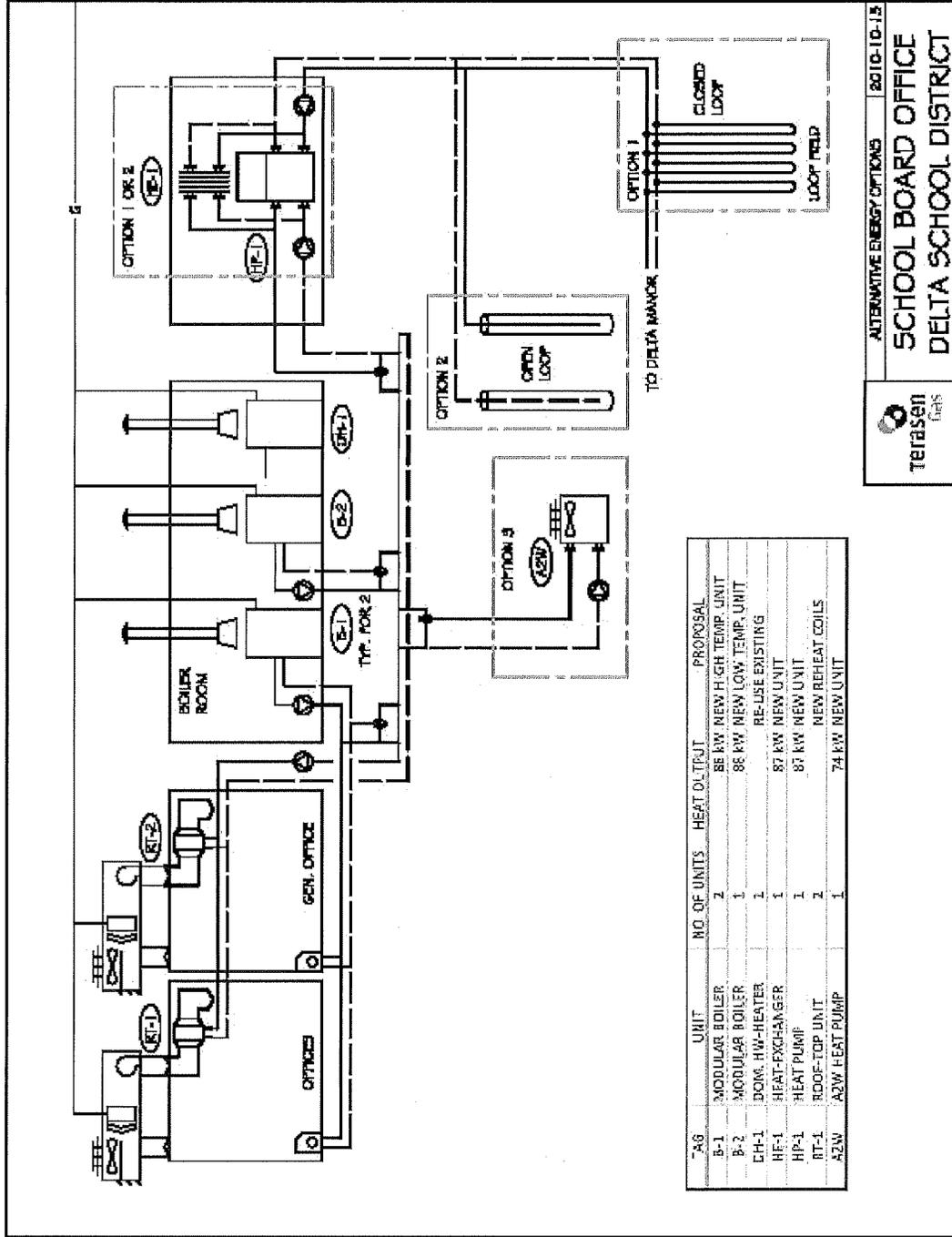




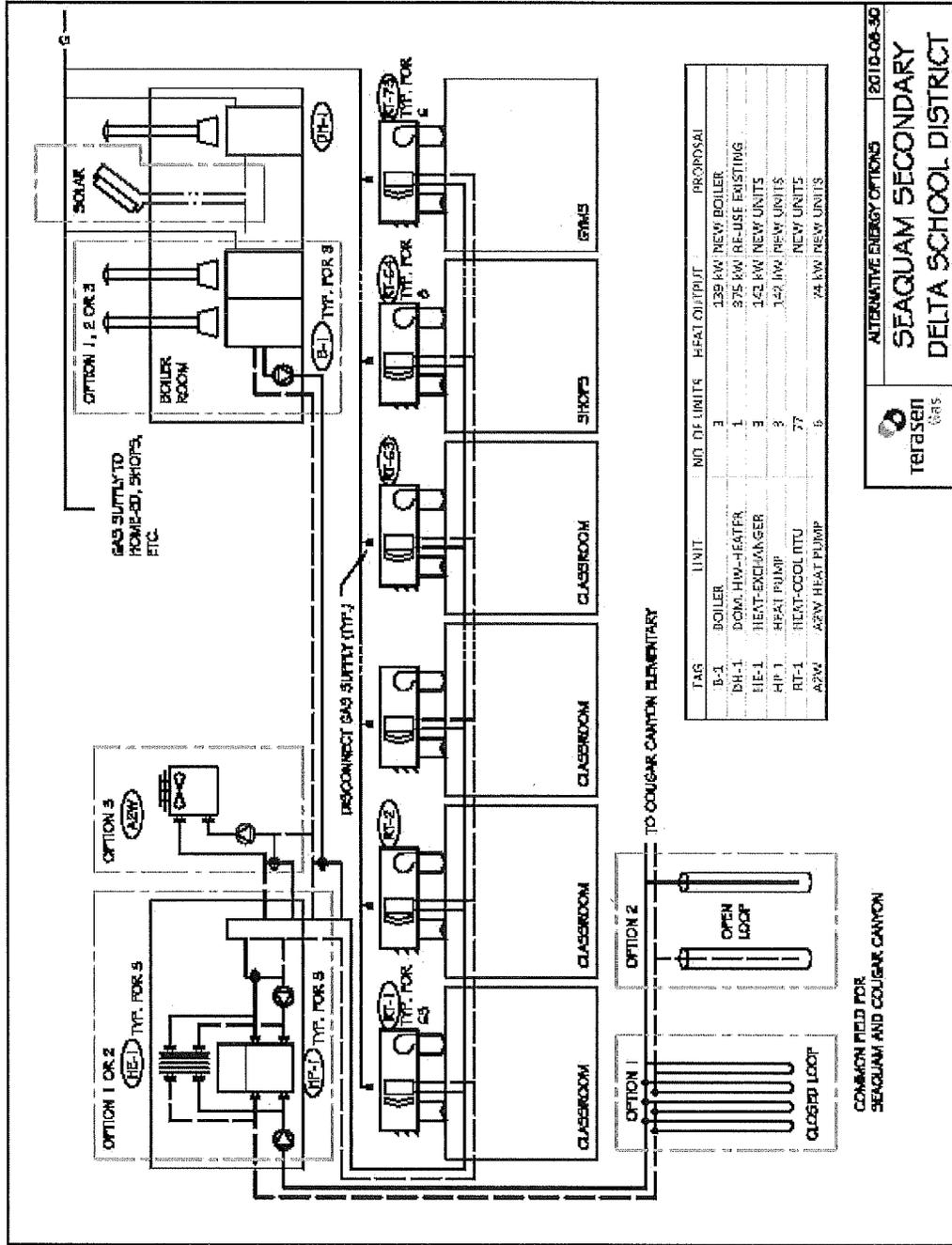


ALTERNATIVE ENERGY OPTIONS 2010-10-15
RICHARDSONS ELEMENTARY
DELTA SCHOOL DISTRICT

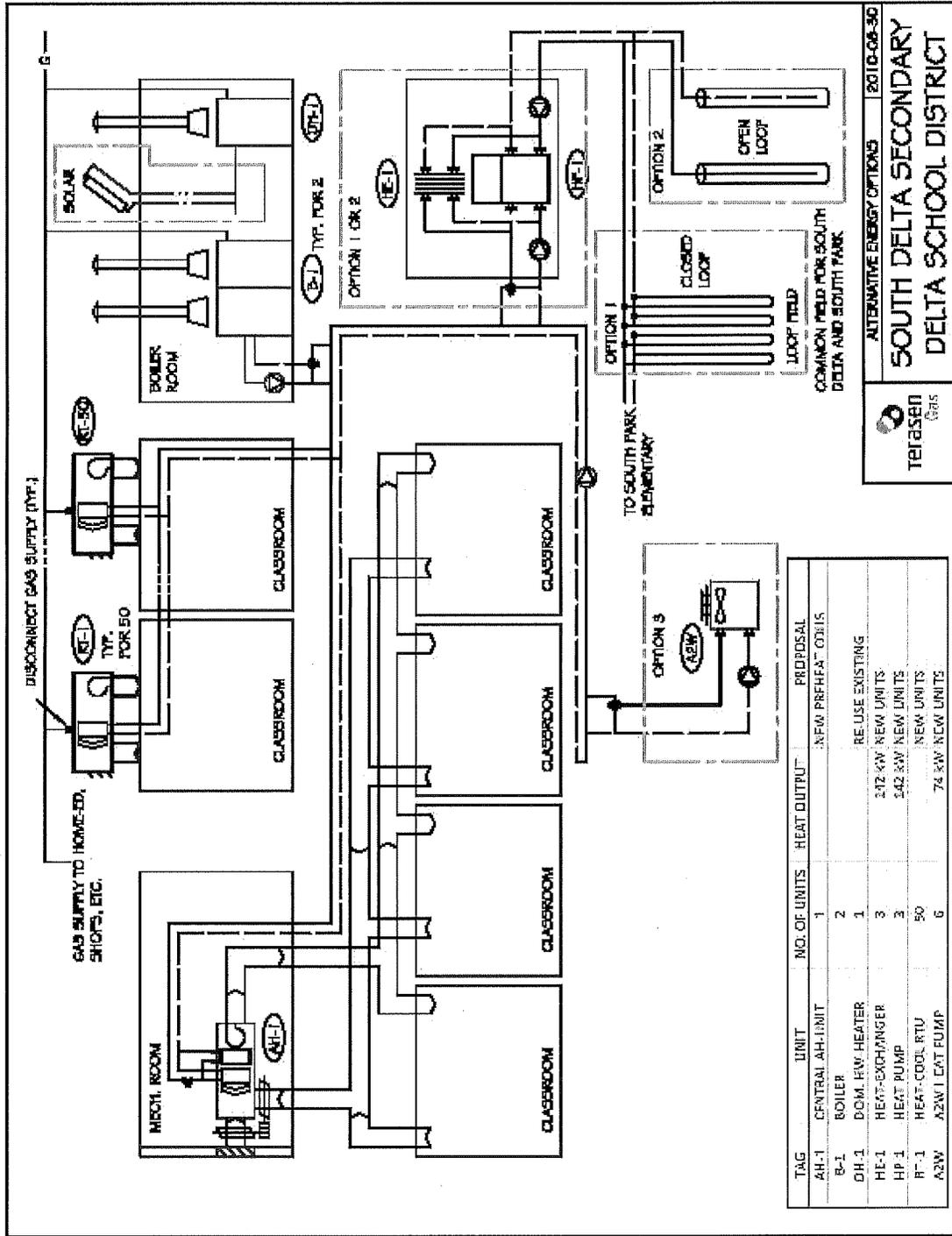
10/15/10

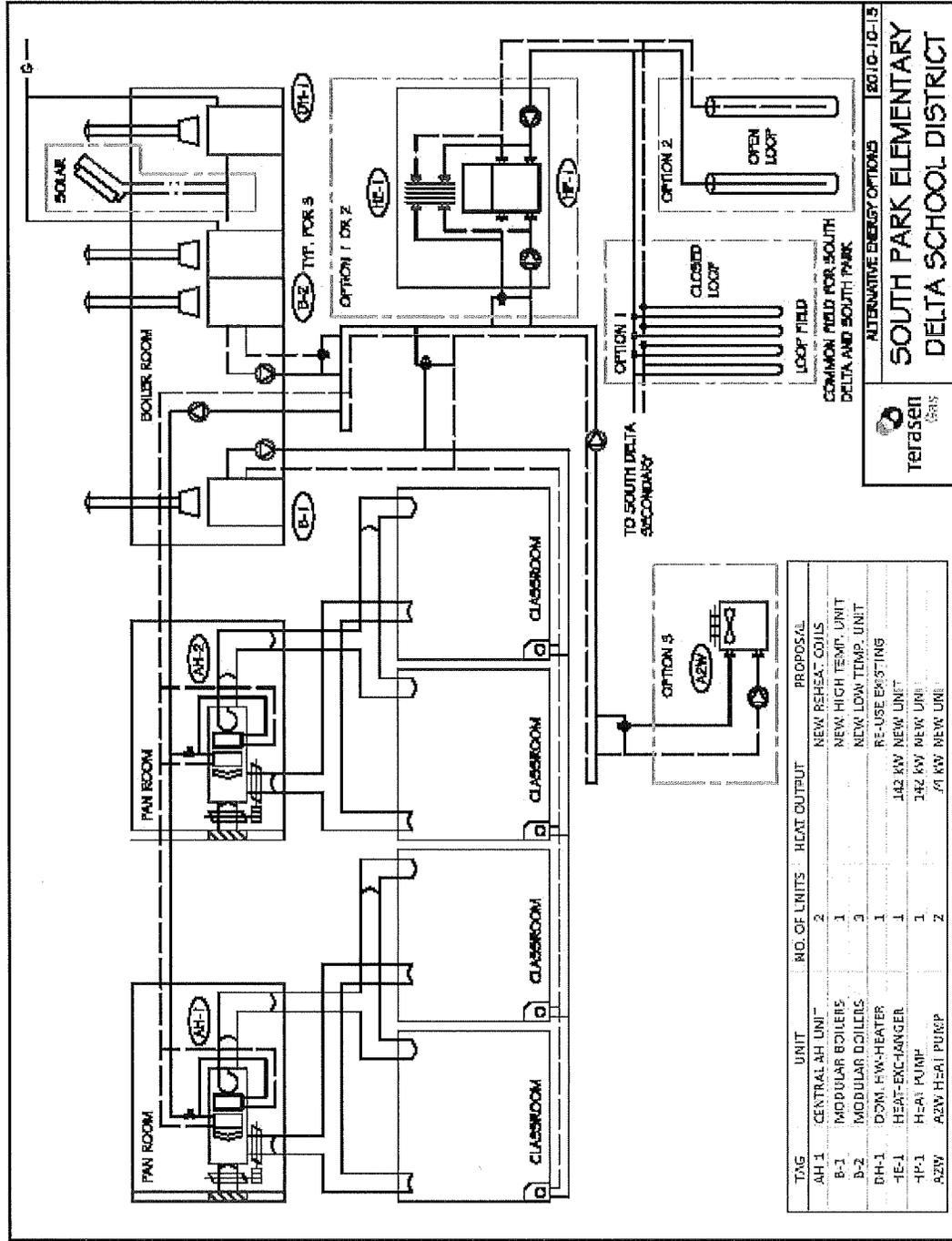


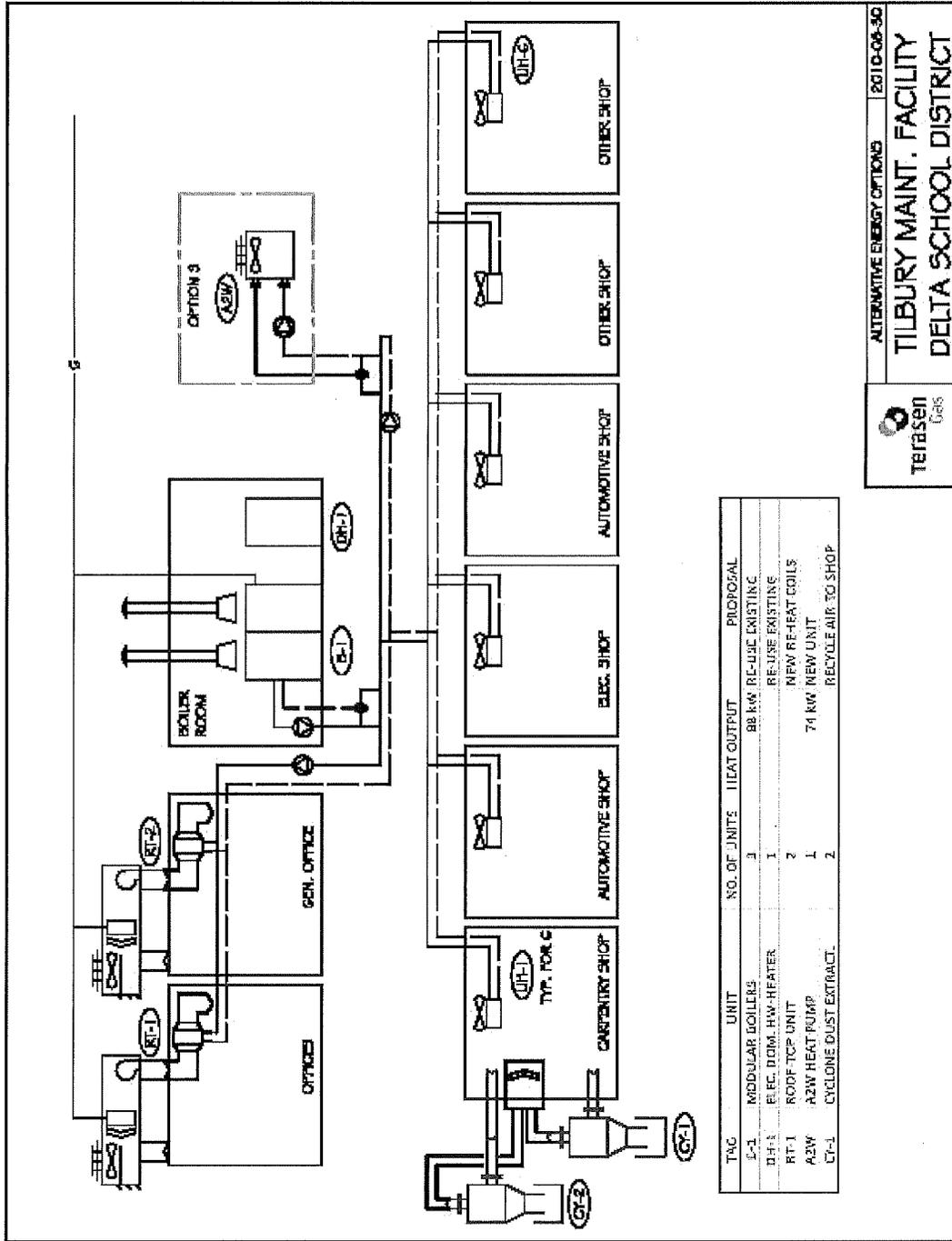

ALTERNATIVE ENERGY OPTIONS 2010-10-13
SCHOOL BOARD OFFICE
DELTA SCHOOL DISTRICT



ALTERNATIVE ENERGY OPTIONS 2010-08-30
SEASQUAM SECONDARY
DELTA SCHOOL DISTRICT









ALTERNATIVE ENERGY OPTIONS | 2010-08-30
TILBURY MAINT. FACILITY
DELTA SCHOOL DISTRICT

APPENDIX C – Natural Resources Canada Heat Pump Technical Summary

Exhibit G



16705 Fraser Highway
Surrey, BC V4N 0E8
Tel: 604-576-7000
Fax: 604-576-7122
www.terasen.com

February 7, 2011

Delta School District No. 37
4585 Harvest Drive
Delta, B.C. V4K 5B4

Attention: Frank Geyer, Director of Facilities & Planning

This is Exhibit "G" referred to in the
affidavit of FRANK GEYER
made before me on AUGUST 10 20 18
Edith Campbell-Mirzad
A Commissioner for taking Affidavits
for British Columbia

Dear Mr. Geyer:

**Re: Agreement Between Delta School District No. 37 ("SD37") and Terasen Gas Inc ("TGI")
Regarding Selected Energy Systems**

TGI and SD37 entered into a Memorandum of Understanding ("MOU") dated January 30, 2009 respecting the viability of purchasing thermal energy from TGI by connecting to energy systems belonging to TGI. The MOU expired on July 31, 2010. Subsequent investigations identified a number of SD37 buildings listed in Appendix A ("SD37 Buildings") which may benefit from service via TGI thermal energy systems ("TGI ES"). The installation of the TGI ES into the SD37 Buildings shall hereinafter be referred to as the "Project".

This Letter of Agreement is intended to provide a basis for the preparation of agreements for the development of the Project. Except for the binding agreements and obligations described in Clauses 6, 7, 8, 9, 11, and 12 hereof, this Letter of Agreement represents only the current intentions of TGI and SD37 to develop the Project on the terms described in this Letter of Agreement. It is not, and is not intended to be, a binding agreement between the parties or any other parties (except as described in Clauses 6, 7, 8, 9, 11, and 12). The principles described herein are necessarily brief and will require further detail to be arrived at during negotiations.

1. TGI and SD37 propose to negotiate the necessary agreements will respect the following principles:
 - a) The TGI ES will provide thermal energy to SD37 Buildings contained in the Project under an approach which pools costs and benefits of TGI ES service to the SD37 Buildings for the purposes of setting rates. If TGI publishes a tariff for comparable thermal energy delivery in future, SD37 will have the option to pay that tariff for the SD37 Buildings;
 - b) TGI will be the exclusive provider of thermal energy systems for the SD37 Buildings contained in the Project. SD37 may connect or disconnect these buildings according to terms that TGI and SD37 agree upon.
 - c) TGI and SD37 will inform each other of any relevant information that they become aware of in a timely fashion that relates to the costs or feasibility of the Project;
 - d) TGI shall assign to SD37 all right, title and interest in any environmental benefits that arise or accrue by virtue of the implementation of the Project at no cost to SD37.
 - e) TGI recognizes the importance of working towards a single rate for thermal energy delivery inclusive of all input energy costs and SD37 accepts that natural gas and electricity are currently subject to independent regulation and that incorporating those costs into the rates is not available at this time.

2. SD37 and TGI will use commercially reasonable efforts to negotiate and enter into a Rate Determination Agreement (RDA) for all SD37 Buildings and a Service Agreement (SA) for each of the SD37 Buildings. The RDA will set out the method that TGI will use to determine rates that will apply to each of the SAs that TGI and SD37 enter into from time to time. Each SA will establish the appropriate energy system that TGI will install at that site.

The RDA will include the following terms:

- a) SD37 will connect each of the SD37 Buildings to the TGI ES according to an SA which, for each building, will have TGI provide thermal energy for all of the building's heat, hot water and other thermal energy needs unless otherwise agreed;
- b) SD37 will purchase thermal energy from TGI for each SD 37 Building and TGI will deliver thermal energy for each SD37 Building at the rate established by the RDA ("RDA Rate");
- c) The RDA will pool the total cost of service that arises from every SA that SD37 and TGI enter into from time to time (Appendix B provides an estimate of the RDA Rate);
- d) TGI and SD37 will determine the appropriate billing method for the RDA Rate;
- e) TGI intends to apply, at its own cost, to the British Columbia Utilities Commission (the "BCUC") for approval of a tariff for thermal energy delivery to comparable buildings during the term of the RDA ("Tariff"), and after such approval, SD37 may elect to pay the tariff subject to the approval of TGI and the BCUC and adoption of the Tariff will result in termination of the RDA and SAs and the adoption of the Tariff terms and conditions;
- f) The RDA will have a term of 20 years, and may be extended for subsequent 10 year terms if TGI and SD37 mutually agree; and
- g) TGI at its own expense, will promptly apply for and obtain all regulatory approvals required for the Project, including without limitation any required BCUC approvals.

For greater certainty, conclusion of the RDA shall be subject to the prior approval of TGI's Board of Directors if required and SD37's Board of Education.

3. Each SA will include the following terms:

- a) SD37 will connect the building to the TGI ES (the scope and cost of which is included in the Project) and the TGI ES will provide all the building's heat, hot water and other thermal energy needs unless TGI and SD37 otherwise agree to partial thermal energy needs, at the RDA Rate;
- b) SD37 will provide TGI with space at each SD37 building location to install the TGI ES as well as access to operate and maintain the energy system; the amount of such space shall mutually agreed upon taking into account the design specifications of the TGI ES and the needs and limitations of SD37;
- c) Operating services which SD37 may provide to TGI and corresponding charges;
- d) TGI will design and construct the TGI ES in a good and workmanlike manner, and according to a schedule that meets SD37's reasonable requirements;
- e) The connection location of the building to the TGI ES at that site;
- f) Each SA will have a term that is equal to but will not exceed the term of RDA; and
- g) Other commercially reasonable terms and conditions that would apply to the Project and the operation of the TGI ES, including, but not limited to:

- (i) method of measuring thermal energy delivered by the TGI ES to each of the SD37 Buildings which will be used for monthly billing purposes;
- (ii) rights of access to the TGI ES by TGI and its contractors;
- (iii) types and amounts of insurance to be carried by each of the parties and their contractors;
- (iv) the operation, maintenance and performance of the TGI ES;
- (v) indemnification of both TGI and SD37;
- (vi) dispute resolution mechanism; and
- (vii) remedies in the event of a breach of the SA

to be applicable during the term of the SA.

For greater certainty, conclusion of the SA shall be subject to the prior approval of TGI's Board of Directors if required and SD37's Board of Education.

4. If further third party studies are required and agreed upon by TGI and SD37, TGI will contract and pay third party contractors/consultants for such studies and will advise SD37 of all related costs in a prompt manner.
5. Upon concluding the RDA and initial SA and subject to BCUC approval if required, all costs and expenses reasonably incurred by TGI in relation to the Project will be included in the RDA rate for recovery in future periods.
6. Based on the foregoing, during the term of this Letter Agreement and any extension thereof, SD37 will work exclusively with TGI in the development of the Project.
7. During the term of this Letter of Agreement and any extension thereof, TGI and SD37 shall use commercially reasonable efforts to conclude the RDA and SD37 shall negotiate exclusively with TGI in respect of the provision of thermal energy services for the Project.
8. If TGI, acting reasonably, determines that proceeding with the Project is commercially feasible from a physical, technical, scheduling and financial (project and operating costs, obtaining necessary third party capital funding) basis, TGI shall promptly deliver written notice of such determination to SD37 (a "Determination Notice"), provided that TGI may not deliver a Determination Notice to SD37 later than 30 days prior to the termination or expiry of this Letter of Agreement. If TGI delivers a Determination Notice to SD37, and SD37, upon the expiry or termination of this Letter of Agreement, has failed to act in a commercially reasonable manner in considering the Project and negotiating with TGI regarding the execution of the RDA and initial SA, SD37 shall, promptly following the expiry or termination of this Letter of Agreement, reimburse TGI for all costs and expenses reasonably incurred by TGI in relation to the Project up to a maximum of \$100,000 as full and complete compensation for costs and expenses incurred by TGI in relation to the Project. This Clause 8 shall survive the termination or expiry of this Letter of Agreement and shall be legally binding and enforceable against the parties thereto, and their respective successors and assigns.
9. All information or documentation, identified as confidential or proprietary received by either SD37 or TGI (the "Receiving Party") regarding the business affairs or trade secrets of the other party (the "Disclosing Party"), including information or documentation pertaining to or arising from the business relationship between the parties, shall be deemed to be confidential or proprietary to the Disclosing Party ("Confidential Information"). Except as otherwise provided herein, the Receiving Party shall not directly or indirectly disclose any such Confidential Information to any third party without the prior written consent of the Disclosing Party. Such consent is not required where the third party is another contractor or consultant retained by the Receiving Party for the purposes of this Project and to the

extent that such disclosure is necessary for the proper performance of the parties' respective obligations contemplated herein. Notwithstanding the foregoing, the Receiving Party may use or disclose such Confidential Information if necessary (a) in connection with the preparation for and conduct of submissions to regulatory agencies, and (b) in connection with routine informational disclosures to its stockholders or owners, or, in the case of SD37 to the Government of British Columbia. Without limiting the generality of the foregoing, SD37 may disclose Confidential Information to representatives of the Government of British Columbia who have a need to have knowledge of such Confidential Information. The obligation of confidentiality set out above shall not apply to material, data or information which is known to the Receiving Party prior to its receipt thereof, which is generally available to the public or which has been obtained from a third party which has the right to disclose the same. A party will not be considered to have breached its obligations under this Clause 9 for disclosing Confidential Information to the extent required to satisfy any legal requirement of a court, tribunal or other competent governmental, administrative or regulatory authority, including any such authority acting under the *Freedom of Information and Protection of Privacy Act* (British Columbia). The confidentiality covenants of the parties herein shall survive the termination or expiry of this Letter of Agreement for a period of two (2) years from the date of termination or expiry of this Letter of Agreement and shall be legally binding and enforceable against the parties thereto, and their respective successors and assigns.

10. TGI and SD37 shall actively market and promote the Project. Upon the execution of this Letter of Agreement and unless otherwise agreed, TGI shall prepare a draft joint press release announcing SD37's intention to negotiate with TGI. Upon SD37 and TGI approval of the joint press release, TGI shall issue same.
11. Unless the parties otherwise agree in writing, this Letter of Agreement will terminate on February 7, 2012. This Letter of Agreement may be extended upon the written agreement of the parties.
12. With the exception of the provisions in Clauses 6, 7, 8, 9, 11, and this Clause 12 the terms of this Letter of Agreement are not intended, nor shall they be construed, to be legally binding on either SD37 or TGI.

If you agree to the terms and conditions of this Letter of Agreement, please so indicate by signing in the space provided below.

Yours truly,

TERASEN GAS INC.

Doug Stout
Vice President
Energy Solutions & External Relations, Terasen Gas Inc.

DELTA SCHOOL DISTRICT NO. 37

Dale Saip
Chairperson, Delta Board of Education

Agreed to and accepted this ____ day of _____, 2011.

APPENDIX A

Energy System Capital Cost Estimates

TGI completed an evaluation of the cost of mechanical system retrofits at Seaquam Secondary School and Cougar Canyon Elementary School. Using the results from those two analyses, TGI utilized a unit cost approach to apply those results to the other buildings in the TGI ES. Based on this cost information, TGI estimates the total cost of the TGI ES will be approximately \$4.9 million plus HST.

TGI performed an assessment of the energy consumption and building characteristics of each building using data provided by SD37. Based on the analysis, TGI and SD37 agreed that the following energy retrofits represent the optimum aggregate approach for the TGI ES. The energy systems by site and the capital cost breakdown are detailed in Table 1, attached.

SD37 anticipates that Provincial Government agencies will provide a Contribution in Aid of Construction (Contribution) of \$1.4 million to TGI for the TGI ES. Changes to the capital cost estimates and buildings in the TGI ES shall not affect the amount of the Contribution, but could result in a higher or lower thermal energy charge.

TGI will support SD37 with an application to the Public Sector Energy Conservation Agreement (PSECA) for funds available to support TGI ES that reduce the energy and carbon footprint of government buildings. Such funding, if approved, would make up in whole or in part the Contribution. If PSECA funding fails to cover the amount of the Contribution, TGI will assist SD37 in locating other funding sources, as SD37 has no capital funds available locally to proceed with the Project and relies totally on government to provide the necessary Contribution. SD37 will directly receive any funds that PSECA or other government agency approves and will apply such towards the Contribution. The Project shall not commence until the Contribution amount is fully funded.

In addition to the Contribution noted above TGI will also apply TGI Energy Efficiency and Conservation (EEC) program funds to the TGI ES capital cost that are available. TGI estimates that EEC funds of \$0.8 million for the 19 school buildings will be available. The calculation of the thermal energy charges includes the application of EEC funds towards the capital costs of the TGI ES.

The remaining capital funding for the TGI ES to be provided by TGI after the application of SD37 Contribution and EEC funds is estimated to be approximately \$2.7 million.

Notes:

- 1) The TGI ES energy systems are estimated to reduce the energy consumption to 47,600 GJ annually (gross, including lighting for the 19 buildings) resulting in annual estimated savings of 32,000 GJ.
- 2) The existing carbon emissions of the TGI ES buildings are estimated to be 2,900 tonnes annually. The TGI ES energy systems are estimated to reduce the carbon emissions to 900 tonnes annually resulting in annual estimated savings of 2,000 tonnes (refer to Table 2).
- 3) TGI's assessment of the feasibility of the energy system proposal for each building uses the best available data at this time. However, information may become available through site specific testing that may indicate that an alternate solution is more feasible or cost effective. TGI will inform SD37 of any relevant information that it becomes aware of in a timely fashion that relates to the energy system proposals at each building.
- 4) Any recently installed equipment that needs to be removed as a result of TGI ES that can be salvaged shall be re-deployed at another site in the Project, subject to sound engineering practice.

Table 1 - Scope and Estimated Cost of Work

No.	Facility Name	Civic Address	Existing Plant	Proposed Plant	Scope of Work			Funding Split		
					Loopfields & Wells	Mechanical Equipment	Total	Terasen Capex	Terasen EEC	Government
1	ANNIEVILLE Elementary	9240 112 Street	CB/UV	BUG	\$ -	\$ 71	\$ 71	\$ -	\$ 12	\$ 59
2	BEACH GROVE Elementary	5955 17A Avenue	CB/UV	BUG	\$ -	\$ 58	\$ 58	\$ -	\$ 12	\$ 46
3	CHALMERS Elementary	11315 75 Avenue	CB/UV	BUG	\$ -	\$ 79	\$ 79	\$ -	\$ 12	\$ 67
4	CLIFF DRIVE Elementary	5025 12 Avenue	CB/UV	BUG	\$ -	\$ 75	\$ 75	\$ -	\$ 11	\$ 64
5	DELTA Secondary	4629 51 Street	CB/AHU	OLS	\$ 181	\$ 392	\$ 573	\$ 329	\$ 244	\$ -
6	DELVIEW Secondary	9111 116 Street	CB/AHU	OLS	\$ 141	\$ 216	\$ 357	\$ 252	\$ 105	\$ -
7	ENGLISH BLUFF Elementary	402 48 Street	CB/UV	OLS	\$ 63	\$ 356	\$ 419	\$ 234	\$ 25	\$ 160
8	HEATH Elementary	11364 72 Avenue	CB/UV	BUG	\$ -	\$ 79	\$ 79	\$ -	\$ 12	\$ 67
9	HOLLY Elementary	4630 61 Street	CB/UV	BUG	\$ -	\$ 79	\$ 79	\$ -	\$ 12	\$ 67
10	LADNER Elementary	5016 44 Avenue	CB/UV	BUG	\$ -	\$ 79	\$ 79	\$ -	\$ 12	\$ 67
11	NEILSON GROVE Elementary	5500 Admiral Boulevard	CB/AHU	GES	\$ 146	\$ 266	\$ 412	\$ 286	\$ 21	\$ 105
12	NORTH DELTA Secondary	8270 114 Street	CB/AHU	OLS	\$ 154	\$ 221	\$ 375	\$ 240	\$ 135	\$ -
13	PINEWOOD Elementary	11777 Pinewood Drive	CB/UV	OLS	\$ 67	\$ 267	\$ 334	\$ 208	\$ -	\$ 126
14	RICHARDSON Elementary	11338 84th Avenue	CB/UV	OLS	\$ 67	\$ 89	\$ 156	\$ 115	\$ 41	\$ -
15	SOUTH DELTA Secondary	750 53 Street	RTU	OLS	\$ 163	\$ 924	\$ 1,087	\$ 580	\$ 105	\$ 402
16	SOUTH PARK Elementary	735 Gilchrist Drive	CB/AHU	OLS	\$ 119	\$ 154	\$ 273	\$ 220	\$ 26	\$ 27
17	Delta Manor Education Centre	4750 57 Street	CB/UV	GES	\$ 83	\$ 66	\$ 149	\$ 135	\$ -	\$ 14
18	District Operations Centre	7186 Brown Street	CB/AHU	BUG	\$ -	\$ 79	\$ 79	\$ -	\$ 12	\$ 67
19	School Board Office	4585 Harvest Drive	CB/AHU	GES	\$ 86	\$ 72	\$ 158	\$ 139	\$ -	\$ 19
					\$ 1,270	\$ 3,622	\$ 4,892	\$ 2,738	\$ 797	\$ 1,357

CB = Conventional Boiler UV = Unit Ventilators AHU = Central Air Handling Unit RTU = Gas-fired Rooftop Units | BUG = Boiler Upgrade. GES = Closed Loop Geoechange Upgrade
 OLS = Open Loop Geoechange Upgrade

Loopfields & Wells = exterior work in support of Geoechange Technology (funded 100% by Terasen)

Mechanical Equipment = interior work (new heating and hot water plant to be operated by Terasen, and re-configuration of piping, ductwork, downstream fan systems, controls, etc. to connect to the new plant by School District)

Table 2 - Energy Reductions

No.	Facility Name	Existing Conditions				After Proposed Retrofits				Net Reduction (Increase)				
		Mechanical Plant	Annual Consumption (GJ)		Annual GHG (tCO2e)	Mechanical Plant	Annual Consumption (GJ)		Annual GHG (tCO2e)	Annual Consumption (GJ)		Annual GHG (tCO2e)		
			Natural Gas	Electricity*			Total	Natural Gas		Electricity*	Total		Natural Gas	Electricity*
1	ANNIEVILLE Elementary	CB/UV	2,218	517	2,735	117	1,219	517	1,736	65	999	-	999	52
2	BEACH GROVE Elementary	CB/UV	1,245	609	1,854	67	719	609	1,328	40	526	-	526	27
3	CHALMERS Elementary	CB/UV	1,824	833	2,657	96	1,063	833	1,896	59	761	-	761	39
4	CLIFF DRIVE Elementary	CB/UV	1,812	850	2,662	98	996	850	1,846	56	816	-	816	42
5	DELTA Secondary	CB/AHU	9,725	4,652	14,417	526	1,228	6,422	7,650	102	8,497	(1,730)	6,767	424
6	DELVIEW Secondary	CB/AHU	4,871	2,039	6,910	261	552	3,192	3,744	48	4,319	(1,153)	3,166	213
7	ENGLISH BLUFF Elementary	CB/UV	2,208	597	2,805	116	408	1,173	1,581	28	1,800	(576)	1,224	88
8	HEATH Elementary	CB/UV	1,641	621	2,262	88	934	621	1,555	52	707	-	707	36
9	HOLLY Elementary	CB/UV	1,565	597	2,162	85	944	597	1,541	52	641	-	641	33
10	LADNER Elementary	CB/UV	1,531	818	2,349	83	875	818	1,693	50	656	-	656	33
11	NEILSON GROVE Elementary	CB/AHU	1,078	541	1,620	58	211	935	1,146	16	868	(394)	474	42
12	NORTH DELTA Secondary	CB/AHU	6,017	3,741	9,758	330	1,122	4,894	6,016	87	4,895	(1,153)	3,742	243
13	PINEWOOD Elementary	CB/UV	2,029	534	2,563	107	368	1,111	1,479	26	1,661	(577)	1,084	81
14	RICHARDSON Elementary	CB/UV	1,815	681	2,496	97	333	1,257	1,590	25	1,482	(576)	906	72
15	SOUTH DELTA Secondary	RTU	8,068	3,902	11,970	436	889	5,065	5,944	76	7,179	(1,153)	6,026	360
16	SOUTH PARK Elementary	CB/AHU	2,289	665	2,954	121	658	1,242	1,900	41	1,631	(577)	1,054	80
17	Delta Manor Education Centre	CB/UV	1,812	885	2,697	98	284	1,492	1,776	24	1,528	(607)	921	74
18	District Operations Centre	CB/AHU	1,847	674	2,521	99	1,015	674	1,689	56	832	-	832	43
19	School Board Office	CB/AHU	1,424	841	2,265	78	298	1,236	1,534	23	1,126	(395)	731	55
			55,040	24,637	79,677	2,963	14,116	33,528	47,644	926	40,924	(8,891)	32,033	2,037

CB = Conventional Boiler UV = Unit Ventilators AHU = Central Air Handling Unit RTU = Gas-fired Rooftop Units | BUG = Boiler Upgrade GES = Closed Loop Geoechange Upgrade OLS = Open Loop Geoechange Upgrade

* - includes lighting

APPENDIX B

RDA Rate Estimate

Terasen Gas Inc.

Delta School District No. 37

February 1, 2010

Delta School District No. 37: RDA Rate Calculation Estimate

Appendix A - Schedule 1

(\$000's), unless otherwise stated

<u>Year</u>	<u>Cost of Electricity</u>	<u>Cost of Natural Gas</u>	<u>Energy System Connection</u>	<u>Annual Charges</u>	<u>Thermal Energy Delivered (GJ)</u>	<u>RDA Rate (\$/GJ)</u>
<u>2011</u>	254	123	379	755	44,034	\$ 17.15
<u>2012</u>	274	134	386	794	44,034	\$ 18.02
<u>2013</u>	296	141	394	831	44,034	\$ 18.88
<u>2014</u>	317	148	402	867	44,034	\$ 19.68
<u>2015</u>	340	153	410	903	44,034	\$ 20.51
<u>2020</u>	393	175	452	1,020	44,034	\$ 23.16
<u>2030</u>	483	213	552	1,248	44,034	\$ 28

Exhibit H

This is Exhibit " H " referred to in the affidavit of FRANK GEYER made before me on August 10 2018
Erin Campbell-Shirred
A Commissioner for taking Affidavits for British Columbia



From: Blermeier, Grant
To: Frank Geyer
Cc: Kostka, Vladimir
Subject: Rate Determination Agreement
Date: May-30-11 5:24:34 PM
Attachments: 11-05-30 RDA SD37.docx

Frank,

First, the RDA is attached for your review. I believe that you will find that the agreement matches with the discussions and your expectations. There is a brief summary below explaining the details of the rate.

BCUC

With respect to the BCUC process, we are welcoming the opportunity. As you know, we had been planning to apply for a general tariff with the BCUC this Spring. In that application, we had been planning on addressing all of the questions that have been raised in this process. As a result, this will be an excellent opportunity to lay the foundation upon which to have the BCUC hear our business plan and how it aligns with both BCUC oversight, competition and Provincial policy.

A few facts may help you understand this process better.

1. The Utilities Commission Act is very clear that a public utility includes thermal energy, as we will be providing to you.
2. We have approval from the BCUC already to enter into this line of business through BCUC Order No. G-141-09.

The underlying issues that the BCUC will want to address in this process are whether or not our participation in this business gives us an unfair competitive advantage and whether our gas customers will be subsidizing this business. As you know, better than most, we are in fact in a competitive environment and this project does not rely on any cross subsidization. So, this will be a great opportunity for us to obtain a determination from the BCUC on these issues.

As per BCUC Order G-141-09, there is a requirement for us to file our contract with the BCUC once we sign it. This is a benefit to you as it will provide regulatory oversight to ensure that you are receiving good value both initially and on an ongoing basis. It is our plan to file this contract immediately and we do expect the BCUC to review our costs and the reasonability of the deal.

RDA

We have put together the RDA to provide three fundamental features:

a. We are providing you with a market rate for thermal energy that delivers the negotiated savings (to reflect the contribution you are making to the project) against the BAU and then uses the natural gas index for BC to ensure that you have at least those savings ongoing.

b. You may choose to pay the cost of service rate at any time during the Agreement. We expect this rate to be lower than the market rate, but the choice will be yours to make.

c. You may choose to pay our BCUC approved tariff rate for thermal energy once it becomes available.

a. As your building needs may change over time, you may add or close a building at any time during the Agreement.

b. Expandability beyond the SD. If you wish to add other parties to the pool, (such as another school district, or other party) we can arrange that with you. This will be advantageous to you as the larger the pool, the better the cost of service will become and subsequently your savings. This enables you to access tariff style risk and efficiency benefits within your agreement itself.

3. Simplicity and Protection

a. The rate is an inclusive rate for thermal energy that we will meter at each site. This means that if there is no thermal energy at the meter, there is no payment obligation and there is no capital obligation on your part during the term of the agreement or if the Agreement terminates in the future.

b. BCUC regulation ensures that you always have oversight of your service levels and rates as well as a forum to adjudicate any disputes, if they should ever arise.

Additional information about the RDA:

The natural gas index is currently 112, with the year 2002 being 100 (12% higher than 9 years ago). This index is published monthly by statistics Canada as part of the CPI calculation and reflects the delivered natural gas prices. Delivered prices are subject to BCUC regulation, so there is indirect regulatory oversight on the index. In your BAU, you would be following this pricing.

We have performed more analysis since completing the LOA, and have better data for thermal energy consumption. As you recall from the LOA, the annual charges in year one were \$755k. In this agreement, we have lowered the annual charges to \$753k (reminder that this includes energy input costs), so the value for the service matches or slightly beats what

we discussed in the LOA. After completing our analysis,

The normalized energy consumption is higher than the previous analysis for this we used the Natural Resources Canada 30-year weather normals. We used standard weather normalization practices for utilities for this purpose and correlated the last 3 years of weather data against your last 3 years of energy consumption to arrive at this value. This increases the energy consumption in the BAU case.

Our analysis of the equipment indicates that efficiencies are lower on average at 65% compared to our original estimate, which reduces the thermal energy consumption to 10,600 MWh, or 38,160GJ (the LOA assumes 12,232MWh or 44,034GJ) this has no effect on the total annual cost, for which we are using \$753k as the target as noted above. The RDA Rate Estimate in the LOA of \$17.15/GJ (\$755k/44,034GJ) in the first year equals \$19.79/GJ using the proper thermal energy consumption of 10,600MWh (\$755k/38,160GJ). We are providing you with a rate of \$19.72/GJ (\$753/38,160GJ), or 7.1 cents per kWh in this agreement, which as noted provides slightly lower initial costs than the LOA provides.

We estimate that 4% of your natural gas consumption is for non-thermal energy purposes and therefore, have reduced the energy in the BAU case by that amount. This lowers your BAU costs and offsets some of the weather normalization effects. In the LOA we did not assume anything for non-thermal energy consumption of natural gas.

The Cost of Service rate is not shown in the agreement as it will be a calculation based on the actual costs. This agreement enables you to switch to COS at any time, and we will be showing you the COS rate on each monthly invoice, so that you can see at all times if there is a benefit to moving to COS.

Next Steps

1. Complete RDA and file with the BCUC.
2. Complete Service Agreements for each site once the RDA is signed. We expect to get the boiler upgrade sites dealt with quickly and then complete the geoexchange sites immediately thereafter.

Have a good trip, I understand you are going to the interior.

Grant Bierlmeier

Business Development Manager

T: 250.380.5794 | C: 250.896.3098

Terasen Gas is known as FortisBC effective March 1, 2011. My e-mail address has changed to [@fortisbc.com](mailto:grbierlmeier@fortisbc.com). Please update your records accordingly. For more information on FortisBC, please visit fortisbc.com.

FORTIS BC | A trusted energy partner

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ENERGY SYSTEM RATE DEVELOPMENT AGREEMENT

THIS AGREEMENT dated for reference the ◆ day of ◆, 2011.

BETWEEN:

THE BOARD OF EDUCATION OF SCHOOL DISTRICT NO. 37 (DELTA)
a corporation established under the School Act R.S.B.C. 1996, c. 412 having an
office at 4585 Harvest Drive, Delta, British Columbia, V4K 5B4,

(the "SD")

OF THE FIRST PART

AND:

FORTISBC ENERGY INC., a company duly incorporated under the laws of the
Province of British Columbia, having its registered office at 10th Floor, 1111
West Georgia Street, Vancouver, B.C. V6E 4M3

("FEI")

OF THE SECOND PART

WHEREAS:

- A. The SD is the owner of schools and buildings in the Delta school district (the "Buildings") located on lands in Delta, British Columbia (the "Lands"). The Buildings are more particularly described in Schedule "A" to this Agreement.
- B. The SD has requested FEI to provide Thermal Energy to each of the Buildings according to a single rate that is applicable to all of the Buildings that the SD enters into service agreements with FEI and is subject to regulation by the British Columbia Utilities Commission (the "BCUC") using an energy systems ("ES") that FEI owns and operates;

NOW THEREFORE THIS AGREEMENT WITNESSES THAT in consideration of the premises and the covenants, agreements, representations, warranties and payments set out herein, the receipt and sufficiency of which is hereby acknowledged by each party, the parties covenant and agree as follows:

ARTICLE 1 - INTERPRETATION

1.1 DEFINITIONS

In this Agreement, the following words and phrases have the meanings set out below and all other terms defined within the text of this Agreement will have the meanings so ascribed:

- (a) "Affiliate" has the meaning set out in the *Business Corporation Act*, S.B.C. 2002, c.57;

- (b) "AFUDC" means the Approval for Funds Used During Construction rate for FEI that the BCUC approves from time to time;
- (c) "Annual" means the period from July 1 to June 30 each year for the purpose of setting rates;
- (d) "Annual Cost of Service" means the total cost of service for all of the Buildings that the SD enters into Energy System Service Agreements with FEI at any time during the term of this Agreement, that the BCUC accepts each year including:
 - (i) the carrying cost of the total capital investment by FEI to provide service to all of the buildings that the SD enters into Service Agreements with FEI during the term of this agreement, less any Capital Contributions, utilizing the capital structure of FEI, the debt financing rate in that capital structure and the benchmark rate of return on equity for utilities in British Columbia plus 50 basis points;
 - (ii) amortization, depreciation and tax costs;
 - (iii) direct costs;
 - (iv) Energy Purchase Costs;
 - (v) a reasonable amount for overhead allocation and administration;
 - (vi) the annual amount necessary to amortize the SD Deferral Account Balance, either credit or debit, over the remaining years in the term of this Agreement or 10 years, whichever is longer; and
 - (vii) any other amount that the BCUC determines that it should include from time to time;
- (e) "Agreement" means this agreement, including the preamble hereto and any schedules attached hereto and the terms "this Agreement", "hereof", "herein", "hereunder" and "hereinafter" and similar expressions refer to the Agreement and not to any particular section or other portion thereof and includes any agreement supplementary or ancillary thereto;
- (f) "BCUC" means the British Columbia Utilities Commission;
- (g) "Building" means each building identified on the attached Schedule "A";
- (h) "Business Day" means any day except Saturday and Sunday or any day on which banks are generally not open for business in Vancouver, British Columbia;
- (i) "Capital Contribution" means the amount, the SD provides to FEI and reduces the Net Book Value of assets that form the basis for calculating the cost of capital in the Annual Cost of Service;

- (j) “Cost of Service Rate” will be the quotient of the forecast Annual Cost of Service excluding the Energy Purchase costs and the forecast thermal energy deliveries for the applicable Annual period, plus the Energy Rate for each Building;
- (k) “District Deferral Account” records the cumulative difference between the Annual Cost of Service and revenues, including a provision for interest at the AFUDC rate;
- (l) “Energy Reimbursement” means the sum of:
 - (i) the amount that FEI pays for electricity, natural gas or any other energy source, that the SD utilizes for any purpose and that FEI does not require to operate an ES that is either measurable by a sub-meter, or that FEI and the SD estimate; plus
 - (ii) the amount that the SD pays for electricity, natural gas, or other energy source, to operate an ES that is either measurable by a sub-meter, or that FEI and the SD estimate;
- (m) “Energy Purchase Costs” means the cost of purchasing energy to supply all ES systems at all Buildings;
- (n) “Energy Rate” will be the quotient of the forecast Energy Purchase Costs at the prevailing rates that the BCUC approves from time to time, and the forecast of thermal energy deliveries for the applicable Annual period for all of the Buildings that the SD Enters into Energy System Service Agreements with FEI;
- (o) “Energy System” means the equipment, that FEI will construct and own which will provide the Buildings its energy needs for space and ventilation heating, cooling and domestic hot water use;
- (p) “Energy System Service Agreement” means that agreement to be entered into by the Parties in respect of the construction, operation and maintenance by FEI of an ES for each Building;
- (q) “Environment” includes the air (including all layers of the atmosphere), land (including soil, sediment deposited on land, fill, lands submerged under water, buildings, and improvements), water (including oceans, lakes, rivers, streams, groundwater, and surface water), and all other external conditions and influences under which humans, animals, and plants live or are developed and “Environmental” will have a corresponding meaning;
- (r) “Expiry Date” means the June 30, 2031 or the expiry of any renewal term thereof;
- (s) “Governmental Authority” means any federal, provincial, regional, municipal, local or other government, governmental or public department, court, tribunal, arbitral body, commission, board, bureau or agency and any subdivision, agent, commission, board or authority thereof;

- (t) "Index Adjustment" equals the quotient of most recent natural gas index value for British Columbia from Statistics Canada with CANSIM vector number V41692506 divided by 112.0;
- (u) "Initial Market Rate" will equal 8.8 cents per kWh as shown in Appendix A;
- (v) "Laws" means laws, statutes, regulations, bylaws, Permits and orders of any Governmental Authority having jurisdiction, including without limitation, Environmental Laws;
- (w) "Market Rate" at any point in time will equal the product of the Initial Market Rate and the Index Adjustment for each Building;
- (x) "Monthly Charges" means that amount established pursuant to this Agreement that the SD is to pay;
- (y) "Party" means the signatories to this Agreement;
- (z) "Permits" means all permits, licences, certificates, approvals, authorizations, consents and the like issued by any Governmental Authority;
- (aa) "Services" means those services to be provided by FEI to supply thermal energy to each Building from an ES;
- (bb) "SD37 Market Rate Rider" as defined in Appendix;
- (cc) "Term" means the term of this Agreement as defined in section 3.1;
- (dd) "Thermal Energy" means the amount of energy that FEI provides to the SD at all of the Buildings measured through a Thermal Energy Meter;
- (ee) "Thermal Energy Meter" means a device that complies with the International Organization of Legal Metrology recommendations for measuring thermal energy;
- (ff) "Thermal Energy Rate" means the Market Rate until the SD notifies FEI in writing that they elect to pay the Cost of Service Rate, after which time the Market Rate will no longer be available;

1.2 SCHEDULES

The following Schedules, as may be amended from time to time, are incorporated by reference into this Agreement:

- Schedule "A" Buildings as amended pursuant to this Agreement
- Schedule "B" Initial Market Rate

1.3 INTERPRETATION

Except where the context requires otherwise or except as otherwise expressly provided, in this Agreement:

- (a) all references to a designated Article or section are to the designated Article or section of this Agreement unless otherwise specifically stated;
- (b) the singular of any term includes the plural, and vice versa, and the use of any term is equally applicable to any gender and, where applicable, body corporate;
- (c) any reference to a corporate entity includes and is also a reference to any corporate entity that is a successor by merger, amalgamation, consolidation or otherwise to such entity;
- (d) the preamble and all schedules referred to and attached to this Agreement are incorporated by reference and will form a part of this Agreement;
- (e) all sums of money which are referred to in this Agreement are in lawful money of Canada; and
- (f) the headings of the Articles and sections set out in this Agreement are for convenience only and will not be considered in any interpretation of this Agreement.

ARTICLE 2 - TERM AND TERMINATION

2.1 TERM

The term of this Agreement shall commence on the date this Agreement is executed by the Parties and, subject to the provisions of this Agreement, shall continue in force for a period of twenty (20) years ("Term") from the July 1, 2011 and ends on the Expiry Date.

2.2 RENEWAL

This Agreement will automatically renew for periods of 10 years unless either FEI or the SD provide written notice no less than 6 months prior to the Expiry Date.

ARTICLE 3 - SERVICE PROVISION

3.1 REQUIREMENT TO CONNECT

- 3.2 EACH AND EVERY BUILDING WILL BE REQUIRED TO CONNECT TO THE ES TO BE CONSTRUCTED AND INSTALLED BY FEI AND THE SD COVENANTS WITH FEI THAT THE CONNECTION TO THE ES AND APPLICATION FOR SERVICE WILL BE A MANDATORY REQUIREMENT FOR EVERY BUILDING.
EXPANSION OPPORTUNITIES

If there is an opportunity to provide Services to other buildings, that the SD may or may not own, FEI may include those facilities in the calculation of Thermal Energy Rate.

3.3 TARIFF OPTION

The SD may elect at any time to pay the tariff rates if and when such tariff rates are approved by the BCUC for the thermal energy that FEI makes available to the SD rather than the Thermal Energy Rate. The SD must notify FEI in writing of this election and this Agreement will terminate subject to the approval of the BCUC if such approval is required.

3.4 EXCLUSIVITY

The SD hereby covenants and agrees with FEI that the powers and rights hereby granted to FEI are and shall be granted to FEI exclusively during the Term and any renewal thereof and the SD shall not supply, construct, install, operate or maintain any alternative energy system, including an Energy System, to provide space heating and cooling and domestic hot water to any Building, or use or allow or consent to any other person, firm or corporation to supply or distribute Thermal Energy to the Buildings.

ARTICLE 4 - RATES AND CHARGES

4.1 THERMAL ENERGY RATE

FEI will charge the SD for the Thermal Energy that is delivered to each Building in accordance with the current Thermal Energy Rate in effect at that time. The SD and FEI agree that the Thermal Energy Rate may be filed with the BCUC and may be subject to change based on the conditions imposed by the BCUC in approving the Thermal Energy Rate.

4.2 MONTHLY STATEMENTS

Subject to section 5.1, FEI will within 15 days following the end of each month deliver to each Building that enters into an Energy System Service Agreement, a statement setting out the Monthly Charges including all applicable taxes payable for that month.

On each monthly statement to the Buildings, FEI will provide for information purposes, the applicable Cost of Service Rate for that period until such time as the SD notifies FEI in writing that it wishes to pay the Cost of Service Rate for all Buildings.

4.3 ADJUSTMENTS TO THERMAL ENERGY RATE AND MONTHLY STATEMENTS

The SD and FEI acknowledge that this Agreement may be subject to the approval of the British Columbia Utilities Commission (the "BCUC"). Both the SD and FEI acknowledge and agree that FEI may apply at its own cost, to the BCUC for approval of a general tariff for thermal energy delivery to comparable buildings and after such approval the SD may elect to pay the tariff for all Buildings subject to the approval of FEI and the BCUC. Adoption of the tariff by the SD will result in termination of this Agreement and the adoption of the tariff terms and conditions.

Each month, FEI will adjust the Thermal Energy Rate on the Monthly Statements for changes in the Market Rate and/or the Cost of Service Rate that are applicable from time to time. In

addition, FEI will apply the relevant Energy Reimbursement amount to each Building, either positive or negative to the Monthly Statement for that Building.

During the period that the Thermal Energy Rate is equal to the Market Rate, FEI will apply the SD37 Market Rate Rider to the Market Rate for the purpose of calculating the Monthly Charges to the SD.

4.4 ACCOUNTING AND REPORTING

FEI will maintain accounting records pertaining to the utility operations for the Buildings that FEI serves according to an Energy System Service Agreement that is subject to this Agreement. Each year, by March 31st, FEI will produce an estimate of the SD Deferral Account balance on July 1st of the upcoming year and the Annual Cost of Service for the upcoming Annual period of the Agreement. FEI will file this information with the BCUC and copy the SD on each annual filing.

ARTICLE 5 - REPRESENTATIONS AND WARRANTIES

5.1 SD'S REPRESENTATIONS AND WARRANTIES

The SD hereby represents and warrants to FEI as follows and acknowledges that FEI is relying on these representations and warranties in entering into the transactions contemplated by this Agreement:

- (a) the SD has the full right, power and authority to enter into this Agreement;
- (b) all necessary action on the part of the SD has been taken to authorize and approve the execution and delivery of this Agreement and the performance by the SD of its obligations hereunder;
- (c) this Agreement and the performance of its obligations under this Agreement does not and will not breach any provisions of any other agreement or Law that is binding on or applicable to the SD as of the date of this Agreement;
- (d) the SD is not party to any action, suit or legal proceeding, actual or threatened, and there are no circumstances, matters or things known to the SD which might give rise to any such action, suit or legal proceeding, and there are no actions, suits or proceedings pending or threatened against the SD before or by any Governmental Authority, which could affect the SD's ability to perform its obligations under this Agreement.

5.2 FEI' REPRESENTATIONS AND WARRANTIES

FEI hereby represents and warrants to the SD as follows and acknowledges that the SD is relying on these representations and warranties in entering into the transactions contemplated by this Agreement:

- (a) FEI has the full right, power and authority to enter into this Agreement;

- (b) all necessary corporate action on the part of FEI has been taken to authorize and approve the execution and delivery of this Agreement and the performance by FEI of its obligations hereunder;
 - (c) this Agreement and the performance of its obligations under this Agreement does not and will not breach any provisions of any other agreement or Law that is binding on or applicable to FEI as of the date of this Agreement;
 - (d) FEI is not party to any action, suit or legal proceeding, actual or threatened, and there are no circumstances, matters or things known to FEI which might give rise to any such action, suit or legal proceeding, and there are no actions, suits or proceedings pending or threatened against FEI before or by any Governmental Authority, which could affect FEI's ability to perform its obligations under this Agreement.
- 5.3 The representations and warranties set out in sections 5.1 and 5.2 hereof shall survive termination of this Agreement.

ARTICLE 6 BRITISH COLUMBIA UTILITIES COMMISSION

6.1 BRITISH COLUMBIA UTILITIES COMMISSION APPROVAL

The parties acknowledge that FEI may assign this Agreement to an Affiliate which is, a "public utility" as defined in the *Utilities Commission Act*, R.S.B.C. 1996, c. 473, and all obligations of the parties under this Agreement and the rates and terms and conditions set out in this Agreement may be subject to approval by the British Columbia Utilities Commission.

ARTICLE 7 - CONSEQUENTIAL LOSS

7.1 CONSEQUENTIAL LOSS

In no event will the SD or FEI or any of their respective officers, directors, employees, contractors or agents be liable to the other party for any indirect or consequential loss, cost or expense whatsoever, including any loss of profits, revenues or other economic loss, suffered by the other party or its officers, directors, employees, contractors or agents.

ARTICLE 8 - SURVIVAL

8.1 SURVIVAL

Upon expiry or earlier termination of this Agreement for any reason, all claims, causes of action or other outstanding obligations remaining or being unfulfilled as of the expiry or termination of this Agreement and all of the provisions of this Agreement relating to the obligation of either the parties to account to or indemnify the other and to pay to the other any amounts owing as at the date of expiry or termination in connection with this Agreement will survive such expiry or termination.

ARTICLE 9 - CONDITIONS PRECEDENT

9.1 CONDITIONS PRECEDENT OF FEI

The obligation of FEI to carry out the transactions contemplated by this Agreement is subject to fulfillment of each of the following conditions on or before such date as may be specified, which conditions are for the sole benefit of FEI, and which may be waived by FEI in accordance with Section 9.2:

- (a) all consents and approvals from regulatory or other applicable Governmental Authorities, including without limitation, the BCUC, required to complete the transactions contemplated herein will have been obtained on terms and conditions relating to FEI or the operation of each ES, which are satisfactory to FEI acting reasonably having regard to its bona fide business interests;
- (b) FEI obtaining the approval by its board of directors of the terms and conditions of this Agreement on or before the 60th day after this Agreement has been executed by both Parties provided that if such approval cannot be obtained by this date due to the fact that the board of directors has not yet considered the transaction FEI reserves the right to extend the period of time to that date when the boards next convene.

9.2 FEI NOTICE OF WAIVER

If a condition set out in section 9.1 has not been satisfied on or before the date as may be specified for its fulfillment, FEI may waive compliance with the condition in whole or in part, in its sole discretion, by written notice to the SD, failing which delivery of written notice of satisfaction or waiver of such condition, this Agreement will, to the extent any further obligations of the parties which remain unfulfilled, be null and void, without liability between the parties hereto, and, neither party will be under any further obligation to the other to complete the transactions or future transactions, as the case may be, contemplated by this Agreement.

ARTICLE 10 - DISPUTE RESOLUTION

10.1 REFERENCE TO ARBITRATION

The parties will make a bona fide attempt to settle all disputes which may arise under, out of, in connection with or in relation to this Agreement by amicable negotiations and will provide frank and timely disclosure to one another of all relevant facts and information to facilitate negotiations. If any dispute remains unresolved within fifteen (15) days of either party requesting that the other party enter into negotiations to resolve the dispute, or if the parties agree to waive such discussions in respect of a particular issue, then the dispute may, if both the SD and FEI agree, be promptly submitted to and finally settled by arbitration in a manner agreed by the parties or, if the parties have not agreed to a manner of arbitration within such fifteen (15) days, then by an arbitrator who is appointed and renders a decision in accordance with the then current "Shorter Rules for Domestic Commercial Arbitration" or similar rules of the British Columbia International Commercial Arbitration Centre ("BCICAC"). The arbitration will either take place in Vancouver, British Columbia, Canada and be conducted in English.

10.2 BINDING DECISION

The decision of the arbitrator will, for all purposes of this Agreement, be binding on the parties.

10.3 CONTINUATION OF SERVICES

Each of the parties will perform all of its respective obligations under this Agreement notwithstanding the existence of any dispute that arises from time to time between the parties in respect of any matter related to this Agreement or during the resolution of any dispute in accordance with this Article 10.

10.4 COSTS

The costs and expenses of the arbitration, but not those incurred by the parties, shall be shared equally, unless the arbitrator determines that a specific party prevailed. In such case, the non-prevailing party shall pay all costs and expenses of the arbitration, but not those of the prevailing party.

ARTICLE 11 - GENERAL

11.1 COOPERATION

FEI and the SD will at all times extend co-operation to each other to ensure the orderly management and operation of the Energy System for Each Building and this Agreement. .

11.2 SOLICITATION

Nothing in this Agreement precludes FEI from soliciting or entering into, other contracts with the SD.

11.3 NOTICES

Any notice or other communication required or permitted to be given under this Agreement will be effective only if in writing and when it is actually delivered (which delivery may be by telecopy or other telecommunications device) to the party for whom it is intended at the following address or such other address in British Columbia as such party may designate to the other party by notice in writing delivered in accordance with this section 11.3:

(a) if to FEI:

FortisBC Energy Inc.
10th Floor, 1111 West Georgia Street
Vancouver, B.C.
V6E 4M3

Attention: Gareth Jones
Telephone: 250-380-5972
Telecopy: 250-388-6876

(b) if to the SD:

The Board of Education of School District No. 37
4585 Harvest Drive
Delta, B.C.
V4K 5B4

Attention: Frank Geyer
Telephone: 1-250-491-4001
Telecopy: 1-250-870-5094

11.4 CONFIDENTIALITY

The SD and FEI will treat as confidential the terms of this Agreement and all Confidential Information (as defined below) and will at all times during the term of this Agreement and for a reasonable time thereafter hold the terms of this Agreement and all Confidential Information in confidence and neither party will, without the prior written consent of the other party, disclose or divulge the terms of this Agreement or any Confidential Information to any person, provided that nothing in this section 11.4 will restrict or prevent either party from making any disclosure of such terms or any Confidential Information:

- (a) which is reasonably necessary or desirable for such party to carry out and give full effect to the terms, conditions and intent of this Agreement and the matters contemplated hereby;
- (b) which is required by any Law;
- (c) to any Governmental Authority;
- (d) to the directors, officers or employees of such party or to an Affiliate of such party or to the directors, officers or employees of an Affiliate of such party;
- (e) to the professional advisors of such party on the same terms of confidentiality;
- (f) which is already in the public domain; or
- (g) in connection with legal proceedings or steps being taken to remedy a breach or default under this Agreement by the other party.

For the purposes of this section 11.4, "Confidential Information" means proprietary information of either party such as data, plans, drawings, manuals, or specifications which have been provided by such party, its employees, contractors, agents, subcontractors, Affiliates to the other party pursuant to this Agreement or proprietary information either party conceived or developed by or for such party concerning construction practices, operation and maintenance practices, agreements, marketing plans and strategies, profits, costs, pricing and systems of procedure (provided that "Confidential Information" does not include information which was disclosed to the receiving party by a third party (unless, to the knowledge of the receiving party, the third party is under an obligation of confidentiality to the other party) or any information developed or

conceived by the receiving party without using the "Confidential Information" of the other party).

11.5 SEVERABILITY

If any provision of this Agreement is found or determined to be invalid, illegal or unenforceable it will be construed to be separate and severable from this Agreement and will not impair the validity, legality or enforceability of any other provisions of this Agreement, and the remainder of this Agreement will continue to be binding on the parties as if such provision had been deleted.

11.6 NO WAIVER

No waiver by either party of any default by the other in the performance of any of the provisions of this Agreement will operate or be construed as a waiver of any other or future default or defaults hereunder, whether of a like or a different character. To be binding, any waiver of any provision of this Agreement must be clearly expressed in writing to be signed by the waiving party.

11.7 BURDEN AND BENEFIT

This Agreement will enure to the benefit of and be binding upon the parties and their respective successors and permitted assigns.

11.8 GOVERNING LAW

This Agreement and all matters arising hereunder will be governed by the laws of British Columbia and the federal laws of Canada applicable in British Columbia.

11.9 ENTIRE AGREEMENT

This Agreement contains the whole agreement between the parties in respect of the subject matter hereof and there are no terms, conditions or collateral agreements express, implied or statutory other than as expressly set forth in this Agreement and this Agreement supersedes all of the terms of any written or oral agreement or understanding between the parties.

11.10 TIME OF ESSENCE

Time is of the essence of this Agreement.

11.11 FURTHER ASSURANCES

Each party will, at all times hereafter on demand by the other, execute and deliver or cause to be executed and delivered all such further documents and do all such further acts and things as may be reasonably requested by the other party to evidence, carry out and give full effect to the intent and meaning of this Agreement and to assure the completion of the transactions contemplated hereby.

11.12 AMENDMENTS TO BE IN WRITING

Except as set out in this Agreement, no amendment or variation of this Agreement will be effective or binding upon the Parties unless such amendment or variation is set out in writing and duly executed by the Parties.

11.13 FACSIMILE

This Agreement may be executed by the parties and transmitted by facsimile transmission and, if so executed, transmitted and received, this Agreement will for all purposes be effective as if the parties had delivered and executed the original Agreement and each party undertakes to provide the other party with a copy of this Agreement bearing original signatures forthwith upon demand.

11.14 SUBJECT TO LEGISLATION

Notwithstanding any other provision hereof, this Agreement and the rights and obligations of FEI and the SD under this Agreement are subject to all present and future laws, rules, regulations and orders of any legislative body, governmental agency or duly constituted authority now or hereafter having jurisdiction over FEI or the SD.

11.15 NO PARTNERSHIP

Nothing herein shall be deemed or construed to create a joint venture, partnership, employment or agency relationship between the parties for any purpose.

11.16 COUNTERPARTS

This Agreement may be executed in counterparts with the same effect as if the parties had signed the same document. All counterparts will be construed together and will constitute one agreement.

11.17 ASSIGNMENT

The SD may not assign this Agreement or any of its rights or obligations under this Agreement without the consent in writing of FEI, such consent not to be unreasonably withheld.

IN WITNESS WHEREOF the parties hereto have executed this Agreement as of the day and year first above written.

FORTISBC ENERGY INC.
by its authorized signatory:

**THE BOARD OF EDUCATION OF
SCHOOL DISTRICT NO. 37**
by its authorized signatory:

SCHEDULE "A"

BUILDINGS

During the term of this Agreement, the following buildings will be subject to this Agreement as long as the SD continues to own or operate them. The Annual Cost of Service will include the costs of providing service to all of the buildings that the SD enters into a Service Agreement with FEI during the term of this Agreement. In addition, FEI will be the exclusive provider of thermal energy to these buildings.

Address	Building
9240 - 112 nd Street	Annieville Elementary
5955 - 17A Avenue	Beach Grove Elementary
11315 - 75 th Avenue	Chalmers Elementary
5025 - 12 th Avenue	Cliff Drive elementary
11364 - 72 nd Avenue	Heath Elementary
4630 - 61 st Street	Holly Elementary
5016 - 44 th Avenue	Ladner Elementary
7186 - Brown Street	District Operations Centre
5500 - Admiral Boulevard	Neilson Grove Elementary
4585 - Harvest Drive	School Board Office
4750 - 57 th Street	Delta Manor Education Centre
750 - 53 rd Street	South Delta Secondary
735 - Gilcrest Drive	South Park Elementary
4629 - 51 st Street	Delta Secondary
9111 - 116 th Street	Deltaview Secondary
402 - 48 th Street	English Bluff Elementary
11777 Pinewood Drive	Pinewood Elementary
11339 - 83 rd Avenue	Richardson Elementary
11447 - 82 nd Avenue	North Delta Secondary

The SD may include additional buildings to this Appendix A at any time during the term of this Agreement, subject to FEI approval and BCUC approval if necessary. FEI will include the costs of providing service to those buildings in the Annual Cost of Service.

FEI may include additional buildings to this Appendix A at any time during the term of this Agreement, subject to BCUC approval if necessary, provided that FEI can demonstrate that the expansion of buildings will be beneficial to the SD.

SCHEDULE "B"

INITIAL MARKET RATE

Delta School District No. 37		2011/2012 Estimates
Buildings	#	19
Total Building Area	m ²	114,877
Weather Normalization		
Natural Gas	GJ	58,650
Electricity	MWh	1,300
Fossil Fuel GHG Emissions	tCO ₂ e	2,915
Thermal Energy	MWh	10,600
BAU Thermal Energy Annual Costs	\$/,000's	941
Initial Market Rate	\$/kWh	\$ 0.089
SD37 Negotiated Reduction to BAU	\$/,000's	(188)
SD37 Market Rate Rider	\$/kWh	\$ (0.018)

Exhibit I

This is Exhibit " I " referred to in the
affidavit of FRANK GEYER
made before me on AUGUST 10 2011
Eric Lambert Shirod
A Commissioner for taking Affidavits
for British Columbia

141

From: Bierlmeier, Grant
To: [Frank Geyer](#)
Cc: [Kostka, Vladimir](#)
Subject: RDA update
Date: July-04-11 5:45:03 PM
Attachments: [11-07-04 RDA eod .doc](#)

Frank,

Based on our discussion this morning, we have made some edits to the RDA document. The edits and explanation are as follows when comparing to the version you sent to Fortis on June 21, 2011:

Section 2.3 is moved from Article 3 as it fits better with termination.

Section 2.4 I have left in for now, but want to note that it is our position that this is better dealt with in the Service Agreements.

Section 4.1 should make it clear that inclusion of additional buildings into the RDA is for rate calculation purposes only physical connection to the energy systems can only occur through the Service Agreements for those sites.

Section 4.3 - I assumed that your change of the SD37 market Rate Rider was for clarity, but based on our discussion this morning, I now understand it was a negotiating point to index both the Market Rate and the SD37 Market Rate Rider. It is our position that the index should apply to the Market Rate since it is the reflection of the BAU, but not the negotiated discount since its purpose is to help produce savings in year one in particular. Therefore, it remains our position that indexing the SD37 Market Rate Rider is not appropriate. Accordingly, I have reworded this section to provide clarity on the application of the SD37 Market Rate Rider. Of note, the SD37 Market Rate Rider is available as long as you are paying the Market Rate, for the duration of the agreement, which produces a savings guarantee against BAU throughout the entire agreement totaling over \$3.8M if you remain on the Market Rate, not just year one, which is worth \$188k alone. Indexing that Rate Rider will mean that the savings will be more or less, than the negotiated amount.

We have also drafted some language that we feel will address your concerns regarding the BCUC approvals and potential assignment of the contract:

Section 6, 9 & 11 - I understand your concern to be that in the event Fortis is not able to obtain regulatory approval from the BCUC and Fortis subsequently decides to assign the agreement to an unregulated affiliate, there may be a risk that Fortis does not provide the same level of service that will occur if the BCUC regulates this service as we all expect and intend. In other words, that Fortis may not honour the spirit or intention of this agreement to provide utility service for thermal energy if we assign to a non-regulated affiliate. Once we commit the money to this project and build the infrastructure, our incentive is to operate the assets as we have set out in this agreement (even if we dont end up with BCUC oversight which I recognize is a possibility, even though it is a remote one in our opinion). We have put in some language into section 9 for your consideration that inserts the 180 days from your June draft into the conditions precedent, requiring us to effectively satisfy the conditions or

waive them within 180 days (as an aside, your lawyers position that we should specify each of the approvals is not unreasonable on the surface, and in the case of the RDA is likely only the BCUC acceptance, with potentially more approvals at the Service Agreement level depending on the technology being installed, however, for the sake of expediency, we are hoping that you can accept that language as written - we can talk about this more if you still have concerns about it). We have also drafted section 11 to clearly make the utility shareholders remain liable in the event that we assign the contract to an unregulated affiliate (also of note is that assignment to an unregulated affiliate does not permanently close the door on becoming subject to BCUC regulation as the tariff option survives and we may apply to the BCUC for regulation at any time in the future). Let me know if these changes to section 6, 9 and 11 satisfy your concerns and if they do, then I will run them through executive for final approval which I will require for these changes.

I think we are getting very close now. Ill be on the mainland tomorrow for a variety of things, not the least of which is a meeting with JCI, who I know are very keen to get working on this project (I also understand that there is a lot of excitement over there as well about this project). If we can get these clauses nailed down, then we can quickly move to the Service Agreements, which are less complex from the standpoint of logical construction, but more detailed in that they specify the actual sites and equipment and service delivery each one is a bit different, but all fairly uniform in their purpose.

Let me know if you need to discuss any of this, particularly the section 6, 9 & 11 material.

Cheers,

Grant Bierlmeier

Business Development Manager

T: 250.380.5794 | C: 250.896.3098

Terasen Gas is known as FortisBC effective March 1, 2011. My e-mail address has changed to [@fortisbc.com](mailto:grant@fortisbc.com). Please update your records accordingly. For more information on FortisBC, please visit fortisbc.com.

FORTIS BC | www.fortisbc.com | 1-800-468-6868

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ENERGY SYSTEM RATE DEVELOPMENT AGREEMENT

THIS AGREEMENT dated for reference the ◆ day of ◆, 2011.

BETWEEN:

THE BOARD OF EDUCATION OF SCHOOL DISTRICT NO. 37 (DELTA)
a corporation established under the School Act R.S.B.C. 1996, c. 412 having an
office at 4585 Harvest Drive, Delta, British Columbia, V4K 5B4
(the "SD")

OF THE FIRST PART

AND:

FORTISBC ENERGY INC., a company duly incorporated under the laws of the
Province of British Columbia, having its registered office at 10th Floor, 1111
West Georgia Street, Vancouver, B.C. V6E 4M3
(“FEI”)

OF THE SECOND PART

WHEREAS:

- A. The SD is the owner of certain buildings in the Delta School District located on lands in Delta, British Columbia, as more particularly described in Schedule A to this Agreement (the “Buildings”).
- B. The Parties intend to use commercially reasonable and good faith efforts to negotiate and enter into Energy System Services Agreements in respect of each of the Buildings, whereby FEI will provide thermal energy to such Buildings using Energy Systems that FEI will own, operate and maintain.
- C. The Parties wish to agree on a single rate for Thermal Energy that FEI delivers to the SD under each of the Energy System Services Agreements.

NOW THEREFORE THIS AGREEMENT WITNESSES THAT in consideration of the premises and the covenants, agreements, representations, warranties and payments set out herein, the receipt and sufficiency of which is hereby acknowledged by each Party, the Parties covenant and agree as follows:

ARTICLE 1 - INTERPRETATION

1.1 DEFINITIONS

In this Agreement, the following words and phrases have the meanings set out below and all other terms defined within the text of this Agreement will have the meanings so ascribed:

- (a) "Affiliate" has the meaning set out in the *Business Corporation Act*, S.B.C. 2002, c.57: and includes FortisBC Inc.
- (b) "AFUDC" means the Approval for Funds Used During Construction rate for FEI that the BCUC approves from time to time;
- (c) "Annual Period" means the period from July 1 to June 30 each year for the purpose of setting rates;
- (d) "Annual Cost of Service" means FEI's total cost of Services for all of the Buildings in respect of which the Parties have entered into Energy System Service Agreements at any time during the Term and that have been approved by the BCUC, including:
 - (i) the carrying cost of the total capital investment by FEI to provide Service to all of the Buildings in respect of which the Parties have entered into Energy System Service Agreements at any time during the Term and that have been approved by the BCUC, less any Capital Contributions, utilizing the capital structure of FEI, the debt financing rate in that capital structure and the benchmark rate of return on equity for utilities in British Columbia plus 50 basis points;
 - (ii) amortization, depreciation and tax costs;
 - (iii) direct costs;
 - (iv) Energy Purchase Costs;
 - (v) a reasonable amount for overhead allocation and administration;
 - (vi) the annual amount necessary to amortize the SD Deferral Account balance, either credit or debit, over the remaining years in the Term or ten (10) years, whichever is longer; and
 - (vii) any other amount that the BCUC determines that it should include from time to time;
- (e) "Agreement" means this agreement, including the preamble hereto and any schedules attached hereto and the terms "this Agreement", "hereof", "herein", "hereunder" and "hereinafter" and similar expressions refer to the Agreement and not to any particular section or other portion thereof and includes any agreement supplementary or ancillary thereto;
- (f) "BAU" means Business As Usual, as if no new Energy System were constructed in the Buildings;
- (g) "BCICAC" has the meaning given in Section 10.1;
- (h) "BCUC" means the British Columbia Utilities Commission;
- (i) "BCUC Acceptance" has the meaning given in Section 6.1;
- (j) "Buildings" have the meaning given in page one of this Agreement, and "Building" means any one of such Buildings;

- (k) "Business Day" means any day except Saturday and Sunday or any day on which banks are generally not open for business in Vancouver, British Columbia;
- (l) "Capital Contribution" means the amount, the SD provides to FEI that reduces the Net Book Value of assets that form the basis for calculating the cost of capital in the Annual Cost of Service;
- (m) "Cost of Service Rate" means the following amount:

$$((\text{FACS} - \text{EPC}) / \text{FTED}) + \text{Energy Rate}$$
 where:
 "FACS" = the forecast Annual Cost of Service;
 "EPC" = Energy Purchase Costs; and
 "FTED" = the Thermal Energy for the applicable Annual Period;
- (n) "Effective Date" means the date set out on Page One hereof;
- (o) "Energy Purchase Costs" means the cost of purchasing energy to supply all Energy Systems at all Buildings;
- (p) "Energy Rate" means the quotient of the forecast Energy Purchase Costs at the prevailing rates that the BCUC approves from time to time, and the forecast of Thermal Energy deliveries for the applicable Annual Period for all Buildings in ~~repeat~~ respect of which the Parties have entered into Energy System Service Agreements at any time during the Term and that have been approved by the BCUC;
- (q) "Energy Reimbursement" means the sum of:
 (i) the amount that FEI pays for electricity, natural gas or any other energy source, that the SD utilizes for any purpose and that FEI does not require to operate an Energy System that is either measurable by a sub-meter, or that the Parties estimate; plus
 (ii) the amount that the SD pays for electricity, natural gas, or other energy source, to operate an Energy System that is either measurable by a sub-meter, or that the Parties estimate;
- (r) "Energy System" means the equipment that FEI constructs and owns which will provides a Building its energy needs for space and ventilation heating, cooling and domestic hot water use, all as set forth in the Energy System Service Agreement for that Building;
- (s) "Energy System Service Agreement" means, in respect of any Building, the agreement that the Parties intend to enter into in respect of the construction, operation and maintenance by FEI of an ~~Energy~~ Energy System for that Building;
- (t) "Environment" includes the air (including all layers of the atmosphere), land (including soil, sediment deposited on land, fill, lands submerged under water, buildings, and improvements), water (including oceans, lakes, rivers, streams, groundwater, and surface

water), and all other external conditions and influences under which humans, animals, and plants live or are developed and "Environmental" will have a corresponding meaning;

- (u) "Expiry Date" means June 30, 2031 or the expiry of any renewal term thereof;
- (v) "FEI" means the Party so identified on page one of this Agreement, and its successors and permitted assigns;
- (w) "Governmental Authority" means any federal, provincial, regional, municipal, local or other government, governmental or public department, court, tribunal, arbitral body, commission, board, bureau or agency and any subdivision, agent, commission, board or authority thereof;
- (x) "Index Adjustment" means, at any point in time, the quotient of most recent natural gas index value for British Columbia from Statistics Canada with CANSIM vector number V41692506 divided by 112.0;
- (y) "Initial Market Rate" has a meaning given in Schedule B;
- (z) "Laws" means laws, statutes, regulations, bylaws, Permits and orders of any Governmental Authority having jurisdiction, including without limitation, Environmental Laws;
- (aa) "Market Rate" at any point in time means an amount equal to:
(Initial Market Rate ~~—SD Market Rate Rider~~) x Index Adjustment;
- (bb) "Monthly Charges" means that amount established pursuant to this Agreement that the SD is to pay for Thermal Energy deliveries to any Building from an Energy System;
- (cc) "Monthly Statement" has a meaning given in section 4.2;
- (dd) "Party" means a signatory to this Agreement, and the "Parties" means all of such signatories;
- (ee) "Permits" means all permits, licences, certificates, approvals, authorizations, consents and the like issued by any Governmental Authority;
- (ff) "Services" means those services to be provided by FEI to supply Thermal Energy to a Building from an Energy System;
- (gg) "SD" means the Party so identified on page one of this Agreement, and its successors and permitted assigns;
- (hh) "SD Deferral Account" records the cumulative difference between the Annual Cost of Service and revenues, including a provision for interest at the AFUDC rate;
- (ii) "SD37 Market Rate Rider" has a meaning given in Schedule B;
- (jj) "Term" means the term of this Agreement as defined in section 2.1;

- (kk) "Thermal Energy" means the amount of energy that FEI provides to the SD at all of the Buildings measured through a Thermal Energy Meter;
- (ll) "Thermal Energy Meter" means a device that complies with the International Organization of Legal Metrology recommendations for measuring thermal energy;
- (mm) "Thermal Energy Rate" means the Market Rate until the SD notifies FEI in writing that it elects to pay the Cost of Service Rate, after which time the Thermal Energy Rate means the Cost of Service Rate and the Market Rate will no longer be available.

1.2 SCHEDULES

The following Schedules, as may be amended from time to time, are incorporated by reference into this Agreement:

Schedule A	Buildings as amended pursuant to this Agreement
Schedule B	Initial Market Rate

1.3 INTERPRETATION

Except where the context requires otherwise or except as otherwise expressly provided, in this Agreement:

- (a) all references to a designated Article or section are to the designated Article or section of this Agreement unless otherwise specifically stated;
- (b) the singular of any term includes the plural, and vice versa, and the use of any term is equally applicable to any gender and, where applicable, body corporate;
- (c) any reference to a corporate entity includes and is also a reference to any corporate entity that is a successor by merger, amalgamation, consolidation or otherwise to such entity;
- (d) the preamble and all schedules referred to and attached to this Agreement are incorporated by reference and will form a part of this Agreement;
- (e) all sums of money which are referred to in this Agreement are in lawful money of Canada; and
- (f) the headings of the Articles and sections set out in this Agreement are for convenience only and will not be considered in any interpretation of this Agreement.

ARTICLE 2 - TERM AND TERMINATION

2.1 TERM

The term of this Agreement ("Term") commences on the Effective Date and continues until the Expiry Date, subject to renewal for the period specified in section 2.2, unless it is terminated earlier as authorized under this Agreement.

2.2 RENEWAL

This Agreement will automatically renew for periods of ten (10) years unless either Party provides written notice to the other Party no less than six (6) months prior to the Expiry Date.

2.3 ~~TARIFF OPTION~~

~~The Parties acknowledge and agree that FEI may apply at its own cost to the BCUC for approval of a general tariff for thermal energy delivery to comparable buildings. The SD, in its sole discretion, may elect at any time to pay such tariff rates for Thermal Energy if and when such tariff rates are approved by the BCUC, rather than the Thermal Energy Rate. The SD must notify FEI in writing of this election. Election of the tariff by the SD will result in termination of this Agreement and may, at the discretion of FEI, result in the termination of the Energy System Service Agreement for each Building, and the adoption of the tariff terms and conditions for each Building, subject to the approval of the BCUC if required by applicable Laws.~~

~~2.3.4~~ 4 TERMINATION

In the event of bankruptcy, insolvency or material breach of this Agreement by either Party, the other Party may terminate the Agreement, with notice to be delivered in written form.

ARTICLE 3 - SERVICE PROVISION

3.1 INTENT TO NEGOTIATE ENERGY SYSTEM SERVICE AGREEMENT

The Parties shall use commercially reasonable and good faith efforts to negotiate and enter into Energy System Service Agreements for each Building on mutually agreeable terms on or before the first anniversary of the date of this Agreement.

~~3.2~~ EXPANSION OPPORTUNITIES

~~If there is an opportunity to provide Services to other buildings, that the SD may or may not own, FEI shall present the proposal to the SD for approval. Any proposed expansion must be of benefit to the SD with no ill effect on the Building connected to the Energy System.~~

~~3.3~~ TARIFF OPTION

~~The Parties acknowledge that this Agreement may be subject to the approval of the BCUC. The Parties acknowledge and agree that FEI may apply at its own cost to the BCUC for approval of a general tariff for thermal energy delivery to comparable buildings. The SD, in its sole discretion, may elect at any time to pay such tariff rates for Thermal Energy if and when such tariff rates are approved by the BCUC, rather than the Thermal Energy Rate. The SD must notify FEI in writing of this election and this Agreement will terminate upon such notice, subject to the approval of the BCUC if required by applicable Laws.~~

3.4.3.2 EXCLUSIVITY

The SD hereby covenants and agrees with FEI that, during the Term the SD shall not supply, construct, install, operate or maintain any thermal energy system ~~other system~~ other than an Energy System to provide space heating and cooling and domestic hot water to any Building in respect of which the Parties have entered into an Energy System Services Agreement that then remains in force, or use or allow or consent to any person, firm or corporation other than FEI to supply or distribute thermal energy to any such Building.

ARTICLE 4 - RATES AND CHARGES

4.1 THERMAL ENERGY RATE

The Parties agree that the rates for Thermal Energy provided under the Energy System Service Agreements shall be as set forth in this Agreement.

Either Party may include additional buildings owned by the SD to Schedule A during the Term for the purposes of calculating the Annual Cost of Service, subject to (a) BCUC approval if necessary under applicable Laws and (b) the Parties entering into an Energy System Services Agreement in respect of such building on mutually agreeable terms.

FEI may include a thermal energy system that provides energy for space and ventilation heating, cooling and domestic hot water to one or more buildings owned by third parties in the calculation of the Thermal Energy Rate provided that doing so will not increase the Cost of Service Rate.

4.2 MONTHLY STATEMENTS

Subject to section 5.1, FEI will within 15 days following the end of each month deliver for each Building that enters into an Energy System Service Agreement, a statement setting out the Monthly Charges including all applicable taxes payable for that month (the "Monthly Statement").

On each Monthly Statement, FEI will provide for information purposes, the applicable Cost of Service Rate for that period until such time as the SD notifies FEI in writing that it wishes to pay the Cost of Service Rate for all Buildings.

4.3 ADJUSTMENTS TO THERMAL ENERGY RATE AND MONTHLY STATEMENTS

Each month, FEI will adjust the Thermal Energy Rate on the Monthly Statements for changes in the Market Rate and/or the Cost of Service Rate that are applicable from time to time. In addition, FEI will apply the relevant Energy Reimbursement amount to each Building, either positive or negative to the Monthly Statement for that Building.

During the period that the Thermal Energy Rate is equal to the Market Rate, FEI will add the SD37 Market Rate Rider to the Market Rate for the purpose of calculating the Monthly Charges to the SD as follows:

Market Rate + SD37 Market Rate Rider

4.4 ACCOUNTING AND REPORTING

FEI will maintain accounting records pertaining to the utility operations for the Buildings that FEI serves according to an Energy System Service Agreement that is subject to this Agreement. Each year, by March 31st, FEI will produce an estimate of the SD Deferral Account balance on July 1st of the upcoming year and the Annual Cost of Service for the upcoming Annual Period of the Agreement. FEI will file this information with the BCUC and copy the SD on each annual filing.

ARTICLE 5 - REPRESENTATIONS AND WARRANTIES

5.1 SD'S REPRESENTATIONS AND WARRANTIES

The SD hereby represents and warrants to FEI as follows, as of the Effective Date, and acknowledges that FEI is relying on these representations and warranties in entering into the transactions contemplated by this Agreement:

- (a) the SD has the full right, power and authority to enter into this Agreement;
- (b) all necessary action on the part of the SD has been taken to authorize and approve the execution and delivery of this Agreement and the performance by the SD of its obligations hereunder;
- (c) this Agreement and the performance of its obligations under this Agreement does not and will not breach any provisions of any other agreement or Law that is binding on or applicable to the SD as of the date of this Agreement;
- (d) the SD is not party to any action, suit or legal proceeding, actual or threatened, and there are no circumstances, matters or things known to the SD which might give rise to any such action, suit or legal proceeding, and there are no actions, suits or proceedings pending or threatened against the SD before or by any Governmental Authority, which could affect the SD's ability to perform its obligations under this Agreement.

5.2 FEI' REPRESENTATIONS AND WARRANTIES

FEI hereby represents and warrants to the SD as follows, as of the Effective Date, and acknowledges that the SD is relying on these representations and warranties in entering into the transactions contemplated by this Agreement:

- (a) FEI has the full right, power and authority to enter into this Agreement;
- (b) all necessary corporate action on the part of FEI has been taken to authorize and approve the execution and delivery of this Agreement and the performance by FEI of its obligations hereunder;
- (c) this Agreement and the performance of its obligations under this Agreement does not and will not breach any provisions of any other agreement or Law that is binding on or applicable to FEI as of the date of this Agreement;
- (d) FEI is not party to any action, suit or legal proceeding, actual or threatened, and there are no circumstances, matters or things known to FEI which might give rise to any such

action, suit or legal proceeding, and there are no actions, suits or proceedings pending or threatened against FEI before or by any Governmental Authority, which could affect FEI's ability to perform its obligations under this Agreement.

5.3 The representations and warranties set out in sections 5.1 and 5.2 hereof shall survive termination of this Agreement.

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ARTICLE 6 BRITISH COLUMBIA UTILITIES COMMISSION

6.1 REGULATORY REVIEW TERMINATION

6.1 Subject to section 6.3, either Party may terminate BRITISH COLUMBIA UTILITIES COMMISSION APPROVAL

~~THE PARTIES ACKNOWLEDGE THAT FEI MAY ASSIGN THIS AGREEMENT if, within one hundred TO AN AFFILIATE, AND fifty (150) days following ALL OBLIGATIONS OF THE Effective Date, PARTIES UNDER THIS AGREEMENT has not been accepted for filing by the BCUC as a [Fortis to advise on type of contract for BCUC approval purposes] contract, without conditions (such acceptance without conditions being herein called "BCUC Acceptance").~~

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6.2 REGULATORY FILING

~~FEI, on behalf of itself and the SD, rates and at its own cost, shall file the terms and conditions set out in this Agreement with the BCUC within a reasonable time after the Effective Date. FEI shall take all steps reasonably required to secure BCUC Acceptance, which shall consist of those procedural steps related to filing the Agreement and providing argument and witnesses in support of filing may be subject to approval by the British Columbia Utilities Commission.~~

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6.3 TERMINATION

A Party entitled to terminate under section 6.1 must do so by giving notice to terminate to the other Party at any time after the right to terminate arises pursuant to section 6.1, and prior to:

- (a) the date of issuance of the BCUC Acceptance; and
(b) the date that is (180) days after the Effective Date.

ARTICLE 7 - CONSEQUENTIAL LOSS

7.1 CONSEQUENTIAL LOSS

In no event will either Party or any of their respective officers, directors, employees, contractors or agents be liable to the other Party for any indirect or consequential loss, cost or expense whatsoever, including any loss of profits, revenues or other economic loss, suffered by the other Party or its officers, directors, employees, contractors or agents.

ARTICLE 8 - SURVIVAL

8.1 SURVIVAL

Upon expiry or earlier termination of this Agreement for any reason, all claims, causes of action or other outstanding obligations remaining or being unfulfilled as of the expiry or termination of this Agreement and all of the provisions of this Agreement relating to the obligation of either Party to account to or indemnify the other Party and to pay to the other Party any amounts owing as at the date of expiry or termination in connection with this Agreement will survive such expiry or termination.

ARTICLE 9 - CONDITIONS PRECEDENT

9.1 CONDITIONS PRECEDENT OF FEI

The obligation of FEI to carry out the transactions contemplated by this Agreement is subject to fulfillment of each of the following conditions on or before such date as may be specified, which conditions are for the sole benefit of FEI, and which may be waived by FEI in accordance with Section 9.2:

- (a) FEI obtaining all consents and approvals from regulatory or other applicable Governmental Authorities, including without limitation, the BCUC, required to complete the transactions contemplated herein will have been obtained on or before the 180th day following the Effective Date on terms and conditions relating to FEI or the operation of each ES, which are satisfactory to FEI acting reasonably having regard to its bona fide business interests; *[Note to Fortis: why is this clause needed?]*
- (b) FEI obtaining the approval by its board of directors of the terms and conditions of this Agreement on or before the 30th day following the Effective Date, provided that if such approval cannot be obtained by this date due to the fact that the board of directors has not yet considered the transaction FEI reserves the right to extend the period of time to that date when the board next convenes.

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9.2 FEI NOTICE OF WAIVER

If a condition set out in section 9.1 has not been satisfied on or before the date as may be specified for its fulfillment, FEI may waive compliance with the condition in whole or in part, in its sole discretion, by written notice to the SD, failing which delivery of written notice of satisfaction or waiver of such condition, this Agreement will, to the extent any further obligations of the Parties which remain unfulfilled, be null and void, without liability between the Parties hereto, and, neither Party will be under any further obligation to the other to complete the transactions or future transactions, as the case may be, contemplated by this Agreement.

ARTICLE 10 - DISPUTE RESOLUTION**10.1 REFERENCE TO ARBITRATION**

The Parties will attempt to resolve all disputes which may arise under, out of, in connection with or in relation to this Agreement by negotiation. They will provide full and timely disclosure to one another of all facts relevant to the disputes to facilitate those negotiations. If any such dispute remains unresolved, for any reason, fifteen (15) days after either Party requested the other Party to enter into negotiations to resolve it, or if the Parties agree to waive negotiations in respect of it, then either Party may submit that dispute for final resolution by arbitration administered by the British Columbia International Commercial Arbitration Centre ("BCICAC") under its "Shorter Rules for Domestic Commercial Arbitration". The seat of that arbitration will be Vancouver, British Columbia, Canada. The language of that arbitration will be English. Alternatively, the Parties may agree, within the 15 days referred to above, to submit that dispute for final resolution by arbitration in another manner.

10.2 BINDING DECISION

The decision of the arbitrator, regardless of what arbitration procedure is used, will, for all purposes of this Agreement, be final and binding on the Parties.

10.3 CONTINUATION OF SERVICES

Each of the Parties will perform all of its respective obligations under this Agreement notwithstanding any dispute between the Parties and during the resolution of any dispute in accordance with this Article 10.

10.4 COSTS

The Parties will each pay half of the costs and expenses of any arbitration, other than those incurred directly by the Parties, unless the arbitrator determines that one Party has prevailed, in which case the non-prevailing Party will pay all costs and expenses of the arbitration, but not any of those incurred directly by the prevailing Party.

ARTICLE 11 - GENERAL**11.1 SOLICITATION**

Nothing in this Agreement precludes either Party from soliciting or entering into, other contracts with the other Party.

11.2 NOTICES

Any notice or other communication required or permitted to be given under this Agreement will be effective only if in writing and when it is actually delivered (which delivery may be by telecopy or other telecommunications device) to the Party for whom it is intended at the following address or such other address in British Columbia as such Party may designate to the other Party by notice in writing delivered in accordance with this section 11.2:

(a) if to FEI:

FortisBC Energy Inc.
 10th Floor, 1111 West Georgia Street
 Vancouver, B.C.
 V6E 4M3

Attention: Gareth Jones
 Telephone: 250-380-5972
 Telecopy: 250-388-6876

(b) if to the SD:

Board of Education of School District No. 37 (Delta) 4585 Harvest Drive
 Delta, B.C.
 V4K 5B4

Attention: Frank Geyer
 Telephone: 604-952-5336
 Telecopy: 604-952-5375

11.3 CONFIDENTIALITY

Each Party will treat as confidential the terms of this Agreement and all Confidential Information (as defined below) of the other Party and will at all times during the term of this Agreement and for a reasonable time thereafter hold the terms of this Agreement and all Confidential Information of the Party in confidence and neither Party will, without the prior written consent of the other Party, disclose or divulge the terms of this Agreement or any Confidential Information of the other Party to any person, provided that nothing in this section 11.3 will restrict or prevent either Party from making any disclosure of such terms or any Confidential Information of the other Party:

- (a) which is reasonably necessary or desirable for such Party to carry out and give full effect to the terms, conditions and intent of this Agreement and the matters contemplated hereby;
- (b) which is required by any Law;
- (c) to any Governmental Authority;
- (d) to the directors, officers or employees of such Party or to an Affiliate of such Party or to the directors, officers or employees of an Affiliate of such Party;
- (e) to the professional advisors of such Party on the same terms of confidentiality;
- (f) which is already in the public domain; or
- (g) in connection with legal proceedings or steps being taken to remedy a breach or default under this Agreement by the other Party.

For the purposes of this section 11.3, "Confidential Information" means proprietary information of either Party such as data, plans, drawings, manuals, or specifications which have been provided by such Party, its employees, contractors, agents, subcontractors, Affiliates to the other

Party pursuant to this Agreement or proprietary information either Party conceived or developed by or for such Party concerning construction practices, operation and maintenance practices, agreements, marketing plans and strategies, profits, costs, pricing and systems of procedure (provided that "Confidential Information" does not include information which was disclosed to the receiving Party by a third Party (unless, to the knowledge of the receiving Party, the third Party is under an obligation of confidentiality to the other Party) or any information developed or conceived by the receiving Party without using the "Confidential Information" of the other Party).

11.4 SEVERABILITY

If any provision of this Agreement is found or determined to be invalid, illegal or unenforceable it will be construed to be separate and severable from this Agreement and will not impair the validity, legality or enforceability of any other provisions of this Agreement, and the remainder of this Agreement will continue to be binding on the Parties as if such provision had been deleted.

11.5 NO WAIVER

No waiver by either Party of any default by the other in the performance of any of the provisions of this Agreement will operate or be construed as a waiver of any other or future default or defaults hereunder, whether of a like or a different character. To be binding, any waiver of any provision of this Agreement must be clearly expressed in writing to be signed by the waiving Party.

11.6 BURDEN AND BENEFIT

This Agreement will enure to the benefit of and be binding upon the Parties and their respective successors and permitted assigns.

11.7 GOVERNING LAW

This Agreement and all matters arising hereunder will be governed by the laws of British Columbia and the federal laws of Canada applicable in British Columbia.

11.8 ENTIRE AGREEMENT

This Agreement contains the whole agreement between the Parties in respect of the subject matter hereof and there are no terms, conditions or collateral agreements express, implied or statutory other than as expressly set forth in this Agreement and this Agreement supersedes all of the terms of any written or oral agreement or understanding between the Parties, including without limitation the letter of intent between the Parties dated February 7, 2011.

11.9 TIME OF ESSENCE

Time is of the essence of this Agreement.

11.10 FURTHER ASSURANCES

Each Party will, at all times hereafter on demand by the other, execute and deliver or cause to be executed and delivered all such further documents and do all such further acts and things as may be reasonably requested by the other Party to evidence, carry out and give full effect to the intent and meaning of this Agreement and to assure the completion of the transactions contemplated hereby.

11.11 AMENDMENTS TO BE IN WRITING

Except as set out in this Agreement, no amendment or variation of this Agreement will be effective or binding upon the Parties unless such amendment or variation is set out in writing and duly executed by the Parties.

11.12 FACSIMILE

This Agreement may be executed by the Parties and transmitted by facsimile transmission and, if so executed, transmitted and received, this Agreement will for all purposes be effective as if the Parties had delivered and executed the original Agreement and each Party undertakes to provide the other Party with a copy of this Agreement bearing original signatures forthwith upon demand.

11.13 SUBJECT TO LEGISLATION

Notwithstanding any other provision hereof, this Agreement and the rights and obligations of the Parties under this Agreement are subject to all present and future laws, rules, regulations and orders of any legislative body, governmental agency or duly constituted authority now or hereafter having jurisdiction over FEI or the SD.

11.14 NO PARTNERSHIP

Nothing herein shall be deemed or construed to create a joint venture, partnership, employment or agency relationship between the Parties for any purpose.

11.15 ASSIGNMENT

Neither Party may assign this Agreement or any of its rights or obligations under this Agreement except:

- (a) with the consent of the other Party, such consent not to be unreasonably withheld, delayed or conditioned; or
- (b) in the case of FEI, to an Affiliate of FEI which is a "public utility" as defined in the *Utilities Commission Act*, R.S.B.C. 1996, c. 473 on notice to, but without the consent of, the SD, or
- ~~(b)~~(c) in the case of FEI, to an Affiliate of FEI which is not a "public utility" as defined in the *Utilities Commission Act*, R.S.B.C. 1996, c. 473 on notice to, but without the consent of, the SD provided that FEI shall remain liable for the obligations of

the assignee under this Agreement, unless otherwise agreed to in writing by the SD.

11.16 COUNTERPARTS

This Agreement may be executed in counterparts with the same effect as if the Parties had signed the same document. All counterparts will be construed together and will constitute one agreement.

IN WITNESS WHEREOF the Parties hereto have executed this Agreement as of the day and year first above written.

FORTISBC ENERGY INC.
by its authorized signatory:

**BOARD OF EDUCATION OF
SCHOOL DISTRICT NO. 37 (DELTA)**
by its authorized signatory:

Joe Strain, Secretary-Treasurer

SCHEDULE A

BUILDINGS

During the Term, each of the following buildings will be subject to this Agreement as long as the SD continues to own or operate such building then and there exists in force an Energy System Services Agreement in respect of such building. The Annual Cost of Service will include the costs of providing service to all of the buildings in respect of which the Parties enter into Energy System Service Agreements during the Term.

Address	Building
9240 - 112 th Street, Delta	Annieville Elementary
5955 - 17A Avenue, Delta	Beach Grove Elementary
11315 - 75 th Avenue, Delta	Chalmers Elementary
5025 - 12 th Avenue, Delta	Cliff Drive Elementary
11364 - 72 nd Avenue, Delta	Heath Elementary
4630 - 61 st Street, Delta	Holly Elementary
5016 - 44 th Avenue, Delta	Ladner Elementary
7186 - Brown Street, Delta	District Maintenance Facility
5500 - Admiral Boulevard, Delta	Neilson Grove Elementary
4585 - Harvest Drive, Delta	School Board Office
4750 - 57 th Street, Delta	Delta Manor Education Centre
750 - 53 rd Street, Delta	South Delta Secondary
735 - Gilcrest Drive, Delta	South Park Elementary
4629 - 51 st Street, Delta	Delta Secondary
9111 - 116 th Street, Delta	Delview Secondary
402 - 48 th Street, Delta	English Bluff Elementary
11777 Pinewood Drive, Delta	Pinewood Elementary
11339 - 83 rd Avenue, Delta	Richardson Elementary
11447 - 82 nd Avenue, Delta	North Delta Secondary

~~Either Party may include additional buildings to this Schedule A during the Term, subject to (a) BCUC approval if necessary under applicable Laws and (b) the Parties entering into an Energy System Services Agreement in respect of that building on mutually agreeable terms.~~

SCHEDULE B

INITIAL MARKET RATE

Delta School District No. 37		2011/2012 Estimates
Buildings	#	19
Total Building Area	m ²	114,877
Weather Normalization		
Natural Gas	GJ	58,650
Electricity	MWh	1,300
Fossil Fuel GHG Emissions	tCO ₂ e	2,915
Thermal Energy	MWh	10,600
Business as Usual ("BAU") Thermal Energy Annual Costs	\$/,000's	941
Initial Market Rate	\$/kWh	\$ 0.089
SD37 Negotiated Reduction to BAU	\$/,000's	(188)
SD37 Market Rate Rider	\$/kWh	\$ (0.018)

Exhibit J

This is Exhibit "J" referred to in the affidavit of FRANK GEYER made before me on AUGUST 20 18
Enik Lambel Shirza
A Commissioner for taking Affidavits for British Columbia

From: Bierlmeier, Grant
To: Frank Geyer
Cc: Kostka, Vladimir
Subject: RE: Documents
Date: September-12-11 8:53:49 AM

Here is FEI's response to my query about their ability to unilaterally switch to tariff under the RDA without us being able to consent to it...

F

----- Original Message -----

Message Sep-12-11 8:53 AM
From: "Bierlmeier, Grant" <Grant.Bierlmeier@fortisbc.com>
To: Frank Geyer
Cc: "Kostka, Vladimir" <Vladimir.Kostka@fortisbc.com>
Subject: RE: Documents
Attachments: Attach0.html Uploaded File 19K

Right,

We covered a lot of ground at the lunch meeting, so while I bringing this up, perhaps there was just a lot going on at the time.

When we met with the BCUC, they gave us some counsel on the RDA. They indicated that first and foremost, to try to have it emulate the standard cost of service as much as possible and second to make any deviations from the standard cost of service as clear as possible.

The market rate is a deviation from the standard cost of service. Albeit a necessary one to provide you, the SD with the guarantee that you need for your board. The issue that we saw was that since only the SD had the choice to switch, it raises the potential that if you (Frank G) are no longer there, and new people who do not understand what the real purpose of the market rate is begin to administer the contract, then they may not switch to the cost of service even if it makes sense to. So, we put in an election for FEI to switch, subject to BCUC approval. You might say, shouldn't we need SD agreement? Well, if the SD agrees, then the SD will simply elect to switch. The FEI election is simply to give both FEI and the BCUC an out to move to cost of service. The nuance here is that BCUC approval is required to switch, so, since the BCUC looks after the interests of customers, FEI would need to present a compelling argument that moving to cost of service is in the interest of the SD, even though the SD does not agree. No small task to say the least (not even sure what kind of argument it would have to be at the moment if you know what I mean).

If you want to discuss more, please don't hesitate to call or reply.

Thanks for your attention on this Frank,

Grant

From: Frank Geyer [<mailto:fgeyer@deltasd.bc.ca>]
Sent: Monday, September 12, 2011 8:09 AM
To: Bierlmeier, Grant
Cc: Kostka, Vladimir
Subject: Re: Documents

Thanks Grant. I have reviewed the draft BCUC application, briefing note and RDA so far and all looks good, save for a few questions that I need answered in the RDA regarding FEI application to move to tariff rate apparently without SD37 election to do so...

Will pore through the ESSA later today.

Frank

"Bierlmeier, Grant" <Grant.Bierlmeier@fortishc.com> on September-09-11 at 5:02 PM -0700 wrote:
 Frank,

I am attaching four files for you:

☐ Briefing note about the Act to help you understand what regulation means to the School District and how it addresses your concerns

☐ Latest drafts of the ESSA and the RDA. I believe that these address the items we all discussed. In the vent that you see something in here that gives you concerns please contact us immediately and we'll resolve it. There has been a lot of discussions and back and forth with documents, so I am giving you clean versions of these, except for some margin notes in the ESSA. These documents should now make it clear that we are proceeding as a BCUC regulated public utility and that you get the rate rider at all times and that we can also apply to the BCUC to move to cost of service.

☐ Draft of the BCUC submission. We will be working with BCUC staff to refine this if necessary.

It would be good if we can schedule a meeting to go over this material so that we can get it signed off right away.

☐

Once we have a discussion, then we can get sign off on these and begin the regulatory approval process and ultimately get on with construction and commissioning.

Thanks,

Grant Bierlmeier

Business Development Manager

T: 250.380.5794 | C: 250.896.3098

Terasen Gas is known as FortisBC effective March 1, 2011. My e-mail address has changed to [@fortisbc.com](mailto:grant.bierlmeier@fortisbc.com). Please update your records accordingly. For more information on FortisBC, please visit fortisbc.com.

FORTIS BC |

This e-mail is the property of FortisBC Holdings Inc. and/or its affiliates in British Columbia and may contain confidential material for the sole use of the intended recipient(s). Any review, use, distribution or disclosure by others is strictly prohibited. FortisBC Holdings Inc. and its affiliates do not accept liability for any errors or omissions which arise as a result of e-mail transmission. If you are not the intended recipient, please contact the sender immediately and delete all copies of the message including removal from your hard drive. Thank you.

Exhibit K

This is Exhibit " K " referred to in the affidavit of FRANK GEYER made before me on AUGUST 20 18
Edna Campbell-Shirred
A Commissioner for taking Affidavits for British Columbia

"Bierlmeier, Grant"

<<mailto:Grant.Bierlmeier@fortisbc.com>Grant.Bierlmeier@fortisbc.com<mailto:Grant.Bierlmeier@fortisbc.com>
<<mailto:Grant.Bierlmeier@fortisbc.com>mailto:Grant.Bierlmeier@fortisbc.com>> on September-15-11 at 1:48 PM

-0700 wrote:
Frank

We can accept your change listed below Frank for section 2.3 as it relates to the tariff. However, I think there may be some confusion as to section 2.3 and what is the tariff and what is the Cost of Service(Section 2.3 is referred to erroneously in the Thermal Energy Rate definition). The tariff is a general access tariff, but the Cost of Service rate is simply your cost of service under these contracts.

The symmetry you suggest requiring the consent of each party before switching to tariff is reasonable because the tariff is unknown as of today. So, that is fine.

However, while I trust you to be reasonable Frank, since I know you understand this deal, I don't know what mindset will prevail at the District in 10 or 15 years from now. As of now, we all want to get to Cost of Service, but you need proof that it will be beneficial, which is what the market rate gives you so that you can get some comfort that COS is going to be reasonable before switching. We would go straight to COS, but this way, with the market rate, you have the chance to watch and ensure that the costs are in line with expectations first. What worries me is in 10 or 15 years from now, if the District is still on the market rate, the people administering the contract may not know what our intent was today and may not elect or agree to go to COS rates, even if there are good reasons to do it. Sometimes it is the reality of bureaucracy.

By giving FEI the ability to ask the BCUC to move the District to COS under the contract, FEI has at least a tiny bit of control over the process. BCUC approval is still necessary, which is to the benefit of the District. If FEI needs District consent to ask the BCUC, then implicitly, the District also wants to move to COS, which does not require BCUC approval. If that is true, then the District will simply elect to pay the COS rate, which means there is no reason to have a clause for FEI to apply to the BCUC to move the District to COS the BCUC will always be the decision maker and the BCUC must consider the District interests.

So, I'd propose to eliminate the reference to section 2.3 in the thermal energy rate definition, but to change section 2.3 as per your proposal below. I hope you find this reasonable.

Grant

Exhibit L

BCUC Web Administration

This is Exhibit " L " referred to in the affidavit of FRANK GEYER made before me on AUGUST 20 18 Ernie Lambert-Howard
A Commissioner for taking Affidavits for British Columbia

Applications

- Current Applications
- Archived Applications
- Create Application Profile

Documents

- Current Documents
- Submit Document

Users

- Current Users
- Registration
- Distributed List

Others

- Companies
- Maintain Dropdown Lists
- Maintain Document Types

Edit User

Last Name, First; e.g. Smith, John

Name*: Geyer, Frank

Professional Designation: PEng, FMA

Organization: Board of Education of School District No. 37 (Delta)

Job Title: Director of Facilities & Planning

Representing: Board of Education of School District No. 37 (Delta)

User Type*: Applicant Interested Party Intervenor Other

Address*: 4585 Harvest Drive

City*: Delta

Province*: BC

Postal Code*: V4K 5B4

Phone*: 604-952-5336

Cell/Pager: 604-616-8565

Fax: 604-952-5375

Primary Email: fgeyer@deltasd.bc.ca

to:

Email 2:

Email 3:

Email 4:

Role*: EndUser

Special Notes:

Copy

Approved Status: Approved?
Only approved users will be allowed to access submit file function.

* - Required

Change user name and password

User Name* (No Spaces): removed

Password* (No Spaces):

Register as intervenor or interested party for the following applications

Applications: (Hold the Ctrl key down to select multiple applications)

- BC Hydro 2011 LGS Rate Proposed Electric Tariff Supplement I
- BC Hydro 2012-2014 Revenue Requirements
- BC Hydro City of New Westminster Operating Agreement TS N
- BC Hydro CPCN-Dawson Creek/Chetwynd Area Transmission P
- BC Hydro Net Metering Service
- BC Hydro Ruskin Dam Upgrade Project
- BC Hydro Tariff Supplement No. 74 CBL Guidelines and Adjust
- Birds Eye Cove CPCN RRA Tariffs
- Direct Energy Reconsideration G-63-08
- FEU Amalgamation and Rate Design Phase 'A'
- FortisBC Energy Alternative Energy Solutions Inquiry
- FortisBC Energy Delta School District 37 Thermal Energy Serv
- FortisBC Energy Temporary Service Agreement for LNG
- FortisBC Energy Utilities 2012-2013 Revenue Requirements &
- FortisBC Inc 2012-2013 Revenue Requirements and Review of
- FortisBC Residential Inclining Block Rate Application (RIB)
- MRS Determination of Reference Amount for a Confirmed Viola
- River District Energy CPCN

Save

Current Date: 12/6/2011
8:42:11 AM

Exhibit M

ALANNA GILLIS
ACTING COMMISSION SECRETARY
Commission.Secretary@bcuc.com
web site: http://www.bcuc.com



This is Exhibit " M " referred to in the
affidavit of FRANK GEYER
made before me on AUGUST 20 18
Eric Campbell
A Commissioner for taking Affidavits
for British Columbia

173

SIXTH FLOOR, 900 HOWE STREET, BOX 250
VANCOUVER, BC CANADA V6Z 2N3
TELEPHONE: (604) 660-4700
BC TOLL FREE: 1-800-663-1385
FACSIMILE: (604) 660-1102

Log No. 37994

VIA EMAIL

fgeyer@deltasd.bc.ca

January 18, 2012

FEI DELTA SCHOOL DISTRICT 37
THERMAL ENERGY SERVICE CONTRACTS CPCN
EXHIBIT A-10

Mr. Frank Geyer
Director, Facilities and Planning
Board of Education of School District No. 37 (Delta)
4585 Harvest Drive
Delta, BC V4K 5B4

Dear Mr. Geyer:

Re: FortisBC Energy Inc.
Project No. 3698648
Application for Certificate of Public Convenience and Necessity
for Approval of Contracts and Rate for Public Utility Service to
Provide Thermal Energy Service to Delta School District Number 37

Enclosed please find Commission Information Request No. 1 to Delta School District Number 37 (Delta SD).

Pursuant to Commission Order G-205-11, Delta SD is to reply to this Information Request by Wednesday, January 25, 2012. Please file your responses in accordance with the Commission Filing Protocol.

Yours truly,

Alanna Gillis

elm

Enclosure

cc: Registered Interveners
(FEI-SD37-TES-RI)

BRITISH COLUMBIA UTILITIES COMMISSION
Information Request No. 1 to Delta School District Number 37

FortisBC Energy Inc. (FEI)
Application for a Certificate of Public Convenience and Necessity (CPCN) for Approval of Contracts and Rates for Public Utility Service to Provide Thermal Energy Service to Delta School District Number 37 (the CPCN Application)

1.0 BENEFITS OF COMMISSION OVERSIGHT

Reference: Exhibit B-3, FEI Response to BCUC 1.10.3, p. 35; UCA Section 45

On page 35 of their response to the British Columbia Utilities Commission (Commission, BCUC), FEI states that:

“Yes, FEI believes that both it and the SD are knowledgeable and sophisticated parties that are capable of negotiating contracts that meet and protect their own needs and interests.

For the SD, as explained in response to BCUC IR 1.10.1, it needs a thermal energy system that will enable it to obtain reliable thermal energy that it requires on an ongoing basis at reasonable prices and reduce their carbon footprint at the same time. As FEI understands it, the SD has access to professional engineers, technicians, financial professionals and legal services during the negotiations, suggesting to FEI that the SD is adequately knowledgeable and sophisticated to look after their own interests and to ensure that each aspect of the contracts is satisfactory legally, financially, and operationally. Several contract provisions demonstrate the School District’s sophistication. For example, the contracts contain the “subject to BCUC approval” condition in the agreements. FEI believes the School District understands the cost of service model employed in the rate design here and the Commission’s regulatory oversight role in approving the agreements and rates contained therein and in ensuring the transparency of the process for the benefits of the general public, including the School District’s own constituents.

Indeed, the School District desires the Commission’s oversight role. Additionally, the contract contains a dispute resolution mechanism, which allows the School District to seek remedies if and when disputes arise. The contracts with the SD were executed following extensive negotiations and final execution of the agreements by the SD demonstrates that it is satisfied that its objectives have been met.”

- 1.1 The Commission would like to hear from Delta School District Number 37 (Delta SD) to better understand what aspects of regulation are of most interest or concern to the Delta SD. What does the Delta SD see as the benefit of being regulated by the Commission?
- 1.2 Are there any concerns that the Delta SD has about regulation under the Commission?
- 1.3 Is the Delta SD aware that being regulated by the Commission does not necessarily require a cost-of-service based rate? For instance, the range of options may include the Commission accepting a rate negotiated between the parties, without a detailed review.

According to Section 45(8) of the *Utilities Commission Act* (UCA), the Commission must not give its approval for a CPCN, unless it determines that it is “necessary for the public convenience and properly conserves the public interest.”

- 1.4 Should the Commission accept the Delta SD signing the terms of the agreement as sufficient evidence that the application is in the public interest?
- 1.5 If the Commission reaches the conclusion that the project as currently structured is not in the interests of the Delta SD, should the Commission deny the CPCN, notwithstanding the fact the Delta SD entered into the contract freely?

2.0 EXPECTATIONS OF THE COMMISSION

Reference: Exhibit A2-6, ESAC Evidence, pp. 24-25

In a proceeding currently before the Commission (AES Inquiry), a Registered Intervener the Energy Services Association of Canada (ESAC) submitted evidence, some of which is quoted below:

“In the case of thermal energy projects, a regulated Cost of Service model transfers all of the risks associated with the capital and operating costs of the asset to the thermal customer. It appears that the only risk that the FEU would undertake in owning and operating a thermal asset is the risk of prudence and all other risks would be absorbed by the thermal customer...”

ESAC further submits that irrespective of the initial tariff agreed to by the Delta SD, all the cost would be absorbed by Delta SD.

- 2.1 Does the Delta SD agree that the risk of cost overruns is absorbed by Delta SD?

3.0 PROJECT ALTERNATIVES CONSIDERED

Reference: Exhibit A2-7, Staff filing Evidence from the AES Inquiry, ESAC Response to BCUC 1.18.1, p. 33

In the AES Inquiry, ESAC states on page 33 of their response to the BCUC 1.18.1 in Exhibit A2-7 that:

“It should be stressed that the carbon neutral requirement for school districts does not mandate that they actually reduce emissions, only that they purchase offsets for what they do emit. This is intended to alter the capital expenditure decision process for school districts towards lower carbon solutions, but in the absence of any such capital, districts are not obligated to reduce actual emissions. They certainly are not obligated to do it in a manner that could result in serious operating budget problems for them.

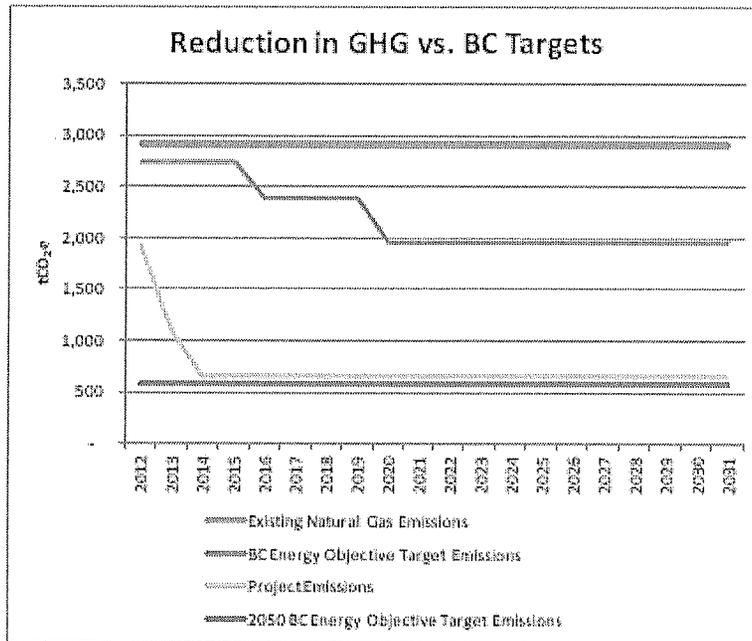
To put things into perspective, the reduction in carbon emission for the proposed 19-school Delta SD project represents an annual emissions offset savings of only \$55,000 while the current capital cost estimate is approximately \$6.5 million. This would appear to be an excessive investment if the objective is to reduce emissions.”

- 3.1 According to ESAC, the Delta SD is not obliged to make emissions reductions, only to purchase sufficient offsets to cover the Delta SD’s greenhouse gas (GHG) emissions. Do you agree with the way that ESAC has described the Delta SD’s carbon-neutral obligations? If not, please explain the Provincial Carbon Neutral Requirements under the BC Climate Action Plan for school districts for 2012 and beyond.
- 3.2 Did FEI ever present the Delta SD with a comparison of the avoided carbon offset costs and the total capital costs of the project?
- 3.3 Did the Delta SD consider any other lower cost options, such as an all gas solution, replacing the existing boilers with high-efficiency boilers? If not, what were the main criteria for not doing so?

4.0 TARGET FOR GHG EMISSION REDUCTIONS

Reference: Exhibit B-3, BCUC 1.6.1

The figure provided by FEI in response to BCUC 1.6.1 has been duplicated here for ease of reference.



- 4.1 How was the level of the SD project target emissions reductions shown on the chart determined?
- 4.2 In response to BCUC 1.6.1.2, FEI states that "In FEI's view the project as currently configured advances the SD's objectives the furthest within their budgetary constraints." Does the Delta SD share this view?

5.0 CRITERIA FOR EVALUATING THERMAL ENERGY SOLUTIONS

Reference: Exhibit B-3, BCUC 1.11.1

"To the best of FEI's knowledge, the general criteria for the schools was to lower GHG emissions, keep energy payments at or below current energy costs, and to retrofit the largest number of schools."

- 5.1 Does this accurately describe the Delta SD's view of the general criteria for the project?
- 5.2 If so, if some factors are more important than others, please indicate the relative weighting that would be applied to each of the criteria.
- 5.3 If this does not accurately describe the Delta SD's view of the general criteria for the project, please describe the Delta SD's view of the general criteria.

6.0 CARBON NEUTRALITY OBLIGATIONS

Reference: Exhibit B-3, BCUC 1.29.2

- 6.1 To the extent that the proposed system does not reduce the current GHG levels to the levels expected in this project, please explain how the Delta SD would meet its carbon neutral obligations within its budget constraints.

- 6.1.1 To the extent the Delta SD has to purchase additional carbon offsets, who would be responsible for the costs? Are these costs included in the cost of service rate?

7.0 PACKAGE SOLUTION

Reference: Exhibit B-3, BCUC 1.22.1 through 1.22.6

In the CPCN Application FEI states “This approach to providing thermal energy enables FEI to pool the costs and benefits of all buildings in a manner that optimizes the overall environmental benefits of employing innovative technologies that utilize clean, renewable resources, while managing the rates for thermal energy within the budgetary constraints of the SD.”

In response to BCUC 1.2.1, regarding whether each of the standalone locations would be considered viable without the “pooling” effect, FEI stated:

“Without the “pooling” effect, each stand alone location is constrained by the financial envelope of that particular site. This is an artificial constraint though, since the School District is responsible for their budget and emissions at a district level, not a site by site level. The logical outcome of such an approach suggested in the question would be high efficiency natural gas boilers at most sites, with the possibility of a few geo-exchange or air source heat pumps at other sites. FEI has not done a study as suggested in the question because both the SD and FEI understand at face value that the pooling approach is a more efficient approach. The economy of scope that occurs by pooling sites enables the use of combinations of multiple technologies to render thermal energy that result in a more efficient outcome overall than approaching each site as a separate business case. This is a crucial component of the project and the overall business model.”

- 7.1 What efficiencies does the Delta SD believe the pooling approach achieves? For example, operational efficiencies, administrative efficiencies, etc.
- 7.2 Is the Delta SD view that this pooling approach results in the outcome that best meets the Delta SD’s objectives for the project? Please describe the objectives and elaborate on how the pooling approach helps to meet these objectives.

8.0 SERVICE PROVIDER SELECTION PROCESS

Reference: Exhibit B-3, BCUC 1.87.1

In response to BCUC 1.87.1, FEI states:

“FEI understands from the SD that other companies had been soliciting the SD over the last number of years, but did not bid against them in a formal RFP or RFQ process. FEI was able to provide a solution that met the SD’s needs.”

- 8.1 Please confirm that FEI was not required to bid against other service providers in a formal RFP or RFQ process.
- 8.2 Did the Delta SD conduct a formal RFP or RFQ process for the project in the past?
- 8.3 What are the Provincial policy requirements that the Delta SD must meet to comply with projects of this nature? For instance, is the Delta SD required to go through BC Bid services?

9.0 THERMAL ENERGY SYSTEM (TES) ALTERNATIVES CONSIDERED

Reference: Exhibit B-5, Corix 1.8.5

In response to Corix 1.8.5, FEI indicated that two previous project configurations were considered for the Delta SD project:

- one with 11 closed loop and 8 open loop geo-exchange systems, and
- one with 8 boiler upgrades, 3 closed loop geo-exchange systems and 8 loop geo-exchange systems.

9.1 To what extent was the Delta SD involved in evaluating each of these two alternatives?

9.2 Please describe the primary pros and cons of each of these alternatives, as the Delta SD understands them, and the reasons these alternatives were rejected.

10.0 TECHNOLOGY SCREENING CRITERIA

Reference: Exhibit B-1, Section 2.4.1, p.16; Exhibit B-3, BCUC 1.32.1

"It is noteworthy that the 15 buildings that the SD originally switched to air source heat pumps still have significant peak demand requirements from their redundant backup systems, although they have reduced emissions at a relatively low capital cost." (Exhibit B-1, p.16)

In response to BCUC 1.32.1, in which the Commission asked FEI if any of these 15 buildings retrofitted with air-source heat pumps use natural gas for backup, FEI did not directly answer the question but noted that "FEI has not specifically assessed the back-up systems for the 15 buildings but made the comment based on the general operating characteristics of air-source heat pumps."

10.1 Please describe the criteria and evaluation process that the Delta SD employed in the technology selection process used to determine the appropriate energy system for these 15 buildings.

10.1.1 What back-up systems did the Delta SD choose to have installed at each of these 15 sites? Please list all that apply.

10.2 Was FEI (or its predecessor Terasen Gas Inc.) or FortisBC Alternative Energy Services Inc. (or its predecessor Terasen Energy Services Inc.) involved in the technology screening process that resulted in the selection of the air-source heat pump technology for these 15 sites? If so, describe which entity and the nature of the involvement.

11.0 TRANSITION FROM NON-REGULATED AFFILIATE TO REGULATED UTILITY

Reference: Exhibit A2-5

11.1 Exhibit A2-5 shows the Delta SD webpage. The scroll window indicated that the business development for thermal energy service was initially carried out with Terasen Energy Services Inc., the non-regulated business affiliate of FortisBC Energy Inc. Since Delta SD's service agreement was signed with FortisBC Energy Inc., please describe the transition of Delta SD's dialogue from Terasen Energy Services Inc. to FortisBC Energy Inc.

12.0 OWNERSHIP OF THERMAL ENERGY SYSTEM

Reference: Exhibit B-4, BCSEA 1.9.1

"FEI is aware that SD37 has, like all school boards, budgetary constraints; however whether it is impossible for SD37 to own the TES system due to legal constraints on the debt it can acquire, must be answered by SD37."

12.1 Are there any legal, contractual, financial, or budgetary constraints for Delta SD to own the thermal energy system in the future, as suggested in this Application?

13.0 FORTISBC PSECA ELIGIBILITY CRITERIA, TERMS AND CONDITIONS

Reference: Exhibit B-4, Attachment 5.6 to BCSEA 1.5.6; Exhibit B-3, BCUC 1.22.3

Attachment 5.6 to BC Sustainable Energy Association's (BCSEA) Information Request 1.5.6, sets out the Program Eligibility Requirements for the FortisBC Energy Inc./FortisBC Energy Vancouver Island Inc. (defined as FortisBC in the referenced document) Public Sector Energy Conservation Agreement (PSECA) Initiative. One of the eligibility requirements is listed as:

"The proposed building or facility must remain a natural gas consumer after the proposed energy savings measures have been implemented."

In response to BCUC 1.22.3, FEI states "Thermal energy services are technology agnostic and provide solutions that meet customer needs in the most efficient manner possible, utilizing available technologies. Regarding thermal energy solutions, the goals of the customer must be addressed when arriving at a thermal energy solution for the customer."

13.1 Please confirm that these FortisBC PSECA Program Eligibility Requirements and General Terms and Conditions apply to the \$116,790 of EEC funding incentives approved for the Delta SD.

13.2 To what extent did the FortisBC PSECA Program Eligibility Requirements influence or determine the criteria used by the Delta SD and/or FEI to screen, evaluate and select the technology for the thermal energy systems for the 19 sites included in the Application.

13.2.1 Did the FortisBC PSECA Program Eligibility Requirements prevent the Delta SD from considering an all-electric thermal energy system?

13.2.2 If so, would this imply the thermal energy system selection process was not "technology agnostic" as described by FEI in response to BCUC 1.22.3?

Attachment 5.6 to BCSEA 1.5.6, also sets out the General Terms and Conditions for the FortisBC PSECA Initiative. Section 3.6 states "FortisBC will have no right title or interest in the equipment or systems which comprise the Energy Savings Measures which are eligible for and which ultimately receive Funding."

13.3 Please confirm that FEI, rather than the Delta SD, will own the thermal energy systems for the 19 Delta SD sites.

Section 5.4 of the FortisBC PSECA Initiative General Terms and Conditions states "The Funding is conditional upon Fortis BC's on-site inspection, final acceptance and written approval of the installed Energy Savings Measures. If FortisBC determines, at its sole discretion, that the installed Energy Savings Measures differ substantially from the approved Energy Savings Measures, the Applicant must have the approved Energy Study updated to reflect such modifications, and must forward the results to FortisBC for review."

13.4 Please confirm that under Section 5.4 of the FortisBC PSECA Initiative General Terms and Conditions, FEI is solely responsible for determining whether the installed Delta SD thermal energy systems qualify for the approved funding.

- 13.5 Does the Delta SD consider it best practices to require a third party to verify the Energy Savings Measures have been achieved?
- 13.6 Under the terms of the Energy System Service Agreements and the Energy System Rate Development Agreement between FEI and SD, is FEI required to warrant that the thermal energy systems that are to be installed by FEI will deliver the approved Energy Savings Measures?
- 13.7 If not, what comfort does Delta SD have that it will receive the Energy Savings Measures it has contracted for with FEI?

14.0 CURRENT GAS SUPPLY ARRANGEMENTS

Reference: Exhibit B-3, BCUC 1.57.5; Exhibit B-1, Appendix D

FEI has provided the following information for each of the sites proposed in the CPCN Application:

Site	Rate Schedule	Natural Gas Supplier (Marketer)
Annieville Elem.	23	Yes
Beach Grove Elem.	2U	Yes
Chalmers Elem.	2U	Yes
Cliff Drive Elem.	2	No
Delta Manor Elem.	2U	Yes
Delta Sec.	2U	Yes
Delview Sec	23	Yes
English Bluff Elem.	23	Yes
Heath Elem.	2U	Yes
Holly Elem.	2U	Yes
Ladner Elem.	2U	Yes
Neilson Grove Elem.	2U	Yes
North Delta Sec.	23	Yes
Pinewood Elem.	2U	Yes
Richardson Elem.	2U	Yes
School Board Office	2U	Yes
South Delta Sec.	23	Yes
South Park Elem.	2U	Yes
District Operations Centre	2U	Yes

The table provided in response to BCUC 1.57.5 indicates that a number of the Delta SD sites are currently supplied by a marketer under either the Customer Choice program (Rate Schedule 2U) or a transportation contract (Rate Schedule 23).

- 14.1 In the event the Delta SD currently has a contract with a marketer for gas supply for which the term extends beyond the date that FEI effectively takes on the role of natural gas distribution service customer at the Delta SD site, do the Delta SD's contracts with the gas supply marketers contemplate FEI taking over as the natural gas customer?
- 14.2 Will these gas supply contracts be terminated effective the date FEI takes ownership of the thermal energy system and, if so, will any exit fees or financial penalties be incurred by the Delta SD for early termination of these supply contracts?

14.2.1 Who would be responsible, the Delta SD or FEI, for the costs of early termination of these contracts and will the costs be considered part of the project costs and thus part of the cost of service?

14.2.2 If so, is the Delta SD aware whether FEI has taken these costs into consideration when forecasting the cost of service rates presented in Appendix D?

14.3 To the best of the Delta SD's knowledge, do the terms of Rate Schedule 2U restrict switching to another Rate Schedule for any of the Delta SD sites currently supplied under Rate Schedule 2U?

14.4 Will any marketer gas supply contracts be assigned to FEI?

15.0 DELTA SD BUDGET CYCLE

Reference: Exhibit B-3, BCUC 1.66.2

FEI states that "The setting of rates on an annual basis from July through June has no bearing on financial reporting of FEI, or on customers that receive natural gas service from FEI."

15.1 If interim rates (interim meaning "subject to retroactive change") were approved for thermal energy service to the Delta SD as a result of the regulatory process for reviewing the cost of service rate, how would this affect Delta SD's budgeting for thermal energy costs for each fiscal year?

16.0 ECONOMIC VIABILITY

Reference: Exhibit A2-6, ESAC Evidence, p. 26; Exhibit A2-7, BCUC 1.18.1

ESAC states that "ESAC members and other market participants have generally not pursued geo-exchange retrofits in schools directly with School Districts because, in the absence of substantial incentives or other forms of subsidization, the projects do not make financial sense when the customer installing the system has to assume the risks associated with actual installation costs and operating efficiency." (Exhibit A2-6, ESAC Evidence, p. 26)

ESAC also states "If a geo-exchange retrofit in a school is simply uneconomic (even after the application of approved EEC funding), then, in ESAC's view, the project should not be done at all by either model. The regulated cost of service model proposed by the FEU for discrete thermal systems does not provide any magical solution to the issue of economic non-viability but it has the potential to mask the fact that a project is not economically viable and put the school district into potentially serious financial peril. There are other options that school districts can employ in a school facility to reduce greenhouse gas emissions and address deferred equipment renewal that do not involve geo-exchange." (Exhibit A2-7, BCUC 1.18.1) [emphasis added]

16.1 Please comment on the above comments by ESAC, particularly the underlined items. Does Delta SD agree with the observations? Please explain.

17.0 SYSTEM RELIABILITY AND RISKS

Reference: Exhibit B-1, Appendix A Energy System Service Agreements

17.1 Is the Delta SD aware of any clause in the energy system service contracts which holds FEI accountable for operational obligations, such as service reliability, guaranteed GHG reduction, or energy savings?

18.0 FURTHER ENERGY EFFICIENCY INITIATIVES**Reference:** Exhibit B-3, BCUC 1.83.1

In response to BCUC 1.83.1, FEI states “Since the RDA contemplates annual setting of the cost of service rate, if the Delta SD engages in activities to reduce thermal demand, they will benefit from a reduction in the total costs of thermal energy, but their average rate for thermal energy per unit may increase, because the sunk costs are still recoverable in the rates.”

18.1 Does the Delta SD agree that, to the extent the “sunk costs” will still be recoverable in rates, the cost of service rate setting methodology will tend to discourage the Delta SD from undertaking further initiatives to reduce energy consumption?

19.0 ANNUAL COST OF SERVICE**Reference:** Exhibit B-2, p. 42; Exhibit B-2, Appendix B; Exhibit A2-5

In the CPCN Application, FEI states that the School District is aware of the risk premium and has agreed to it forming part of the rate.

In the CPCN Application, the cost of service rate includes the cost related to the return on the Rate Base Value which is defined as the benchmark rate of return on equity for utilities in British Columbia plus 50 basis points.

19.1 Does the Delta SD understand that the rate-of-return component in the cost of service rate is dependent on both: (i) the allowed return on equity and (ii) the allowed premium on the return on equity, and that both could change from time to time?

20.0 TRIGGERING SWITCH FROM MARKET RATE TO COST OF SERVICE RATE**Reference:** Exhibit B-3, BCUC 1.38.4

In response to BCUC 1.38.4, when asked what factor or criteria the Delta SD should consider before triggering their election to switch to the cost of service rate, FEI replied:

“Ultimately this is a question for the SD and not FEI.

However, in FEI’s opinion, at any given time that the SD is on the market rates the SD may well consider such things as the outright difference between the two rates first, the budgetary conditions they currently operate within, the prevailing market conditions for energy and the fact that the market rate is intended to the transition, not provide a market speculation mechanism.”

20.1 Does FEI’s response accurately describe the factors that the Delta SD would consider before triggering an election to switch from the market rate to the cost of service rate?

20.2 Are there any other factors not listed here that the Delta SD would consider?

21.0 COST OF SERVICE RATE**Reference:** Exhibit B-5, Corix 1.1.1; Exhibit B-3, BCUC 1.38.1

FEI states that “The SD will want to switch to the cost of service rate because it will be lower overall than the market rate.” (Exhibit B-5, Corix 1.1.1)

FEI also states that “The market rate represents the amount that the SD and FEI agree represents a

reasonable approximation of their current costs indexed against natural gas, which may be lower, or higher than the cost of service.” (Exhibit B-3, BCUC 1.38.1)

- 21.1 Is Delta SD satisfied with the assumptions made by FEI in the calculation of each of the rate options?
- 21.2 Once the Delta SD has elected to switch to the cost of service rate, FEI indicates that it is unable to switch back to the market rate (Exhibit B-3, BCUC 1.38.7). Assuming that the market conditions and market rate of energy is more favourable than the Cost of Service rate in the future, how does the Delta SD expect the Commission to respond, if at all?

22.0 MARKET RATE

Reference: Exhibit B-1, Section 6.3.5

FEI states that the “initial “market rate” has been set at \$0.089 per kWh. This initial “market rate” was the result of analysis and negotiations with the SD, and the rate reflects an agreement on the forecast of the costs of thermal energy that the SD expect to pay,...in the upcoming fiscal year...The cost estimate utilized the normalized billing data...including a provision for the maintenance costs that the Project will eliminate for the SD.”

- 22.1 Is the Delta SD’s interpretation of the market rate synonymous with the “avoided cost” that the Delta SD may expect to pay under current operating conditions of its existing system?

In Exhibit A2-11, ESAC’s response to FEU’s question 2.2 states “The transitional “market rate” established for this project which is initially set at \$.089 per kWh of delivered thermal energy is approximately 40-60% higher than the DSD’s current cost of energy for these facilities (net of the rider).” (Exhibit A2-11, FEU 1.2.2) [emphasis added]

- 22.2 Please comment on the above statement and/or provide correcting figures if available.

23.0 CONTINGENCIES AND VARIABLE COSTS

Reference: Exhibit A2-6, ESAC Evidence (p. 23); Exhibit B-3, BCUC 1.51.3, 1.54.4 and 1.51.7

FEI states that “The total value of the contract is \$6,350,000 (as stated), however, the fixed costs components of the contract total \$2,050,000 and the variable components total \$4,300,000.” (Exhibit B-3, BCUC 1.51.3)

“There are no specific project or related contingency costs.”(Exhibit B-3, BCUC 1.51.7)

- 23.1 Given that there are no contingencies included in this project, is Delta SD aware that it is held accountable for all costs that are deemed to be prudently spent in the currently proposed cost of service rate design mechanism? Given that its annual budgets are generally fixed, please discuss how the Delta SD plans on dealing with any potential cost overruns?

“Preliminary sensitivity analysis indicates a 10% cost increase for the variable portion of the contract price represents a 2.7% increase in the thermal energy rate. At this level, the thermal energy rate remains significantly below the market rate. This analysis has not been shared with the SD.” (Exhibit B-3, BCUC 1.51.4)

- 23.2 Is the Delta SD satisfied that the above calculations are reasonable given FEI’s assumptions in calculating the market rate?

23.3 What is the Delta SD's understanding of the inputs into the market rate calculation? Please comment on whether these inputs are reasonable.

24.0 RESIDUAL ASSET VALUE

Reference: Exhibit A2-10, BCSEA 1.6.1

ESAC states that "there could be a large residual at the end of the term (such as the \$4.1 million of rate base left over after 20 years on the proposed Delta School District..."

24.1 Does the Delta SD believe the above estimate to be appropriate and reasonable?

ESAC also states that "This approach resembles an "Operating Lease" structure which has generally been determined in the past as being public debt and therefore prohibited under the government's Debt Management program."

24.2 Please comment on the above observation.

25.0 COST OF SERVICE AND SPECIAL RATE RIDER

Reference: Exhibit B-3, BCUC 1.38.11 and 1.67.2; Exhibit A2-10, BCSEA 1.6.1

FEI states that "The SD37 Deferral Account,..., captures variances between the cost of service and the revenues for subsequent recovery/refund." (Exhibit B-3, BCUC 1.67.2)

FEI also states that "...variances between the market rate and the actual cost of service will be recorded in the SD37 deferral account and either recovered from or returned to the customer over the life of the contract." (Exhibit B-3, BCUC 1.38.11)

25.1 Given that the special rider is a reduction in actual revenues to be received from the Delta SD, the reduced revenues would ultimately contribute to the variance that is recorded in the Delta SD deferral account. The above statements suggest that this variance is then recovered from the Delta SD over the life of the contract. Please confirm that although the Delta SD may receive a special rider discount in its initial term, they end up paying for this discount throughout the life of the contract. Does the Delta SD agree with this observation?

ESAC states "It is not clear that BC's Comptroller General will not view such back-end loaded financing as being public debt which would eliminate one of the reasons for financing a project in such a fashion in the first place. If such an arrangement is considered debt, then the extrapolation of the DSD project across multiple school districts would have significant consequences for the Ministry of Education's overall debt cap and the provincial government's debt-to-GDP ratio." (Exhibit A2-10, BCSEA 1.6.1)

25.2 Please comment on the above observation and provide correcting statements if necessary.

25.3 Has the Delta SD had any discussions on the potential impact this project would have on the Ministry of Education's financial and credit status? If not, does the Delta SD plan on having this discussion in the near future?

26.0 RATE DESIGN

Reference: Exhibit B-3, BCUC 1.64.4

"During negotiations, which are confidential, many alternatives were discussed. However, the SD expressed a strong preference for this model whereby the thermal energy rate is inclusive of all costs. In this manner, it is much more transparent and simple for the SD to understand what their costs for

thermal energy are and to obtain the flexibility that they desire, which levelized rates are not well suited for.” (Exhibit B-3, BCUC 64.4)

26.1 In the view of the Delta SD, what are the advantages or disadvantages for FEI to implement a fixed rate or levelized rate contract? Who bears the risks for cost overruns in each rate options?

26.2 If a fixed rate option was once discussed in negotiations, please explain why this was rejected (you may file your response in confidence if required).

27.0 TES DEVELOPMENT COSTS

Reference: Exhibit A2-6, ESAC Evidence, p. 24

“the DSD’s share of any other Thermal projects whose development costs have been charged to the Deferral Account but which have been abandoned and not implemented” (p.24)

27.1 Given that the Delta SD is the first of its kind of thermal energy services provided by FEI, is it aware of or concerned with its share of (any) TES development costs that may be transferred to the SD? These would include general TES business development costs, general marketing costs, and/or costs related to develop other projects which may have been abandoned.

28.0 OVERHEAD COSTS TO THE DELTA SD

Reference: Exhibit B-3, BCUC 1.65.2

FEI claims that “In preparation for the 2012-2013 RRA, FEI conducted a review of the overhead costs being incurred for the thermal energy class of service and determined that \$500,000 continues to be the appropriate allocation for each of the next two years.”

28.1 Given that a decision on the 2012-2013 revenue requirement application (RRA) is still pending, is the Delta SD aware that the outcome of the 2012-2013 RRA may impact the cost of service for the Delta SD?

Exhibit N



FEI DELTA SCHOOL DISTRICT 37
THERMAL ENERGY SERVICE CONTRACTS EXHIBIT C1-2

188

24 January 2012

British Columbia Utilities Commission
Sixth Floor, 900 Howe Street
Vancouver, BC V6Z 2N3

Attention: Ms. Alanna Gillis, Acting Commission Secretary
(via email: Commission.Secretary@bcuc.com)

Dear Ms. Gillis:

Re: FortisBC Energy Inc. ("FEI") Project No. 3698648 - Application for a Certificate of Public Convenience and Necessity for Approval of Contracts and Rate for Public Utility Service to Provide Thermal Energy Service to Delta School District No. 37 ("Delta SD")
Response to the British Columbia Utilities Commission ("BCUC" or the "Commission") Information Request ("IR") No. 1

This is Exhibit "N" referred to in the affidavit of FRANK GEYER made before me on AUGUST 10 20 18
Erica Lambert Shreed
A Commissioner for taking Affidavits for British Columbia

In accordance with the Commission's letter, dated 18 January 2012, please find attached the Delta Board of Education's response to BCUC IR No. 1.

Please contact the undersigned at tel. 604-952-5336 or email fgeyer@deltasd.bc.ca if you have any questions or concerns, or require additional information.

Yours truly,

F.J. (Frank) Geyer, PEng, FMA
Director of Facilities & Planning

Attach.

c.c. (e-mail only): Registered Parties
G. Ayres, Deputy Superintendent of Schools
J. Strain, Secretary-Treasurer

1.0 BENEFITS OF COMMISSION OVERSIGHT

Reference: Exhibit B-3, FEI Response to BCUC 1.10.3, p. 35; UCA Section 45

On page 35 of their response to the British Columbia Utilities Commission (Commission, BCUC), FEI states that:

"Yes, FEI believes that both it and the SD are knowledgeable and sophisticated parties that are capable of negotiating contracts that meet and protect their own needs and interests.

For the SD, as explained in response to BCUC IR 1.10.1, it needs a thermal energy system that will enable it to obtain reliable thermal energy that it requires on an ongoing basis at reasonable prices and reduce their carbon footprint at the same time. As FEI understands it, the SD has access to professional engineers, technicians, financial professionals and legal services during the negotiations, suggesting to FEI that the SD is adequately knowledgeable and sophisticated to look after their own interests and to ensure that each aspect of the contracts is satisfactory legally, financially, and operationally. Several contract provisions demonstrate the School District's sophistication. For example, the contracts contain the "subject to BCUC approval" condition in the agreements. FEI believes the School District understands the cost of service model employed in the rate design here and the Commission's regulatory oversight role in approving the agreements and rates contained therein and in ensuring the transparency of the process for the benefits of the general public, including the School District's own constituents.

Indeed, the School District desires the Commission's oversight role. Additionally, the contract contains a dispute resolution mechanism, which allows the School District to seek remedies if and when disputes arise. The contracts with the SD were executed following extensive negotiations and final execution of the agreements by the SD demonstrates that it is satisfied that its objectives have been met."

- 1.1 The Commission would like to hear from Delta School District Number 37 (Delta SD) to better understand what aspects of regulation are of most interest or concern to the Delta SD. What does the Delta SD see as the benefit of being regulated by the Commission?

Response:

Delta SD desires the protection measures contained in the Utilities Commission Act, specifically pertaining to continuity of service by the public utility (in case of ownership change, bankruptcy, change in business focus, etc.) and Commission review and approval of rates.

- 1.2 Are there any concerns that the Delta SD has about regulation under the Commission?

Response:

No.

- 1.3 Is the Delta SD aware that being regulated by the Commission does not necessarily require a cost-of-service based rate? For instance, the range of options may include the Commission accepting a rate negotiated between the parties, without a detailed review.

Response:

Delta SD is aware that there are a variety of rate options that may exist, and that the role of the Commission is to review (level of detail at the discretion of the Commission) and approve the rate, whether cost-of-service or negotiated.

According to Section 45(8) of the *Utilities Commission Act* (UCA), the Commission must not give its approval for a CPCN, unless it determines that it is "necessary for the public convenience and properly conserves the public interest."

- 1.4 Should the Commission accept the Delta SD signing the terms of the agreement as sufficient evidence that the application is in the public interest?

Response:

Yes. Delta SD believes that the agreement with FEI, as approved by the Board of Education, is in the best interest of Delta SD and its stakeholders.

- 1.5 If the Commission reaches the conclusion that the project as currently structured is not in the interests of the Delta SD, should the Commission deny the CPCN, notwithstanding the fact the Delta SD entered into the contract freely?

Response:

Delta SD would like to clarify that, from its point of view, the Application pertains to the on-going service of delivering thermal energy to schools, and not merely a specific "project".

That said, if the Commission deems that the thermal energy service as currently structured is not in the best interests of Delta SD, Delta SD would appreciate the Commission making the necessary alterations to the CPCN to satisfy the Commission. As per BCUC IR 1-1.4 Response above, Delta SD believes the current service structure to be in the best public interest.

2.0 EXPECTATIONS OF THE COMMISSION

Reference: Exhibit A2-6, ESAC Evidence, pp. 24-25

In a proceeding currently before the Commission (AES Inquiry), a Registered Intervener the Energy Services Association of Canada (ESAC) submitted evidence, some of which is quoted below:

"In the case of thermal energy projects, a regulated Cost of Service model transfers all of the risks associated with the capital and operating costs of the asset to the thermal customer. It appears that the only risk that the FEU would undertake in owning and operating a thermal asset is the risk of prudence and all other risks would be absorbed by the thermal customer..."

ESAC further submits that irrespective of the initial tariff agreed to by the Delta SD, all the cost would be absorbed by Delta SD.

2.1 Does the Delta SD agree that the risk of cost overruns is absorbed by Delta SD?

Response:

No. Delta SD and FEI have agreed that any cost overruns resulting from unforeseen circumstances at the time of the agreements will be remedied by adjustment in scope or material at one or more of the 19 project sites in order to maintain the thermal energy rate. Any extra work requested by Delta SD to its thermal energy distribution systems connecting to the new thermal energy plants would be borne by Delta SD.

3.0 PROJECT ALTERNATIVES CONSIDERED

Reference: Exhibit A2-7, Staff filing Evidence from the AES Inquiry, ESAC Response to BCUC 1.18.1, p. 33

In the AES Inquiry, ESAC states on page 33 of their response to the BCUC 1.18.1 in Exhibit A2-7 that:

"It should be stressed that the carbon neutral requirement for school districts does not mandate that they actually reduce emissions, only that they purchase offsets for what they do emit. This is intended to alter the capital expenditure decision process for school districts towards lower carbon solutions, but in the absence of any such capital, districts are not obligated to reduce actual emissions. They certainly are not obligated to do it in a manner that could result in serious operating budget problems for them.

To put things into perspective, the reduction in carbon emission for the proposed 19-school Delta SD project represents an annual emissions offset savings of only \$55,000 while the current capital cost estimate is approximately \$6.5 million. This would appear to be an excessive investment if the objective is to reduce emissions."

3.1 According to ESAC, the Delta SD is not obliged to make emissions reductions, only to purchase sufficient offsets to cover the Delta SD's greenhouse gas (GHG) emissions. Do you agree with the way that ESAC has described the Delta SD's carbon-neutral obligations? If not, please explain the Provincial Carbon Neutral Requirements under the BC Climate Action Plan for school districts for 2012 and beyond.

Response:

Delta SD does not necessarily agree with ESAC's statement. Delta SD is required, under the Greenhouse Gas Reduction Targets Act and as a signatory to the BC Climate Action Charter, to be carbon neutral for the calendar year. As per Section 6(1) of the GGRTA, Delta SD, as a public sector organization (PSO) must:

- (a) pursue actions to minimize its PSO greenhouse gas emissions for the calendar year,
- (b) determine its PSO greenhouse gas emissions for that calendar year in accordance with the regulations, and
- (c) no later than the end of June in the following calendar year, apply emission offsets in accordance with the regulations to net those emissions to zero.

- 3.2 Did FEI ever present the Delta SD with a comparison of the avoided carbon offset costs and the total capital costs of the project?

Response:

Yes, options were presented for various thermal energy solutions and their respective thermal energy rates and carbon offset reductions. Delta SD disagrees with the ESAC statement:

"the reduction in carbon emission for the proposed 19-school Delta SD project represents an annual emissions offset savings of only \$55,000 while the current capital cost estimate is approximately \$6.5 million. This would appear to be an excessive investment if the objective is to reduce emissions."

as the program is not a capital project from the perspective of Delta SD, but a thermal energy delivery service provided by FEI. Therefore, the capital cost was not a factor in the decision making process, rather it was the resulting thermal energy rate and the reduced life cycle cost of operating the thermal energy plants.

- 3.3 Did the Delta SD consider any other lower cost options, such as an all gas solution, replacing the existing boilers with high-efficiency boilers? If not, what were the main criteria for not doing so?

Response:

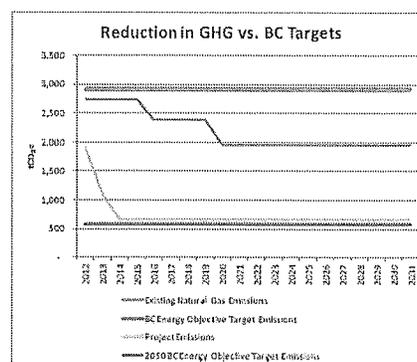
Delta SD could have gone with the low cost option of replacing all existing boilers with high efficiency boilers, but desired to go with geo-exchange technology at certain sites to maximize greenhouse gas emission reductions and had prepared a program to achieve this goal. Capital projects were presented to provincial ministries and agencies for funding, however, approval was not forthcoming.

The FEI service allows for the "best fit" solution to Delta SD's needs, as it addresses not just the need to replace thermal energy equipment, but also the requirement to minimize greenhouse gas emissions and reduce annual operating and maintenance costs without any District capital funding.

4.0 TARGET FOR GHG EMISSION REDUCTIONS

Reference: Exhibit B-3, BCUC 1.6.1

The figure provided by FEI in response to BCUC 1.6.1 has been duplicated here for ease of reference.



- 4.1 How was the level of the SD project target emissions reductions shown on the chart determined?

Response:

Delta SD, regardless of the requirements of the BC Clean Energy Act, desired to maximize the greenhouse gas emission reductions as both a cost avoidance and a global citizenship basis. The amount and timing of emission reductions were determined by FEI's engineers and reviewed/agreed to by Delta SD, based on the technologies proposed.

- 4.2 In response to BCUC 1.6.1.2, FEI states that "In FEI's view the project as currently configured advances the SD's objectives the furthest within their budgetary constraints." Does the Delta SD share this view?

Response:

Yes, Delta SD shares this view, as the thermal energy service reduces carbon offset purchase costs and reduces annual operating and maintenance costs as well as other life cycle costs without any District capital funding.

5.0 CRITERIA FOR EVALUATING THERMAL ENERGY SOLUTIONS

Reference: Exhibit B-3, BCUC 1.11.1

"To the best of FEI's knowledge, the general criteria for the schools was to lower GHG emissions, keep energy payments at or below current energy costs, and to retrofit the largest number of schools."

- 5.1 Does this accurately describe the Delta SD's view of the general criteria for the project?

Response:

Yes.

- 5.2 If so, if some factors are more important than others, please indicate the relative weighting that would be applied to each of the criteria.

Response:

The highest weighting was applied to the reduction of energy consumption in Delta SD, which drives the GHG emissions and annual costs. The intent was to retrofit all schools not previously retrofitted with new thermal energy systems, which this service fully accomplishes.

- 5.3 If this does not accurately describe the Delta SD's view of the general criteria for the project, please describe the Delta SD's view of the general criteria.

Response:

Refer to BCUC IR 1- 5.2 Response above.

6.0 CARBON NEUTRALITY OBLIGATIONS

Reference: Exhibit B-3, BCUC 1.29.2

- 6.1 To the extent that the proposed system does not reduce the current GHG levels to the levels expected in this project, please explain how the Delta SD would meet its carbon neutral obligations within its budget constraints.

Response:

Delta SD currently budgets for and purchases carbon offsets annually, based on current equipment and systems. The thermal energy service reduces the carbon footprint, thereby reducing this annual amount, and freeing up valuable dollars for the delivery of education. If the thermal energy service were not to proceed or not totally meet expectations, Delta SD would be required to adequately fund the higher cost of carbon offset purchase at the expense of other District operations to maintain carbon neutrality.

- 6.1.1 To the extent the Delta SD has to purchase additional carbon offsets, who would be responsible for the costs? Are these costs included in the cost of service rate?

Response:

Under the thermal energy service, the carbon footprint for Delta SD will only reduce, therefore additional carbon offsets will not need to be purchased. If expected reductions do not materialize, Delta SD would be required to adequately fund the higher cost of carbon offset purchase at the expense of other District operations to maintain carbon neutrality.

7.0 PACKAGE SOLUTION

Reference: Exhibit B-3, BCUC 1.22.1 through 1.22.6

In the CPCN Application FEI states "This approach to providing thermal energy enables FEI to pool the costs and benefits of all buildings in a manner that optimizes the overall environmental benefits of employing innovative technologies that utilize clean, renewable resources, while managing the rates for thermal energy within the budgetary constraints of the SD."

In response to BCUC 1.2.1, regarding whether each of the standalone locations would be considered viable without the "pooling" effect, FEI stated:

"Without the "pooling" effect, each stand alone location is constrained by the financial envelope of that particular site. This is an artificial constraint though, since the School District is responsible for their budget and emissions at a district level, not a site by site level. The logical outcome of such an approach suggested in the question would be high efficiency natural gas boilers at most sites, with the possibility of a few geo-exchange or air source heat pumps at other sites. FEI has not done a study as suggested in the question because both the SD and FEI understand at face value that the pooling approach is a more efficient approach. The economy of scope that occurs by pooling sites enables the use of combinations of multiple technologies to render thermal energy that result in a more efficient outcome overall than approaching each site as a separate business case. This is a crucial component of the project and the overall business model."

- 7.1 What efficiencies does the Delta SD believe the pooling approach achieves? For example, operational efficiencies, administrative efficiencies, etc.

Response:

Delta SD agrees with the FEI statement in FEI BCUC IR 1- 1.2.1 above and wishes to add that 19 different rates as opposed to one thermal energy rate for a pool of 19 buildings would increase administrative costs at both the FEI end and Delta SD end (review, negotiation, etc.) leading to higher costs. As the pool of buildings increases as expected, the FEI administrative costs per Delta SD building (which are contained in the thermal energy rate) are expected to decrease.

- 7.2 Is the Delta SD view that this pooling approach results in the outcome that best meets the Delta SD's objectives for the project? Please describe the objectives and elaborate on how the pooling approach helps to meet these objectives.

Response:

The pooling approach leads to lower thermal energy service unit costs, which best meets Delta SD's objectives to reduce carbon offset purchase costs and reduce annual operating and maintenance costs as well as other life cycle costs without any District capital funding.

8.0 SERVICE PROVIDER SELECTION PROCESS

Reference: Exhibit B-3, BCUC 1.87.1

In response to BCUC 1.87.1, FEI states:

"FEI understands from the SD that other companies had been soliciting the SD over the last number of years, but did not bid against them in a formal RFP or RFQ process. FEI was able to provide a solution that met the SD's needs."

- 8.1 Please confirm that FEI was not required to bid against other service providers in a formal RFP or RFQ process.

Response:

This is confirmed.

- 8.2 Did the Delta SD conduct a formal RFP or RFQ process for the project in the past?

Response:

No, but Delta SD did receive a number of unsolicited expressions of interest in the past 10 years which did not satisfy Delta SD's objectives.

- 8.3 What are the Provincial policy requirements that the Delta SD must meet to comply with projects of this nature? For instance, is the Delta SD required to go through BC Bid services?

Response:

The process by which the agreements with FEI were negotiated and signed are in line with provincial requirements. The Ministry of Education and Ministry of Environment, by way of PSECA funding approval of the capital portion of the thermal energy service, supported the selection of FEI and its service.

9.0 THERMAL ENERGY SYSTEM (TES) ALTERNATIVES CONSIDERED

Reference: Exhibit B-5, Corix 1.8.5

In response to Corix 1.8.5, FEI indicated that two previous project configurations were considered for the Delta SD project:

- one with 11 closed loop and 8 open loop geo-exchange systems, and
- one with 8 boiler upgrades, 3 closed loop geo-exchange systems and 8 loop geo-exchange systems.

9.1 To what extent was the Delta SD involved in evaluating each of these two alternatives?

Response:

What was originally proposed by FEI was eight open loop and three closed loop geo-exchange systems, as well as eight high efficiency condensing boilers. Upon further review by both FEI and Delta SD, the mix was adjusted to nine closed loop and two open loop geo-exchange systems, with eight high efficiency condensing boilers in order to best reduce carbon offset purchase costs and reduce annual operating and maintenance costs as well as other life cycle costs without any District capital funding. Delta SD and FEI never considered a scenario of 11 closed loop and eight open loop geo-exchange systems.

9.2 Please describe the primary pros and cons of each of these alternatives, as the Delta SD understands them, and the reasons these alternatives were rejected.

Response:

Please refer to BCUC IR 1- 9.1 Response above and BCUC IR 1- 3.3 Response.

10.0 TECHNOLOGY SCREENING CRITERIA

Reference: Exhibit B-1, Section 2.4.1, p.16; Exhibit B-3, BCUC 1.32.1

"It is noteworthy that the 15 buildings that the SD originally switched to air source heat pumps still have significant peak demand requirements from their redundant backup systems, although they have reduced emissions at a relatively low capital cost." (Exhibit B-1, p.16)

In response to BCUC 1.32.1, in which the Commission asked FEI if any of these 15 buildings retrofitted with air-source heat pumps use natural gas for backup, FEI did not directly answer the question but noted that "FEI has not specifically assessed the back-up systems for the 15 buildings but made the comment based on the general operating characteristics of air-source heat pumps."

10.1 Please describe the criteria and evaluation process that the Delta SD employed in the technology selection process used to determine the appropriate energy system for these 15 buildings.

Response:

Delta SD reviewed a number of alternative thermal energy solutions at these locations, which had inefficient, antiquated gas-fired rooftop heating units feeding 1-2 rooms each throughout the building. The prohibitive capital cost to convert these schools to central heating plants, coupled with lack of annual and one-time capital funding and Delta SD's objectives to reduce carbon offset purchase costs and reduce annual and life cycle costs, led Delta SD to conclude that air source heat pumps with natural gas backup, was the most operationally and financially efficient solution.

10.1.1 What back-up systems did the Delta SD choose to have installed at each of these 15 sites? Please list all that apply.

Response:

Please refer to BCUC IR 1- 10.1 Response above.

10.2 Was FEI (or its predecessor Terasen Gas Inc.) or FortisBC Alternative Energy Services Inc. (or its predecessor Terasen Energy Services Inc.) involved in the technology screening process that resulted in the selection of the air-source heat pump technology for these 15 sites? If so, describe which entity and the nature of the involvement.

Response:

No.

11.0 TRANSITION FROM NON-REGULATED AFFILIATE TO REGULATED UTILITY

Reference: Exhibit A2-5

11.1 Exhibit A2-5 shows the Delta SD webpage. The scroll window indicated that the business development for thermal energy service was initially carried out with Terasen Energy Services Inc., the non-regulated business affiliate of FortisBC Energy Inc. Since Delta SD's service agreement was signed with FortisBC Energy Inc., please describe the transition of Delta SD's dialogue from Terasen Energy Services Inc. to FortisBC Energy Inc.

Response:

Delta SD desired from the onset that the service would be delivered under a regulated model regardless of the corporate entity.

12.0 OWNERSHIP OF THERMAL ENERGY SYSTEM

Reference: Exhibit B-4, BCSEA 1.9.1

"FEI is aware that SD37 has, like all school boards, budgetary constraints; however whether it is impossible for SD37 to own the TES system due to legal constraints on the debt it can acquire, must be answered by SD37."

12.1 Are there any legal, contractual, financial, or budgetary constraints for Delta SD to own the thermal energy system in the future, as suggested in this Application?

Response:

Given the recent history of funding shortfalls by the Province, Delta SD has to take whatever steps necessary to balance its operating budget and not incur additional costs, therefore it is not in the best interest of Delta SD to consider the ownership of the thermal energy plants in the future. That said, there are no legal or contractual constraints for Delta SD to own the thermal energy plants.

13.0 FORTISBC PSECA ELIGIBILITY CRITERIA, TERMS AND CONDITIONS

Reference: Exhibit B-4, Attachment 5.6 to BCSEA 1.5.6; Exhibit B-3, BCUC 1.22.3

Attachment 5.6 to BC Sustainable Energy Association's (BCSEA) Information Request 1.5.6, sets out the Program Eligibility Requirements for the FortisBC Energy Inc./FortisBC Energy Vancouver Island Inc. (defined as FortisBC in the referenced document) Public Sector Energy Conservation

Agreement (PSECA) Initiative. One of the eligibility requirements is listed as:

"The proposed building or facility must remain a natural gas consumer after the proposed energy savings measures have been implemented."

In response to BCUC 1.22.3, FEI states "Thermal energy services are technology agnostic and provide solutions that meet customer needs in the most efficient manner possible, utilizing available technologies. Regarding thermal energy solutions, the goals of the customer must be addressed when arriving at a thermal energy solution for the customer."

13.1 Please confirm that these FortisBC PSECA Program Eligibility Requirements and General Terms and Conditions apply to the \$116,790 of EEC funding incentives approved for the Delta SD.

Response:

This is confirmed.

13.2 To what extent did the FortisBC PSECA Program Eligibility Requirements influence or determine the criteria used by the Delta SD and/or FEI to screen, evaluate and select the technology for the thermal energy systems for the 19 sites included in the Application.

Response:

It had no influence on the decision analysis by Delta SD.

13.2.1 Did the FortisBC PSECA Program Eligibility Requirements prevent the Delta SD from considering an all-electric thermal energy system?

Response:

No. Delta SD has an energy management agreement with BC Hydro to reduce electricity consumption throughout, so in locations where central heating using natural gas exists, electric units were never considered, regardless of the FortisBC PSECA Program Eligibility Requirements.

13.2.2 If so, would this imply the thermal energy system selection process was not "technology agnostic" as described by FEI in response to BCUC 1.22.3?

Response:

Please refer to BCUC IR 1- 13.2.1 Response above.

Attachment 5.6 to BCSEA 1.5.6, also sets out the General Terms and Conditions for the FortisBC PSECA Initiative. Section 3.6 states "FortisBC will have no right title or interest in the equipment or systems which comprise the Energy Savings Measures which are eligible for and which ultimately receive Funding."

13.3 Please confirm that FEI, rather than the Delta SD, will own the thermal energy systems for the 19 Delta SD sites.

Response:

This is confirmed. Delta SD is not required to contribute the \$116,790 of EEC funding incentives towards the thermal energy service.

Section 5.4 of the FortisBC PSECA Initiative General Terms and Conditions states "The Funding is conditional upon Fortis BC's on-site inspection, final acceptance and written approval of the installed Energy Savings Measures. If FortisBC determines, at its sole discretion, that the installed Energy Savings Measures differ substantially from the approved Energy Savings Measures, the Applicant must have the approved Energy Study updated to reflect such modifications, and must forward the results to FortisBC for review."

13.4 Please confirm that under Section 5.4 of the FortisBC PSECA Initiative General Terms and Conditions, FEI is solely responsible for determining whether the installed Delta SD thermal energy systems qualify for the approved funding.

Response:

This is confirmed.

13.5 Does the Delta SD consider it best practices to require a third party to verify the Energy Savings Measures have been achieved?

Response:

Only if the terms and conditions of the agreement require an independent third party to verify compliance. Otherwise, before and after data can be compared to ensure compliance at little to no cost.

13.6 Under the terms of the Energy System Service Agreements and the Energy System Rate Development Agreement between FEI and SD, is FEI required to warrant that the thermal energy systems that are to be installed by FEI will deliver the approved Energy Savings Measures?

Response:

No, they are unrelated.

13.7 If not, what comfort does Delta SD have that it will receive the Energy Savings Measures it has contracted for with FEI?

Response:

Delta SD is very confident that energy reduction targets as set out in all agreements will be reasonably met.

14.0 CURRENT GAS SUPPLY ARRANGEMENTS

Reference: Exhibit B-3, BCUC 1.57.5; Exhibit B-1, Appendix D

FEI has provided the following information for each of the sites proposed in the CPCN Application:

The table provided in response to BCUC 1.57.5 indicates that a number of the Delta SD sites are currently supplied by a marketer under either the Customer Choice program (Rate Schedule 2U) or a transportation contract (Rate Schedule 23).

Site	Rate Schedule	Natural Gas Supplier (Marketer)
Anneville Elem.	23	Yes
Beach Grove Elem.	2U	Yes
Chalmers Elem.	2U	Yes
Cliff Drive Elem.	2	No
Delta Manor Elem.	2U	Yes
Delta Sec.	2U	Yes
Delview Sec	23	Yes
English Bluff Elem.	23	Yes
Heath Elem.	2U	Yes
Holly Elem.	2U	Yes
Lodner Elem.	2U	Yes
Neilson Grove Elem.	2U	Yes
North Delta Sec.	23	Yes
Pinewood Elem.	2U	Yes
Richardson Elem.	2U	Yes
School Board Office	2U	Yes
South Delta Sec.	23	Yes
South Park Elem.	2U	Yes
District Operations Centre	2U	Yes

- 14.1 In the event the Delta SD currently has a contract with a marketer for gas supply for which the term extends beyond the date that FEI effectively takes on the role of natural gas distribution service customer at the Delta SD site, do the Delta SD's contracts with the gas supply marketers contemplate FEI taking over as the natural gas customer?

Response:

No.

- 14.2 Will these gas supply contracts be terminated effective the date FEI takes ownership of the thermal energy system and, if so, will any exit fees or financial penalties be incurred by the Delta SD for early termination of these supply contracts?

Response:

Yes, and there are no penalties for termination of existing building supply agreements.

- 14.2.1 Who would be responsible, the Delta SD or FEI, for the costs of early termination of these contracts and will the costs be considered part of the project costs and thus part of the cost of service?

Response:

Not applicable, please refer to BCUC IR 1- 14.2 Response above.

- 14.2.2 If so, is the Delta SD aware whether FEI has taken these costs into consideration when forecasting the cost of service rates presented in Appendix D?

Response:

Not applicable, please refer to BCUC IR 1- 14.2 Response above.

- 14.3 To the best of the Delta SD's knowledge, do the terms of Rate Schedule 2U restrict switching to another Rate Schedule for any of the Delta SD sites currently supplied under Rate Schedule 2U?

Response:

No.

- 14.4 Will any marketer gas supply contracts be assigned to FEI?

Response:

There are no plans at this time, however, it is possible.

15.0 DELTA SD BUDGET CYCLE

Reference: Exhibit B-3, BCUC 1.66.2

FEI states that "The setting of rates on an annual basis from July through June has no bearing on financial reporting of FEI, or on customers that receive natural gas service from FEI."

- 15.1 If interim rates (interim meaning "subject to retroactive change") were approved for thermal energy service to the Delta SD as a result of the regulatory process for reviewing the cost of service rate, how would this affect Delta SD's budgeting for thermal energy costs for each fiscal year?

Response:

Currently, Delta SD's budget must allow for uncertainties in natural gas costs over the course of the fiscal year, therefore, having the thermal energy rate set to coincide with the July-June fiscal year is preferable. Interim rates eliminate this efficiency and are no different than the status quo.

16.0 **ECONOMIC VIABILITY**

Reference: Exhibit A2-6, ESAC Evidence, p. 26; Exhibit A2-7, BCUC 1.18.1

ESAC states that "ESAC members and other market participants have generally not pursued geo-exchange retrofits in schools directly with School Districts because, in the absence of substantial incentives or other forms of subsidization, the projects do not make financial sense when the customer installing the system has to assume the risks associated with actual installation costs and operating efficiency." (Exhibit A2-6, ESAC Evidence, p. 26)

ESAC also states "If a geo-exchange retrofit in a school is simply uneconomic (even after the application of approved EEC funding), then, in ESAC's view, the project should not be done at all by either model. The regulated cost of service model proposed by the FEU for discrete thermal systems does not provide any magical solution to the issue of economic non-viability but it has the potential to mask the fact that a project is not economically viable and put the school district into potentially serious financial peril. There are other options that school districts can employ in a school facility to reduce greenhouse gas emissions and address deferred equipment renewal that do not involve geo-exchange." (Exhibit A2-7, BCUC 1.18.1) [emphasis added]

- 16.1 Please comment on the above comments by ESAC, particularly the underlined items. Does Delta SD agree with the observations? Please explain.

Response:

The comments made by ESAC are unfounded and assume that Delta SD has no expertise in the area of sustainable operations and facilities management. Delta SD has studied a number of potential options, including design-bid-build-own-operate, energy service company (ESCO) and design-build-lease. The FEI option transfers the ownership, including all on-going maintenance, repair and future replacement of the thermal energy plants along with the associated costs, from Delta SD to FEI in return for an all-inclusive, reliable, affordably priced thermal energy service. The FEI option, which is a unique and scalable solution based on the cost advantages of pooling of buildings, was presented to the Provincial Government, who awarded the PSECA grant to Delta SD on the basis of the energy cost savings, reduction in GHG emissions and the overall business model that the other options fail to provide.

17.0 SYSTEM RELIABILITY AND RISKS

Reference: Exhibit B-1, Appendix A Energy System Service Agreements

- 17.1 Is the Delta SD aware of any clause in the energy system service contracts which holds FEI accountable for operational obligations, such as service reliability, guaranteed GHG reduction, or energy savings?

Response:

Yes.

18.0 FURTHER ENERGY EFFICIENCY INITIATIVES

Reference: Exhibit B-3, BCUC 1.83.1

In response to BCUC 1.83.1, FEI states "Since the RDA contemplates annual setting of the cost of service rate, if the Delta SD engages in activities to reduce thermal demand, they will benefit from a reduction in the total costs of thermal energy, but their average rate for thermal energy per unit may increase, because the sunk costs are still recoverable in the rates."

- 18.1 Does the Delta SD agree that, to the extent the "sunk costs" will still be recoverable in rates, the cost of service rate setting methodology will tend to discourage the Delta SD from undertaking further initiatives to reduce energy consumption?

Response:

No, Delta SD does not understand how the cost of service rate setting methodology would discourage further energy reduction initiatives. Delta SD will continue to explore other innovative ways to conserve and reduce energy, both independently and in cooperation with FEI (i.e. expanding the pool of buildings).

19.0 ANNUAL COST OF SERVICE

Reference: Exhibit B-2, p. 42; Exhibit B-2, Appendix B; Exhibit A2-5

In the CPCN Application, FEI states that the School District is aware of the risk premium and has agreed to it forming part of the rate.

In the CPCN Application, the cost of service rate includes the cost related to the return on the Rate Base Value which is defined as the benchmark rate of return on equity for utilities in British Columbia plus 50 basis points.

- 19.1 Does the Delta SD understand that the rate-of-return component in the cost of service rate is dependent on both: (i) the allowed return on equity and (ii) the allowed premium on the return on equity, and that both could change from time to time?

Response:

As the rate-of-return component is well defined in the Rate Determination Agreement, to which Delta SD and FEI are parties, Delta SD fully understands that both the allowed return on equity and allowed premium could change from time to time.

20.0 TRIGGERING SWITCH FROM MARKET RATE TO COST OF SERVICE RATE

Reference: Exhibit B-3, BCUC 1.38.4

In response to BCUC 1.38.4, when asked what factor or criteria the Delta SD should consider before triggering their election to switch to the cost of service rate, FEI replied:

"Ultimately this is a question for the SD and not FEI.

However, in FEI's opinion, at any given time that the SD is on the market rates the SD may well consider such things as the outright difference between the two rates first, the budgetary conditions they currently operate within, the prevailing market conditions for energy and the fact that the market rate is intended to the transition, not provide a market speculation mechanism."

20.1 Does FEI's response accurately describe the factors that the Delta SD would consider before triggering an election to switch from the market rate to the cost of service rate?

Response:

Yes, these factors have been discussed during agreement negotiations and are well understood by Delta SD.

20.2 Are there any other factors not listed here that the Delta SD would consider?

Response:

Not at this time.

21.0 COST OF SERVICE RATE

Reference: Exhibit B-5, Corix 1.1.1; Exhibit B-3, BCUC 1.38.1

FEI states that "The SD will want to switch to the cost of service rate because it will be lower overall than the market rate." (Exhibit B-5, Corix 1.1.1)

FEI also states that "The market rate represents the amount that the SD and FEI agree represents a reasonable approximation of their current costs indexed against natural gas, which may be lower, or higher than the cost of service." (Exhibit B-3, BCUC 1.38.1)

21.1 Is Delta SD satisfied with the assumptions made by FEI in the calculation of each of the rate options?

Response:

Yes, the rate calculations have been discussed during agreement negotiations and are well understood by Delta SD.

21.2 Once the Delta SD has elected to switch to the cost of service rate, FEI indicates that it is unable to switch back to the market rate (Exhibit B-3, BCUC 1.38.7). Assuming that the market conditions and market rate of energy is more favourable than the Cost of Service rate in the future, how does the Delta SD expect the Commission to respond, if at all?

Response:

In accordance with the Rate Determination Agreement, once Delta SD elects to switch to the cost of service rate, the market rate effectively disappears. Thus, no, Delta SD does not expect a Commission response to this matter in the future.

22.0 MARKET RATE

Reference: Exhibit B-1, Section 6.3.5

FEI states that the "initial "market rate" has been set at \$0.089 per kWh. This initial "market rate" was the result of analysis and negotiations with the SD, and the rate reflects an agreement on the forecast of the costs of thermal energy that the SD expect to pay,...in the upcoming fiscal year... The cost estimate utilized the normalized billing data... including a provision for the maintenance costs that the Project will eliminate for the SD."

22.1 Is the Delta SD's interpretation of the market rate synonymous with the "avoided cost" that the Delta SD may expect to pay under current operating conditions of its existing system?

Response:

Yes.

In Exhibit A2-11, ESAC's response to FEU's question 2.2 states "The transitional "market rate" established for this project which is initially set at \$.089 per kWh of delivered thermal energy is approximately 40-60% higher than the DSD's current cost of energy for these facilities (net of the rider)." (Exhibit A2-11, FEU 1.2.2) [emphasis added]

22.2 Please comment on the above statement and/or provide correcting figures if available.

Response:

The cost of:

- Energy (natural gas, electricity)
- Associated carbon offsets
- Operations & maintenance

of the existing heating plants at the affected facilities, at the time of agreement, is consistent with the \$0.089/kWh quoted by FEI.

23.0 CONTINGENCIES AND VARIABLE COSTS

Reference: Exhibit A2-6, ESAC Evidence (p. 23); Exhibit B-3, BCUC 1.51.3, 1.54.4 and 1.51.7

FEI states that "The total value of the contract is \$6,350,000 (as stated), however, the fixed costs components of the contract total \$2,050,000 and the variable components total \$4,300,000."

(Exhibit B-3, BCUC 1.51.3)

"There are no specific project or related contingency costs." (Exhibit B-3, BCUC 1.51.7)

23.1 Given that there are no contingencies included in this project, is Delta SD aware that it is held accountable for all costs that are deemed to be prudently spent in the currently proposed cost of service rate design mechanism? Given that its annual budgets are generally fixed, please discuss how the Delta SD plans on dealing with any potential cost overruns?

Response:

Please refer to BCUC IR 1- 2.1 Response.

"Preliminary sensitivity analysis indicates a 10% cost increase for the variable portion of the contract price represents a 2.7% increase in the thermal energy rate. At this level, the thermal energy rate remains significantly below the market rate. This analysis has not been shared with the SD." (Exhibit B-3, BCUC 1.51.4)

23.2 Is the Delta SD satisfied that the above calculations are reasonable given FEI's assumptions in calculating the market rate?

Response:

Yes.

23.3 What is the Delta SD's understanding of the inputs into the market rate calculation? Please comment on whether these inputs are reasonable.

Response:

Please refer to BCUC IR 1- 22.2 Response above.

24.0 RESIDUAL ASSET VALUE

Reference: Exhibit A2-10, BCSEA 1.6.1

ESAC states that "there could be a large residual at the end of the term (such as the \$4.1 million of rate base left over after 20 years on the proposed Delta School District..."

24.1 Does the Delta SD believe the above estimate to be appropriate and reasonable?

Response:

Yes.

ESAC also states that "This approach resembles an "Operating Lease" structure which has generally been determined in the past as being public debt and therefore prohibited under the government's Debt Management program."

24.2 Please comment on the above observation.

Response:

FEI is providing a service, not the thermal energy plant. Delta SD is purchasing thermal energy from FEI, in the same manner as purchasing natural gas or electricity, and not paying a lease or a mortgage on the plant. Therefore ESAC's observation is categorically incorrect, and since the Province of British Columbia supports this initiative through its awarding of the PSECA 3 grant, we are confident that there is no breach in government policy pertaining to public debt.

25.0 COST OF SERVICE AND SPECIAL RATE RIDER

Reference: Exhibit B-3, BCUC 1.38.11 and 1.67.2; Exhibit A2-10, BCSEA 1.6.1

FEI states that "The SD37 Deferral Account,..., captures variances between the cost of service and the revenues for subsequent recovery/refund." (Exhibit B-3, BCUC 1.67.2)

FEI also states that "...variances between the market rate and the actual cost of service will be recorded in the SD37 deferral account and either recovered from or returned to the customer over the life of the contract." (Exhibit B-3, BCUC 1.38.11)

- 25.1 Given that the special rider is a reduction in actual revenues to be received from the Delta SD, the reduced revenues would ultimately contribute to the variance that is recorded in the Delta SD deferral account. The above statements suggest that this variance is then recovered from the Delta SD over the life of the contract. Please confirm that although the Delta SD may receive a special rider discount in its initial term, they end up paying for this discount throughout the life of the contract. Does the Delta SD agree with this observation?

Response:

Yes, provided the pool of buildings does not expand. Delta SD is confident, given the expected positive outcome of the AES Inquiry, that the FEI pool will indeed expand and that any concern is moot.

ESAC states "It is not clear that BC's Comptroller General will not view such back-end loaded financing as being public debt which would eliminate one of the reasons for financing a project in such a fashion in the first place. If such an arrangement is considered debt, then the extrapolation of the DSD project across multiple school districts would have significant consequences for the Ministry of Education's overall debt cap and the provincial government's debt-to-GDP ratio." (Exhibit A2-10, BCSEA 1.6.1)

- 25.2 Please comment on the above observation and provide correcting statements if necessary.

Response:

Please refer to BCUC IR 1- 24.2 Response above.

- 25.3 Has the Delta SD had any discussions on the potential impact this project would have on the Ministry of Education's financial and credit status? If not, does the Delta SD plan on having this discussion in the near future?

Response:

The Ministry of Education, by way of PSECA funding approval of the capital portion of the thermal energy service, is aware of the initiative and supported the selection of FEI and its service. Please also refer to BCUC IR 1- 24.2 Response. Delta SD does not plan on having further discussion with the Ministry on this matter.

26.0 RATE DESIGN

Reference: Exhibit B-3, BCUC 1.64.4

"During negotiations, which are confidential, many alternatives were discussed. However, the SD expressed a strong preference for this model whereby the thermal energy rate is inclusive of all costs. In this manner, it is much more transparent and simple for the SD to understand what their costs for thermal energy are and to obtain the flexibility that they desire, which leveled rates are not well suited for." (Exhibit B-3, BCUC 64.4)

- 26.1 In the view of the Delta SD, what are the advantages or disadvantages for FEI to implement a fixed rate or levelized rate contract? Who bears the risks for cost overruns in each rate options?

Response:

Delta SD desired an open book approach to the thermal energy service replacement, meaning Delta SD was looking for the all-in cost using the new thermal plants to be easily identifiable and compared to the cost to operate the existing heating plants. Assuming "fixed rate" is synonymous with "levelized rate", the commodity costs (i.e. natural gas, electricity) are not included – which did not satisfy Delta SD's requirement. Please refer to BCUC IR 1- 2.1 Response regarding cost overruns.

- 26.2 If a fixed rate option was once discussed in negotiations, please explain why this was rejected (you may file your response in confidence if required).

Response:

The fixed rate option was discussed and rejected by Delta SD as it did not satisfy its needs for transparency. Please refer to BCUC IR 1- 26.1 Response for more information.

27.0 TES DEVELOPMENT COSTS

Reference: Exhibit A2-6, ESAC Evidence, p. 24

"the DSD's share of any other Thermal projects whose development costs have been charged to the Deferral Account but which have been abandoned and not implemented" (p.24)

- 27.1 Given that the Delta SD is the first of its kind of thermal energy services provided by FEI, is it aware of or concerned with its share of (any) TES development costs that may be transferred to the SD? These would include general TES business development costs, general marketing costs, and/or costs related to develop other projects which may have been abandoned.

Response:

Delta SD expects to pay its fair share of the indirect costs as would any present or future customers of the FEI thermal energy service.

28.0 OVERHEAD COSTS TO THE DELTA SD

Reference: Exhibit B-3, BCUC 1.65.2

FEI claims that "In preparation for the 2012-2013 RRA, FEI conducted a review of the overhead costs being incurred for the thermal energy class of service and determined that \$500,000 continues to be the appropriate allocation for each of the next two years."

- 28.1 Given that a decision on the 2012-2013 revenue requirement application (RRA) is still pending, is the Delta SD aware that the outcome of the 2012-2013 RRA may impact the cost of service for the Delta SD?

Response:

The initial market rate negotiated and contained in the rate determination agreement protects Delta SD from any impacts on the cost of service rate within the early stages of the agreement, and until Delta SD opts to switch to the cost of service rate.

Exhibit O



**FAES G-31-12 COMPLIANCE FILING - REVISIONS TO
RATES & RATE DESIGN DELTA SCHOOL DISTRICT No.37 EXHIBIT B-1**

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April 3, 2012

British Columbia Utilities Commission
6th Floor, 900 Howe Street
Vancouver, BC
V6Z 2N3

This is Exhibit " 0 " referred to in the
affidavit of FRANK GEVER

made before me on AUGUST 10 2012

Erin Gombel Shiva

A Commissioner for taking Affidavits
for British Columbia

Attention: Ms. Alanna Gillis, Acting Commission Secretary

Dear Ms. Gillis:

Re: FortisBC Alternative Energy Services Inc.

Revisions to Rates and Rate Design for Thermal Energy Service to Delta School District Number 37

British Columbia Utilities Commission ("BCUC" or the "Commission") Order No. G-31-12 Compliance Filing

On November 28, 2011, FortisBC Energy Inc. ("FEI") applied for a Certificate of Public Convenience and Necessity ("CPCN") from the Commission to construct and operate an energy system to provide thermal energy to Delta School District Number 37 (the "SD"). The application sought approval of, among other things, the rates and the rate design contained within the Energy System Rate Development Agreement (the "RDA").

On March 9, 2012, the Commission issued its Decision (the "Decision") and Order No. G-31-12 (the "Order") granting a CPCN on the condition that the Service Agreements and the RDA be assigned to an affiliate of FEI. On March 16, 2012, subsequent to FEI's filing and pursuant to paragraph 1 of the Order requiring the provision of proof of the assignments, the Commission issued a CPCN to FortisBC Alternative Energy Service Inc. ("FAES") by Order No. C-3-12.

In paragraph 2 of the Order, the Commission denied the proposed rates and rate design as set out in the RDA. However, the Commission indicated in paragraph 3 of the Order that, with the agreement of FEI and Delta, it would approve a rate and rate design based upon a 60/40 debt/equity capital structure containing:

- a) A restriction of the rate schedule to Delta School District's current and future sites;
- b) Allowances for:

- i. capitalized overheads;
 - ii. cash working capital;
 - iii. inflation and escalation on capital replacements/sustaining capital; and
 - iv. replacement of “unpaid time” by FEI employees with “paid time”;
- c) A cost of debt rate based on an entity with a BBB rating with an additional premium to reflect the extra cost to arrange an incremental small debt issue; and
- d) A maximum of 50 basis points premium above the benchmark Return on Equity or a lower negotiated equity premium.

FAES and the SD have both agreed to revise the rates and rate design consistent with the rate design described above, specifically including:

- a) A 60/40 debt/equity capital structure as was originally submitted by FEI;
- b) A restriction of the rate schedule to the current and future sites of the SD, as was originally submitted by FEI;
- c) Inclusion of allowances in the cost of service for:
 - i. Capitalized overheads at the rate of 14%;
 - ii. Cash working capital at the rate of 12.5% of operations and maintenance expense;
 - iii. Inflation and escalation on capital replacements and sustaining capital items; and
 - iv. Replacement of “unpaid time” with “paid time” by FEI employees of \$20,000¹;
- d) A cost of debt rate of 5.91% rather than the FEI embedded cost of debt of 6.88%, based on an entity with a BBB rating with an additional premium to reflect the extra cost to arrange an incremental small debt issue; and
- e) A 50 basis point premium above the benchmark return on equity as negotiated in the RDA.

This rate design lowers the forecast of the levelized rate from \$0.120/kWh as was submitted on January 25, 2012 to \$0.116/kWh.

With respect to the directive to replace “unpaid time” by FEI employees with paid time, FAES would like to clarify that the project development costs already account for “unpaid” time. This is because the hourly rate for the allocation of employee costs to projects such as the

¹ The total project development costs relating to both “paid” and “unpaid” employee time is now \$145,000. This amount consists of the \$125,000 identified in BCUC IR 2.51.1 and the additional \$20,000 for “unpaid time” now included.

SD includes both base compensation and incentive compensation. That is, M&E employees are not paid for overtime on the basis of overtime hours worked, instead the employees receive a base salary tied to hours worked plus an annual incentive payment. While not a specific requirement, achieving the incentive payment will generally require working extra hours from time to time. However, FAES believes that the intent of the directive was to increase the forecast costs associated with the project and as such, an arbitrary increase of 15%, or \$20,000, has been added to the internal project development costs. FAES and the SD believe that this is a reasonable compromise. Furthermore, although FEI and FAES will continue with the practice of not tracking “unpaid” hours, FEI and FAES will also continue to ensure that M&E costs are appropriately allocated to projects.

Since each of the items described above are cost of service inputs, which the RDA describes as being subject to BCUC approval from time to time, this new rate and the rate design do not require any amendments to the RDA or Service Agreements.

Further, the Order, pursuant to paragraphs 4 (a) through (c), directed that FEI or its affiliate, in this case FAES, submit three reports to the SD and to the Commission within thirty (30) days of the date of the Order (by April 9, 2012). Accordingly, attached are the following reports:

1. Determination of the cost of debt;
2. Rate base items and recovery method after 20 years; and
3. Schedule of market rates versus cost of service rates.

Paragraph 4(d) requested that FAES and FEI (the “Companies”) confirm in writing whether the current Transfer Pricing Policy (“TPP”) requires any amendments in the short term to deal with the regulated affiliate and services which may be provided to it. The Companies hereby confirm that the TPP, with changes as requested in the FortisBC Energy Utilities (“FEU”) 2012-2013 Revenue Requirements Application (“2012-2013 RRA”), is adequate to deal with the provision of regulated services between FEI and FAES. Although, as confirmed in the Decision at page 97, the TPP pertains to the use of utility resources by an affiliated non-regulated business and does not apply between two regulated entities, in the 2012-2013 RRA the FEU requested approval to use the existing TPP with the exclusion of the overhead charge of 10 percent and the facility fee as the basis for cross charges between the regulated FEU and FortisBC Inc. (“FBC”) entities.² Thus, consistent with the treatment requested in the 2012-2013 RRA, the TPP excluding the overhead charge and facility fee will be used as a basis for cross charges between FEI and FAES. The Companies further confirm that they will follow this adjusted TPP methodology until the Commission orders otherwise. FEI and FAES also note the references at pages 91 and 98 of the Decision to a future process to review the cost allocation methodology affecting thermal energy service (including the Delta SD Project) and other regulated utility services provided by the Companies. The Companies believe this future review process is the appropriate context in which to establish cost allocation approaches that are fair for the customers of all regulated service offerings.

² FEU 2012-2013 RRA, Exhibit B-1, Page 276 and Appendix L-3

April 3, 2012
British Columbia Utilities Commission
Revisions to Rates and Rate Design for Thermal Energy Service to Delta SD
BCUC Order No. G-31-12 Compliance Filing
Page 4



Accordingly, and pursuant to paragraphs 4(f) and (g) of the Order, FEI will track and charge to FAES all overhead that it incurs for the provision of service to the Delta SD. Further, FAES and FEI will track the costs of providing service to the Delta SD, regardless of the entity providing the service, and will evaluate the cost allocation methodology on an ongoing basis.

Pursuant to paragraph 4(e) of the Order, FEI also confirms that the entire Thermal Energy Services Deferral Account will be maintained and remain with FEI until such time as the panels in the AES Inquiry, the FEU 2012-2013 RRA or other proceedings direct otherwise.

If you require further information or have any questions regarding this submission, please contact Grant Bierlmeier at (250) 380-5794.

Yours very truly,

on behalf of FORTISBC ALTERNATIVE ENERGY SERVICES INC.

Original signed by:

Diane Roy

Attachments

Attachment 1

COMPLIANCE FILING - EXECUTED

COMPLIANCE FILING
BRITISH COLUMBIA UTILITIES COMMISSION
ORDER No. G-31-12
RATES AND RATE DESIGN

TO: British Columbia Utilities Commission

Pursuant to:

- A. The British Columbia Utilities Commission (BCUC) Order No. G-31-12 (the "Order") dated March 9, 2012, paragraph 2 and 3 indicating that the BCUC denies the rates and rate design as applied for, but will approve the rates and rate design based upon a 60/40 debt/equity capital structure containing:
- a) A restriction of the rate schedule to Delta School District's (the SD) current and future sites;
 - b) Allowances for:
 - a. capitalized overheads;
 - b. cash working capital;
 - c. inflation and escalation on capital replacements/sustaining capital; and
 - d. replacement of "unpaid time" by FortisBC Energy Inc. (FEI) employees with "paid time";
 - c) A cost of debt rate based on an entity with a BBB rating with an additional premium to reflect the extra cost to arrange an incremental small debt issue; and
 - d) A maximum of 50 basis points premium above the benchmark Return on Equity or a lower negotiated equity premium.
- B. Paragraphs 4 (b) and (c) that direct that FEI or its affiliate, as the case may be, in this case, FortisBC Alternative Energy Service Inc. (FAES), submit to the SD and to the Commission within thirty (30) days of the date of the Order (by April 9, 2012 the following reports:
- a) Rate Base items and recovery method after 20 years; and
 - b) Schedule of market rates versus cost of service rates
1. FAES and the SD confirm that the rates and rate design acceptable to the BCUC as set out in Order G-31-12 are also acceptable to both FAES and the SD and are consistent with the existing terms of the Energy System Rate Development Agreement (RDA). The specific cost of service items and rate design attributes the BCUC requires FAES and the SD to accept in order to approve the rates and rate design are as follows:
- a) A 60/40 debt/equity capital structure as was originally submitted to the BCUC;
 - b) Restriction of the rate schedule to the current and future sites of the SD, as was originally submitted to the BCUC;

- c) Inclusion of allowances in the Cost of Service for:
- a. Capitalized overheads at the rate of 14%;
 - b. Cash working capital at the rate of 12.5% of OM&A;
 - c. Inflation and escalation on capital replacements and sustaining capital items; and
 - d. Replacement of "unpaid time" with "paid time" by FEI employees of \$20,000;
- d) A cost of debt rate of 5.91% rather than the FEI embedded cost of debt of 6.88%, based on an entity with a BBB rating with an additional premium to reflect the extra cost to arrange an incremental small debt issue; and
- e) A 50 basis point premium above the benchmark Return on Equity as negotiated in the RDA.
2. This rate and rate design lowers the forecast of the levelized rate from \$0.120/kWh as was submitted on January 25, 2012 to \$0.116/kWh.
3. Since each of these items are cost of service inputs, which the RDA describes being subject to BCUC approval from time to time, this new rate and the rate design do not require any amendments to the RDA or Service Agreements.
4. FAES has provided to the SD the following reports:
- a) Rate Base items and recovery method after 20 years; and
 - b) Schedule of market rates versus cost of service rates.

The SD confirms receipt of these reports and accepts the information contained within to be consistent with the intent of the SD.

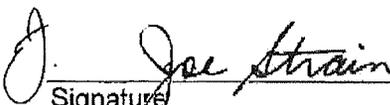
Dated as at April 3, 2012

**FORTISBC
ALTERNATIVE ENERGY SERVICES INC.**



Signature
Name: GARETH JONES
Title: VP EGM

**BOARD OF EDUCATION OF
SCHOOL DISTRICT NO. 37 (DELTA)**



Signature
Name: Joe Strain
Title: Secretary-Treasurer

Attachment 2

ENDING RATE BASE AND RISK



FORTISBC ENERGY INC. ON BEHALF OF FORTISBC ALTERNATIVE ENERGY SERVICES INC.
 DELTA SCHOOL DISTRICT DECISION AND ORDER NO. G-31-12 COMPLIANCE FILING

Ending Rate Base and Risk

As requested in order G-31-12 from the BCUC, the following is a summary of the items included in rate base at the end of the 20 year contract term and how these amounts will be recovered in the event the Service Agreements are not renewed.

The ending rate base is comprised of the depreciated value of the original capital investment, including the contribution in aid of construction, as well as the depreciated value of the sustainment capital necessary to provide ongoing service. The forecast ending rate base includes sustaining capital items and depreciation. The actual ending rate base may differ from this value due to the actual sustaining capital items that are necessary to deliver service to the SD as well as any changes to depreciation rates that may occur. Further, the ending rate base also includes amounts for capitalized overhead on O&M costs and for cash working capital. Of note, the capitalized overhead increases the ending rate base by \$650k. The table below summarizes the balances for each of these items at the end of the 20 year contract term:

Rate Base Summary (000s)

	Initial Investment (2012/2013)	Additional investments (2014-2031)	Accumulated Depreciation (2031)	Ending Net Book Value
Plant				
Pumps	\$ 1,829	\$ -	\$ (1,636)	\$ 193
Boilers	\$ 663	\$ -	\$ (369)	293
Ground Source Heat Exchangers	\$ 4,196	\$ -	\$ (1,613)	2,583
Sustaining Capital	\$ -	\$ 3,110	\$ (590)	2,520
Capitalized Overhead	\$ 58	\$ 822	\$ (232)	648
CIAC	(1,357)	-	651	(707)
Total Plant	\$ 5,389	\$ 3,932	\$ (3,790)	\$ 5,532
Cash Working Capital				46
TOTAL 2031 ENDING RATE BASE				5,577
2030 ENDING RATE BASE				5,792
2031 MID-YEAR RATE BASE ((Opening 2031 Rate Base + Ending 2031 Rate Base) / 2)				\$ 5,685

It is anticipated that at the end of the contract term, the energy systems will be in good working order and capable of continuous, reliable and efficient service.

To mitigate the risk that the Delta School District will not continue service at the end of the contract term, FAES will carefully manage the actual sustainment capital expenditures to minimize the actual cost of service, while also providing reliable service at competitive rates.

FORTISBC ENERGY INC. ON BEHALF OF FORTISBC ALTERNATIVE ENERGY SERVICES INC.
DELTA SCHOOL DISTRICT DECISION AND ORDER NO. G-31-12 COMPLIANCE FILING

In the event the DSD does not renew the contract or purchase the energy systems at the end of the initial term, some of the assets might be available to be re-deployed; however, as discussed in response to BCUC IR 1.59.3, some of the assets (e.g. the loop fields) would potentially be stranded and be at shareholder risk. If, at the end of the term, the Commission were to determine that the thermal energy system assets serving the DSD were no longer used and useful, then the shareholder would bear the risk.

On a present value basis, the rate base forecast at the end of the 20 year contract term is \$1.3M, which represents approximately 25% of the initial \$5.3M capital investment necessary to begin service. FAES must manage the amount of rate base by:

- Minimizing initial and sustaining capital investments in rate base
- Minimizing the thermal energy rates
- Delivering safe, reliable service on a continuous basis to the Delta School District
- Growing the overall thermal energy service

As can be seen, it is in the best interests of FAES to manage the costs, provide quality service to the SD in order to enhance the probability that the SD will choose to renew their service beyond the initial term and enable FAES to continue to earn a reasonable return on the assets it employs to provide this service into the future.

Attachment 3

**MARKET RATE AND COST OF SERVICE
RATE COMPARISON**

Market Rate comparison to Cost of Service Rate

As per the British Columbia Utilities Commission (BCUC) Order G-31-12, FortisBC Alternative Energy Services Inc. (FAES), an affiliate of FortisBC Energy Inc. (FEI) is providing the following schedule comparing the Net Present Value of the “market rate” to the cost-of service rate including amortization of the SD37 deferral account. FAES has recalculated the cost of service and rates based on the modifications set out in section 3 of the Order. The following are the updated NPV values requested in the Order.

	NPV (\$000's)
Market Rate	\$13,060
Cost of Service	\$11,415
Amortization	\$1,719
Cost of Service plus Amortization	\$13,134
Rate Rider	(\$1,740)
Thermal Energy Rate less Rate Rider	\$11,407

From this calculation, it is apparent that the rate the SD37 will pay (Thermal Energy Rate less Rate Rider) is effectively equal to the cost of service, as is the intent. In addition, the cost-of-service is lower than the market rate as is the intent. While the forecast cost of service including amortization is slightly higher than the market rate, it is not relevant, because the rate that the SD will pay includes both the amortization and the rate rider. The following two items are relevant in considering the actual rates that the SD will pay:

- The rate rider is applied to the rates that the SD pays and is then amortized in the following year. This causes a slight difference between the NPV of the Rate Rider and the Amortization amounts.
- Any difference between cost of service and revenues (other than the rate rider, which is amortized directly the following year as described above) is amortized over the remainder of the initial term. Since the amortization offsets the difference between revenues and cost of service, the amortization merely brings revenues back in line with the cost of service overall.



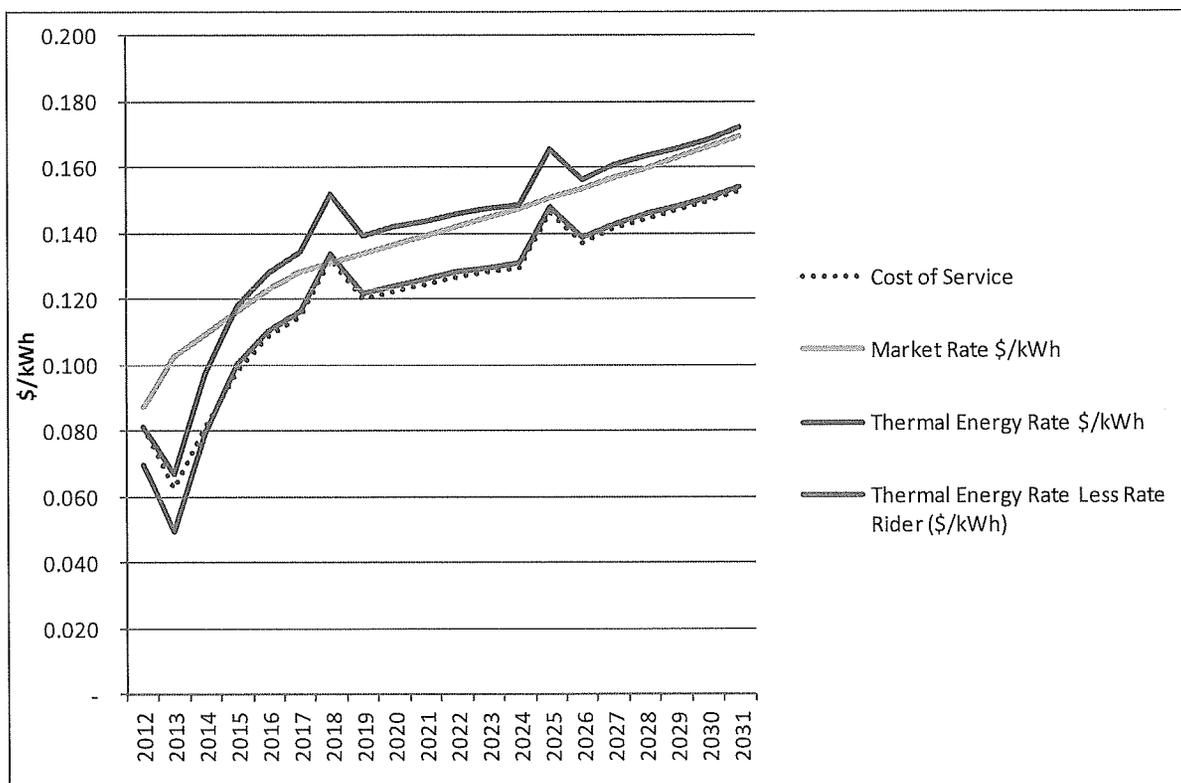
FORTISBC ENERGY INC. ON BEHALF OF FORTISBC ALTERNATIVE ENERGY SERVICES INC.
 DELTA SCHOOL DISTRICT DECISION AND ORDER No. G-31-12 COMPLIANCE FILING

The chart below illustrates graphically the relationships described by the NPV table above. Notably, on page 47 of the BCUC Decision for Order G-31-12, the BCUC states:

“Delta SD would effectively be providing a floor thermal rate, and only other systems with higher or equivalent costs would have an incentive to join.”

While the BCUC also made it clear that this service is currently limited to Delta School District’s current and future buildings, the rate design does respond to this issue by setting a thermal energy rate above the cost of service of the Delta SD, so as to facilitate the potential integration of other customers into the pool. In this context, the rate rider plays an important role. Also visible in this graph are the years in which significant sustainment capital is invested by FAES to ensure ongoing service quality and performance of the energy systems.

In this table, it is also apparent that the rate the SD will pay (Thermal Energy Rate less Rate Rider) is virtually identical to the cost-of-service each year, as was the intent of the rate design absent expansion of the pool.



Attachment 4

**COST OF DEBT FOR DELTA SCHOOL DISTRICT
THERMAL ENERGY SERVICE**

FORTISBC ENERGY INC. ON BEHALF OF FORTISBC ALTERNATIVE ENERGY SERVICES INC.
 DELTA SCHOOL DISTRICT DECISION AND ORDER NO. G-31-12 COMPLIANCE FILING

Cost of Debt for Delta School District Thermal Energy Service

Following receipt of order G-31-12 from the BCUC, FAES has derived a cost of debt for providing thermal energy service to Delta School District of 5.91%. This is consistent with an entity with a BBB rating (investment grade) including an additional premium to reflect the extra cost to arrange an incremental small debt issue as of March 14, 2012.

FAES will apply this rate for a period of 20 years for the initial term of the Energy System Rate Development Agreement (RDA).

In order to establish this rate, FAES obtained BBB debt rate quotes from two Canadian Chartered banks, CIBC World Markets and RBC Capital Markets as of March 14, 2012 and March 13, 2012 respectively.

FAES calculated the rate as follows, as per the Order G-21-12 – “Includes a cost of debt rate based on an entity with a BBB rating with an additional premium to reflect the extra cost to arrange an incremental small debt issue”:

Credit Spread	CIBC Interpolated BBB 20-year rate	3.08%	
	RBC Interpolated BBB 20-year rate ¹	<u>3.16%</u>	
	Average Rate		3.12%
GOC	CIBC Interpolated GOC Benchmark 20 - year	2.53%	
	RBC Interpolated GOC Benchmark - 20 year ¹	<u>2.34%</u>	
	Average Rate		2.44%
Issuance Fee Annualized			<u>0.35%</u>
Total Interest Rate			5.91%

¹- Linear Interpolation

Attachment 5
FINANCIAL MODEL OUTPUT

Live Spreadsheets provided Confidentially in electronic format

Fortis BC
Thermal Energy Solutions
School District No 37 - Delta
Financial Schedules

	<u>Schedule</u>
Revenue Requirement	1
Cost of Natural Gas	2
Cost of Electricity	3
O&M and Property Tax	4
Income Tax	5
Capital Cost Allowance	6
Rate Base	7
Capital Spending	8
Gross Plant In Service and Contributions in Aid of Construction	9
Accumulated Depreciation and Amortization	10
Deferred Charges	11
Rate Design	12
Economic Test	13

Fortis BC
 Thermal Energy Solutions
 School District No 37 - Delta

Thermal Energy Solutions: Illustrative Revenue Requirement

(\$000's), unless otherwise stated

Line Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
1 Revenue Requirement																					
2 Cost of Natural Gas	48	114	127	134	142	147	150	153	156	160	163	166	169	173	176	180	183	187	191	195	
3 Cost of Electricity	26	174	228	234	241	248	255	262	270	277	285	293	301	310	318	327	336	346	355	365	
6 Operation and Maintenance	144	214	218	223	227	232	232	244	249	254	259	264	270	284	284	289	295	301	307	313	
7 Property Taxes	-	-	1	4	8	11	12	12	14	13	13	13	14	14	14	16	15	15	15	16	
8 Depreciation Expense	64	142	155	160	164	165	166	168	177	185	187	188	190	212	234	236	238	239	253	267	
12 Income Taxes	(276)	(464)	(262)	(100)	(17)	38	59	73	62	54	67	75	82	25	(6)	32	58	76	54	40	
13 Earned Return	164	360	390	388	386	376	370	360	370	379	369	359	348	393	434	421	407	393	411	429	
14																					
15 Annual Revenue Requirement	170	540	858	1,043	1,150	1,217	1,404	1,274	1,298	1,321	1,343	1,359	1,373	1,556	1,455	1,501	1,532	1,557	1,587	1,625	
Sum of Lines 1 through 13																					

Fortis BC
Thermal Energy Solutions
School District No 37 - Delta

Thermal Energy Solutions: Cost of Natural Gas
(5000%), unless otherwise stated
Schedule 2

Line	Particulars	Reference	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031			
2	Natural Gas (GJ)																								
3	Residential																								
4	Small Commercial (<2,000 GJ/555 MWh)		5,803	12,995	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641		
5	Large Commercial (>2,000 GJ/555 MWh)																								
6	Small Institution (<2,000 GJ/555 MWh)																								
7	Large Institution (>2,000 GJ/555 MWh)																								
8	Total Natural Gas (GJ)		5,803	12,995	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641	13,641		
9	Cost																								
10	Natural Gas Cost																								
11	Residential																								
12	Small Commercial (<2,000 GJ/555 MWh)	Line 3 x \$ per GJ/1000	48	114	127	134	142	147	150	153	156	160	163	166	169	173	176	180	183	187	191	195			
13	Large Commercial (>2,000 GJ/555 MWh)	Line 4 x \$ per GJ/1000																							
14	Small Institution (<2,000 GJ/555 MWh)	Line 5 x \$ per GJ/1000																							
15	Large Institution (>2,000 GJ/555 MWh)	Line 6 x \$ per GJ/1000																							
16	Total Natural Gas Energy Cost	Line 7 x \$ per GJ/1000																							
17		Sum of Lines 12 through 16	48	114	127	134	142	147	150	153	156	160	163	166	169	173	176	180	183	187	191	195			

Forks BC
 Thermal Energy Solutions
 Scenario District No 37 - Delta

Thermal Energy Solutions: Cost of Electricity
 (\$000's), unless otherwise stated
 Schedule 3

Line	Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031				
1	Electricity (MWh)																								
2	Residential																								
3	Small Commercial (< 2,000 GJ/555 MWh)																								
4	Large Commercial (> 2,000 GJ/555 MWh)																								
5	Small Institution (< 2,000 GJ/555 MWh)	377	2,376	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095		
6	Large Institution (> 2,000 GJ/555 MWh)																								
7	Total Electricity (MWh)	377	2,376	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095	3,095		
8	Cost																								
9	Electricity Cost																								
10	Residential																								
11	Small Commercial (< 2,000 GJ/555 KWh)																								
12	Large Commercial (> 2,000 GJ/555 KWh)																								
13	Small Institution (< 2,000 GJ/555 KWh)	26	174	228	234	241	248	255	262	270	277	285	293	301	310	318	327	336	346	355	365	365	365	365	
14	Large Institution (> 2,000 GJ/555 KWh)																								
15	Total Electricity Cost	26	174	228	234	241	248	255	262	270	277	285	293	301	310	318	327	336	346	355	365	365	365	365	
16	Reference																								
17	Sum of Lines 12 through 16	26	174	228	234	241	248	255	262	270	277	285	293	301	310	318	327	336	346	355	365	365	365	365	

Fortis BC
Thermal Energy Solutions
School District No 37 - Delta

Thermal Energy Solutions: Indicative O&M, Other Revenue and Property Tax

Schedule 4
(\$000's), unless otherwise stated

Line	Particulars	Reference	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1	Gross O&M		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
2	Labour Costs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3	Vehicle Costs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
4	Employee Expenses		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
5	Materials & Supplies		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	Computer Costs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
7	Fees & Administrations Costs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	Contractor Costs		134	199	203	207	211	216	364	227	232	236	241	246	251	400	264	269	274	280	286	291
9	Facilities		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
10	Overheads and Shared Services Allocation ¹		34	50	51	52	53	54	91	57	58	59	60	61	63	100	66	67	69	70	71	73
11	Sum of Lines 4 through 11		168	249	254	259	264	269	455	284	290	295	301	307	314	500	330	336	343	350	357	364
12	Non-Labour Costs		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13	Line 2 + Line 13		168	249	254	259	264	269	455	284	290	295	301	307	314	500	330	336	343	350	357	364
14	Total Gross O&M Expenses		168	249	254	259	264	269	455	284	290	295	301	307	314	500	330	336	343	350	357	364
15	(Less): Capitalized Overhead		(24)	(35)	(36)	(36)	(37)	(38)	(64)	(40)	(41)	(41)	(42)	(43)	(44)	(70)	(46)	(47)	(48)	(49)	(50)	(51)
16	Net O&M		144	214	218	223	227	232	391	244	249	254	259	264	270	430	284	289	295	301	307	313
17	Other Revenue		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18	Environmental Credits		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19	Electricity Sales Revenue		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20	Total Other Revenue		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21	Property Taxes		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	General, School and Other		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23	1% in Lieu of General Municipal Tax ²		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
24	1% in Lieu of General Municipal Tax ²		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
25	Total Property Taxes		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
26	Schedule 12, Line 26 x 1%		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
27	Line 28 + Line 29		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
28	1 - Overhead charges from FEI		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
29	2 - Calculation is based on the second preceding year, ex., 2014 is based on 2012 revenue		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
30			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
31			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Ferch BC
Thermal Energy Solutions
Schedule No 37 - Defra

Thermal Energy Solutions: Indicative Income Tax Expense
(5000%), unless otherwise stated

Line Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1 Income Tax Expense																				
2																				
3 Earned Return	164	360	390	388	386	376	370	360	370	379	368	359	348	363	434	471	467	393	441	439
4 Deduct: Interest on Debt	(77)	(169)	(183)	(182)	(181)	(177)	(174)	(168)	(174)	(178)	(178)	(169)	(168)	(185)	(204)	(186)	(191)	(185)	(195)	(202)
5 Add: Depreciation Expense	64	142	156	150	164	165	166	168	177	185	187	188	190	212	234	230	234	211	233	(201)
6 Deduct: Overhead Capitalized Expensed for Tax	(10)	(15)	(15)	(16)	(16)	(16)	(17)	(17)	(17)	(18)	(18)	(18)	(19)	(20)	(20)	(20)	(21)	(21)	(21)	(21)
7 Deduct: Capital Cost Allowance	(988)	(1,709)	(1,183)	(650)	(403)	(234)	(159)	(122)	(168)	(207)	(258)	(334)	(410)	(516)	(663)	(844)	(1,057)	(1,317)	(1,681)	(2,152)
8 Taxable Income After Tax	(827)	(1,392)	(798)	(300)	(51)	114	176	220	186	161	201	226	246	74	(18)	95	175	228	151	121
9 Income Tax Rate	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
10 1- Current Income Tax Rate	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%
11																				
12																				
13 Taxable Income	(1,103)	(1,856)	(1,049)	(400)	(68)	132	235	294	249	215	268	302	327	89	(24)	127	234	305	215	161
14																				
15 Total Income Tax Expense	(276)	(464)	(262)	(100)	(17)	88	59	73	62	54	67	75	82	25	(6)	32	58	76	54	40
16 Adjustments	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
17 Net Tax Expense	(276)	(464)	(262)	(100)	(17)	88	59	73	62	54	67	75	82	25	(6)	32	58	75	54	40
18 Loss Carry-forward	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Opening Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Loss Carry-forward	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Loss Utilization	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Closing Balance	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23																				

Fortis BC
Thermal Energy Solutions
School District No 37 - Delta

Thermal Energy Solutions: Capital Cost Allowance

(500%), unless otherwise stated

Line Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1 Pump: Class 43.2 @ 50%		933	629	315	157	79	39	20	10	5	2	1	1	0	0	0	0	0	0	0
2 Opening Balance	1,244	217																		
3 Additions	(311)	(521)	(315)	(157)	(79)	(39)	(20)	(10)	(5)	(2)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
4 CCA																				
5 Closing Balance	933	629	315	157	79	39	20	10	5	2	1	1	0	0	0	0	0	0	0	0
6 Boilers for CCA: Class 17 @ 8%																				
7 Opening Balance																				
8 Additions	545	(42)	(48)	(95)	(47)	(30)	(28)	(25)	(23)	(21)	(20)	(18)	(17)	(15)	(14)	(13)	(12)	(11)	(10)	(9)
9 CCA																				
10 Closing Balance	523	481	443	407	375	345	317	292	268	247	227	209	192	177	163	150	138	127	117	107
11																				
12																				
13 Jeep Field (Ground Source Heat Exchanger): Class 43.2 @ 50%		1,894	1,511	756	378	189	94	47	24	12	6	3	1	1	0	0	0	0	0	0
14 Opening Balance																				
15 Additions	2,525	752	(756)	(378)	(189)	(94)	(47)	(24)	(12)	(6)	(3)	(1)	(1)	(0)	(0)	(0)	(0)	(0)	(0)	(0)
16 CCA	(651)	(1,155)																		
17 Closing Balance	1,894	1,511	756	378	189	94	47	24	12	6	3	1	1	0	0	0	0	0	0	0
18																				
19 Sustainable Capital: Class 43.2 @ 50%																				
20 Opening Balance																				
21 Additions																				
22 CCA																				
23 Closing Balance																				
24																				
25 Sustainable Capital: Class 43.2 @ 30%																				
26 Opening Balance																				
27 Additions																				
28 CCA																				
29 Closing Balance																				
30																				
31																				
32 Capitalised Overhead: Class 43.2 @ 44.7%																				
33 Opening Balance																				
34 Additions																				
35 CCA																				
36 Closing Balance																				
37 Total CCA																				
38 Opening Balance																				
39 Additions	4,333	993	55	218	37	38	85	40	553	41	65	43	44	1,511	71	47	48	49	935	51
40 CCA	(968)	(1,709)	(1,133)	(650)	(403)	(254)	(159)	(122)	(169)	(207)	(169)	(134)	(110)	(344)	(257)	(197)	(197)	(288)	(352)	(552)
41 Closing Balance	3,365	2,648	1,570	1,137	771	575	501	419	804	638	540	449	383	1,578	1,187	890	890	552	1,178	878

Fortis BC
Thermal Energy Solutions
School District No 37 - Delta
Thermal Energy Solutions: Indicative Rate Base
(2000's), unless otherwise stated

Line	Particulars	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1	TES Rate Base										
2	Gross Plant in Service - Beginning	-	5,212	6,746	8,801	7,019	7,056	7,094	7,179	7,218	7,218
3	Gross Plant in Service - Ending	5,222	6,746	6,801	7,019	7,056	7,094	7,179	7,218	7,218	7,218
4	Accumulated Depreciation - Beginning	-	(75)	(244)	(484)	(628)	(826)	(1,024)	(1,225)	(1,427)	(1,627)
5	Accumulated Depreciation - Ending	(75)	(244)	(484)	(628)	(826)	(1,024)	(1,225)	(1,427)	(1,627)	(1,827)
6	CIAC - Beginning	-	(850)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)
7	CIAC - Ending	(850)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)
8	Accumulated Amortization - Beginning	-	11	38	72	106	140	174	208	242	276
9	Accumulated Amortization - Ending	11	38	72	106	140	174	208	242	276	310
10	Net Plant in Service, Mid-Year	2,149	4,740	5,133	5,111	5,077	4,950	4,846	4,741	4,685	4,582
11	Adjustment to 13-month average	-	-	-	-	-	-	-	-	-	-
12	Unamortized Deferred Charges, Mid-Year	-	-	-	-	-	-	-	-	-	-
13	Cash Working Capital	21	31	32	32	33	34	35	36	37	37
14	Total TES Rate Base	2,170	4,771	5,165	5,144	5,110	4,984	4,903	4,777	4,702	4,582
15	Return on TES Rate Base										
16	Equity Return ¹	87	191	207	206	204	199	196	191	196	201
17	Debt Component ²	77	169	183	182	181	177	174	169	174	178
18	Total Earned Return	164	360	390	388	385	376	370	360	370	379
19	Return on Rate Base %	7.55%	7.55%	7.55%	7.55%	7.55%	7.55%	7.55%	7.55%	7.55%	7.55%
20	Cost of Service Discount Rate	1.08	1.15	1.24	1.34	1.44	1.55	1.66	1.79	1.92	2.07
21	Equity component of rate base at 40.0% with return on equity of 10.0%										
22	Debt component of rate base at 60.0% with debt rate of 5.91%										

¹ Equity component of rate base at 40.0% with return on equity of 10.0%
² Debt component of rate base at 60.0% with debt rate of 5.91%

Ferris BC
Thermal Energy Solutions
School District No 37 - Delta

Thermal Energy Solutions: Capital Spending
(5000\$), unless otherwise stated

Schedule 8

Line Particulars	Reference	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031		
1																							
2	Capital Spending 2012 Onwards																						
3	Pumps	1,488	328																				
4	Boilers low CCA	652																					
5	Loop Field (Ground Source Heat Exchanger)	9,020	1,137																				
6	Sustaining Capital			20	181			21		513		25			1,441	25						885	
7	Total Capital Spending 2012 Onwards	5,159	1,465	20	181			21		513		25			1,441	25						885	
8	AFUDC 2012 Onwards																						
9	Pumps	6	7																				
10	Boilers low CCA	11																					
11	Loop Field (Ground Source Heat Exchanger)	12	27																				
12	Sustaining Capital																						
13	Total AFUDC 2012 Onwards	29	34																				
14	Total Capital Spending	5,159	1,465	20	181			21		513		25			1,441	25						885	
15	Total AFUDC	29	34																				
16	Total Annual Capital Spending and AFUDC	5,188	1,499	20	181			21		513		25			1,441	25						885	
17	Contributions in Aid of Construction	(850)																					
18	Removal Costs																						
19	Net Annual Project Costs- Capital	4,338	992	20	181			21		513		25			1,441	25						885	
20	Total Project Costs- Capital Spending and AFUDC	9,797																					
21	Sum of Lines 16 and 22	8,440																					
22	Total Net Project Costs- Capital Spending, AFUDC, CCA & Removal Costs																						
23	Sum of Lines 16 and 22																						
24	Total Net Project Costs																						
25	Sum of Lines 16 and 22																						
26	Sum of Lines 16 and 22																						
27	1- Including capitalized overhead: First year of analysis includes all prior year spending for development costs																						

Fortis BC
Thermal Energy Solutions
School District No 37 - Delta

Thermal Energy Solutions: Gross Plant in Service & Contributions in Aid of Construction
(5000\$), unless otherwise stated

Line Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
1. Gross Plant in Service																					
2 Gross Plant in Service, Beginning	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
3 Pumps	1,493	1,493	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829
4 Boilers low CCA	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663
5 Loop Field (Ground Source Heat Exchanger)	3,032	3,032	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196
6 Sustaining Capital	-	-	20	20	201	201	201	201	201	201	201	201	201	201	201	201	201	201	201	201	201
7 Capitalized Overhead	-	-	58	94	130	167	205	269	308	349	390	432	476	519	589	683	731	780	830	881	850
8 Total Gross Plant in Service, Beginning	5,212	6,746	6,801	7,019	7,056	7,094	7,179	7,218	7,218	7,772	7,813	7,879	7,922	7,966	9,476	9,547	9,595	9,643	9,692	10,627	10,677
9 Gross Plant in Service, Additions ¹																					
10 Pumps	1,493	386	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
11 Boilers low CCA	663	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12 Loop Field (Ground Source Heat Exchanger)	3,032	1,164	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
13 Sustaining Capital	-	-	20	181	-	21	-	513	-	1,441	23	-	-	-	-	-	-	-	-	-	-
14 Capitalized Overhead	24	35	36	37	38	38	64	40	41	41	42	43	44	70	46	47	48	49	50	51	51
15 Total Gross Plant in Service, Additions	5,212	1,534	55	218	37	38	85	40	553	41	65	43	44	1,511	71	47	48	49	50	51	51
16 Gross Plant in Service, Retirements																					
17 Pumps	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
18 Boilers low CCA	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
19 Loop Field (Ground Source Heat Exchanger)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
20 Sustaining Capital	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
21 Capitalized Overhead	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22 Total Gross Plant in Service, Retirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
23 Gross Plant in Service, Ending																					
24 Pumps	1,493	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829	1,829
25 Boilers low CCA	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663	663
26 Loop Field (Ground Source Heat Exchanger)	3,032	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196	4,196
27 Sustaining Capital	-	-	20	201	201	201	201	201	201	201	201	201	201	201	201	201	201	201	201	201	201
28 Capitalized Overhead	24	58	94	130	167	205	269	308	349	390	432	476	519	589	683	731	780	830	881	850	850
29 Total Gross Plant in Service, Ending	5,212	6,746	6,801	7,019	7,056	7,094	7,179	7,218	7,772	7,813	7,879	7,922	7,966	9,476	9,547	9,595	9,643	9,692	10,627	10,677	10,678
Contributions in Aid of Construction (CIAC)																					
30 CIAC, Beginning	-	(850)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)
31 Additions	(850)	(507)	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
32 Retirements	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
33 CIAC, Ending	(850)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)

42. 1-AFUDC included in 2012 and 2013 Gross Plant in Service Additions is calculated using actual estimated timing of spend while assuming a mid-year in service date for all projects

Fonds BC
Thermal Energy Solutions
School District No 37 - Delta

Thermal Energy Solutions: Accumulated Depreciation & Amortization
(5000's), unless otherwise stated

Line Particulars	Reference	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1 Accumulated Depreciation																					
2																					
3 Accumulated Depreciation, Beginning																					
4 Preceding Year, Line 28			(35)	(112)	(195)	(281)	(366)	(450)	(535)	(620)	(704)	(789)	(874)	(958)	(1,043)	(1,128)	(1,212)	(1,297)	(1,382)	(1,466)	(1,551)
5 Pumps			(8)	(26)	(47)	(66)	(85)	(104)	(123)	(142)	(161)	(180)	(199)	(218)	(237)	(256)	(275)	(293)	(312)	(331)	(350)
6 Boilers low COA			(30)	(103)	(187)	(271)	(354)	(438)	(523)	(606)	(690)	(774)	(858)	(942)	(1,026)	(1,110)	(1,194)	(1,278)	(1,361)	(1,445)	(1,529)
7 Loop Field (Ground Source Heat Exchanger)			-	-	(0)	(3)	(9)	(15)	(21)	(27)	(41)	(62)	(84)	(105)	(127)	(170)	(233)	(297)	(361)	(424)	(501)
8 Sustaining Capital			(0)	(2)	(4)	(7)	(11)	(17)	(23)	(32)	(44)	(52)	(63)	(76)	(91)	(107)	(124)	(143)	(163)	(185)	(208)
9 Capitalized Overhead			(75)	(244)	(434)	(628)	(826)	(1,024)	(1,225)	(1,427)	(1,637)	(1,857)	(2,077)	(2,300)	(2,523)	(2,769)	(3,038)	(3,308)	(3,579)	(3,852)	(4,139)
10 Sum of Lines 4 through 9			(85)	(277)	(485)	(695)	(905)	(1,115)	(1,325)	(1,535)	(1,745)	(1,955)	(2,165)	(2,375)	(2,585)	(2,795)	(2,995)	(3,195)	(3,395)	(3,595)	(3,795)
11 Accumulated Depreciation, Depreciation Expense ¹																					
12 Pumps@ 4.65%			(8)	(19)	(33)	(49)	(66)	(83)	(100)	(117)	(134)	(151)	(168)	(185)	(202)	(219)	(236)	(253)	(270)	(287)	(304)
13 Boilers low COA@ 2.86%			(30)	(72)	(124)	(184)	(244)	(304)	(364)	(424)	(484)	(544)	(604)	(664)	(724)	(784)	(844)	(904)	(964)	(1,024)	(1,084)
14 Loop Field (Ground Source Heat Exchanger)@ 2%			(0)	-	(0)	(3)	(9)	(15)	(21)	(27)	(41)	(62)	(84)	(105)	(127)	(170)	(233)	(297)	(361)	(424)	(501)
15 Sustaining Capital@ 8.7%			(0)	(2)	(4)	(7)	(11)	(17)	(23)	(32)	(44)	(52)	(63)	(76)	(91)	(107)	(124)	(143)	(163)	(185)	(208)
16 Capitalized Overhead@ 2.87%			(75)	(244)	(434)	(628)	(826)	(1,024)	(1,225)	(1,427)	(1,637)	(1,857)	(2,077)	(2,300)	(2,523)	(2,769)	(3,038)	(3,308)	(3,579)	(3,852)	(4,139)
17 Total Depreciation Expense			(85)	(277)	(485)	(695)	(905)	(1,115)	(1,325)	(1,535)	(1,745)	(1,955)	(2,165)	(2,375)	(2,585)	(2,795)	(2,995)	(3,195)	(3,395)	(3,595)	(3,795)
18																					
19 Accumulated Depreciation, Retirements																					
20 Pumps																					
21 Boilers low COA																					
22 Loop Field (Ground Source Heat Exchanger)																					
23 Sustaining Capital																					
24 Capitalized Overhead																					
25 Total Accumulated Depreciation, Retirements																					
26																					
27 Accumulated Depreciation, Ending																					
28 Pumps			(35)	(112)	(195)	(281)	(366)	(450)	(535)	(620)	(704)	(789)	(874)	(958)	(1,043)	(1,128)	(1,212)	(1,297)	(1,382)	(1,466)	(1,551)
29 Boilers low COA			(9)	(28)	(47)	(66)	(85)	(104)	(123)	(142)	(161)	(180)	(199)	(218)	(237)	(256)	(275)	(293)	(312)	(331)	(350)
30 Loop Field (Ground Source Heat Exchanger)			(30)	(103)	(187)	(271)	(354)	(438)	(523)	(606)	(690)	(774)	(858)	(942)	(1,026)	(1,110)	(1,194)	(1,278)	(1,361)	(1,445)	(1,529)
31 Sustaining Capital			(0)	(2)	(4)	(7)	(11)	(17)	(23)	(32)	(44)	(52)	(63)	(76)	(91)	(107)	(124)	(143)	(163)	(185)	(208)
32 Capitalized Overhead			(75)	(244)	(434)	(628)	(826)	(1,024)	(1,225)	(1,427)	(1,637)	(1,857)	(2,077)	(2,300)	(2,523)	(2,769)	(3,038)	(3,308)	(3,579)	(3,852)	(4,139)
33 Total Accumulated Depreciation, Ending			(85)	(277)	(485)	(695)	(905)	(1,115)	(1,325)	(1,535)	(1,745)	(1,955)	(2,165)	(2,375)	(2,585)	(2,795)	(2,995)	(3,195)	(3,395)	(3,595)	(3,795)
34																					
35																					
36 Accumulated Amortization of Contributions in Aid of Construction (CIAC)																					
37 Preceding Year, Line 40			11	38	72	106	140	174	208	242	276	310	344	378	412	446	481	515	549	583	617
38 Amortization			11	28	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34	34
39 Retirements			-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
40 Accumulated Amortization CIAC, Ending			11	38	72	106	140	174	208	242	276	310	344	378	412	446	481	515	549	583	617
41																					
42 Removal Cost Provision																					
43 Pumps																					
44 Boilers low COA																					
45 Loop Field (Ground Source Heat Exchanger)																					
46 Sustaining Capital																					
47 Total Removal Cost Provision																					
48																					
49 1- Depreciation & Amortization Expense calculation & based on opening balance + additions x 1/2 for all years, including 2012 and 2013, as project in-service dates vary in those years																					

Ford's BC
Thermal Energy Solutions
School District No 37 - Delta

Thermal Energy Solutions: Deferred Charges
(\$000's), unless otherwise stated
Schedule 11

Line Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
1																					
2																					
3		25	146	175	166	156	147	137	128	118	108	98	88	77	66	56	45	33	22	11	
4																					
5		24	116	19	(20)	(19)	(19)	(18)	(18)	(17)	(17)	(16)	(16)	(15)	(15)	(14)	(14)	(13)	(12)	(12)	
6																					
7		6	10	11	10	10	9	9	8	7	7	6	5	5	4	3	3	2	1	1	0
8		25	121	29	(9)	(9)	(10)	(10)	(10)	(10)	(10)	(10)	(10)	(11)	(11)	(11)	(11)	(11)	(11)	(11)	
9																					
10		25	146	175	166	156	147	137	128	118	108	98	88	77	66	56	45	33	22	11	(1)
11																					
12																					
13																					
14																					
15																					
16																					
17																					
18																					
19																					
20																					
21																					

Deferred Charges

Foris BC
Thermal Energy Solutions
School District No 37 - Delta

Thermal Energy Solutions: Indicative Rate Design
(\$000's), unless otherwise stated

Line Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031
1 Annual Volume for Billing (MWh)	2,999	7,451	8,525	7,927	7,971	6,854	6,973	10,605	10,605	10,605	10,605	10,605	10,605	10,605	10,605	10,605	10,605	10,605	10,605	10,605
2 Present Value	58,105	0.133	13,060	11,415	0.081	0.098	0.108	0.115	0.122	0.132	0.142	0.152	0.162	0.172	0.182	0.192	0.202	0.212	0.222	0.232
3 Market Rate \$/kWh	0.087	0.103	0.109	0.116	0.123	0.136	0.150	0.164	0.178	0.192	0.206	0.220	0.234	0.248	0.262	0.276	0.290	0.304	0.318	0.332
4 Market Rate Revenue	263	884	1,160	1,253	1,306	1,363	1,390	1,418	1,447	1,476	1,505	1,535	1,566	1,597	1,629	1,662	1,695	1,729	1,763	1,799
5 Present Value	170	784	933	922	968	881	886	792	752	715	676	641	608	577	547	519	492	467	443	420
6 Cost of Service	170	540	858	1,049	1,150	1,217	1,404	1,274	1,298	1,321	1,343	1,369	1,373	1,356	1,455	1,501	1,532	1,557	1,587	1,625
7 Present Value	158	447	690	790	800	786	843	712	674	638	603	568	533	562	469	445	420	398	379	353
8 Cost of Service Rate \$/kWh	0.081	0.065	0.081	0.098	0.108	0.115	0.132	0.120	0.122	0.125	0.127	0.128	0.129	0.147	0.137	0.142	0.145	0.147	0.150	0.153
9 CCS Switch	-	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
10 Amortization Period	20	19	18	17	16	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1
11 Provision of Deferral Account	-	37	169	208	208	207	207	206	206	205	205	204	204	203	203	202	202	201	201	200
12 Present Value	-	4,719	32	436	456	444	434	424	415	407	392	385	379	373	368	363	359	354	350	347
13 CCS including Amortization	170	577	1,027	1,252	1,358	1,424	1,610	1,481	1,504	1,527	1,547	1,564	1,577	1,759	1,658	1,704	1,734	1,758	1,787	1,824
14 Present Value	158	499	826	936	944	920	868	827	781	738	695	653	612	635	557	532	503	475	449	426
15 Thermal Energy Rate \$/kWh	0.081	0.067	0.097	0.118	0.128	0.134	0.152	0.140	0.142	0.144	0.146	0.147	0.149	0.166	0.156	0.161	0.164	0.166	0.169	0.172
16 SD 37 Rate Rider	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)
17 SD 37 Rate Discount	(97)	(153)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)	(188)
18 Present Value	(1,740)	(132)	(151)	(141)	(131)	(122)	(113)	(105)	(98)	(91)	(84)	(79)	(73)	(68)	(63)	(59)	(55)	(51)	(47)	(44)
19 Total Annual Revenue	146	424	839	1,064	1,170	1,236	1,422	1,292	1,316	1,339	1,359	1,376	1,389	1,371	1,470	1,515	1,546	1,570	1,599	1,636
20 Present Value	11,407	136	367	675	795	813	789	855	722	694	647	611	575	567	494	473	449	424	401	382
21 Thermal Energy Rate Less Rate Rider (\$/kWh)	0.116	0.049	0.078	0.100	0.110	0.117	0.134	0.122	0.124	0.126	0.128	0.130	0.131	0.148	0.139	0.143	0.146	0.148	0.151	0.154
22 Schedule 11, Line 10 / Schedule 7, Line 29	23	126	141	124	109	95	82	71	61	52	44	37	30	24	19	14	10	6	3	(0)

Forts BC
Thermal Energy Solutions
School District No 37 - Delta
(\$000's), unless otherwise stated
Schedule 13

Economic Test Summary
PV of Inflows (Sum of Line 9)
12,396
PV of Outflows (Sum of Line 21)
12,101
PI 1.02
Total Required Contribution For PI-1

Line Particulars	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	
1 After-Tax WACC																					
2 Discount Factor	1.00	1.07	1.14	1.21	1.29	1.38	1.47	1.57	1.67	1.79	1.91	2.03	2.17	2.31	2.47	2.63	2.81	2.99	3.19	3.40	3.63
3																					
4 Inflow																					
5 Rate Revenue	146	424	839	1,064	1,170	1,236	1,422	1,282	1,316	1,339	1,359	1,376	1,389	1,371	1,470	1,515	1,546	1,570	1,599	1,636	1,686
6 Rate \$/kWh	\$ 0.070	\$ 0.049	\$ 0.079	\$ 0.100	\$ 0.110	\$ 0.117	\$ 0.134	\$ 0.122	\$ 0.124	\$ 0.126	\$ 0.128	\$ 0.130	\$ 0.131	\$ 0.148	\$ 0.139	\$ 0.143	\$ 0.146	\$ 0.148	\$ 0.151	\$ 0.154	\$ 0.154
7 Annual Net Cash Inflow	146	424	839	1,064	1,170	1,236	1,422	1,282	1,316	1,339	1,359	1,376	1,389	1,371	1,470	1,515	1,546	1,570	1,599	1,636	1,686
8 Discounted Cash Inflow	137	373	692	822	848	859	906	772	737	703	689	635	601	637	559	540	517	492	470	451	451
9																					
10 Outflow																					
11 Capital Investment	4,338	892	20	181	-	-	21	-	513	-	23	-	-	1,441	25	-	-	-	885	-	-
12 Cost of Energy Sold	74	286	354	388	383	395	405	416	426	437	448	459	471	483	495	507	520	533	546	560	560
13 O & M	168	249	254	259	264	269	284	290	290	295	301	307	314	320	330	336	343	350	357	364	364
14 Property Taxes	0	0	1	4	8	11	12	12	12	13	13	13	14	14	14	16	16	15	15	16	16
15 Income Tax Expense ¹	(24)	(28)	(283)	(163)	(101)	(56)	(40)	(30)	(42)	(52)	(44)	(33)	(28)	(79)	(116)	(86)	(64)	(49)	(72)	(88)	(88)
16 CCA Tax Shield	(242)	(427)	(283)	(163)	(101)	(56)	(40)	(30)	(42)	(52)	(44)	(33)	(28)	(79)	(116)	(86)	(64)	(49)	(72)	(88)	(88)
17 Terminal Value																					
18 Annual Net Cash Outflow	0	4,314	1,074	404	759	683	757	991	827	842	854	855	918	2,502	906	937	980	1,017	1,902	(4,659)	(4,659)
19 Discounted Cash Outflow	0	4,044	944	333	566	495	514	631	494	442	440	413	397	1,015	344	334	328	319	559	(1,283)	(1,283)
20 Cash Flow																					
21 Discounted Cash Flow	0	(4,168)	(650)	436	305	487	479	431	466	(31)	497	465	480	471	(930)	564	578	588	533	(303)	6,296
22 PV of cash Flow	0	(3,907)	(571)	359	236	353	325	274	278	(18)	261	229	222	204	214	206	189	173	(89)	(89)	1,734
23 Sum of Line 24	295																				

¹ Before CCA & Overhead Capitalized Tax Shield

Attachment 6
DRAFT ORDER

SIXTH FLOOR, 900 HOWE STREET, BOX 250
VANCOUVER, BC V6Z 2N3 CANADA
web site: <http://www.bcuc.com>



BRITISH COLUMBIA
UTILITIES COMMISSION

ORDER
NUMBER

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

DRAFT ORDER

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

and

An Application by FortisBC Energy Inc.
For a Certificate of Public Convenience and Necessity for the Approval of a Rate Schedule to Provide Thermal
Energy Services to Delta School District Number 37

BEFORE:

(Date)

WHEREAS:

- A. On November 28, 2011, FortisBC Energy Inc. (FEI) filed an application (the Application) for a Certificate of Public Convenience and Necessity (CPCN) for the construction and operation of thermal energy projects at 19 individual sites for the Delta School District Number 37 (Delta SD), under sections 45 and 46 of the Utilities Commission Act (Act), and for the approval of rates and rate design established by an Energy System Rate Development Agreement (RDA) and individual Energy System Service Agreements (Service Agreements) entered into between FEI and Delta SD, as just and reasonable rates under sections 59 through 61 of the Act;
- B. On March 9, 2012, the British Columbia Utilities Commission (the Commission) issued its Decision and Order G-31-12 (the "Order") granting approval of the CPCN on the condition that the RDA and the Service Agreements be assigned to an affiliate of FEI with proof of the assignments being submitted to the Commission by no later than 30 days from the date of the Order;
- C. In the Order, the Commission denied approval of the proposed the rate and rate design, as applied for and as set out in the RDA and the Service Agreements;
- D. In paragraph 3 of the Order, the Commission indicated that it would accept for filing by no later than 30 days from the date of the Order a rate and rate design based upon a 60/40 debt/equity capital structure which contains the following modifications:

**BRITISH COLUMBIA
UTILITIES COMMISSION**

**ORDER
NUMBER**

2

- a) The rate schedule is restricted to Delta School District's current and future sites;
 - b) The rate must include allowances for capitalized overhead, cash working capital, inflation and escalation on capital replacements/sustaining capital items and replace "unpaid time" by FEI employees with "paid time";
 - c) Includes a cost of debt rate based on an entity with a BBB rating with an additional premium to reflect the extra cost to arrange an incremental small debt issue; and
 - d) Provides for a maximum 50 basis points premium above the benchmark Return on Equity or a lower negotiated equity premium.
- E. Further, in paragraph 4 of the Order, the Commission directed that if FEI accepts the condition attached to the grant of the CPCN and FEI and Delta School District agree to submit a revised rate schedule and rate design as referred to above, then FEI, or its affiliate, as the case may be, are directed to:
- a) Within 30 days from the date of this Order, file with the Commission a report stating what is the cost of debt rate as specified above and how it was determined;
 - b) Within 30 days from the date of this Order, provide to Delta School District and the Commission a report setting forth the items that are included in the \$4.1 million rate base at the end of the 20 year term with an explanation as to how that amount is to be recovered in the event the Service Agreements are not renewed;
 - c) Within 30 days from the date of this Order, provide to Delta School District and the Commission a schedule showing the Net Present Value comparison between the "market rate" and the cost-of-service rate including in both instances the amortization of the SD37 Deferral Account;
 - d) Within 30 days from the date of this Order, advise the Commission in writing whether its current Transfer Pricing Policy requires any amendments in the short term to deal with the regulated affiliate and services, which may be provided to it and follow its current Transfer Pricing Policy until the Commission otherwise orders;
 - e) Maintain the entire Thermal Energy Services Deferral Account with FEI until such time as the Panels in the AES Inquiry, the FEU 2012/2013 RRA or other proceedings direct otherwise;
 - f) Track and charge to its affiliate all overhead incurred for the provision of services to the Delta School District; and
 - g) Examine, track and develop, if necessary, its cost allocation methodology to ensure all appropriate costs are allocated to the Delta School District thermal service, regardless of the particular entity providing them.

**BRITISH COLUMBIA
UTILITIES COMMISSION****ORDER
NUMBER**

3

- F. On March 16, 2012, FEI provided an executed copy of the assignment agreement between FEI and its affiliate FortisBC Alternative Energy Services Inc. ("FAES") for the Service Agreements and the RDA along with the related notices (the "Assignment");
- G. On March 16, 2012, subsequent to FEI filing proof of the Assignment to FAES, the Commission issued a CPCN to FAES by Order No. C-13-12 for the construction and operation of the Delta SD thermal energy projects as described in the Application;
- H. On April 3, 2012, FAES and the Delta SD submitted evidence indicating that both FAES and the Delta SD agree to accept the Commission's rate and rate design containing the following components:
- a) A 60/40 debt/equity capital structure as was originally submitted by FEI;
 - b) Restriction of the rate schedule to the current and future sites of the SD, as was originally submitted by FEI;
 - c) Inclusion of allowances in the Cost of Service for:
 - a. Capitalized overheads at the rate of 14%;
 - b. Cash working capital at the rate of 12.5% of OM&A;
 - c. Inflation and escalation on capital replacements and sustaining capital items; and
 - d. Replacement of "unpaid time" with "paid time" by FEI employees of \$20,000;
 - d) A cost of debt rate of 5.91% rather than the FEI embedded cost of debt of 6.88%, based on an entity with a BBB rating with an additional premium to reflect the extra cost to arrange an incremental small debt issue; and
 - e) A 50 basis point premium above the benchmark Return on Equity as originally negotiated in the RDA.
- I. On April 3, 2012, FAES filed the following information:
- a. FAES report stating the cost of debt rate and how FAES determined the rate are accepted as filed;
 - b. FAES report setting forth the details of the ending rate base of \$5.6M in 20 years, explaining how the amount is to be recovered in the event Service Agreements are not renewed, including evidence that the report has been shared with Delta SD;
 - c. FAES schedule showing the Net Present value comparison between the "market rate" and the cost-of-service rate including in both instances the amortization of the SD37 Deferral Account, including evidence that the report has been shared with Delta SD; and
 - d. FAES and FEI confirmation that the current Transfer Pricing Policy does not require any amendments to deal with the regulated affiliate FAES and services which may be provided by FEI to FAES.

**BRITISH COLUMBIA
UTILITIES COMMISSION**

**ORDER
NUMBER**

4

NOW THEREFORE the Commission orders as follows:

1. The rates and rate design are approved containing the following components:
 - a. A 60/40 debt/equity capital structure;
 - b. Restriction of the rate schedule to the current and future sites of the SD;
 - c. Inclusion of allowances in the Cost of Service for:
 - i. Capitalized overheads at the rate of 14%;
 - ii. Cash working capital at the rate of 12.5% of OM&A;
 - iii. Inflation and escalation on capital replacements and sustaining capital items; and
 - iv. Replacement of "unpaid time" with "paid time" by FEI employees of \$20,000;
 - d. A cost of debt rate of 5.91% rather than the FEI embedded cost of debt of 6.88%, based on an entity with a BBB rating with an additional premium to reflect the extra cost to arrange an incremental small debt issue; and
 - e. A 50 basis point premium above the benchmark Return on Equity.

2. The following information is accepted as filed:
 - a. FAES report stating the cost of debt rate and how FAES determined the rate are accepted as filed;
 - b. FAES report setting forth the details of the ending rate base of \$5.6M in 20 years, explaining how the amount is to be recovered in the event Service Agreements are not renewed, including evidence that the report has been shared with Delta SD;
 - c. FAES schedule showing the Net Present value comparison between the "market rate" and the cost-of-service rate including in both instances the amortization of the SD37 Deferral Account, including evidence that the report has been shared with Delta SD; and
 - d. FAES and FEI confirmation that the current Transfer Pricing Policy does not require any amendments to deal with the regulated affiliate FAES and services which may be provided by FEI to FAES.

DATED at the City of Vancouver, In the Province of British Columbia, this day of <MONTH>, 2011.

BY ORDER

Exhibit P

SIXTH FLOOR, 900 HOWE STREET, BOX 250
VANCOUVER, BC V6Z 2N3 CANADA
web site: <http://www.bcuc.com>



BRITISH COLUMBIA
UTILITIES COMMISSION

ORDER
NUMBER G-88-12

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 Alternative Energy Services Inc.
Revisions to Rates for Thermal Energy Service to Delta School District Number 37
British Columbia Utilities Commission Order G-71-12 Compliance Filing

This is Exhibit " P " referred to in the
affidavit of FRANK BEYER
made before me on AUGUST 20 2012
Eric Lambert
A Commissioner for taking Affidavits
for British Columbia

BEFORE: L.A. O'Hara, Panel Chair/Commissioner
D.M. Morton, Commissioner June 25, 2012
R.D. Revel, Commissioner

O R D E R

WHEREAS:

- A. On November 28, 2011, FortisBC Energy Inc. (FEI) filed an application (the Application) for a Certificate of Public Convenience and Necessity (CPCN) for the construction and operation of thermal energy projects at 19 individual sites for the Delta School District Number 37 (Delta School District), under sections 45 and 46 of the *Utilities Commission Act* (Act), and for the approval of rates and rate design established by an Energy System Rate Development Agreement (RDA) and individual Energy System Service Agreements (Service Agreements) entered into between FEI and Delta School District, as just and reasonable rates under sections 59 through 61 of the Act;
- B. On March 9, 2012, the British Columbia Utilities Commission (Commission) issued its Decision (First Decision) and Order G-31-12 (Order) granting the CPCN on the condition that the RDA and the Service Agreements be assigned to an affiliate of FEI with proof of the assignments being submitted to the Commission by no later than 30 days from the date of the Order;
- C. In the Order, the Commission denied approval of the proposed rate and rate design, as applied for and as set out in the RDA and the Service Agreements. However, the Commission indicated that the Commission would accept for filing a rate and rate design based upon a 60/40 debt/equity capital structure which contain certain modifications including, among other items:
 - a) allowances for capitalized overhead;
 - b) a cost of debt rate based on an entity with a BBB rating with an additional premium to reflect the extra cost to arrange an incremental small debt issue;

**BRITISH COLUMBIA
UTILITIES COMMISSION****ORDER
NUMBER G-88-12**

2

- D. On March 16, 2012, FEI provided an executed copy of the assignment agreement between FEI and its affiliate FortisBC Alternative Energy Services Inc. (FAES) for the Service Agreements and the RDA along with the related notices (the Assignment) and on the same day the Commission issued a CPCN to FAES by Order C-3-12 for the construction and operation of the Delta School District thermal energy projects as described in the Application;
- E. On April 3, 2012, FAES and the Delta School District submitted evidence (Compliance Filing) indicating that both FAES and the Delta School District agree to accept the rate and rate design containing the revised components as directed in the Order and also filed certain reports as also directed in the Order;
- F. On June 5, 2012, the Commission issued Order G-71-12 and accompanying Decision (Second Decision) approving the rate design and accepting the reports as filed in the First Compliance Filing but denying approval of the rate, indicating FAES had not met all the prior conditions of the First Decision;
- G. In the Second Decision, the Commission required FAES to submit a revised rate that is amended to:
- a) only include an allowance in the cost of service for capitalized overheads at the rate of 14 percent during years in which FAES expects capital additions or capital replacements and to apply the appropriate capitalization rate in future based on the appropriate accounting policies in place at that time;
 - b) recalculate the cost of debt rate based on BBB-rated entities operating specifically in the Thermal Energy Services (TES) class of service or BBB-rated distribution utilities such as AltaGas Ltd. and Emera Inc. as a proxy for the TES class of service;
- H. The Commission noted that going forward, it may require FAES to set the debt rate each year according to a deemed interest rate automatic adjustment mechanism if such a mechanism is ever approved or in the same manner as described above if such a mechanism has not been approved;
- I. In the Second Decision, the Commission also confirmed the requirement for FAES to track all affiliate charges related to providing this service regardless of the entity providing them and, in addition, directed FAES to provide a report of these charges as part of its next revenue requirements application for the Delta School District;
- J. On June 11, 2012, FEI on behalf of FAES filed a revised rate (Second Compliance Filing) containing the following amendments:
- a) Capitalization of overheads applied to only the years when replacements or additions are forecast, instead of every year;

BRITISH COLUMBIA
UTILITIES COMMISSION

ORDER
NUMBER G-88-12

3

- b) A cost of debt that reflects a credit spread for BBB-rated distribution utilities at 2.58 percent which effectively lowers the cost of debt from 5.91 percent to 5.37 percent;
- K. The Commission has reviewed the Second Compliance Filing and accepts the rate as modified by FAES in the Second Compliance Filing.

NOW THEREFORE the Commission approves the rate as recalculated in the Second Compliance Filing.

DATED at the City of Vancouver, in the Province of British Columbia, this 25th day of June 2012.

BY ORDER

Original signed by:

L.A. O'Hara
Panel Chair/Commissioner

Exhibit Q

From: Darryl McCulley <darryl@smithenergy.com>
Sent: November-04-11 4:58 PM
To: fgeyer@deltasd.bc.ca
Cc: Tom Louie; Garnet Ayres; Dale Saip; Joe Strain
Subject: Re: Fortis BC Alternate Energy Services "Regulated Tariff" option (in confidence)
Attachments: SmithLogo[2][12].png; SmithLogo[2][3].png

Hello Frank,

Thank you for the note,

I certainly appreciate and understand your prospective.

I am sorry you feel that way as others had also expressed similar views until they have had an opportunity to better understand the tremendous value our boilers deliver in terms GHG reductions and energy cost savings. They have also found though leveraging my unique technical and energy industry background with noted companies in Gas Compression & production, CHP, BioGas, Power Gen, and HVAC that they were better informed to make valued decisions.

I certainly enjoy the odd cup of coffee now and then and could be available at your convenience if there is interest in building a common understanding of other potential options.

All the best.

Regards,
Darryl McCulley CET CSP BA
BC Region
[SmithLogo\[2\]\[12\].png](#)
Unit 101 20167 96th Avenue
Langley, BC V1M 3C5
Office: 604.513.5919
Cell: 604.803.8170
Fax: 604.513.5920
Facebook: Smith Energy
Web: www.smithenergy.com & www.harscopk.com

This is Exhibit " Q " referred to in the affidavit of FRANK GEYER
made before me on AUGUST 10 2011
Enka Lambert Smith
A Commissioner for taking Affidavits
for British Columbia

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From: Frank Geyer <fgeyer@deltasd.bc.ca>
Reply-To: <fgeyer@deltasd.bc.ca>
Date: Fri, 4 Nov 2011 23:30:07 +0000
To: Darryl McCulley <darryl@smithenergy.com>
Cc: Tom Louie <Tom_Louie@sd34.bc.ca>, Garnet Ayres <gjayres@deltasd.bc.ca>, Dale Saip <dalesaip@gmail.com>, Joe Strain <jstrain@deltasd.bc.ca>
Subject: Re: Fortis BC Alternate Energy Services "Regulated Tariff" option (in confidence)

Mr. McCulley,

Please refrain from including the Delta School District in your future correspondence. Our agreements with FortisBC have been executed for the delivery of thermal energy at 19 of our sites, and we have no intentions of moving away from our commitments and dealing with companies such as yours.

Frank Geyer, PEng, FMA
 Director of Facilities & Planning
 Delta School District

Sent from my BlackBerry device on the Rogers Wireless Network

From: Darryl McCulley <darryl@smithenergy.com>
Date: Fri, 04 Nov 2011 16:15:25 -0700
To: <fgeyer@rogers.blackberry.net>;
John.Vandongen.MLA@leg.bc.ca<John.Vandongen.MLA@leg.bc.ca>
Cc: Mike.deJong.MLA@leg.bc.ca<Mike.deJong.MLA@leg.bc.ca>;
Randy.Hawes.mla@leg.bc.ca<Randy.Hawes.mla@leg.bc.ca>; Frank Geyer<fgeyer@deltasd.bc.ca>;
Jennifer.Champion@gov.bc.ca>; Tom Louie<Tom_Louie@sd34.bc.ca>
Subject: Fortis BC Alternate Energy Services "Regulated Tariff" option (in confidence)

Hello John,

Thank you for your time today to review the developing issue of Fortis BC application to provide Alternate Energy Services to BC School Districts under a Regulated Tariff model.

As discussed, there are sophisticated companies already providing these services to the market such as engineering firms, contractors, and energy service companies (Escos). In addition, many private companies (ie. Brookfield LePage) have undergone energy retrofit initiatives by utilizing an *Energy Service* model such as: Contract engineering services firm to conduct energy audit/study on facilities for water/gas/electricity
 Develop economic fleasibility plan for retrofit works by establishing objectives and minimum thresholds (payback)
 Leverage incentive grants from OEE-NRCan, Fortis BC, & BC Hydro to either expand project scope or reduce payback
 Blend paybacks (water/gas/electricity) to achieve overall target objective
 Select engineering service firm through RFP process to design the project

Scrutinize to energy savings through peer review by another energy services firm (hired by insurance company backing the project savings)
 Finance the project (how?)
 Project goes to tender and awarded
 Project managed by engineering services firm or by school district capital budget personnel
 Monitor and report results
 Q - So does this model work?

The above mentioned plan/model was formulated by a BC School District as they conducted their own energy enhancement initiative delivering results under budget and achieving quicker paybacks than modelled. They borrowed funds (yes) and received grant monies to finance their projects plus backstopped any potential risk by taking out an insurance policy to hedge/mitigate this risk. Interesting note that they not only reduced their environmental impact but didn't employ the proposed geothermal solution as in the Fortis BC option as the ROI was significantly outside their target payback objectives. In other words, uneconomical.

Q So why haven't more BC school districts taken this path?

Maybe other school districts don't have the in-house capabilities (personnel) but most have relationships with engineering firms and contractors that do.

Are they restricted by access to capital funding? Seems so and yet they are impacted by mandated GHG reduction targets and subsequent penalties. Seems to me their hands are tied behind their backs as they get beaten down.

As for the role of Fortis BC in this mature industry, I am not clear where they would add value to these sort of projects especially under there proposed regulated tariff option (which appears to include the establishment of deferral accounts to manage costs, etc).

Q - Isn't the role of a utility to serve the public interest when no other viable solutions is available?

It appears that Fortis BC would reap the rewards without taking on undo risk under this regulated rate option. I may not be fully understanding their proposal but one would think that if they are sincere about facilitating these types of projects why not go to their shareholders for a risk profile assessment and then do like the rest of us and compete for the business in an established industry.

As for Smith Energy, we are a team of industry professionals representing a boiler manufacturer and have provided high efficient boilers to many energy retrofit projects across Canada including the Toronto School Board, Calgary School Board, Regina School Board, BC Housing, and North Vancouver School District to name a few.

In closing, experimenting with public dollars just doesn't make sense to me. I maybe wrong about the Fortis BC initiative, but why mess with a proven economic model that can quickly deliver results and achieve the objectives noted in the Clean Energy Act of June 2010.

Thanks in advance for your consideration of these points.

PS. The response to the interim tariff application are now available on the Fortis BC website by the following link:

<http://www.fortisbc.com/About/RegulatoryAffairs/GasUtility/NatGasBCUCSubmissions/LowerMainlandSquamishInterior/Pages/Alternative-Energy-Solutions-BCUC-Inquiry.aspx>

Attachments:

BCUC Interim Tariff Decision and Fortis BC responses to ESCO intervener questions

Smith Energy Boiler Efficiency Comparison showing GHG and operating cost reductions through retrofitting to high efficient boilers

Thames Valley (London Ontario) School District - MACH Customer Reference Letter

SPOA (School Plant Operators Association of BC) article by ESCO

Regards,

Darryl McCulley

BC Region

SmithLogo[2][3].png

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From: Darryl McCulley
To: struelove@deltasd.bc.ca; ldixon@deltasd.bc.ca; dsaip@deltasd.bc.ca; dturner@deltasd.bc.ca
Cc: [Adrian M.; editor@southdeltaleader.com](mailto:Adrian.M; editor@southdeltaleader.com); len.kelsey@bcuc.com; rich.coleman.mla@leg.bc.ca; george.abbott.mla@leg.bc.ca; [Jordan Bateman; John.Horgan.MLA@leg.bc.ca](mailto:Jordan.Bateman; John.Horgan.MLA@leg.bc.ca); newsroom@abbynews.com; commission.secretary@bcuc.com; [Kaye; Erik MEM:EX](mailto:Kaye; Erik.MEM:EX); [Dana Taylor](mailto:Dana.Taylor); [Gord Monro](mailto:Gord.Monro); [Martin Luymes](mailto:Martin.Luymes); [Frank Geyer](mailto:Frank.Geyer)
Subject: Response to Delta South Leader Article - Energy Upgrading
Date: October-03-12 12:49:01 PM
Attachments: [Excerpts from BCUC Delta SD Decision.pdf](#)
[SmithLogo21\[190\].png](#)

Dear Delta School District Chair, Vice-Chair, Trustee, and Superintendent;

I am writing in regards to a recent article in the Delta South Leader newspaper regarding your energy enhancement project with Fortis BC.

I congratulate you on your pro-active initiative to curb GHG emissions and reduce consumption. This is a noble pursuit that I fully support and hope more schools and industries strive towards this objective. I had written Frank Greyer back in November as my only contention is with the "Regulated Tariff" energy services agreement with Fortis BC.

When the Delta School District (DSD) project with FortisBC was first announced back in February 2011, it raised considerable concern within the thermal energy industry about both the economic viability of the project and the concept that the arrangement with Fortis would be regulated and in Frank's opinion overseen by the BCUC (I think there is a belief out there that the role of the BCUC's is to mitigate and backstop risk). While the DSD project has followed its own separate BCUC approval process, it was the catalyst for the launching of an Inquiry by the BCUC into Fortis's overall Alternative Energy Solutions (AES) offering by Fortis. The BCUC's decision on the AES Inquiry is expected this fall and the hearing delved into a wide array of regulatory, cross- subsidization and market competition issues.

The DSD project was the subject of a separate BCUC hearing process (referred to as a CPCN application) which ran in parallel with the AES Inquiry because the project was initiated before the AES Inquiry started. While the BCUC eventually approved the regulated tariff that Fortis applied for (in part because of written provincial government support for the project), it did so with serious reservations about the risks that DSD was assuming (see attached CPCN Decision Excerpts). The BCUC also went to the unprecedented step of requiring written confirmation from the DSD that they were aware of the \$5.6 Million residual rate base liability that is expected to still exist at the end of the 20-year contract term. At the end of 20 years if the DSD doesn't renew the regulated agreement with Fortis won't these residual stranded costs be required to be repaid or rather rolled into the next regulated agreement if the contract is renewed. What is perplexing to me is this future liability and debt doesn't get accounted for or acknowledge anywhere but will be there for another board to tackle in 20 years.

During the CPCN process, the BCUC asked for evidence that the DSD Trustees had approved the project. In response, DSD administration provided the minutes of the March 15th, 2011 Board meeting where the financials of the project were presented to the Trustees as part of a By-law approval for the spending of the government grant money. However, by the time the final agreement with Fortis and the associated tariff were being approved in Feb, 2012, the economic viability of the project had changed considerably since March 2011 and there was no mention of the residual rate base. The capital cost of the project had increased by \$1.5 Million and the \$800,000 of expected gas rate payer-funded utility incentives had been

rejected. This meant that the amount of capital that Fortis was investing (the initial rate base) increased by nearly 90% from \$2.7 Million to \$5.0 Million.

Under a Cost of Service tariff model, all else being equal, this increase in the initial rate-base should have a significant impact on the rates DSD would pay Fortis for thermal energy. However, DSD claims regarding how much the project will save (in comparison to a hypothetical "market rate") have actually increased since the original announcement and there are no public records, to my knowledge, of the Board being apprised of these changes in the projects economics or being made aware of the residual rate-base issue. This warrants an independent audit/analysis of the project and its balance sheet implications so that the Trustees can fully understand the agreement that DSD has entered into.

The DSD thermal energy project with Fortis, along with other similar projects that Fortis has been developing, raises serious questions about the role of a public utility in previously unregulated and competitive markets. Their ability to corner the market by expanding the web or regulation to exclude other competitors is of serious concern to market participants because of the market power they will be able to exert if they are successful. These are the very issues that the AES Inquiry is expected to address provided that the BCUC is not thwarted by new government regulations.

As the regulated natural gas distribution utility for most of BC, Fortis entered into an agreement with the provincial government to distribute funding under the Public Sector Energy Conservation Agreement (PSECA) to worthy efficiency projects that reduced utility costs and GHG emissions. Nowhere in that agreement did it authorize Fortis to use those taxpayer funds to develop their own projects (\$1.36 Million of PSECA funding is being invested in the DSD thermal assets that Fortis will own). In stark contrast, BC Hydro also distributed PSECA funding to projects but none of them were assets to be owned by BC Hydro or resulted in an upside for their shareholders.

Many industry associations were caught unaware of what Fortis was up to because the implications were not immediately apparent. This was compounded by the fact that Fortis was able to "slip" approval for their thermal tariff regime into their 2010/2011 Revenue Requirements Application (RRA) which went through a closed Negotiated Settlement Process (NSP) rather than a normal full BCUC hearing. As a very small part of a very large RRA, the thermal tariff regime went virtually unnoticed by the traditional interveners and was completely missed by the rest of the industry until the DSD project announcement. Even after the announcement of the AES Inquiry that was triggered by the DSD project, many industry participants remained unaware of the full implications of Fortis AES plans until it was too late to participate in either the DSD CPCN hearing or the AES Inquiry.

Additional Points:

- As per the Geothermal Act don't landowners own the right to the thermal energy under their properties (up to 80 degrees Fahrenheit). So am I to assume then that Fortis has contracted with DSD to purchase your thermal energy so they can sell it back to you?
- One would also assume that Fortis has also contracted for right of way access and rental/lease space for their thermal plants at each school. This is typically of such agreements in the energy and petroleum industries (my former digs).
- Fortis was specifically asked by the BCUC about savings and performance risks during

the CPCN hearing and they admitted that DSD was assuming all of the risks associated with capital and operating costs and energy consumption. This was the basis for the Commission's concerns (see attached) about the risks and Frank's inferring that there are guarantees is another example of ignoring the reality of the agreement.

- Freeing up staff to work elsewhere does not result in a true savings to DSD. In order to even get close to breakeven with the base case costs you would need to lay off 2-3 FTEs and if you don't do that you actual costs would go up.
-
- I have heard rumours that the Province of British Columbia has studied the model and fully supports it and encourages it for public sector organizations. What study? Have you seen it?
-
- I find it rather interesting that other public entities such as BC Housing initiated 32 energy retro-fit enhancement projects using the non-regulated energy services model with ESCO's competing for these projects.
- Also on an aside and as a parent of school age children, how will Fortis personnel and contractors be vetted for criminal records before working on school property?
- This DSD - Fortis BC regulated thermal energy initiative will also affect the customer choice program for deregulated natural gas commodity supply as the schools would now be locked into the Fortis BC regulated tariff for 20 plus years using a benchmark CPI market rate for natural gas and power. This point alone shows a considerable lack of knowledge about how the commodity of natural gas is priced and forecasted.

Have you given any thought as to why other school districts across Canada have been able use the non-regulated energy services model to enhance their infrastructure and reduce GHG emissions. Seems their provincial governments have ensured an open competitive market place for industry to come to the table with capital, assumption of risk, and the expertise to facilitate these projects. I guess to my limited way of thinking wouldn't competition would drive value and fairness. Ask yourself, how do you know you got the best deal or the right solution for these projects or was it energy enhancement at any cost?

Don't you find it interesting that there have been a few BC school districts that have proactively self-funded energy reduction projects for years. They seem to have had the foresight to take action in order to become compliant with the carbon reduction objectives laid out in the BC Clean Energy Act. These folks should be recognized publicly don't you think. Yet we now know that other school districts such as Abbotsford (my region), Central Okanagan, Prince George, Saanich, and Vancouver have signed or are about to sign the same type of agreements with Fortis BC. Well I suppose if I want to get involved with these projects I will need to talk to Fortis now or at least that was the impression inferred to me by a Fortis executive recently.

My objective is to raise further awareness regarding this growing trend of using a "regulate" the energy services model for these public sector projects. In my opinion, there needs to be more debate and discussion to build a common understanding of what this direction will mean for school districts, for taxpayers, for industry, and our future.

Thank you in advance for reviewing this email.

Regards,
Darryl McCulley
BC Region



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From: Darryl McCulley
To: [Adrian M.; editor@southdeltaleader.com; struelove@deltasd.bc.ca; ldixon@deltasd.bc.ca; dsaip@deltasd.bc.ca; dtturner@deltasd.bc.ca; Frank Geyer](mailto:Adrian.M.; editor@southdeltaleader.com; struelove@deltasd.bc.ca; ldixon@deltasd.bc.ca; dsaip@deltasd.bc.ca; dtturner@deltasd.bc.ca; Frank.Geyer)
Cc: newsroom@abbynews.com; John.Vandongen.MLA@leg.bc.ca; preet_rai@sd34.bc.ca; john_sutherland@sd34.bc.ca; len.kelsey@bcuc.com; commmission.secretary@bcuc.com; rich.coleman.mla@leg.bc.ca; george.abbott.mla@leg.bc.ca; Kave.Erik.MEM:EX
Subject: SOUTH DELTA LEADER Article Published in Error: Delta School District Fortis BC Thermal Energy Regulated Project - and now Abbotsford School District????
Date: October-12-12 1:39:46 PM
Attachments: [Vancouver Landfill Project Brochure.pdf](#)
[SmithLogof2\[11\].png](#)
[SmithLogof2\[5\].png](#)

Hello Adrian,

I see that your article is now published on-line at www.southdeltaleader.com.

Interesting comment by Frank Greyer at the DSD that Smith Energy competes with Fortis BC as that statement alone demonstrates Frank's lack of due diligence in this entire process.

Smith Energy is a manufacturers representative for Patterson Kelley high efficiency boilers in four provinces. We are a small independent agency of seasoned professionals promoting the retro-fitting of in-efficient boilers to higher efficient ones. Our customers across Canada typically see financial paybacks in a few short years even at todays low natural gas costs.

My interest in the DSD Fortis initiative was solely based on my experience in attempting to sell boilers to school districts and many other potential commercial customers across BC. I was repeatedly told that I should go talk to Fortis now because they had been approached by them and were strongly considering selling their plants to Fortis and purchasing the thermal energy back from them under a regulated tariff model.

I had never heard of a utility owning and operating their customers equipment and especially under a regulated tariff model. I also am not aware of any other jurisdiction in North America that has allowed a utility to offer this model (for the reasons noted below). Yes this is a complex issue, but my opinion is based on my 30 years in the energy industry working from a field tech to vice president with the likes of Alberta Power, Alberta Energy Company, BC Gas Utility, Enbridge Energy Services, Finning Power Systems, EnMax Energy, & NGC). This experience affords me the unique insight in understanding the regulated tariff model verse the established open market competitive model as I have had the pleasure to be involve in many leading projects such as Maxim's Vancouver Landfill Combined Heat & Power Project in Delta (see attached brochure).

So now your follow up article is published with inaccuracies yet again as I don't know why you didn't contact me to verify what we do and why we hold the position we do.

No worries though as a number of industries associations (bcc) and others are now ramping to challenge the Fortis market intrusion so I am sure you will be reading more about this in the future.

Regards,
 Darryl McCulley
 BC Region



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From: Darryl McCulley <darryl@smithenergy.com>
Date: Friday, 12 October, 2012 12:02 PM
To: "Adrian M." <adrian@southdeltaleader.com>, "editor@southdeltaleader.com" <editor@southdeltaleader.com>, <struelove@deltasd.bc.ca>, <ldixon@deltasd.bc.ca>, <dsaip@deltasd.bc.ca>, <dturner@deltasd.bc.ca>
Cc: <newsroom@abbynews.com>, "John.Vandongen.MLA@leg.bc.ca" <John.Vandongen.MLA@leg.bc.ca>, <preet_raj@sd34.bc.ca>, <john_sutherland@sd34.bc.ca>, "len.kelsey@bcuc.com" <len.kelsey@bcuc.com>, "commission.secretary@bcuc.com" <commission.secretary@bcuc.com>, "rich.coleman.mla@leg.bc.ca" <rich.coleman.mla@leg.bc.ca>, "george.abbott.mla@leg.bc.ca" <george.abbott.mla@leg.bc.ca>, "Kaye, Erik MEM:EX" <Erik.Kaye@gov.bc.ca>
Subject: Delta School District Fortis BC Thermal Energy Regulated Project - and now Abbotsford School District????

Hello Adrian,

How are you making out researching your follow up article?

With reference to my introduction email regarding the Delta School District (DSD) Fortis project, I thought I would pass along a summary take on things from a number of concerned individuals, companies, and associations in the energy and mechanical industries who are just now getting up to speed on this initiative. Given that I am an Abbotsford resident I have cc the Abbotsford News as well as Abby School District Trustees given that they have signed an MOU with Fortis now to do a similar project only twice the size as Delta School District. Please note that I had forwarded to the BCUC Chair a series of emails from Doug Stout VP Fortis (with his permission) which from our prospective what seemed like an attempt to silence my communications to raise awareness to this monopolistic venture.

The serious concerns registered by the BCUC regarding the risks that DSD (see attached excerpts) has taken on speak for themselves as the project does not make any financial sense even if all of Fortis's capital and operating costs estimates were proven correct. No one should be taking own view on any of this but, given that the DSD has gone public with the financial virtues of this project and the likelihood that the BCUC's concerns were not shared with the Board, we believe that and an independent, third-party analysis should be done to determine the true business case and balance sheet treatment of this

project. The Business Case for this project is very dependent on the relative costs of natural gas and electricity which are current heading in a direction that is not conducive to geo-exchange projects. Fortis and DSD's assumptions are based on gas prices that are expected to increase at over 10% per year over current rates (compounded) between now and 2016 while electricity prices are expected to only increase by 2.3% (which is unlikely given the BC Hydro Deferral Accounts that will be reflected in future rates).

The financial viability of the project is also very dependent on the efficiency and capacity of the geo-exchange systems. Fortis's sub-contractor is working under a "cost-plus" contract with no fixed price for the installation of the geo systems. Fortis has stated during the CPCN hearing that if actual geo system costs come in higher than expected, they have the option of reducing the size of the geo fields (i.e. reducing the number of wells).

REV. 1 - On page 42 of the DSD CPCN Decision, the Commission states:

"While Delta SD claims to be aware of clauses in the individual service contracts which hold FEI accountable for operational obligations, such as service reliability, guaranteed GHG reduction, or energy savings (Exhibit C1-2, BCUC 17.1), the Commission was unable to locate these clauses after examining the Contracts."

Fortis also acknowledged that this would result in increased usage of the back-up gas boilers and increased gas costs which would be passed on to DSD. Given that no test wells were drilled to establish the geo system cost estimates, this constitutes a significant risk for DSD. Fortis also acknowledged that they did not adjust for the fact that the geo systems would be used exclusively for heating. Unless all of these sites have adequate hydro-geology characteristics, the lack of a cooling load to recharge the fields could result in partially or full freezing the fields along with the associated reduction in geo capacity. Again this would result in increased gas costs for DSD due to the additional use of the back-up boilers.

Finally, the optimum use of each geo system is limited by its ability to generate hot enough water for the mechanical delivery systems in the buildings. Many of these schools were designed with mechanical systems requiring 85 Deg. C hot water at peak loads. Even at non-peak loads, the challenge with heating existing buildings with geo-exchange is that the return temperature of the water coming back from the mechanical systems is too hot for the geo-exchange heat pumps to adequately contribute to the heating load (the same thing applies to condensing boilers). Mechanical enhancements can be made to partially offset this problem but they come at a cost. In any event, since Fortis is not assuming any risk on the performance of the geo systems or the amount of gas consumption required for heating back-up, there would be no assurance that this problem has been mitigated.

The Base Case costs associated with operating the existing thermal plants in these 19 facilities include:

- Gas and electricity utility costs of about \$550,000 per year at current utility rates (based on consumption figures submitted with the CPCN application)
- Costs associated with annual maintenance of the boiler plants
- Capital replacement costs of some of the boiler plants over the next 20 years (not all the boilers are being replaced under the project)

- Carbon offset costs

Under the Cost of Service thermal energy rate with Fortis, the elements of the thermal energy tariff would include:

- Pass-through gas and electricity costs that are perhaps \$150,000 less than the utility costs in the Base Case (with a significant switch from gas to electricity)
- A Capital and Maintenance charge of approximately \$600,000 per year (it will ramp up to that level by 2016 when the installation is complete and then grow with CPI)
- Carbon offsets that are approximately \$50,000 less than the Base Case (2,000 Tonnes @ \$25/Tonne). Note, the Carbon Tax is refunded to school districts so there are no Carbon Tax savings.

Assuming current utility prices (and everything going as hoped), in order to break even, the Base Case would have to assume current boiler maintenance and replacement costs of approximately \$400,000 per year which we believe would be very difficult to demonstrate. In any event, this would be made up primarily by internal labour since DSD does most of their maintenance and replacement work with internal staff. Any such savings would necessarily require the elimination of staff (FTEs) in order to generate the actual savings required to pay for the thermal energy charges. In contrast, claiming \$180,000 of net annual savings without any FTE reductions, would seem impossible to achieve. Again, the analysis is based on current utility costs and it is easy to obfuscate these numbers with bizarre assumptions about the relative costs between gas and electricity pricing (electricity pricing for geo-exchange systems need to properly account for peak demand charges). DSD appears to base their assumptions about savings on a so-called "Market Rate" for thermal energy which is theoretically intended to approximate their Base Case costs. However, this Market Rate seems to include excessive assumptions about boiler maintenance and replacement costs as well as bizarre assumptions about current and future gas and electricity prices. It would be difficult to demonstrate that DSD would not be paying at least \$200,000 per year more than their current costs for thermal energy under this project and it would get worse from there if capital cost and system performance estimates proved to be overly optimistic.

Fortis is allowed to receive a guaranteed rate of return on the rate base associated with delivering thermal energy for this project. In addition to their on-going operating and maintenance costs, they charge a return on the amount capital that is deployed which is depreciated at different rates. The initial rate base for capital is estimated at \$5.1 Million but there will be re-capitalization during the 20-year period as geo equipment needs to be replaced. The combined impact of depreciation and re-capitalization over 20 years is expected to result in a residual rate base of \$5.6 Million. Unlike a traditional loan arrangement where one would hope to have paid down the balance within 20 years, this arrangement results in an increase in the rate base even after 20 years. The BCUC went to the unprecedented step of requiring written confirmation that DSD was aware of the residual rate base before they approved the tariff. At the end of the 20-year term, DSD would be faced with the choice of continuing with the thermal tariff under a contract extension (and thus continue to pay significantly more than their base case of thermal energy) or pay Fortis the \$5.6 Million. This sets up a self-fulfilling prophecy wherein the DSD would have no choice but to renew the contract. However, our understanding is that a Board of Trustees cannot impose such a financial decision on a future board of trustees. This could result in the \$5.6 Million being recorded as a debt of DSD's balance sheet at the outset. When the

project was first announced in March 2011, the estimated initial rate base was only \$2.7 Million and the annual savings to DSD were estimated at \$100,000. Now that the initial rate base has nearly doubled to \$5.1 Million (which would necessarily result in an increase to the Capital charge portion of the tariff), the estimated savings claimed by DSD have increased to \$180,000. This make absolutely no sense whatsoever.

DSD was never going to be a prospective customer of our firm (per Frank's attached email to me) or any of the other companies that have taken issue with the Thermal Energy services offered by Fortis. However, since DSD has chosen to publicly promote the virtues of this project and overtly market their arrangement with Fortis to other school districts (who could be potential customers) at events like the annual EFMA (SPOA) meetings in Penticton this past June, we felt that the light of day needed to shine on the true financial viability (or non-viability) of this project. As previously noted, no one should be taking our view on any of this but there should be sufficient grounds to warrant a third-party, independent analysis of the business case of this project and the risks that DSD is facing. We have nothing against geo-exchange technology (work with it all the time) and we applaud efforts to reduce emissions. However, we agree with the BCUC that "green at any cost" is not necessarily the right approach when scarce education funding dollars are involved. Our firm, and many like us (email bcc list is extensive), have serious concerns with the regulatory implications of what Fortis is doing (as one mechanical contractor called it a "market intrusion") and we hope that they will be addressed in the BCUC's pending decision under the Fortis AES Inquiry. However, that is a separate issue from project financial viability and the manner in which public dollars are spent.

Minutes from April 23rd Abby School District finance committee meeting

3.3 Fortis BC Thermal Energy Proposal

Director of Facilities, Tom Louie, reviewed the proposal from Fortis BC which provides the opportunity to move forward with a feasibility study to further consider a possible \$12M investment by Fortis BC in thermal energy equipment over a 20 year period. Fortis will be invited to make a brief presentation at the next board meeting.

The topic was raised as a presentation to the Abbotsford Trustees at the May 7th meeting.

4.2 Fortis BC – Presenter: Vladimir Kostka

Tom Louie, Director of Facilities & Transportation, introduced Vladimir Kostka who introduced the Thermal Energy Delivery Program. The purpose is to assess the feasibility of delivering clean thermal energy to some buildings in the school district.

My understanding though is that they have an MOU stage per an email note from Tom Louie (attached) with Fortis but I am not able to confirm this through the board minutes. Note that Vladmir Kostka is a Fortis "utility" employee who had also contacted me sometime ago. Please review this exchange in the attached Fortis conversation email.

Thanks in advance for this consideration.

Regards,
Darryl McCulley

BC Region



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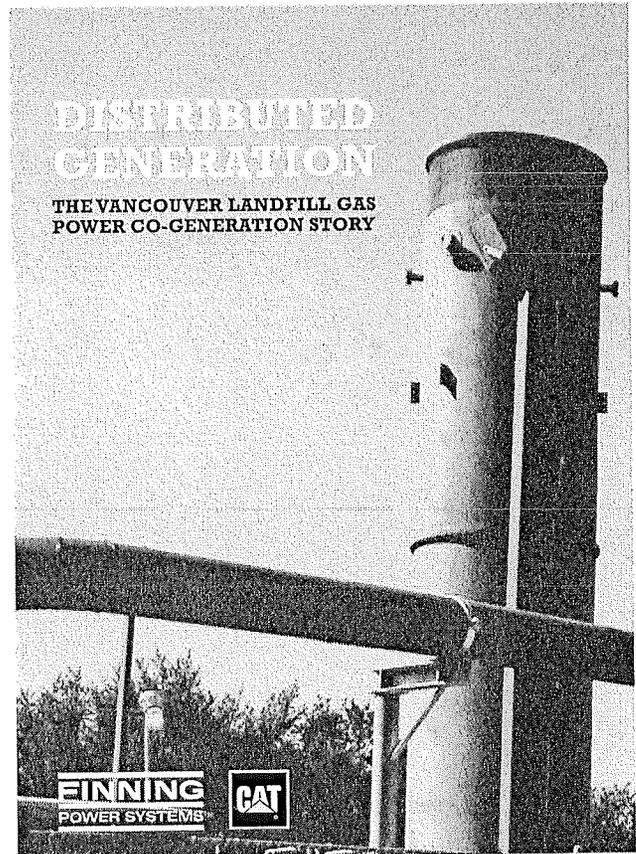
Fax: 604.513.5920

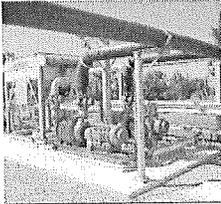
Facebook: Smith Energy BC

Web: www.smithenergy.com & www.harscopk.com

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DISTRIBUTED GENERATION THE VANCOUVER LANDFILL GAS POWER CO-GENERATION STORY	
CLIENT:	Maxim Power Corporation
LOCATION:	CanAgro Greenhouses, Delta, BC, Canada
PROJECT:	Energy conversion of landfill gas to electricity and heat
TURNKEY DEVELOPER:	Finning Power Systems (Canada)
EQUIPMENT:	Three - Caterpillar 3532 Generators w/heat recovery rated at 1,850 kW each. (Fourth unit to be added in 2004.)
ELECTRICAL OUTPUT:	5,550 kW with three generators (7,400 kW with four)
HEAT OUTPUT:	23.1 million BTU/hr. of waste heat captured through heat exchangers and exported to the greenhouse
GHG EMISSIONS:	30,000 tonnes annual reduction of carbon dioxide greenhouse gases equivalent to 6,000 cars taken off the road.
EPA:	20 year Energy Purchase Agreement with BC Hydro
HEAT CONTRACT:	20 year Waste Heat Contract with CanAgro Greenhouses
O & M:	20 year Operation & Maintenance services contracted to Finning Power Systems





Maxim Power Corp.

Landfill gas, a byproduct of the breakdown of garbage at the Vancouver Landfill, is now being turned into energy in an innovative Power Systems project that won three important environmental awards before the project was even completed. The flagship project is the result of Finning's new strategic alliance with Maxim Power Corporation and is a perfect fit for both companies as the world turns to green power generation in an increasingly deregulated market.

"This project has triple bottom line results," says Rick Hoop, Maxim Power's Vice President of Business Development. "The environment is better off, the City of Vancouver receives a portion of the revenues from electricity and heat sales and a private greenhouse, CanAgro has an attractive long-term supply deal for a good portion of their energy requirements (30 per cent). The project is clean and green in every aspect and provides substantial financial benefits as well. We will be using a waste source of carbon close to our customer and turning it into viable energy source in the form of heat and power."

Before the ground-breaking project got underway, the Vancouver Landfill produced 20 million cubic metres of landfill gas a year which was collected and flared off. A landfill gas collection and flare system has been in

THE VANCOUVER LANDFILL GAS POWER CO-GENERATION STORY

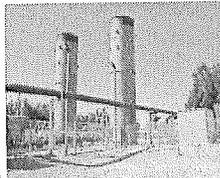
DISTRIBUTED GENERATION



place at the Vancouver landfill since 1991 and was expanded in 2002. The Finning and Maxim project is taking a by-product and turning it into a creative, new energy option that protects, environmental benefits, and revenue. Starting in the fall of 2003, instead of being flared, the gas is going through a cogeneration process.

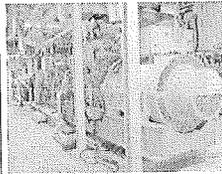
The award-winning project uses three Cat 3532 engines to capture heat and generate electricity from the landfill's methane. Electricity from the cogeneration plant will be sold to B.C. Hydro equivalent to the energy requirements of 3,000 to 4,000 households per year) under a 20-year purchase agreement in response to their Green Energy Projects program. The facility includes a short electricity transmission system connected to a local distribution power line.

What makes the project even more unique is that the power generated will also be used to heat a nearby greenhouse operation. Waste heat will be recovered from the plant in the form of hot water and sold to CanAgro which has two large vegetable greenhouses with a total glass growing area of about 2.5 million square feet.



REDUCED EMISSIONS, INCREASED ENERGY EFFICIENCY

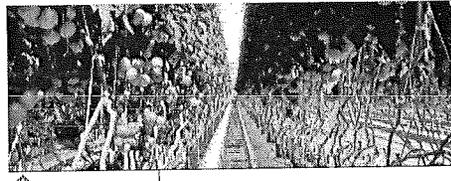
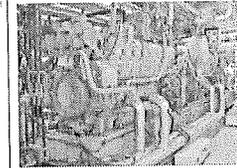
"We are talking about a significant reduction of methane," says Greg Roberts, Finning Power Systems Canada's Project Development Manager. "The cogeneration project will result in a reduction of carbon dioxide emissions of at least 30,000 tonnes per year. The facility is expected to use more than 95 per cent of the



landfill gas collected at site and the overall system energy efficiency will reach 95 per cent. Finning's role in the project is full turnkey services providing the technology, design and construction, and the ongoing operations and maintenance of the facility.

The Cat 3532 engines were chosen for the project for their size to power ratio and long history as a workhorse in the industry, Roberts says. "These engines have been used for prime power generation, standby power, mining power, high Arctic mine development, military applications, you name it. There is nowhere that this engine hasn't been applied."

"It's been translated to a greenhouse gas savings equivalent to taking 5,000 cars off the road," Roberts adds. "When you think about what we have done with this Vancouver Landfill project it is really an excellent application of technology. Unique in Western Canada if not in all of Canada, this project is making maximum use of all available waste heat. The design is innovative and very forward thinking. This project is really a great example of what we can accomplish with our Finning Power Systems."



CanAgro Produce Ltd.

A CUTTING EDGE PROJECT WITH LONG TERM BENEFITS

Project Manager for CanAgro Greenhouses, Dan Schwartz says, "We had this concept for four or five years. We knew we could make use of the gas from the landfill and we were convinced the benefits were real. There were a lot of hurdles along the way but combined with the positive thinking from Maxim Power we are today, it's really been a great project. Very unique, one-of-a-kind, very challenging but so they say it couldn't be an achievement if it wasn't hard to come by."

Schwartz says his 20-year locked in rate for heat energy from the landfill means a lot to his operation. "It's allowing us to be in line of our business plan and our need to keep our 300 employees employed. It gives us a whole lot of certainty and the heat leaves us for that."

The innovative project has won the Federation of Canadian Municipalities-CH2M HILL Sustainable Community Award for renewable energy, among other awards for taking a by-product and turning it into a creative new energy option. Projects are judged for innovation, excellence, and the ability to demonstrate environmental and social benefits, and their impact on the community, as well as economic and cost-effectiveness benefits.

The Vancouver Landfill project involved a number of challenges, including its tight timeline approval came in February 2002 and the project was completed in September of 2003) and high technology demands with the

added element of the heat recovery aspect of the project. "It was made even more challenging by the requirement to house the power solution in the smallest possible footprint building-very," Roberts adds.

"CanAgro needed the building to use as little as possible of their allowed non-agriculture land use in their business licence. In addition, the monitoring of the power system is being performed by Finning in the United Kingdom. You roll all that together and the project is definitely technically interesting."

Hoop agrees and adds, "Maxim and Finning worked very well together on this project. We are on time and on budget on this very leading edge project."

THE POWER TO DELIVER

Darryl McCulley, Sales Manager Finning Power Systems Canada adds, "Finning International Power Systems is a leading provider of power and energy systems worldwide through divisions in Canada, United Kingdom, and the Southern Cone of South America including Argentina, Bolivia, Chile, and Uruguay. Our ability to fulfill our promise of The Power to Deliver Worldwide, is based not only on our technical expertise, integrated support services, innovation, and global reach, but on a world class line up of Caterpillar products. Through several affiliated companies like Maxim Power Corporation we integrate the strengths and international experience needed to provide complex power and energy services worldwide."

in the UK, Finning has installed over 200 landfill gas powered generation plants that convert environmentally damaging greenhouse gases into electric power. In Phoenix Park, Finning designed, built, and commissioned a 16MW modular distributed generation plant including load management system, controls and 22kV switchgear for Maxim Power Corporation. In Canada, powering a diamond mine in the north, Finning installed and now operates five Caterpillar 3616 Generator Sets rated at 4.4MW each with heat recovery; the system not only helps solve a heating problem for the onsite facilities but also reduces overall operating costs for the mine. Darryl McCulley adds, "The Caterpillars low emission, fuel-efficient medium speed product line is ideally suited to the distributed energy market with products ranging from under one MW to 15.7 MW. To date, we have power installations on five continents with a combined generating capacity of more than one GigaWatt."

Finning Power Systems and Energyt (UK and Europe) are also a prime source of mobile rental distributed power modules ranging from 3kW to 2MW. During the disaster relief first time in British Columbia in 2003, in less than a week Finning dispatched, installed and then operationally supported more than 38 MW of mobile distributed power modules, keeping businesses and communities operating.

Finning Power Systems is a division of Finning International Inc., a Canadian based international corporation that sells, rents, finances and provides customer support services for Caterpillar machines and engines, and construction equipment since 1933. Finning International is one of the world's largest Caterpillar dealers with revenues in the billions of dollars and an employee base of more than 10,000 people worldwide. As a major business unit within the Finning organization, Finning Power and Energy Group has the management and financial foundation from which to further develop its expertise and to enter into business agreements and joint ventures no matter how big the challenge.

From: Darryl McCulley
To: struelove@deltasd.bc.ca; ldixon@deltasd.bc.ca; dsaip@deltasd.bc.ca; dturner@deltasd.bc.ca
Cc: [Adrian M.; editor@southdeltaleader.com](mailto:Adrian.M.;editor@southdeltaleader.com); [Frank Geyer; len.kelsey@bcuc.com](mailto:Frank.Geyer;len.kelsey@bcuc.com); rich.coleman.mla@leg.bc.ca; [Jordan Bateman; John.Horgan.MLA@leg.bc.ca](mailto:Jordan.Bateman;John.Horgan.MLA@leg.bc.ca); george.abbott.mla@leg.bc.ca
Subject: Fortis Guarantee on DSD Project
Date: October-04-12 3:59:59 PM

The following items of record from the DSD CPCN hearing confirm that there is no guarantee of system performance or utility consumption levels being provided by Fortis on the thermal project.

On page 42 of the DSD CPCN Decision, the Commission states:

“While Delta SD claims to be aware of clauses in the individual service contracts which hold FEI accountable for operational obligations, such as service reliability, guaranteed GHG reduction, or energy savings (Exhibit C1-2, BCUC 17.1), the Commission was unable to locate these clauses after examining the Contracts.”

The following is FEI’s response to a specific question on this issue:

90.0 THE SD’S MANDATE TO REDUCE GHG EMISSIONS

Reference: Exhibit B-1, pp. 9, 12, 25-26; UCA Section 60

According to page 9, a—primary driver for the Project, ...is the SD's desire to implement energy systems that reduce GHG emissions and make use of renewable energy sources that are cost effective over the long term.¶

Page 12 of the Evidence states:—The Project will reduce GHG emissions by over 70% from these sites. The sites currently generate 2,900 tCO₂e per year, and this amount will be reduced to 700 tCO₂e per year.¶

Pages 25-26 of the Evidence states:

—For systems with backup boilers for peaking, poor design, implementation and commissioning can result in overuse of the boilers during times when the geo-exchange pumps are capable of delivering the entire thermal energy loads of the system.

Furthermore, poor design of the systems and integration of sizing loop fields, heat pumps and control systems can result in significant inefficiencies and lack of performance. FEI is using a highly qualified design build contractor, JCLP, to design and

build the systems.¶

“60 (1) In setting a rate under this Act

...(b) the commission must have due regard to the setting of a rate that

(i) is not unjust or unreasonable within the meaning of section 59,

(ii) provides to the public utility for which the rate is set a fair and reasonable return on any expenditure made by it to reduce energy demands, and

(iii) encourages public utilities to increase efficiency, reduce costs and enhance performance,¶

90.1 In terms of greenhouse gas emission reductions, has FEI entered into any explicit agreement with the School District regarding the expected performance of the new thermal systems over the initial contract period? If yes, please provide information on the performance guarantee or agreement.

Response:

The system must provide the thermal energy requirements of the SD as set out in the Specifications that are set out in the 19 Energy Service Agreements and the RDA. There are no specific provisions that deal with specific emission reduction levels that must be achieved.

90.2 In the hypothetical event of declining or below expected performance of the geothermal loop fields, what are the implications for:

90.2.1 The thermal service;

Response:

If performance is below expectations, this has no impact on the thermal demand of the buildings, but rather could increase electricity and natural gas usage to make up for the deficiency, which could thereby increase the costs of providing the services.

90.2.2 The gas-service in terms of the volumes of gas required to make up for any performance deficiencies;

Response:

The question seems to suggest that a system performance problem with the geo-exchange systems will increase natural gas consumption. FEI confirms that if natural gas is providing the backup, then if system performance on peak days is deficient, then it could result in greater natural gas usage during those times. However, for most of the year, if performance is below expectations, the result will be higher electricity usage, not natural gas, since natural gas is only used as a backup during the peak conditions, and electricity is used as the primary driver of the equipment at all times.

90.2.3 The SD in terms of their GHG reductions commitments?

Response:

The SD is to be carbon neutral as of 2010. Should system performance be less than expected,

the SD may have to purchase more carbon offsets to meet their carbon neutral obligations.

From: Frank Geyer
To: Garnet Ayres; Jim White; John Vantol; fgeyer@deltasd.bc.ca
Subject: Fw: MLA John Yap regarding your endorsement of the Delta School District (DSD) Fortis
Date: October-16-12 4:30:24 PM
Attachments: Excerpts from BCUC Delta SD Decision.pdf

Here's the latest.

I was hoping either Dale or Dianne was going to send out our response to all recipients of these emails by now that I gave Deneka last week.

Frank

Sent from my BlackBerry device on the Rogers Wireless Network

From: Darryl McCulley <darryl@smithenergy.com>
Date: Tue, 16 Oct 2012 13:12:29 -0700
To: <fgeyer@rogers.blackberry.net>; <john.yap.mla@leg.bc.ca>
Cc: rich.coleman.mla@leg.bc.ca<rich.coleman.mla@leg.bc.ca>; george.abbott.mla@leg.bc.ca<george.abbott.mla@leg.bc.ca>; <struelove@deltasd.bc.ca>; <ldixon@deltasd.bc.ca>; <dsaip@deltasd.bc.ca>; <dturner@deltasd.bc.ca>; editor@southdeltaleader.com<editor@southdeltaleader.com>; newsroom@abbynews.com<newsroom@abbynews.com>; Jordan Bateman<jbateman@taxpayer.com>; John.Vandongen.MLA@leg.bc.ca<John.Vandongen.MLA@leg.bc.ca>; <struelove@deltasd.bc.ca>; <ldixon@deltasd.bc.ca>; <dsaip@deltasd.bc.ca>; <dturner@deltasd.bc.ca>; len.kelsey@bcuc.com<len.kelsey@bcuc.com>; Frank Geyer<fgeyer@deltasd.bc.ca>; Tom Louie<Tom_Louie@sd34.bc.ca>; Doug McClary<dmcclary@vsb.bc.ca>; <vpalmer@vancouver.sun.com>; <msmyth@direct.ca>; Dana Taylor<danat@mcabc.org>; Gord Monro<glmonro@shaw.ca>; Kaye, Erik MEM:EX<Erik.Kaye@gov.bc.ca>; Adrian M.<adrian@southdeltaleader.com>; Grant Davidson<gdavidson@sd23.bc.ca>; Nino Maletta<nmaletta@sd57.bc.ca>; Glenn Miller<ggmiller@sd61.bc.ca>
Subject: MLA John Yap regarding your endorsement of the Delta School District (DSD) Fortis

Dear Mr. John Yap, MLA Richmond - *Minister of Advanced Education, Innovation and Technology*;

I am writing to sincerely express my support of the governments carbon reduction objectives as laid out in the BC Clean Energy Act; but please take note, not at any cost or compromise to the integrity of the competitive market place. Based on this perspective, I was surprised to see your picture attached to the recent article in the *South Delta Leader* this past Friday seemingly endorsing Fortis BC's project to **regulate** the 19 discrete (island) thermal energy plants for the Delta School District.

My sole interest in this issue is based on my recent experiences in attempting to sell boilers to other school districts and commercial customers across BC. We are a small independent manufacturers rep agency selling high efficient commercial boilers in four provinces. When contacting these potential customers recently, I was being told that they were considering selling their boiler plants to Fortis. Wow, I was more than taken a back by the thought of a utility owning their customers equipment as this has the potential of establishing the utility as the market-maker/gatekeeper (ie. **monopoly**) in BC. So I began a writing campaign

to raise awareness to those in the mechanical consulting and contractor industries. Many months later, we received an email from a Fortis VP challenging our opposition to the Delta School District **regulated** project. In the same letter though this VP invited us to come by and promote our boilers to Fortis (*which I have to admit in my 30 years in the industry, I was a surprise to get this invite given that utilities have never purchases boiler equipment on behalf of their customers before*).

I also began to hear from mechanical contractors about Fortis utility personnel approaching their long standing customers (hotels, healthcare facilities, condos) with offers to purchase their thermal (heat & cool) equipment and sell them back thermal energy. In my opinion, this flies in the face of fair open competitive markets and represents an unparalleled **intrusion** by the gas utility based on a loose interpretation of the definition of a **discrete thermal energy plant** in the BC Utilities Act. There are no other jurisdictions in North America that have allowed utilities to offer this type of **regulated** thermal energy model (for the reasons noted below after this email). So why here in BC then is the question?

So do I take then Minister that you also endorse Fortis leveraging their utility brand and resources (*bought & paid for by the rate base*) to promote their new business initiative with no apparent separation or the ability to distinguish between regulated and non-regulated resources and personnel?

We certainly recognize and understand the tremendous fiscal pressure facing school districts with budget constraints and labour demands. On top of this pressure though, your government policy also requires them to reduce carbon emissions and/or begin purchasing carbon offsets. Great, with what? No worries though as there is a "white knight" (Fortis) and *do they have a deal for you*. They will lend you the funds required for energy enhancements by applying to the BC Utilities Commission (BCUC) to regulate these projects (akin to a **regulated lease**) even though school districts can't borrow money per the School Act and govt debt restrictions. It gets even better as this "white knight" also makes the decisions on the technologies to be used and partners contracted to execute these projects. All you have to do DSD is sit back and pay the regulated tariff rate that Fortis applies for each year. But that's not all, as you will also get to pay back any deferred capital and/or operating costs that have accumulated over the 20 year term of the deal with an annually adjusted rate recovery rider. And get this, at the end of 20 years if you decide exit the **regulated** contract you get the pleasure of paying out the projects estimated \$4 million plus residual on an estimated \$5.7 million contract. (Note, industry experts comment that most of the equipment will need to be recapitalized and replaced during the 20 years. Also note, these figure are subject to change given that this is a cost plus contract with one escalation recorded since it was presented to the DSD board of trustees).

I was also perplexed to hear that the Delta School District are under the impression the BCUC will backstop and provide oversight for the commercial arrangement entered into with Fortis BC thereby protecting the taxpayer. Where does it say this in the BCUC decision paper? Rather, it seems to me the BCUC clearly states that these are two "*sophisticated counter parties*" entering into a commercial contract. So in other words Delta School District and using my own words: "*You want it. You got it. So all the best and don't expect the rate base to bail you out*". So it appears that **DSD assumes all the technical and contract risk** and the **utility collects their ROI** in the form of allowable earnings (i.e., *return on investment*) no matter what happens to project economics' because it is now **regulated**. According to the following: REV. 1 - On page 42 of the DSD CPCN Decision, the Commission states: "*While Delta SD claims to be aware of clauses in the individual service contracts which hold FEI accountable for operational obligations, such as service reliability, guaranteed GHG reduction, or energy*

savings (Exhibit C1-2, BCUC 17.1), the Commission was unable to locate these clauses after examining the Contracts.” (see attachments).

As an endorser of these **regulated** projects, help me understand exactly how this benefits or enhances the existing open competitive marketplace with better choice and more discernible ways of determining value of competing technologies and commercial terms? What I find interesting is that other school districts such as North Vancouver, Campbell River, and Surrey have been self-funding and proactively upgrading equipment for years. BC Housing recently undertook 32 separate (discrete) thermal energy/building enhancement projects without this questionable **regulated** model. How?

I have heard from many in the industry now who say they have attempted to engage school districts with the objective of building a common understanding of alternate technologies and comparable project economics of similar projects across Canada. Unfortunately, they have been rebuffed as many of these school districts are now considering the DSD **regulated** option. So rather than engage in a protracted debate, one industry expert suggested that an independent third party should evaluate the feasibility of the DSD/Fortis **regulated** project to determine if they got the best value as maybe we just don't get it.

In closing, please note that you would have never heard from me if this project were **unregulated, a district heating project, and not being promoted using utility personnel/resources.**

I am sure you will be hearing more about this from others as industry opposition seems to be gathering momentum. I suspect they will petitioning the government (MOE) to grant an **exemption** from regulating **Discrete Thermal projects (like DSD) under Article 88(3) of the UCA.** If the exemption is sought and granted then this all goes away over night.

Thanks in advance for this reviewing these concerns.

Bcc. 150+

Regards,
Darryl McCulley
BC Region



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Addition Background and commentary:

With reference to my introduction email regarding the Delta School District (DSD) Fortis project, I thought I would pass along a summary take on things from a number of concerned individuals, companies, and

associations in the energy and mechanical industries who are just now getting up to speed on this initiative. Given that I am an Abbotsford resident I have cc the Abbotsford News as well as Abby School District Trustees given that they have signed an MOU with Fortis now to do a similar project only twice the size as Delta School District. Please note that I had forwarded to the BCUC Chair a series of emails from Doug Stout VP Fortis (with his permission) which from our prospective what seemed like an attempt to silence my communications to raise awareness to this monopolistic venture.

The serious concerns registered by the BCUC regarding the risks that DSD (see attached excerpts) has taken on speak for themselves as the project does not make any financial sense even if all of Fortis's capital and operating costs estimates were proven correct. No one should be taking own view on any of this but, given that the DSD has gone public with the financial virtues of this project and the likelihood that the BCUC's concerns were not shared with the Board, we believe that and an independent, third-party analysis should be done to determine the true business case and balance sheet treatment of this project. The Business Case for this project is very dependent on the relative costs of natural gas and electricity which are current heading in a direction that is not conducive to geo-exchange projects. Fortis and DSD's assumptions are based on gas prices that are expected to increase at over 10% per year over current rates (compounded) between now and 2016 while electricity prices are expected to only increase by 2.3% (which is unlikely given the BC Hydro Deferral Accounts that will be reflected in future rates).

The financial viability of the project is also very dependent on the efficiency and capacity of the geo-exchange systems. Fortis's sub-contractor is working under a "cost-plus" contract with no fixed price for the installation of the geo systems. Fortis has stated during the CPCN hearing that if actual geo system costs come in higher than expected, they have the option of reducing the size of the geo fields (i.e. reducing the number of wells).

Fortis also acknowledged that this would result in increased usage of the back-up gas boilers and increased gas costs which would be passed on to DSD. Given that no test wells were drilled to establish the geo system cost estimates, this constitutes a significant risk for DSD. Fortis also acknowledged that they did not adjust for the fact that the geo systems would be used exclusively for heating. Unless all of these sites have adequate hydro-geology characteristics, the lack of a cooling load to recharge the fields could result in partially or full freezing the fields along with the associated reduction in geo capacity. Again this would result in increased gas costs for DSD due to the additional use of the back-up boilers.

Finally, the optimum use of each geo system is limited by its ability to generate hot enough water for the mechanical delivery systems in the buildings. Many of these schools were designed with mechanical systems requiring 85 Deg. C hot water at peak loads. Even at non-peak loads, the challenge with heating existing buildings with geo-exchange is that the return temperature of the water coming back from the mechanical systems is too hot for the geo-exchange heat pumps to adequately contribute to the heating load (the same thing applies to condensing boilers). Mechanical enhancements can be made to partially offset this problem but they come at a cost. In any event, since Fortis is not assuming any risk on the performance of the geo systems or the amount of gas consumption required for heating back-up, there would be no assurance that this problem has been mitigated.

The Base Case costs associated with operating the existing thermal plants in these 19 facilities include:

- Gas and electricity utility costs of about \$550,000 per year at current utility rates (based on consumption figures submitted with the CPCN application)
- Costs associated with annual maintenance of the boiler plants
- Capital replacement costs of some of the boiler plants over the next 20 years (not all the boilers are being replaced under the project)

- Carbon offset costs

Under the Cost of Service thermal energy rate with Fortis, the elements of the thermal energy tariff would include:

- Pass-through gas and electricity costs that are perhaps \$150,000 less than the utility costs in the Base Case (with a significant switch from gas to electricity)
- A Capital and Maintenance charge of approximately \$600,000 per year (it will ramp up to that level by 2016 when the installation is complete and then grow with CPI)
- Carbon offsets that are approximately \$50,000 less than the Base Case (2,000 Tonnes @ \$25/Tonne). Note, the Carbon Tax is refunded to school districts so there are no Carbon Tax savings.

Assuming current utility prices (and everything going as hoped), in order to break even, the Base Case would have to assume current boiler maintenance and replacement costs of approximately \$400,000 per year which we believe would be very difficult to demonstrate. In any event, this would be made up primarily by internal labour since DSD does most of their maintenance and replacement work with internal staff. Any such savings would necessarily require the elimination of staff (FTEs) in order to generate the actual savings required to pay for the thermal energy charges.

In contrast, claiming \$180,000 of net annual savings without any FTE reductions, would seem impossible to achieve. Again, the analysis is based on current utility costs and it is easy to obfuscate these numbers with bizarre assumptions about the relative costs between gas and electricity pricing (electricity pricing for geo-exchange systems need to properly account for peak demand charges). DSD appears to base their assumptions about savings on a so-called "Market Rate" for thermal energy which is theoretically intended to approximate their Base Case costs. However, this Market Rate seems to include excessive assumptions about boiler maintenance and replacement costs as well as bizarre assumptions about current and future gas and electricity prices. It would be difficult to demonstrate that DSD would not be paying at least \$200,000 per year more than their current costs for thermal energy under this project and it would get worse from there if capital cost and system performance estimates proved to be overly optimistic.

Fortis is allowed to receive a guaranteed rate of return on the rate base associated with delivering thermal energy for this project. In addition to their on-going operating and maintenance costs, they charge a return on the amount capital that is deployed which is depreciated at different rates. The initial rate base for capital is estimated at \$5.1 Million but there will be re-capitalization during the 20-year period as geo equipment needs to be replaced. The combined impact of depreciation and re-capitalization over 20 years is expected to result in a residual rate base of \$5.6 Million. Unlike a traditional loan arrangement where one would hope to have paid down the balance within 20 years, this arrangement results in an increase in the rate base even after 20 years. The BCUC went to the unprecedented step of requiring written confirmation that DSD was aware of the residual rate base before they approved the tariff. At the end of the 20-year term, DSD would be faced with the choice of continuing with the thermal tariff under a contract extension (and thus continue to pay significantly more than their base case of thermal energy) or pay Fortis the \$5.6 Million. This sets up a self-fulfilling prophecy wherein the DSD would have no choice but to renew the contract. However, our understanding is that a Board of Trustees cannot impose such a financial decision on a future board of trustees. This could result in the \$5.6 Million being recorded as a debt of DSD's balance sheet at the outset. When the project was first announced in March 2011, the estimated initial rate base was only \$2.7 Million and the annual savings to DSD were estimated at \$100,000. Now that the initial rate base has nearly doubled to \$5.1 Million (which would necessarily result in an increase to the Capital charge portion of the tariff), the estimated savings claimed by DSD have increased to \$180,000. This make absolutely no sense whatsoever.

DSD was never going to be a prospective customer of our firm (per Frank's attached email to me) or any of

the other companies that have taken issue with the Thermal Energy services offered by Fortis. However, since DSD has chosen to publicly promote the virtues of this project and overtly market their arrangement with Fortis to other school districts (who could be potential customers) at events like the annual EFMA (SPOA) meetings in Penticton this past June, we felt that the light of day needed to shine on the true financial viability (or non-viability) of this project. As previously noted, no one should be taking our view on any of this but there should be sufficient grounds to warrant a third-party, independent analysis of the business case of this project and the risks that DSD is facing. We have nothing against geo-exchange technology (work with it all the time) and we applaud efforts to reduce emissions. However, we agree with the BCUC that "green at any cost" is not necessarily the right approach when scarce education funding dollars are involved. Our firm, and many like us (email bcc list is extensive), have serious concerns with the regulatory implications of what Fortis is doing (as one mechanical contractor called it a "market intrusion") and we hope that they will be addressed in the BCUC's pending decision under the Fortis AES Inquiry. However, that is a separate issue from project financial viability and the manner in which public dollars are spent.

Minutes from April 23rd Abby School District finance committee meeting

3.3 Fortis BC Thermal Energy Proposal

Director of Facilities, Tom Louie, reviewed the proposal from Fortis BC which provides the opportunity to move forward with a feasibility study to further consider a possible \$12M investment by Fortis BC in thermal energy equipment over a 20 year period. Fortis will be invited to make a brief presentation at the next board meeting.

The topic was raised as a presentation to the Abbotsford Trustees at the May 7th meeting.

• 4.2 Fortis BC – Presenter: Vladimir Kostka

Tom Louie, Director of Facilities & Transportation, introduced Vladimir Kostka who introduced the Thermal Energy Delivery Program. The purpose is to assess the feasibility of delivering clean thermal energy to some buildings in the school district.

My understanding though is that they have an MOU stage per an email note from Tom Louie (attached) with Fortis but I am not able to confirm this through the board minutes. Note that Vladimir Kostka is a Fortis "utility" employee who had also contacted me sometime ago. Please review this exchange in the attached Fortis conversation email.

Excerpts from BCUC Orders G-31-12/G-71-12
CPCN Application: Delta School District Thermal Energy Project

Although the BCUC ultimately approved the DSD Project, it did so only with a number of conditions and required the project to be transferred to an affiliate of FortisBC Energy Inc.

Below are some specific concerns raised by the Commission Panel:

Risks:

“The Panel is concerned with the cost risks that Delta SD will be assuming with a COS model, which will hold the current and future Boards of Trustees of the SD accountable in the initial contractual term of 20 years. By using a COS model, the assumption of risk lies largely at the hands of the customer, in this case the DSD. In other alternative pricing models the forecast or costs risks are more balanced between the service provider and the customer.

With regard to the risks being assumed by Delta SD, the Panel notes there are risks that the renewable portions of the Project may need to be scaled back to meet budgetary constraints. However, this could increase operating costs because of greater fuel requirements and the need to purchase additional carbon offsets to meet the requirements of carbon neutrality. The Service Agreements also appear to provide no significant performance guarantees, and as such, little control over operating costs. The Commission Panel cannot assess how well these provisions are understood by the SD and the extent to which any aspects of the service may be guaranteed.”¹

“A related concern, that affects both the Project as scoped and a down-scoped version of it, is that there appear to be no penalties in the event the reductions aren’t achieved. Given that GHG reductions are cited as a primary need, the Panel finds it unusual that there is no requirement for FEI to actually achieve the reductions.”²

Residual Liability:

“An issue of particular concern to the Panel is the possibility of stranded assets at the end of the 20 year term. The Panel has previously discussed the fact that there is some \$4.1 million in rate base at that time and the DSD will be under no obligation to continue service with FEI. The Panel is of the opinion that capital costs that are incurred by FEI to provide thermal services to the DSD should be properly amortized and included in rates. If new capital equipment is purchased by FEI during the course of these Service

¹ BCUC Order G-31-12 Page 84

² BCUC Order G-31-12 Page 64

Agreements, and that equipment has a life that extends beyond the current term of the agreements, new agreements should be negotiated at the time of purchase that will ensure that FEI fully recovers those purchase costs over the life of that equipment.”³

“The following are accepted as filed:...The FAES report setting forth the details of the ending rate base of \$5.6M in 20 years, explaining how the amount is to be recovered in the event Service Agreements are not renewed, and evidence that the report has been shared with Delta School District;”⁴

Cost Effectiveness:

“Returning now to the issue of economic efficiency, the Panel questions why economic efficiency was not more fully considered when addressing Project alternatives. Given the screening analysis as described by the Applicant, the parties have agreed upon a Project with a capital budget of approximately \$6.5 million. However, is it economically efficient for the SD to pay \$6.5 million for the GHG reductions that will be achieved? Could a more economically efficient result be achieved by adopting a less expensive alternative, such as an all stand-alone HEGB solution? To determine this would require a detailed analysis, such as a comparison of the net present value of the cost of offsets, differences in fuel consumption, amortization, etc. as compared to the project cost of \$6.5 million. If another approach is indeed more economically efficient, then any cost savings could potentially be applied to the reduction of GHGs in other areas (i.e. transportation) which could result in greater overall GHG reductions. Green at any cost is not necessarily desired, especially if there are more cost-effective alternatives. The Panel is not satisfied that the need as identified by the parties, and the approach to satisfying that need, has been sufficiently analyzed.”⁵

“Notwithstanding this finding the Panel has some concerns regarding the particular solution proposed as highlighted in previous Sections. Green at any cost cannot necessarily be in the public interest. The Panel is of the view that economic efficiency should be a primary consideration even in the case of ‘green’ projects and the Panel has previously noted its concerns that the SD and FEI have not adequately analyzed Project alternatives. As such, it is not possible to say whether this Project is the most efficient approach and whether it provides the SD the best value for its money.”⁶

³ BCUC Order G-31-12 Page 85

⁴ BCUC Order G-71-12 Page 4

⁵ BCUC Order G-31-12 Page 65

⁶ BCUC Order G-31-12 Page 68

Future Risks:

“In addition, the Panel further notes that there is a distinction between the current Delta SD parents and taxpayers and those of future. The technology chosen by Delta SD for this Project is expensive – more expensive than some available alternatives. In order to accommodate Delta SD’s limited budget, the proposed rate structure transfers costs to future years through a deferral account, thereby raising issues of intergenerational equity. Furthermore, most of the operational risk is borne by Delta SD. This means that if there are unforeseen increases in cost, rates will be increased for Delta SD.”⁷

“Given this potential for future cost escalation, the Panel questions whether the interests of future parents and taxpayers of Delta SD have been adequately considered. The Panel is concerned that the nature of the Project, combined with the proposed rate structure, potentially results in a substantial transfer of risk to future generations.”⁸

“The Panel has serious concerns about the possible deferred cost implications for future Delta School Boards. The Panel also notes FEI’s intention to make similar negotiated rates available to other thermal customers with regard to other projects.”⁹

⁷ BCUC Order G-31-12 Page 59

⁸ BCUC Order G-31-12 Page 59

⁹ BCUC Order G-31-12 Page 59

From: Frank Geyer
To: Vladimir Kostka; Grant Biermeier; fgeyer@deltasd.bc.ca
Cc: Tom Louie
Subject: Fw: MOU with Fortis BC
Date: October-25-11 10:39:27 AM
Attachments: [SmithLogo\[2\]\[21\].png](#)

FYI. You may want to pass this by your lawyers...

Frank

Sent from my BlackBerry device on the Rogers Wireless Network

From: Darryl McCulley <darryl@smithenergy.com>
Date: Tue, 25 Oct 2011 09:00:32 -0700
To: <fgeyer@rogers.blackberry.net>; Frank Geyer<fgeyer@deltasd.bc.ca>
Subject: MOU with Fortis BC

FYI food for thought!

From: Darryl McCulley <darryl@smithenergy.com>
Date: Mon, 24 Oct 2011 18:11:05 -0700
To: <Tom.Louie@sd34.bc.ca>, <rick_walker@sd34.bc.ca>
Subject: MOU with Fortis BC rev. II

Gentlemen,

I am writing in regards the recently signed a MOU with Fortis BC to conduct an "energy study" regarding alternate or thermal energy systems under a *regulated utility model*.

I congratulate the school district on wanting to be proactive about reducing energy consumption and greenhouse gas emissions.

It is interesting though that some industry experts and pundits say that simple payback on these sort of projects for BC schools are not economical without significant incentives and/or subsidies (with a potential 35+ year simple payback depending on the cost of energy). The Fortis BC initiative may seem like a viable option as long as there is an understanding of the following:

- What happens if the savings don't materialize or the project and ongoing operating costs are more than estimated?
- Who bears this financial risk as the utility would get their annual *regulated* rate of return under the *regulated utility model*?
- How to mitigate limits on liability and fully indemnify the school district?
- How do regulated tariffs work and what is the mechanism to set tariffs each year?
- What similar services are available in the unregulated competitive market? i.e.. Energy service companies (Esco).
- What happens to stranded utility costs for assets already in the ground? Are these factored in the new capital costs?
- What happens if there is new technology available in a few years. Are there any provisions for upgrades during the tenure of the contract or are you stuck with the original equipment for the duration of the contract...just wondering...

What real benefit does the utility bring to the table as these services don't require right of way access cross property lines? Do they really add value or just collect revenue?

Why don't school districts just establish their own utilities entities much like some municipalities as you will end up with all the risk anyways so you may as well see some reward?

Why are no other school districts (other than Delta) in Canada going down this path?

Also, I trust that the school district had been made aware of the ongoing BCUC *"Inquiry into FortisBC Energy Inc. regarding the Offering of Products and Services in Alternative Energy Solutions and Other New Initiatives"* as the outcome of this inquiry would impact the future direction of this project. See link: <http://www.bcuc.com/ApplicationView.aspx?ApplicationId=309>

I do have significant energy industry experience with complex energy projects and only encourage the school district to employ knowledgeable industry and regulatory legal experts to assist in the due diligence process.

In closing, it is only fair to disclose that I am an Abbotsford resident with an indirect interest in the outcome as the BC manufacturers representative for Harsco Industrial Patterson Kelley boilers. We have retrofitted entire school districts in other provinces with new high efficient boilers resulting in significant energy reduction, lower emissions, and very aggressive paybacks. I would welcome the opportunity to meet with you say over a coffee to discuss further.

Thank you in advance for this consideration.

Darryl J. McCulley
36127 Buckingham Drive
Abbotsford, BC
604.850.5855 home
604.803.8170 cell

dmhome@shaw.ca

Respectfully,
Darryl McCulley
BC Region

SmithLogo[2][21].png

Unit 101 20167 96th Avenue

Langley, BC V1M 3C5

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Cell: 604.803.8170

Fax: 604.513.5920

www.smithenergy.com

Facebook: Smith Energy

Exhibit R

Oct 12/2012
South Delta
Leader



John Yap, Minister of Advanced Education, Innovation and Technology, speaks at Neilson Grove Elementary about Delta School District's new geoexchange partnership with FortisBC. Submitted photo

Fortis contract could be more expensive: critics

Green energy project for the Delta School District touted to reduce emissions and save \$180,000 a year

ADRIAN MACNAIR
REPORTER

The Delta School District recently entered into a 20-year partnership with FortisBC to provide thermal energy for 19 buildings, but a Delta engineer warns there are hidden costs to the project.

The \$6.4 million project—with \$5 million coming from Fortis and \$1.4 million from a provincial green energy fund—was attractive to the school district because the capital costs are being paid by Fortis.

But Neil Caldwell, an energy conservation engineer who lives in Delta and has children in the school district, says the economics for the project don't make any sense.

"Geoexchange can be a great application for some projects, especially new construction, however, retrofitting them into an existing school is very expensive," says Caldwell, adding taxpayers will likely be paying the costs for years to come.

Caldwell pointed to comments made by the B.C. Utilities Commission—which is responsible for regulating rates and service quality in natural gas and electricity utilities—in its review of the project prior to approval. The panel wrote that it was concerned with the cost risks of the school district assuming a cost of service model with Fortis.

The panel also warned about increased operating costs because of greater fuel requirements and the need to purchase additional carbon offsets to meet the requirements of carbon neutrality. With few performance guarantees, the school district has little control over costs, it added.

Proponents of the project have claimed the contrary—that reduced natural gas usage means the school district expects to save \$180,000 a year, and that energy output will be reduced by nearly half. Greenhouse gas emissions are also expected to be cut by 69 per cent.

The school district was originally approached by Fortis in late 2009 during a time when it was looking at

finding more energy efficient replacements for gas-fired furnaces that had reached the end of their lifespan.

"What we wanted to do was get away from spending considerable taxpayer dollars on replacing and operating the equipment, but at the same time we wanted to reduce our need for energy to heat our buildings and as a result pay less on our carbon taxes and carbon offsets," says Frank Geyer, director of facilities and planning for the school district.

But that answer doesn't satisfy Caldwell.

"Vicki Huntington was quoted as stating the tunnel should not be replaced at any cost, and greenhouse gas reductions should not be pursued at any cost either."

"The technology chosen by Delta SD for this project is expensive—more expensive than some available alternatives," the B.C. Utilities Commission wrote. However, in approving the deal, the panel acknowledged the school district needs to replace aging infrastructure and the project gives it "the opportunity to reduce its GHG emissions while helping to mitigate its exposure to potentially increasing carbon offset costs in the future."

Because Fortis came to the school district with the proposal, some energy providers are also miffed at the sole source contract. Darryl McCulley, B.C. regional manager at Smith Energy, says costs have already escalated. He says that between a March 15, 2011 school board meeting when trustees were presented the project, and the final agreement in February, 2012, capital costs had increased by 90 per cent, or \$1.5 million.

But Geyer says McCulley is merely criticizing the project because his company is a competitor with Fortis. The school district voluntarily went through a B.C. Utilities Commission process to further provide transparency and protection for taxpayers, he added.

Construction began Oct. 1 and is expected to be completed by 2014.

adrian@southdeltaleader.com

This is Exhibit "R" referred to in the affidavit of FRANK GEYER made before me on AUGUST 10 2012
Erin Campbell-Hirz
A Commissioner for taking Affidavits for British Columbia

Exhibit S

Write Stuff

The South Delta Leader encourages reader participation in your community newspaper. Log in and comment on any story you see in the paper online at southdeltaleader.com. Share your thoughts in a letter to the editor (200 words or less) including your full name, address and phone number. Here's how:

To submit a letter to the editor, FAX 604-943-8619 MAIL 7-1363 56th St., Delta, V4L 2P7 EMAIL newsroom@southdeltaleader.com

Board over 50 years ago. At the time of the construction of the tunnel the navigation depths of the Fraser River at that location were 22.5 feet below low water over a width of 300 feet.

Geothermal needs economy of scale

Re: "Fortis contract could be more expensive critics," Oct. 12

I am pleased to see that some other folks in Delta can see through the deception and "smoke and mirrors" being used by Fortis and the Delta School District to paint this project as being a good solution. The fact of the matter is clear to anyone with a cursory of knowledge about district heating systems and geothermal heat pump systems — unless there is an economy of "scale" (not scope), you cannot justify this approach at current natural gas prices.

Fortis has found a way to milk the

their depth fully loaded was 43.5 feet. Let us remember that the depth over the top of tunnel exceeded the depth of the river, so in order to bring a 80,000-ton tanker to New Westminster at low water the whole river would

"Green Economy" to guarantee an 8.9 per cent return on its investment with a subsidy of \$1.6 million by the province, and increased operating costs to be paid by the taxpayers of Delta.

Even the added cost of reducing Greenhouse Gas Emissions does not meet the test of a lower cost system. Our Provincial government appears bent on reducing GHGs at any cost in order to meet its 2020 target of 33 per cent reduction.

This project is predicated on cooling thermal heat from the ground at the cost of electricity. If that is the real cost, then a much cheaper solution over a 20 year period would be to install an all-electric system. And that approach would virtually reduce emissions by 100 per cent rather than the expected

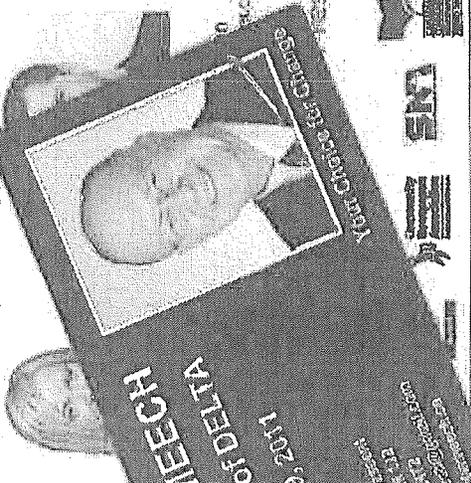
system unless it is to allow them to bring even deeper ships, like tankers to its Fraser Surrey Docks? We cannot let this happen.

Douglas George Massey
Delta

70 per cent. All of the risks of this system are being taken on by the School District with Fortis now owning the infrastructure. One should check into the failed system that Tarasyn (now Fortis) installed in that Coal Harbour condominium building. The residents are paying double the cost to heat their homes that they had been promised. I am a strong believer in geothermal energy systems but not at any cost. This was a foolish decision that the Delta School District and Delta taxpayers will live to regret as time passes.

John Meech, P.Eng., Ph.D.
Professor of Mining Engineering and Director of the USC Centre for Environmental Research in Minerals, Metals, and Materials

behind the scenes



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Oct 19/2012
South Delta
leader

This is Exhibit " S " referred to in the affidavit of FRANK GELER made before me on AUG 19 20 12
Frank Campbell Phizand

A Commissioner for taking Affidavits for British Columbia

Exhibit T

This is Exhibit "I" referred to in the affidavit of FRANK GEYER made before me on AUGUST 20 12 Ena Combatt Shirzad
A Commissioner for taking Affidavits for British Columbia

287

From: Bierlmeier, Grant
To: [Frank Geyer](#)
Subject: FW: BCUC FORTIS BC -DELTA SCHOOL DELTA Thermal Energy Tariff decision
Date: October-03-12 2:16:35 PM
Attachments: [Fortis Thermal Energy Service O&A.doc](#)
[MEM_Final-Submission.pdf](#)
[image001.png](#)

Fyi – this was our response to Vancouver SD last month.

I will put together a formal response to your e-mail.

From: Bierlmeier, Grant
Sent: Tuesday, August 21, 2012 4:25 PM
To: 'Kirthi Roberts'; Kostka, Vladimir
Subject: RE: BCUC FORTIS BC -DELTA SCHOOL DELTA Thermal Energy Tariff decision

Kirthi,

As an overall comment to start, the Fortis thermal energy service will enable installation of more equipment leading to more equipment sales in British Columbia than without the Fortis thermal energy service. So, suppliers will continue to compete with each other to sell their equipment, except that when Fortis is providing thermal energy service, Fortis will be the purchaser – a purchaser with much more purchasing power than most current purchasers of equipment. So, the argument of a supplier against the Fortis model is at least curious if not outright perplexing. We could easily purchase equipment from Smith Energy as much as we could from Honeywell, or another supplier.

Second, we have been through extensive review with the BCUC in the AES Inquiry, the revenue requirements applications, Delta Application, Tsawwassen Springs Application, and PCI Marine Gateway Application. The amount of questions has far exceeded 10,000 to date and there have been submissions on behalf of the Province of BC, competitors of Fortis, customers of Fortis and various interveners representing a wide range of interests both economic and social. The Fortis thermal energy service model has easily endured.

Responses to specific issues:

Mr. McCulley is of the opinion that this is not regulated service.

Page 21 of the Delta Decision

“The Commission Panel finds that the provision of thermal energy service to Delta SD is a regulated service under the *UCA*.”

By selling thermal energy, not natural gas and metering that thermal energy delivery, the service is not “natural gas service”, nor is Fortis extending this service as part of the natural gas service – it is thermal energy service and as such it is regulated under the UCA for the protection of customers.

With respect to his claim that the Province does not understand or is not aware of the consequences of the BCUC decision, I offer the following from the Ministry of Energy and Mines as a letter of support in the Delta School District BCUC Process.

“This application has tremendous potential for use in other public and private buildings, and can play a key role in meeting B.C.’s greenhouse gas reduction targets and promoting green technologies.”

On the residual Value discussion Mr McCulley is confused. The reason there could be a residual value is that *Fortis will continue to invest in the energy systems to provide reliable and efficient service*. The concern that the BCUC raises relates to the fact that the Delta Schools has no obligation to purchase the systems and that *Fortis* would have no way of recovering the residual value! The concern is not that Delta would have a problem, but Fortis would.

With respect to the regulated rate of return – of course Fortis, as a utility provider seeks to earn the regulated return – which is an amount that is subject to BCUC review and approval at all times- for the protection of customers again.

Regarding the restricted access to capital of the Schools- the Fortis service offers a solution to this by providing thermal energy at rates that are competitive with existing costs but using new equipment that Fortis purchases. It is difficult to see the concern in this. The article by Doug Wall misrepresents outright the economics of our solution. With the proper economics, the article actually argues successfully that the Fortis solution is the only solution that works given the extreme capital constraints in place.

On the issue of cost effectiveness, the Delta service was designed to offer maximum emission reductions without costing more. It is true that a purely “low-cost” solution could have been implemented instead, but without the huge emission reductions that the service delivers. Given carbon neutrality is the mandate, with an emphasis on real reductions being the priority, we feel strongly that the project best achieves this. The BCUC merely is putting on record that they think there may be cheaper solution, without the green benefits available. Nonetheless, they Ministry supported the project and ultimately the BCUC approved this project, thereby indicating their support for it.

I actually disagree with the Commission opinion on the current and future risks. The service that was approved by the BCUC has checks and balances on initial and future costs via the prudency reviews that the BCUC has done and will be doing each year on the service. In contrast, a long term investment decision along with firm long term contracts by a school district based solely on forecasts of energy and price savings into the future done at this moment in time exposes future ratepayers to immense risk without any opportunity to represent themselves. In our solution, future ratepayers will have an ongoing opportunity to represent their interests to the BCUC. As such, I believe the quoted BCUC statements on this matter in the Delta decision are incorrect and that the BCUC are becoming more aware of this through the subsequent processes we have been engaged in with them since the Delta Decision. In any event, we must remember that the BCUC approved this rate design and will be reviewing it each year for reasonableness in the interests of customers.

I have also attached a Q&A summary of our service explaining how it responds to customers’ needs, regulation and economic viability.

Please do not hesitate to ask if you have any further questions or concerns.

Grant Bierlmeier

Business Development Manager

T: 250.380.5794 | C: 250.896.3098

FORTIS BC | www.fortisbc.com

From: Kirthi Roberts [<mailto:kiroberts@vsb.bc.ca>]
Sent: Tuesday, August 21, 2012 3:02 PM
To: Bierlmeier, Grant; Kostka, Vladimir
Subject: FW: BCUC FORTIS BC -DELTA SCHOOL DELTA Thermal Energy Tariff decision

Hi Grant, Vladimir -

Are you aware of these letters and attachments?

What are your thoughts/comments?

Kirthi

Kirthi Roberts, PhD.

Manager, Sustainability & Climate Action

Superintendent's Office

Vancouver Board of Education

Office: 604-713-5288 | **Mobile:** 778-228-1838

E-mail: kiroberts@vsb.bc.ca

Fax: 604-713-5077

From: Darryl McCulley [<mailto:darryl@smithenergy.com>]
Sent: Wednesday, August 15, 2012 9:42 AM
To: Kaye, Erik MEM:EX
Cc: rich.coleman.mla@leg.bc.ca; george.abbott.mla@leg.bc.ca; commission.secretary@bcuc.com
Subject: BCUC FORTIS BC -DELTA SCHOOL DELTA Thermal Energy Tariff decision

Hello Erik,

Thank you for the response to my email letter (attached) sent to **Rich Coleman Minister of Energy & Mines** and **George Abbott Minister of Education** regarding the BCUC decision to approve the **Fortis BC tariff rate application for a Thermal Energy Project with the Delta School District (DSD)**.

I respect and support the point made in your email that government doesn't interfere with the independent BCUC Public Hearing process or its subsequent decisions. In turn, I trust that you appreciate that a small business does not have the resources or time to become an active intervener in such proceedings either. As an alternative method now I have engage industry trade associations where I am a member to review the potential impact of the BCUC decision on its members. If deemed a concern, I anticipate that they will take an active role in future regulatory proceedings as Fortis BC has stated they have another eight school districts signed to MOU's for similar thermal energy projects.

I would also comment that given the context of your letter it appears that government doesn't fully appreciate or understand the unintended consequences this of decision. In my opinion, government needs provide greater clarity to the definition of "thermal energy plants" as noted in the Utilities Act as I am sure it was never intended to be applied to a customers heating/cooling plant located inside their own building and doesn't serve other customers.

It is also my understanding from speaking with some of the interveners, that Fortis BC commented they would not have entertained the Delta School District project without the regulated tariff format that guarantees their allowable earnings (ROI). Why? Was it to diminish moral suasion governing fair value with balanced risk? I think the attached article published in the spring 2012 edition of the Educational Facility Managers Association of BC (EFMA-BC) – Ops Talk magazine) better explains this point than I can.

I have also attached my email letter forwarded recently to the BC Tax Payers Federation in regards to their editorial article in the Sun and Province new papers (as well as TV news broadcasts). In this letter, I had commented on the contentious issue raised in the articles pertaining to the governments 2010 Clean Energy Act (CEA) and the impact and financial burden placed on school districts. In my opinion, this government policy played a significantly role in motivating the Delta School District to reduce their exposure to purchasing carbon offsets as required by the CEA. Very understandable. The end result though may have swayed the school district (and potentially others now) into an unprecedented "regulated" lease transaction with Fortis BC all the while the ultimate client (the taxpayer) is now fully exposed the liabilities of the technical and contractual terms of this regulated lease agreement.

In closing, my intent is to better understand the shifting landscape of the BC market place so we can best determine the direction of our small business. These recent decisions and policies initiatives though leave the impression that the government is implementing some sort of Trudeau style oligarchy strategy in inorder to achieve the objectives of the CEA 2010. I trust this is not the intent.

Thank you in advance for consideration of this very important issue.

Regards,

Darryl McCulley

BC Region



Unit 101 – 20167 96th Avenue

Langley, BC V1M 3C5

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Fax: 604.513.5920

Facebook: Smith Energy BC

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From: "Kaye, Erik MEM:EX" <Erik.Kaye@gov.bc.ca>

Date: Friday, 10 August, 2012 10:46 AM

To: Darryl McCulley <darryl@smithenergy.com>

Subject: CLIFF 69746

Mr. Darryl McCulley

Email: darryl@smithenergy.com

Dear Mr. McCulley:

Thank you for your July 11, 2012, e-mail addressed to Honourable Rich Coleman, Minister of Energy and Mines, concerning the British Columbia Utilities Commission's (BCUC) decision with respect to the FortisBC Regulated Tariff for the Delta School District Thermal Energy Project.

As you may be aware the BCUC is a regulatory agency operating under the authority of the *Utilities Commission Act*. As such, the BCUC's function is quasi-judicial and it has the power to make legally binding rulings. For this reason, the ministry does not give opinions on the merits of specific BCUC decisions.

There are provisions under the *Utilities Commission Act* for intervenors in a proceeding to request reconsideration of a BCUC decision. You may contact the BCUC directly at (604) 660-4700 or by e-mail at commission.secretary@bcuc.com for more information on the reconsideration process.

Please contact me directly at Erik.Kaye@gov.bc.ca if you have further questions.

Sincerely,

Erik Kaye

Senior Policy Advisor, Energy Efficiency Branch

Ministry of Energy and Mines

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Question 1

Is there a growing understanding of thermal energy service in the community by customers?

Everyone requires thermal energy in Canada, creating one of the single largest opportunities to reduce our carbon footprint since building emissions represent over 50% of all carbon emissions in our communities.

Recognizing this, in British Columbia, the Province and over 180 local governments have signed the Climate Action Charter to reduce emissions and many are commissioning feasibility studies to determine if thermal energy service could serve customers in their communities and reduce energy consumption and emissions.

I believe that Fortis, as a public utility will play a central role in bringing thermal energy services to all customers in our communities because our solution addresses three primary needs of our customers:

1. Customers need tangible benefits, not technology.

It is possible to deliver thermal energy to customers using different technologies. Fortis uses the best technology for the customer.

2. Customers focus on the short run.

Customers want to save money and be green immediately, but benefits may take time to realize. Fortis has the patience and business tools to unlock long term benefits for customers today.

3. Customers need it to be easy.

We have to take the service to customers in a way that is immediately familiar. Fortis knows customers find it simple, easy and familiar to access public utility services.

The Fortis business model reveals an enormous opportunity for thermal energy service.

We need public utility service providers like Fortis to be able to serve the thermal energy needs of customers in all of our communities throughout Canada.

Question 2

How do we resolve the regulatory issues & is this a regulated business?

We all know and accept that regulation of public utility services in Canada produces many benefits and is necessary.

Proven regulatory practices enable us to set rates and service levels for any public utility service and the laws of British Columbia define someone who provides thermal energy service as a public utility.

I know that regulating thermal energy service is as manageable as regulating any other public utility service and customers need regulation for three main reasons:

1. *"Ex-ante"* prior to signing contracts, the negotiations favour sellers, not customers meaning there may be unethical, unfair or cutthroat competition *"for the market"*.

*"...consumers need protection from exploitation from producers arising from the long-lived, transaction-specific, idiosyncratic, immobile capital investments that are required to provide service."*¹

2. *"Ex-post"* once customers connect, they are captive which prevents any further competition *"in the market"*.

*"If there are barriers to entry and demand is inelastic, the sole producer who survives the competitive struggle while efficient – in that it can produce the output demand at a lower cost than two or more firms – could restrict output, raise prices, and reap monopoly profits."*²

3. *"Subadditive costs"* mean it is more efficient for a single firm to supply the market, which leads to public utility markets becoming *"natural monopolies"*.

*"the very characteristics of a public utility business not only rule out reliance on actual competition as an automatic price regulator, but also rule out attempts to emulate the behavior of pure competition in the control of monopoly prices."*³

At Fortis, as the largest provider of public utility services in Canada, we believe that regulation provides important benefits and protections for customers which the market requires to properly function.

We can and should apply standard regulation to thermal energy service providers like Fortis.

¹ Bonbright, Principles of Public Utility Rates, page 63

² Bonbright, Principles of Public Utility Rates, page 33

³ Bonbright, Principles of Public Utility Rates, page 148

Question 3

What's the business case for Thermal Energy Service?

Situations differ amongst customers for a variety of reasons, which is why we have standard business cases to compare these differences regardless of the public utility service in question.

In practice, the business case for thermal energy service, including District Energy Systems, evaluates service alternatives by comparing "levelized" rates for thermal energy in \$/kWh⁴.

I am confident that business cases demonstrate that public utilities such as Fortis are in the best position to provide thermal energy service because of these three advantages:

1. Alignment of long term interests to produce quality forecasts.

Owners, consumers and the public live with these decisions for a long time. The interests of public utilities such as Fortis, as an owner and service provider align with the other long term stakeholders to produce quality forecasts.⁵

2. Alignment of economic incentives to select more efficient technologies.

Public utilities only earn long run profit on the capital investment, or rate base that regulators approve while they directly pass through all other costs of providing service in rates. Public utilities also have very low long term capital carrying costs. This provides an incentive to use the capital intensive, lower energy usage and emissions technologies which aligns with the interests of consumers, suppliers and policies.

3. Internal efficiencies directly benefit customers, stakeholders and suppliers.

Public utilities have the technical, financial and legal expertise to negotiate purchases of the equipment, supplies and services necessary to provide thermal energy service on a large scale. In addition, public utilities are able to pass on further efficiencies to customers through shared or joint costs. These all reduce overall costs for customers, enhancing business cases, which also benefits suppliers of equipment and services.

There is an alignment of incentives when public utilities such as Fortis provide thermal energy service that becomes evident in our business cases.

Business cases clearly indicate that customers, suppliers and stakeholders will benefit and should support public utilities like Fortis in developing the market for thermal energy service.

⁴ Levelized rates are calculated as the present value of forecast costs over the present value of forecast thermal energy demand both using a discount rate equal to the forecast cost of capital.

⁵ Necessary forecasts over minimum 20 years include: energy sources, consumption, emissions and prices; capital costs for purchasing, financing, depreciating and replacing equipment; applicable taxes on income, property and carbon emissions; ongoing costs of operation, maintenance and administration including inflation; and thermal energy demand and growth

February 10, 2012

Ms. Alanna Gillis, Acting Commission Secretary
British Columbia Utilities Commission
Sixth Floor, 900 Howe Street, Box 250
Vancouver, BC V6Z 2N3

Dear Ms. Gillis,

On behalf of the British Columbia Ministry of Energy and Mines (MEM) and the Climate Action Secretariat (CAS), we are writing in support of FortisBC Energy Inc. (FEI)'s application for a Certificate of Public Convenience and Necessity (CPCN) to provide Thermal Energy Service to Delta School District Number 37 (SD 37).

On February 7, 2011, the province of British Columbia provided \$1.4 million in support of this project to SD 37, under the B.C. Public Sector Energy Conservation Agreement. The Public Sector Energy Conservation Agreement (PSECA) was created in 2007 as a partnership between BC Hydro and the Government of B.C. Budget 2008/09 committed \$75 million over three years to help public sector organizations reduce provincial greenhouse gas (GHG) emissions, energy consumption and operating costs. In addition it was created to support government's goal of carbon neutrality and to stimulate the economic benefits from the growth of clean and alternative technology. FEI (formerly Terasen Gas Inc) joined the PSECA framework in June 2010.

The PSECA funding was granted as this project met the programs objectives stated above. In particular, it will reduce greenhouse gas emissions by nearly 70%, the equivalent of taking nearly 450 cars off the road each year. The Delta project also demonstrates transformative thinking – tapping into renewable energy sources and using a mix of technologies. In addition, this project meets a number of government energy objectives under the *Clean Energy Act* (CEA) such as fostering the development in British Columbia of innovative technologies that support energy conservation and efficiency and the use of clean or renewable resources. The FEI application meets this objective with the use of state-of-the-art geexchange systems to provide zero-emission thermal energy to eleven SD 37 sites. This application has tremendous potential for use in other public and private buildings, and can play a key role in meeting B.C.'s greenhouse gas reduction targets and promoting green technologies.

This reduction is also consistent with the *Clean Energy Act's* energy objectives for reducing greenhouse gas emissions, including the target of 80% reduction in B.C.'s greenhouse gas emissions below 2007 levels by 2050. It is important to recognize that these targets are for the entire province and are not allocated by sector, as all sectors do not have the opportunity to make such significant reductions in fossil fuel use by employing transformative technologies.

Once again, on behalf of MEM and CAS, we support this application for the reasons noted above.

Sincerely,

Paul Wieringa
Executive Director, Alternative Energy
Ministry of Energy and Mines

Colleen Sparks
Director, Carbon Neutral Government
Climate Action Secretariat, Ministry of Environment

Exhibit U

This is Exhibit " U " referred to in the
affidavit of FRANK GEYER
made before me on AUGUST 10 20 18
Edna Lambert Shirek
A Commissioner for taking Affidavits
for British Columbia

301

From: Stout, Douglas
To: fgeyer@deltasd.bc.ca
Subject: Delta School District - FortisBC Letter of Response
Date: October-30-12 9:40:24 AM
Attachments: [Delta School District Letter - Mr. Geyer.pdf](#)

This went to the entire list of recipients of the emails from McCulley and Meech.

F

----- Original Message -----

Message Oct-30-12 9:39 AM
From: "Stout, Douglas" <Douglas.Stout@fortisbc.com>
To: Frank Geyer View in Browser
Subject: Delta School District - FortisBC Letter of Response
Attachments: Delta School District Letter - Mr. Geyer.pdf Uploaded File 197K

Please find attached a letter from FortisBC addressing concerns brought up in a recent article.

Sincerely,

Doug Stout

Vice President, Energy Solutions & External Relations, FortisBC

President, FortisBC Alternative Energy Services Inc.

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via email

October 30, 2012

Dear Mr. Geyer:

I am writing firstly to address concerns brought up in an October 12 *South Delta Leader* article in which Messrs. Neil Caldwell and Darryl McCulley were quoted and a subsequent letter to the editor by Dr. John Meech. Secondly, I would like to address Mr. McCulley's October 4 email as well as other emails from him to you. While we appreciate everyone has the right to express opinions, at this point, FortisBC is concerned that these letters and emails unfairly target the Delta School District and misrepresent the public utility service that FortisBC is providing to the Delta School District.

As background, the FortisBC thermal energy service for Delta School District underwent an intensive eight-month review process with the British Columbia Utilities Commission (BCUC) prior to receiving approval from the BCUC to proceed. The BCUC is responsible for ensuring that customers receive safe, reliable and non-discriminatory energy services at fair rates from the utilities it regulates, that shareholders of these utilities are afforded a reasonable opportunity to earn a fair return on their invested capital, and that the competitive interests of BC businesses are not frustrated. The BCUC function is quasi-judicial and it has the power to make legally binding rulings. During this eight-month review, members from the public and representatives of companies were invited to register to receive information or ask questions of FortisBC and many did so. FortisBC provided responses to all public inquiries and welcomed the opportunity to do so. Support from numerous customer stakeholders was expressed at this time and the BCUC, based on the evidence presented, determined that the FortisBC thermal energy service for the Delta School District was in the public interest.

While Dr. Meech and Messrs. Caldwell and McCulley are now expressing concerns, they did not participate in the BCUC proceeding despite their knowledge of the BCUC and their respective affiliations with Delta municipal politics, Ameresco (a company which offers energy performance contracts as an alternative to the FortisBC public utility service and who participated in the BCUC regulatory process through its trade association) and Smith Energy (a gas boiler supplier).

In his letter to the editor, Dr. Meech who notes he is a Professor of Mining Engineering, and Director of the UBC Centre for Environmental Research in Minerals, Metals, and Materials put forth a discussion of the relative cost of geothermal energy systems. Unfortunately, his assumptions on scope result in a mischaracterization of not only the cost of the system to the Delta School District but also to the science of the Delta School District project itself.

To clarify, if a retrofit geo-exchange system is considered in isolation, it may be more costly than a conventional energy solution. But contrary to Dr. Meech's assumptions, this is not the solution FortisBC has developed for the Delta School District. Instead, FortisBC developed a 19-building solution for Delta School District which includes different solutions for individual buildings including geo-exchange (not geothermal) systems, high efficiency gas boilers and air source heat pumps in order to arrive at a solution which maximizes greenhouse gas reductions at affordable rates. While the solution is innovative, it has been reviewed in depth by the BCUC and a host of interveners and found to be in the public interest.

Like Dr. Meech's letter and the accounts in the *South Delta Leader* article, Mr. McCulley's email significantly misrepresents the Delta School District project and the thorough public BCUC review process. Key points in this regard are as follows:

1. Mr. McCulley recommends a third party analysis to determine the true business case and states serious concerns have been raised by the BCUC. In fact, the BCUC is the third party of record and has conducted an exhaustive review with the input and evidence of all interveners, and has found the Delta School District project to be in the public interest.
2. Mr. McCulley, possibly because he is a boiler supplier, discusses the project and the gas and electric cost implications as though it is entirely a geo-exchange solution and that FortisBC is somehow ignorant of basic geo-exchange design considerations. In fact, the Delta School project is an optimized combination of gas boilers, geo-exchange and air-source heat pump solutions specific to individual buildings all assessed and designed by technical experts.
3. Mr. McCulley states that FortisBC and the Delta School District make unrealistic assumptions on future gas and electricity costs. In fact, the energy cost forecasts are drawn from publically available forecasts. Regardless of this, the technology mix (both gas and electricity are fuels) dampens the effect of relative changes.
4. Mr. McCulley asserts that FortisBC has guaranteed earnings and that the forecast residual value of \$5.6 million is somehow a Delta School District liability. In fact, Mr. McCulley has this entirely backwards. As clearly outlined in the BCUC proceeding and compliance filing, this residual value is entirely the risk of FortisBC shareholders, not the School District, which has no obligation to renew the agreements or purchase assets whatsoever. Furthermore, while the School District has no obligation to renew, under the Utilities Commission Act FortisBC has the obligation to serve the Delta School District in perpetuity.

FortisBC invests capital as a public utility service, creating opportunities for an array of suppliers and contractors, while avoiding increased debt obligations for public sector entities, such as the Delta School District. Since FortisBC is able to offer this service at competitive utility rates and since the service can also provide significant greenhouse gas reduction benefits, it is obviously an attractive option for the public sector, and the Delta School District should be congratulated for its leadership and action to realize these important benefits.

FortisBC public utility service projects and operations are subject to BCUC oversight and undergo transparent regulatory processes in which any member of the public is allowed to participate. We encourage Delta residents to get involved in future FortisBC projects. More information is available at bcuc.com. We hope that interested parties choose to participate in future BCUC proceedings so that concerns may be dealt with objectively, without customer harassment.

Sincerely,



Doug Stout
Vice President, Energy Solutions & External Relations, FortisBC
President, FortisBC Alternative Energy Services Inc.

Exhibit V

This is Exhibit " V " referred to in the
affidavit of FRANK GELER
made before me on NOV 10 2012
Erin Lambert-Shaw
A Commissioner for taking Affidavits
in the Province of Columbia

J.

306

BC Utilities Commission Order Favours Competition over Regulation

On December 27th 2012, the BC Utilities Commission issued Order G-201-12 following a 20-month Inquiry (the AES Inquiry) into the Alternative Energy Services activities of FortisBC Energy Utilities (FEU). Order G-201-12 requires that "*The principles and guidelines set forth in the attached Inquiry Report shall apply to regulated public utilities who provide products and services outside of traditional utility activities*"¹. In terms of its impact on School Districts, the Inquiry Report specifically noted that regulation of Discrete Thermal projects is not warranted and that exemption from regulation will be obtained for these projects². This essentially eliminates the regulated Cost of Service (COS) model that has been the basis for FEU's proposed school district thermal energy projects.

There are reasons why no other jurisdiction in North America regulates these projects. The rejection of regulation for Discrete Thermal projects results from the Commission's recognition that, in the absence of any natural monopoly characteristics, regulation should be the method of last resort and competition should always be favoured over regulation when it comes to protecting consumers. The elimination of regulation from these projects **will actually protect school districts** from the significant and unnecessary risks they would have faced under a regulated COS model. Many customers appear to assume that regulation by the BCUC would protect them from rate increases resulting from faulty initial assumptions by the utility on capital costs and operating efficiencies. On the contrary, the regulated model guarantees a return on all prudent costs incurred by the utility even if they differ wildly from the assumptions that the project's business case were based on.

A case in point is the **Delta School District (DSD)** thermal energy project whose tariff was reluctantly approved by the Commission before the AES Inquiry had concluded. In approving the DSD tariff, the Commission went out of its way to alert the DSD to the significant risks it was assuming and confirmed that the regulated COS model would not protect the DSD from these risks³. When questioned by the Commission during the tariff application hearing, DSD inferred that it believed it had performance guarantees in place in its contract. However, the Commission stated that after reviewing all of the pertinent documents (including confidential ones), it could find no reference to any performance guarantees⁴. DSD is responsible for all flow-through gas and electricity costs, no matter what they end up being, including any increased gas consumption that would result from consciously under-sizing the geo-exchange fields to limit capital costs⁵. This is of particular concern given that no test boreholes were drilled prior to estimating the costs and energy savings for the DSD project.⁶ The Commission also expressed serious concerns about the large residual liability that DSD would face at the end of the 20-year contract term.⁷

¹ BCUC Order G-201-12 Page 3

² AES Inquiry Report Page 71

³ BCUC Order G-31-12 Page 84

⁴ BCUC Order G-31-12 Page 42

⁵ BCUC Order G-31-12 Pages 71-72

⁶ Exhibit B-3 page 112, DSD CPCN Hearing, FEU response to IR 1.35.7.1

⁷ BCUC Order G-31-12 Page 85

The operating cost risks that DSD is assuming are, among other things, a function of the engineering assumptions that were made at the outset to estimate the post-retrofit gas and electricity consumption. To the extent that these assumptions turn out to be optimistic, the additional operating costs would be absorbed by DSD and it is not clear that DSD realized it would be assuming these risks. Geo-exchange is an excellent technology utilized by many experienced alternative energy service providers on a regular basis - where appropriate. However, one of the least appropriate places to install it is in existing schools (particularly with the current ratio between gas and electricity prices) because of the heat transfer problems noted below and the heating-only nature of the load (typically) which can result in field degradation over time and even freezing (closed loop systems). As the BCUC noted in the DSD tariff Decision, “*green at any cost*” is not necessarily in the public interest.⁸

In the DSD tariff application, FEU stated that the operating costs for the 11 geo-exchange systems were based on the assumption that they would be satisfying 90% of the annual thermal load for the schools.⁹ This is despite the long term impact that heating-only operation will have on the ground loop temperatures and the likelihood of field down-sizing due to capital cost issues (the geo-exchange design-build contract is not fixed price¹⁰). FEU also stated that in order to achieve this, the HVAC systems would have to be modified to accept 50 Deg. C supply water¹¹ (as opposed to the 75-85 Deg. C for which they would typically be designed). These assumptions sound reasonable in theory but from a practical perspective, assuming that basic laws of thermodynamics apply to this project, they must be characterised as grossly optimistic over the long term in a world where actual comfort conditions must be maintained. Unfortunately, in these circumstances, the risk associated with not achieving these assumptions accrues to the DSD and not the firm that generated the assumptions.

Modifying the HVAC systems to accept 50 Deg. C water can be expensive and complex and it appears that any cost for this was to be absorbed by DSD outside of the contract.¹² The project budget data does not indicate any funds being specifically set aside for this work.¹³ Even if this work were done, it could significantly increase fan and pump energy (costs absorbed by DSD) or degrade airflows and IAQ (or both). To the extent that the required HVAC modifications are not fully made, the ability of the geo-exchange systems to contribute to the heating load necessarily falls off and the difference would have to be made up by additional back-up boiler operation (at current efficiencies since these boilers are not being replaced¹⁴ and cannot be run under condensing conditions). The additional gas costs would be absorbed by DSD with no recourse to the utility.

⁸ BCUC Order G-31-12 Page 65

⁹ Exhibit B-10 page 15, DSD CPCN Hearing, FEU response to IR 2.5.4

¹⁰ BCUC Order G-31-12 Page 35

¹¹ Exhibit B-1 page 19, DSD CPCN Hearing

¹² Exhibit C1-2 Page 3, DSD CPCN Hearing, DSD response to BCUC IR 1-2.1

¹³ Exhibit B-3 page 217, DSD CPCN Hearing, FEU response to IR 1.70.1

¹⁴ Exhibit B-10 page 15, DSD CPCN Hearing, FEU response to IR 2.5.4

Given the assumptions made, the actual gas savings and GHG emissions reductions at these schools could easily be less than half of what was projected over the long term. This would effectively destroy the already suspect financial viability of the overall DSD project and eliminate the main justification for the use of this technology in this instance: GHG emissions reductions. Heat pumps with higher supply temperatures could be installed to partially offset this but they are more expensive and the efficiency (Coefficient of Performance or COP) would drop off considerably impacting electricity costs.

The risks that DSD has assumed serve to demonstrate the lack of customer protection that would be provided were Discrete Thermal energy services to be regulated. The BCUC should be commended for reinforcing the notion that, where competition exists, competition is always preferable to regulation and for taking steps to protect other schools districts who may incorrectly assume that, because they are dealing with a public utility, they will always be adequately protected from being induced to take on excessive risk through a diligent regulatory process.

Details of the AES Inquiry can be found at:
FortisBC Energy 2012 Alternative Energy Solutions Inquiry
<http://www.bcuc.com/ApplicationView.aspx?ApplicationId=309>

Details of the Delta SD Tariff hearing can be found at:
FortisBC Energy 2011 Delta School District 37 Thermal Energy Service Contracts CPCN
<http://www.bcuc.com/ApplicationView.aspx?ApplicationId=326>

Exhibit W

This is Exhibit "W" referred to in the affidavit of FRANK GEYER

made before me on AUGUST 20, 18

Enla Lambert

A Commissioner for taking Affidavits
for British Columbia

310

From: Frank Geyer
To: [Bierlmeier](#); [Frank Geyer](#)
Cc: [Kostka](#)
Bcc: [Jim White](#); [Debra Eng](#); [John Vantol](#)
Subject: Re(2): Fwd(2): Paper Ameresco is distributing...

Wow... thanks Grant. Way more thorough than I guess I needed, but hey, you probably ripped this off in a couple minutes! I am in a budget meeting this morning and spoke with our Superintendent and Deputy Superintendent (my boss) about our meeting last week and the latest diatribe from Ameresco and other phone calls of concern coming from of the Districts. They are still 100% on board and confirmed that we are in it for the long haul. I reminded them that two major pieces missing from the criticism is the \$1.4 Million that came from the Province (without that, we likely would not have proceeded with the program in the current form) and the Rate Rider we negotiated, which for all intents and purposes "guaranteed" a savings for the life of the agreement.

No real need for an extensive report summarizing the BCUC AES inquiry findings... just an Executive Summary interpreting the findings into layman's terms would be appreciated. The rebuttal to Ameresco's letter (which you guys will probably need to send to all of the school districts that you are still in negotiations with), containing the engineering responses, also need not be extensive... your call.

On a side note, when can we expect the 4 pricing scenarios based on:

1. continuing with program scope as-is
2. reducing program scope by deleting the ASHP from SDSS
3. Scenario #1 above plus adding Devon Gardens and Sunshine Hills (already retrofitted boiler sites only requiring thermal energy meters)
4. Scenario #2 above plus DG and SH

as we discussed last week? I have a Board meeting next Tuesday and may need to discuss program status...

Thanks again for taking care of us! Frank

"Bierlmeier, Grant" <Grant.Bierlmeier@fortisbc.com> on February-20-13 at 9:48 AM -0800 wrote:
Frank,

I'll spare you the pain of reading yet another report (though of course you are at liberty to read it yourself). The AES "report" says:

Directives:

1 - Thermal Energy service is regulated under as per the Utilities Commission Act. We expected this and we also know that the Province has no intention of changing the law, since they support this activity including directly supporting the Delta service explicitly in the BCUC process.

2 - The \$0 CPCN Threshold for TES Projects is maintained. This has no impact on schools projects as they are all above CPCN levels anyway.

3 - TES comprise a fundamentally different line of business, occurring beyond the gas distribution meter, and cannot therefore be considered an extension of the utility distribution system. This is a nuance and means that a tariff for thermal energy is separate from natural gas. We believe that this is logical. Interestingly, last week, in another order, the Commission has asked us to bring forward a tariff for thermal energy.

4 - Commission Staff will conduct consultation on a scaled regulatory framework for TES utilities. The resulting framework will be brought to the Commission for approval. This is a good development and demonstrates how the BCUC will be working with us to establish an efficient method of regulating these services. As a thermal energy customer, you of course are invited to participate in this process if you wish to, although you have no obligation to.

There are a number of recommendations relating to Thermal Energy Service as well that speak to the Commission view that an affiliate is preferable to a class of service, and that for small scale discrete thermal energy systems, regulation may be burdensome and therefore applicants for those services are *encouraged* (not directed) to seek exemptions from the Act. This does not refer to School Districts given your scale and also given your clear desire and need for regulation (which is your right under the laws of BC).

So, from this we can ascertain that the BCUC will be regulating these services and that they will be working with us to establish the most efficient framework for regulation. There is one final recommendation that I want to address because it is where the BCUC recommends an amendment to the UCA to exempt these services where there is no need for consumer protection through regulation. Clearly that is not the case with you, and we also know that the Province has no intention of amending the Act – rather they have come out in support of this service would like to see more of them.

I'll do a more formal response to the AES report for you.

A couple more points on the service:

1 – you have a thermal energy rate that you pay in exchange for thermal energy service. We must provide that service no until you no longer want it (effectively we are obligated in perpetuity now). We must pay for the costs of providing that service and providing those costs are reasonable, we have a reasonable expectation that we can recover those costs, over time. You have lowered your risks relative to energy input costs in a number of ways. First, your rate is for thermal energy, all-in. Second, the equipment we are using to provide the

thermal energy will dramatically reduce energy usage overall thereby reducing the exposure to commodity prices and volumes. Finally, you have direct protection under the UCA guaranteeing you continuous, reliable service at reasonable rates subject to oversight by a panel of experts (and you have already seen the standards they hold us up to). This protection extends to whether we go bankrupt or sell the service – it is much more powerful a protection than any hollow “performance guarantee” that requires you to come up with the investment capital and rely on the price forecasts provided at the time of analysis applied to what are effectively certain energy performance characteristics driven by the nature of the predictability of your need for thermal energy and the design of the systems. Your service provides much more protection and reduction in risk than any other alternative. For Ameresco, what are they afraid of? Why are they afraid these services might be regulated? What are they hiding?

2 – we are going to put together an analysis of a school that we successfully retrofitted a geo-exchange system into in BC. That retrofit was similar to yours and the performance of it has exceeded design expectations. The performance does not rely on summer cooling (a myth that this is necessary – proper sizing of the field does not result in freeze off) and since installation, the gas backup has not been used at all (zero...) which is much better than was predicted.

3 – we will have the engineers put together a proper rebuttal of the design criticisms that should quench any of these fires they are trying to light.

In the end, they are fighting hard because they know this is a great service and they have to put on a full court press to scare everyone. The irony of that is that when we deliver results and we don't go away, their credibility is the one that will suffer. Consider that their service requires the School District to come up with a loan or some other form of capital (taxpayer funded debt) and relies on forecasts of energy prices over an extended period to deliver the results (and what if there is a problem, do you go to court? How much profit are they making?). Whereas, your service provides you with reliable thermal energy at reasonable rates under the ongoing protection of the laws of the province – it is no wonder they are scared, not just for BC, but beyond (I suspect they have had what could be described as lucrative results in some other jurisdictions like Ontario). What is ironic about this though is that we are prepared to work with companies like Ameresco as evidenced by JCI and Honeywell. I guess the profits they will make working with us are not as attractive as without us. Why do you suppose that is? At this point I might suggest that our negotiating power with these multinationals is fairly “substantial” compared to an individual customer...

We'll put together a full report on this for you – I expect that will take a week or two unless you indicate that it is more urgent and we'll turn up the crank on it.

At a personal level, feel free to rant any time, but you must sleep and take care of yourself. All this will play out as it should and as you said “I didn't become stupid overnight”. The same logic and same justification for moving forward before applies today. In fact, I believe you should take this latest round as a form of vindication, because if it wasn't good, then they wouldn't be fighting so hard against it right now.

We are here, and will continue to be here as long as you need us to be.

Cheers,

Grant

p.s. now take a deep breath and exhale

From: Frank Geyer [mailto:fgeyer@deltasd.bc.ca]
Sent: Wednesday, February 20, 2013 7:09 AM
To: Kostka, Vladimir; Bierlmeier, Grant
Cc: Jim White; Debra Eng; John Vantol
Subject: Re: Fwd(2): Paper Ameresco is distributing...

Thanks guys. We have confirmation from SD38 that it came via e-mail from Ameresco, and it does have a lot of overtones that we've seen from them before.

The one piece I'll definitely need to be ready for is the outcomes of the AES Inquiry. I hadn't the time to read the final findings, but if it's true that the BCUC will bristle at future CPCN requests like ours (as I've heard from others), taking the "competition over regulation" stance, this could make our agreement a one of a kind and open to constant scrutiny for the next 20 years.

Another thing that has me a bit concerned is their discussion of the geo-exchange operation issues. I know that JCI has determined and confirmed system viability through its test bores, design and background, but the "freeze-up" of the fields if we don't cool the buildings over the summer to recharge the fields is something I completely forgot about at the smaller sites. We will need excellent and easy to follow operating instructions to ensure the highest year-round performance at lowest operating cost to ensure comfort and savings, as well as to prove Ameresco wrong and again allay concerns with our Trustees.

Thanks for letting me rant again... It was yet another sleepless night as a result of our agreement.

Only 9 years, 10 months to retirement...

Frank

Sent from my BlackBerry device on the Rogers Wireless Network

From: "Kostka, Vladimir" <Vladimir.Kostka@fortisbc.com>

Date: Tue, 19 Feb 2013 23:03:24 -0800

To: <fgeyer@rogers.blackberry.net>; Frank Geyer<fgeyer@deltasd.bc.ca>

Cc: Bierlmeier, Grant<Grant.Bierlmeier@fortisbc.com>; <jwhite@deltasd.bc.ca>; <deng@deltasd.bc.ca>; <jvantol@deltasd.bc.ca>

Subject: Re: Fwd(2): Paper Ameresco is distributing...

Frank,

First of all Thank you and sorry!

I know there would be more discussion on this so at this moment I would like to put forward my first reaction.

All the main arguments about risks in this "article" seems to be based on the assumptions with limited knowledge of the facts . How do you react to that?

How do we know that it came from Ameresco? There is no signature or anything else that would

identify the author. Is it by design?

This is quite frankly ridiculous!

I am not saying to do nothing, but really am at the end of my thoughts as to what....to say, what to react to.

I am at the conference at San Diego until the end of the week, will ask Grant and some others within FortisBC to put forward their ideas.

Best Regards

Vlad

On 2013-02-19, at 10:04 PM, "Frank Geyer"
<fgeyer@deltasd.bc.ca<mailto:fgeyer@deltasd.bc.ca>> wrote:

Hi Grant and Vlad.

In case you haven't seen the attached yet, I'm sure that we're going to face another round of pounding from critics and other school districts. Perhaps a rebuttal from FortisBC needs to be considered as I likely once again will need to put our Trustees' minds at ease after they hear from their counterparts.

Frank

----- Original Message -----
Amersco still on th go

Jim White
Energy Manager
jwhite@deltasd.bc.ca<<mailto:jwhite@deltasd.bc.ca>>
604 946 5088 ext 5293
604 841 0104

----- Original Message -----

From: Debra Eng
"Don Lee" <DonLee@sd38.bc.ca<<mailto:DonLee@sd38.bc.ca>>>
February-19-13 3:51:22 PM
Subject: Paper Ameresco is distributing...
To: Jim White
Attachments: Fortis AES Inquiry Impact.pdf Uploaded File 21K

I got this from Don from Richmond.

D

----- Original Message -----

From: "Don Lee" <DonLee@sd38.bc.ca<<mailto:DonLee@sd38.bc.ca>>> February-19-13 1:39:07 PM
Subject: Re: Dina's Contact
To: Debra Eng [View in Browser](#)
Attachments: Fortis AES Inquiry Impact.pdf Uploaded File 21K

Howdy Debra,
comments below... plus
see attached. This 'white paper' just came from Ameresco the other day.
Some issues you brought up are noted in the paper plus all the other 'risks' with the AES contract Delta signed with Fortis.

<[Fortis AES Inquiry Impact.pdf](#)>

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Exhibit X

This is Exhibit " X " referred to in the
 affidavit of FRANK GEYER
 made before me on AUGUST 20 18
Eric Campbell-Shirano
 A Commissioner for taking Affidavits
 for British Columbia

Archived: August-09-18 10:07:34 AM
 From: Bierlmeier, Grant
 Sent: Thu, 28 May 2015 14:42:16
 To: Frank Geyer
 Cc: jstrain@deltasd.bc.ca
 Subject: Re: FAES.Delta SD F2015-16 RR & Rates Application ~ Project No.3698838
 Importance: Normal

Frank,
 Can Jarek and I come to see you tomorrow at 10:30?

Sent from my iPhone

On May 28, 2015, at 12:08 PM, Frank Geyer <fgeyer@deltasd.bc.ca<<mailto:fgeyer@deltasd.bc.ca>>> wrote:

Thanks Grant. I checked with our S-T, Joe Strain, and between 10:30 and noon works best for us Friday.

Frank

"Bierlmeier, Grant" <Grant.Bierlmeier@fortisbc.com<<mailto:Grant.Bierlmeier@fortisbc.com>>> on May-28-15 at 9:48 AM -0700 wrote:

Received Frank and I will find out if a conference could be arranged.

From: Frank Geyer [<mailto:fgeyer@deltasd.bc.ca>]
 Sent: Wednesday, May 27, 2015 11:38 AM
 To: Bierlmeier, Grant
 Cc: Joe Strain
 Subject: Re: FAES.Delta SD F2015-16 RR & Rates Application ~ Project No.3698838

Hi Grant.

Well, the BCUC also contacted our Secretary-Treasurer late yesterday regarding their concern about the huge disparity between the COS Rate and Market Rate, and the \$1.4 Million Deferral Account and the District's exposure to eventually having to assume this growing cost. I have asked our legal counsel (BLG, who you may recall assisted us in the negotiations of the RDA and ESSA) to review the agreements again, as well as the FAES RR&RA submission to the BCUC, to advise us on what, if anything, we should do next.

After listening to the BCUC and re-reviewing our RDA, my new concern is that, despite our excellent working relationship and mutual understanding that the choice to switch to the COS Rate from the Market Rate rests with SD37, with the increasing gap between the COS Rate and Market Rate, at some point FAES may apply to the BCUC to force SD37 to switch to the COS Rate, and SD37's opposition would not be taken seriously and we would end up paying

double for thermal energy - totally in contravention of the promises made by Fortis back in 2010/2011 that our annual thermal energy costs would be lower than our business as usual thermal energy costs. Presently, we are paying less than what the BAU would have been (maybe \$10K per year plus the \$60K in maintenance), but not the \$180K per year that we were sold on. Doubling the thermal energy rate on us would be catastrophic for both parties, both from a public relations perspective and SD37 financial perspective. I recall you and I discussing the opportune time for SD37 to switch to the COS Rate and you mentioned that it would take a few years for the COS Rate to come down and the indexed Market Rate to go up such that the two would be on a par. Is this still forecast to be the case, given what is contained in the RR&RA document?

I'm not sure who all at FAES we should be speaking to on this matter, but perhaps it would be a good idea for us to maybe have a conference call tomorrow (Friday) to clear things up. I am away next week and from what I can tell from the BCUC's latest correspondence, our deadline for comments to the RR&RA is June 9th.

Thanks for your continued patience and cooperation. Frank

"Bierlmeier, Grant" <Grant.Bierlmeier@fortisbc.com<<mailto:Grant.Bierlmeier@fortisbc.com>>> on May-27-15 at 11:30 AM -0700 wrote:
Sure,

I'll try to be clearer:

Regulatory hearings and review cost money in terms of commission time, company time and intervener time. Regulatory costs are part of the cost of service which forms part of the COS rates.

When there are many customers to bear those costs, a large hearing with many interveners and process may have little effect on customer rates but provide a forum for customers to have their concerns vetted and responded to by the utility.

In your case, you are the only customer (no other School districts are part of the pool today). So, the costs of the hearing including Commission and intervener cost awards form part of the COS rate. Further, given that you are the only customer and you have a direct relationship with us to ask us any questions, it raises the concern that the costs of the hearing are not warranted based on the benefits to you.

Our perspective is that we have a contract and we are each living up to the terms of that contract. As such, provided we are all doing that and the BCUC has reviewed those costs, then a hearing is unnecessary. This is supported by the AES Inquiry which was clear that the costs of regulation should not outweigh the benefits.

I hope this clarifies your question and as always don't hesitate to ask anything you need clarification on.

Feel free to share this with the BCUC if you wish.

Cheers,

Grant

From: Frank Geyer [<mailto:fgeyer@deltasd.bc.ca>]
Sent: Wednesday, May 27, 2015 10:34 AM
To: Bierlmeier, Grant
Subject: Re: FAES.Delta SD F2015-16 RR & Rates Application ~ Project No.3698838

Thanks Grant. Figured as much.

Not quite sure what you mean by "a protracted review process costs money that gets allocated to your costs ultimately as well. So, there is a balance that needs to be managed between the review for your interests and the costs of that review"... maybe it's a case of ignorance or information overload.

F

"Bierlmeier, Grant" <Grant.Bierlmeier@fortisbc.com<<mailto:Grant.Bierlmeier@fortisbc.com>>> on May-27-15 at 10:24 AM -0700 wrote:
Your understanding is absolutely correct Frank. You pay the market rate until you elect to switch to the COS rate exactly as you describe below.

Appreciate the heads up and absolutely, if you desire to intervene or otherwise get third party advice that is your prerogative and right to do so.

A couple more thoughts are: this is primarily a mechanical exercise of reporting and forecasting. While the BCUC is doing what they do best (review and scrutinize information) given that you are the only customer, a protracted review process costs money that gets allocated to your costs ultimately as well. So, there is a balance that needs to be managed between the review for your interests and the costs of that review.

Cheers,

Grant

From: Frank Geyer [<mailto:fgeyer@deltasd.bc.ca>]
Sent: Wednesday, May 27, 2015 10:14 AM
To: Bierlmeier, Grant
Subject: Fwd: FAES.Delta SD F2015-16 RR & Rates Application ~ Project No.3698838
Importance: High

Hi Grant.

Yolanda Domingo from BCUC just called me regarding the subject application and encouraged me to be an intervener as they are concerned about the growing SD37 Deferral Account that they see as a liability to the District that we (not FAES) will eventually have to pay it off regardless of what we pay as a thermal energy rate (market or COS). In short, she said that I should be very concerned as well and should seek further understanding and guidance on the matter.

I re-read the RDA and am still under the belief that as long as we stay on the market rate (indexed), the deferral account will not be a factor to to the District. Once the COS rate drops at or below the Market Rate and we elect to change, only then would the deferral account affect the District (as part of the COS rate in the form of an amount necessary to amortize the deferral account balance).

Please tell me that I'm correct and that I didn't get duped...

Thanks, Frank

Frank Geyer, PEng, FMA
 Director of Facilities & Planning
 4585 Harvest Drive, Delta, BC V4K 5B4
 Delta School District #37
 Ph: 604-952-5336 Fax: 604-952-5375
 Email: fgeyer@deltasd.bc.ca <<mailto:fgeyer@deltasd.bc.ca>>
<http://facilities.deltasd.bc.ca>
 <77F87AF3-3B9ACA00-1-image001.gif>

----- Original Message -----

Message May-27-15 9:58 AM

From: Frank Geyer
 To: commission.secretary@bcuc.com <<mailto:commission.secretary@bcuc.com>>
 Subject: FAES.Delta SD F2015-16 RR & Rates Application ~ Project No.3698838

Please add me as an intervener for the subject application.

Frank Geyer, PEng, FMA
 Director of Facilities & Planning
 4585 Harvest Drive, Delta, BC V4K 5B4
 Delta School District #37
 Ph: 604-952-5336 Fax: 604-952-5375
 Email: fgeyer@deltasd.bc.ca <<mailto:fgeyer@deltasd.bc.ca>>
<http://facilities.deltasd.bc.ca>
 <77F87AF3-3B9ACA00-1-image001.gif>

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Exhibit Y

FAES DELTA SD F15-16 RR & RATES
EXHIBIT C1-1

From: Frank Geyer <fgeyer@deltasd.bc.ca>
Sent: Wednesday, May 27, 2015 9:59 AM
To: Commission Secretary BCUC:EX
Subject: FAES.Delta SD F2015-16 RR & Rates Application ~ Project No.3698838

Please add me as an intervener for the subject application.

Frank Geyer, PEng, FMA
Director of Facilities & Planning
4585 Harvest Drive, Delta, BC V4K 5B4
Delta School District #37
Ph: 604-952-5336 Fax: 604-952-5375
Email: fgeyer@deltasd.bc.ca
<http://facilities.deltasd.bc.ca>

This is Exhibit "Y" referred to in the
affidavit of FRANK GEYER
made before me on AUGUST 10 20 18
Eric Lambert-Hirsz
A Commissioner for taking Affidavits
for British Columbia



Exhibit Z

24 March 2015

Mtg w/ FAES (GB, JB), JS, JC, TU, FG

- BCUC call re: SD Deferral
- GB: Per the IR's, FEI & its shareholders on the hook for SD Deferral & roll risks.
- Concerned about growth of deferred amounts - less usage than expected, need to optimize system performance.
- govt incentives - accelerated depreciation (50%) over first 2 years, massive tax credit, exceeds deferral account.
- FAES switching to COS rate? Lawyers wanted the clause, but not likely never going to be invoked.
- JS - two components - risk that BCUC approves FAES application to switch to COS? GB - we respect S037, but could re-negotiate to remove clause.
- Could make an IR on what is FAES' stance on the Deferral Account is & the COS rate.
- Please confirm FAES will not ~~confirm~~ convert to COS rate unless

149

advantageous to SP37."

- Any intention to make change to COS
if not in best interests of SP37."

Exhibit AA



FAES DELTA SD F15-16 RR & RATES

EXHIBIT C1-2

02 June 2015

British Columbia Utilities Commission
Sixth Floor, 900 Howe Street
Vancouver, BC V6Z 2N3

Attention: Erica Hamilton, Commission Secretary
(via BCUC website posting)

Dear Ms. Hamilton:

Re: FortisBC Alternative Energy Services Inc. (FAES) Delta School District F2015-16 Revenue Requirements and Rates Application, Project No. 3698838

Intervener Information Request No. 1 to FAES

The Board of Education of School District No. 37 (Delta), hereinafter referred to as "Delta School District" and as the sole customer affected, has reviewed the subject application, dated 29 April 2015 and requests the following information from FAES:

1. During the FortisBC Energy Inc. (FEI) Application for a Certificate of Public Convenience and Necessity for Approval of Contracts and Rate for Public Utility Service to Provide Thermal Energy Service (TES) to Delta School District No. 37 (SD) regulatory review process, IR 1.2.2 asked "In the event that some of FEI's investment to serve the SD, or to develop TES in general, becomes impossible to recover from the SD or other TES customers, who will bear the financial loss? Are there any possible circumstances in which FEI will apply to have its other ratepayers share in the loss?"

FEI stated that:

TES customer rates will be set to recover, over time, the costs of production, generation, distribution of the thermal energy including an allowance for overheads, and amortization of the TES deferral account. According to the 2010-2011 NSA (Order No. G-141-09, Appendix A, page 9) revenue received from customers for all TES projects, based on contracts approved by the Commission are to be recorded in the Thermal Energy Service Deferral Account. The risk of non-recovery of amounts in the Thermal Energy Service Deferral Account is not to be borne by natural gas ratepayers. Therefore, on the assumption that the Delta SD and other TES customer agreements are approved by the Commission as per Order G-141-09, should FEI be unsuccessful in recovering costs or generating revenues for TES as a whole, then any shortfall is at the risk of the

This is Exhibit "AA" referred to in the affidavit of FRANK BEIER made before me on AUGUST 10 20 15
Erica Hamilton
A Commissioner for taking Affidavits for British Columbia

330

shareholder, not customers of other classes of service i.e., not natural gas customers (reference AES Inquiry, Exhibit B-11, page 18, response to BCUC IR 1.4.2).

With the Delta School District Deferral Account currently projected to be at \$1,408,000 by 30 June 2016, the Delta School District would like FAES to confirm that the financial risk associated with potential non-recovery of this amount will be borne by FAES shareholders, and not the Delta School District.

2. The BCUC IR 1.38:5 asked: *"What factors or criteria should FEI consider before triggering the need to apply to the Commission to charge the cost of service rate?"*

FEI stated that:

"The only way that FEI will make a unilateral submission to the Commission to move the SD to cost of service is if the SD and FEI have a disagreement about when the switch should occur. Given that both parties expect that the cost of service will provide advantages, and both parties desire those advantages, FEI does not expect to be making a submission to move the SD to the cost of service. In short, the provision is necessary as a dispute resolution mechanism in the event that the parties cannot agree."

With the gap between the Cost of Service Rate and Market Rate currently projected to reach \$0.097/kWh by 30 June 2016, the Delta School District would like FAES to confirm that it is not seeking approval from the BCUC to convert the Thermal Energy Rate from the Market Rate to the Cost of Service Rate now and that FAES will only make such an application if it can clearly demonstrate that it is in the best interest of the Delta School District to switch to the Cost of Service Rate.

Based on recent and past communications between our parties, the Delta School District expects that the foregoing information requests will be confirmed by FAES. The contractual and operational relationships between the Delta School District and FortisBC Alternative Energy Services Inc. pertaining to the delivery of thermal energy service by the utility has been very open and positive to date, and we do not envision these changing. The Delta School District appreciates the opportunity to provide input into the subject application by way of the public hearing process.

Yours truly,



F.J. (Frank) Geyer, PEng, FMA
Director of Facilities & Planning

c.c. J. Strain, Secretary-Treasurer

Exhibit BB



ERICA HAMILTON
COMMISSION SECRETARY
Commission.Secretary@bcuc.com
web site: http://www.bcuc.com

SIXTH FLOOR, 900 HOWE STREET, BOX 250
VANCOUVER, BC CANADA V6Z 2N3
TELEPHONE: (604) 660-4700
BC TOLL FREE: 1-800-663-1385
FACSIMILE: (604) 660-1102

Log No. 50300

VIA EMAIL

FAES.regulatory.affairs@fortisbc.com

June 2, 2015

FAES DELTA SD F15-16 RR & RATES

EXHIBIT A-3

Julie Tran
Senior Manager, Alternative Energy Solutions
FortisBC Alternative Energy Services Inc.
10th Floor, 1111 West Georgia Street
Vancouver, BC V6E 4M3

This is Exhibit "BB" referred to in the
affidavit of FRANK GIBEL
made before me on AUGUST 10 2015
Erica Hamilton
A Commissioner for taking Affidavits
for British Columbia

Dear Ms. Tran:

Re: FortisBC Alternative Energy Services Inc.
Application for Approval of the Fiscal 2015/16 Revenue Requirements and
Cost of Service Rate for Thermal Energy Services to Delta School District Number 37

Further to your April 29, 2015 application on the above noted matter, enclosed please find Commission Information Request No. 1. In accordance with the Regulatory Timetable, please file your responses no later than Friday, June 19, 2015.

Yours truly,

Erica Hamilton

/kbb

BRITISH COLUMBIA UTILITIES COMMISSION
Commission Information Request No. 1

**FortisBC Alternative Energy Services Inc. (FAES)
Fiscal 2015/16 Revenue Requirements and
Thermal Energy Services Rate Application for Delta School District No. 37 (Application)**

**1.0 Reference: Exhibit B-1, p. 5
Delta School District (SD) site details**

FAES' Application on page 5 states: "...during which the service has been provided to all 21 sites of the DSD..."

1.1 Please provide a list of all sites including a minimum of the following information for each site:

- Load Forecast
- Nameplate capacity of heat pumps
- Number of sites with heat pumps FAES planned to install (forecasted in the CPCN), compared to what has actually been installed

**2.0 Reference: Exhibit B-1, p. 6
SD 37 Deferral Account**

FAES states that the deferral account will be \$1,408,000, including AFUDC, by June 30, 2016.

- 2.1 Does this balance align with FAES' original forecast during the 2011/12 Certificate of Public Convenience and Necessity (CPCN) proceeding?
- 2.2 Please provide a graphical comparison of the deferral balance (including amortization) between the original forecast and the current forecast for the time period of the contract term.
- 2.3 Please clarify if the customer, Delta SD, has been made aware of the annual balance in the deferral account. If so, how often is this information communicated to the customer? Please describe the process of engagement or consultation.
- 2.4 Please explain FAES' intended method for the clearing of (i.e. amortization of) this deferral account. When does FAES anticipate it to be fully amortized?

In the original CPCN application,¹ FEI stated that: "The SD will pay this market rate for thermal energy until they elect to switch to the cost of service rate, with variances captured in the SD37 Deferral Account" and "The RDA contemplates using a deferral account (the "SD37 Deferral Account") to capture variances between the forecast cost of service and the revenues, with the balance being recovered in rates in subsequent years as part of the cost of service."

The following IR was asked during the original CPCN application:² "Given that the special rider is a reduction in actual revenues to be received from the SD, the reduced revenues would ultimately contribute to the variance that is recorded in the SD37 deferral account.... Please confirm that although

¹ FEI Application for a CPCN for Approval of Contracts and Rates for Public Utility Service to Provide Thermal Energy Service to Delta School District 37 (original CPCN application), Exhibit B-1, pp. 2-3.

² BCUC IR 2.44.3 in the original CPCN application.

SD 37 may receive a special rider discount in its initial term, they end up paying for this discount throughout the life of the contract.”

In response, FEI stated that “If the SD pool does not grow to include other customers then, as suggested, they would end up paying for the discount throughout the life of the contract.”

- 2.5 Please clarify which party holds the ultimate responsibility of this deferral account balance. If there is a clause in the service agreements to support this understanding then please provide the excerpt.
- 2.6 If the market rate continues to widely differ from the calculated cost of service rate, please discuss what decision making criteria will be relevant for FAES in determining the level of and timing of the recovery of this deferral balance.

The current year’s amortization of the deferral account is calculated to be \$15 thousand, as shown in Line 11 of Schedule 1.

- 2.7 Given that the Delta SD has not given notice to switch to the cost of service rate at this time, please confirm that the forecast amortization simply remains in the deferral account and then updated at the next fiscal period. If not confirmed, please explain how the amortization is treated.
- 2.8 What is FAES’ interpretation of the Commission’s jurisdiction on the enforcement of rates? Could the Commission direct FAES to commence charging of the cost of service rates at any time in order to reduce the balance in the deferral account?
- 2.9 Based on the current financial forecast and schedules, what is the 20-year levelized rate for the Delta SD project?

FAES notes that its financial model shows the historical actuals for the each fiscal period, comprising various months of actual data and forecast data.

- 2.10 Please clarify whether the deferral account is updated *monthly* as each additional month’s “actuals” become available. Otherwise, is the deferral account adjusted only on an annual basis?
- 2.11 Please clarify whether AFUDC is calculated on the ending annual balance each year, on the monthly balance or on the mid-year balance.

**3.0 Reference: Exhibit B-1, p. 6
Annual billing volumes**

FAES’ forecast load for the 2014/15 period was originally at 7,892 MWh which inadvertently included the thermal load supplied by equipment owned by the customer. Accordingly, the forecast load for the same period has now been revised to be 5,443 MWh.

For the questions below, please list and use the same assumptions for each question (i.e. expected date of Delta SD switching from the market rate to the COS rate).

- 3.1 Please provide a bar graph showing the original load forecast versus the current/revised load forecast for *each year* of the contract term.

- 3.2 Please provide the annual cost of service (COS) impact arising from this discrepancy in the load forecast then compare this to the original COS impact that was included in the CPCN application (for each year of the contract term).
- 3.3 Please provide the annual revised deferral account forecast arising from this discrepancy, then compare this to the original deferral account forecast that was included in the CPCN application (for each year of the contract term).

**4.0 Reference: Exhibit B-1, p. 7; Financial Schedule 1
Market rate calculation**

Using the formula where: $A/[(112-X)/100]+1$ Staff recalculates each of the market rates according to information provided by FAES in the Application. Please clarify the discrepancies highlighted in yellow in the tables below, or provide corrections, if necessary. If the variances are due to rounding, please clarify FAES' standard practice of rounding.

- 4.1 Referring to the data in Table 3 of the Application on page 7:

	*FAES 2014/15	Staff calculation 2014/15
[A] Initial Market Rate \$/kWh	0.089	0.089
[X] Natural Gas Index	120.2	120.2
Market Rate \$/kWh	0.096	0.097
SD 37 Rate Rider	-0.018	-0.018
Thermal Energy Rate Less Rider	0.078	0.079

(*reference: Table 3, Application, p.7)

- 4.2 Referring to Schedule 1 of the Financial Schedules in Appendix B of the Application:

	FAES* 2012/13	Staff calculation 2012/13	FAES* 2013/14	Staff calculation 2013/14	FAES* 2014/15	Staff calculation 2014/15	FAES* 2014/15	Staff calculation 2014/15
[A] Initial Market Rate \$/kWh	0.089	0.089	0.089	0.089	0.089	0.089	0.089	0.089
[X] Natural Gas Index	105.5	105.5	121.9	121.9	113.2	113.2	110.1	110.1
Market Rate \$/kWh	0.084	0.084	0.097	0.099	0.090	0.090	0.087	0.087
SD 37 Rate Rider	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018
Thermal Energy Rate Less Rider	0.066	0.066	0.079	0.081	0.072	0.072	0.069	0.069

(*reference: Schedule 1, Application, App.B)

- 4.3 Appendix A contains the January 2015 CPI table, however in last year's rate filing, FAES provided the most recent CPI table (March 2014). Please provide the most recently available CPI table and recalculate the market rate using this most recent information.

**5.0 Reference: Exhibit B-1, pp. 8–9
Natural gas consumption**

FAES' Application on page 8 states "The cost of natural gas is now forecasted to be \$213,000 for 2014/15, a significant increase from the \$97,000 that FAES forecasted last year... This is due to a significant increase in the forecast natural gas consumption for 2014/15, compared to last year's forecast."

Further, Cost of Electricity section, page 9 states: "FAES' primary focus was ensuring end user comfort and, at times, that translated into higher use of natural gas boilers that were able to provide thermal energy in a short time window."

- 5.1 Please describe the factors contributing to the significant increase in the forecast natural gas consumption. Based on the above statement from the Cost of Electricity section, has natural gas consumption increased as a result of meeting the thermal energy demands?
- 5.2 Please discuss the relationship between natural gas consumption and thermal energy demand.

**6.0 Reference: Exhibit B-1, pp. 5, 9, Schedule 5
Operating and maintenance and overhead allocation**

On page 5, the Application states "FAES has contracted with the DSD's facilities department to provide the preventative maintenance... FAES also requires specialized contractors in order to resolve the operational issues discussed in section 'Order G-100-14 – Directive 4'... Based on this, FAES forecasts that during the fiscal year 2015/16 the annual maintenance costs will amount to \$101,000." [emphasis added]

In the Application on page 9, it further states "FAES requires specialized contractors. The additional cost for contractors shown in this Application for the year 2014/15 reflects the forecasted use of specialized contractors to deal with heat pump issues." [emphasis added]

In FAES' Application, Schedule 5, \$101,000 is allocated to "Contractor Costs." However, as mentioned above, page 5 indicates that \$101,000 is allocated to "annual maintenance cost."

- 6.1 Please provide a breakdown of the \$101,000. Does this cost include the following?
- Annual maintenance cost.
 - All three of the following categories of contractors:
 - Delta SD facilities staff that FAES has contracted, who will provide preventative maintenance on FAES facilities during forecast period.
 - Specialized contractors who will resolve operational issues discussed in section 'Order G-100-14 – Directive 4'.
 - Specialized contractors who will resolve operational issues pertinent to heat pumps.
 - Any FAES staff or materials costs.
- 6.2 Please confirm that the use and cost of the specialized contractors has been communicated to and agreed upon with the customer.
- 6.3 How long does FAES anticipate it will require the services of the specialized contractors?

FAES states on page 5 that it is “including \$50,000 as a forecast for overhead charges as a proxy for an actual value, until such time as sufficient operational experience is gained and cost allocation methods are in place to update the estimate with actual overhead charges.” [underline added]

- 6.4 Please discuss in what ways, if any, the recent Commission decision pertaining to FEI’s Transfer Pricing and Code of Conduct has provided in terms of direction and/or guidance to the underlined issue in the above statement.

**7.0 Reference: Exhibit B-1, pp. 8–9
Monitoring system**

On page 8, the Application states “In December of 2014, FAES installed a Honeywell Energy Monitoring System that collects operational data and provides trending that is required to optimize the operation of these systems... Each site currently has one natural gas meter that measures natural gas load used by both the FAES’ equipment and the DSD’s equipment.”

- 7.1 Please clarify if the Honeywell Energy Monitoring System is monitoring operational data from all 19 sites.
- 7.2 How do the current natural gas meters differ from or contribute to the Honeywell Energy Monitoring System?
- 7.3 Please provide the cost of this installation and expected benefits/savings the system can provide.
- 7.4 Please clarify which party has paid for this equipment (asset and installation). Otherwise has it been included as an addition to the Delta SD rate base?
- 7.5 Given the operational issues suggested by FAES and Delta SD, please provide itemized details of the thermal infrastructure that is not currently used being utilized.

**8.0 Reference: Exhibit B-1, p. 9
Utilization of electricity**

The FAES Application on page 9 states “The modified control sequence has been deployed to a number of test sites to evaluate its effectiveness. FAES plans to deploy modified control sequence to the remaining boiler/heat pump sites prior to the upcoming heating season. These actions should result in an improvement of systems performance and an increase in the utilization of electricity.”

- 8.1 Given the significant decrease of forecasted cost of electricity from \$241,000 last year to \$25,000 this year, how much increase in utilization of electricity is anticipated once the modified control sequence has been implemented in remaining boiler/heat pump sites?

**9.0 Reference: Exhibit B-1, pp. 8–9
Cost of natural gas**

The FAES Application on page 9 states “FAES and the DSD had previously agreed that, on annual basis, the DSD would credit FAES an amount equal to 2,720 GJ (756 MWh) of natural gas. The DSD and FAES had also agreed to review this amount from time to time to ensure that it accurately reflects the non FAES natural gas load.”

- 9.1 Please clarify whether the existing natural gas meters at each site are owned and operated by FAES.
- 9.2 Please explain why Delta SD has agreed to credit FAES an amount equal to 2,720 GJ (756 MWh) of natural gas on an annual basis?

**10.0 Reference: Exhibit B-1, p.5; Financial Schedule 1
Other cost of service**

FAES has included a provision for property taxes in 2015/16 although property taxes have not yet been levied against FAES for the thermal service.

- 10.1 If the Commission denies the inclusion of the property tax forecast, please confirm that FAES would be able to adjust this part of the COS in its deferral account at the next rate application.

In Financial Schedule 1, capitalized overhead is calculated on Line 17 as a reduction to gross O&M.

- 10.2 For 2014/15, the capitalized overhead amount is \$24 thousand. In last year's rate application, this amount was zero. Please explain the difference in the forecast provided.

**11.0 Reference: Appendix B, Financial Schedule 7
Capital cost allowance**

- 11.1 Please explain why Schedule 7 in the current application widely differs from the same schedule filed in last year's rate application. In particular, there are additional asset classes which were not included last year (Mechanical room Piping, Structures, Intrasystem Piping, Meter Low CCA).

11.1.1 Did FAES split out the previous assets into further asset classes? If so, please explain why.

- 11.2 Please discuss and provide a reconciliation to show how these further asset classes may have impacted depreciation for each of the past fiscal periods, if any.

11.2.1 Please identify where FAES has corrected for this adjustment in the Financial Schedules.

**12.0 Reference: Exhibit B-1, Schedules 7, 9, 10, 11
Financial Schedules**

In FAES' Application under Schedule 7, 8, 9, 10, and 11, there are references to costs allocated to "Pumps" and "Loop Field (Ground Source Heat Exchanger)".

- 12.1 Please clarify whether the costs under "Pumps" refer to heat pumps specifically. If not, please provide costs separately for heat pumps, water pumps related to the ground loop and other pumps.

12.2 Please confirm which sites use "Loop Field (Ground Source Heat Exchange)."

12.3 Please provide the AFUDC rate for the 2014/15 and 2015/16 fiscal periods.

Exhibit CC



10th Floor, 1111 West Georgia Street
Vancouver, B.C. V6E 4M3

June 23, 2015

Via Email
Original via Mail

Board of Education of School District No. 37 (Delta)
4585 Harvest Drive
Delta, BC
V4K 5B4

Attention: Mr. F.J. (Frank) Geyer, Peng, FMA

Dear Mr. Geyer:

Re: FortisBC Alternative Energy Services Inc. (FAES)

Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application)

Response to the Delta School District No. 37 (Delta SD or DSD) Information Request (IR) No. 1

On April 29, 2015, FAES filed the Application referenced above. In accordance with Commission Order G-85-15 setting out the Regulatory Timetable for the review of the Application, and Exhibit A-4 granting FAES' request for an extension to the deadline for filing responses to IR No. 1, FAES respectfully submits the attached response to Delta SD IR No. 1.

If you require further information or have any questions regarding this submission, please contact Julie Tran at (604) 443-6567.

Sincerely,

FORTISBC ALTERNATIVE ENERGY SERVICES INC.

Original signed:

Julie Tran
Senior Manager, Alternative Energy Solutions

Attachments

cc: Commission Secretary
Registered Parties (email only)

This is Exhibit " CC " referred to in the
affidavit of FRANK GEYER
made before me on AUGUST 20 2015
Erna Lambert Shirod
A Commissioner for taking Affidavits
for British Columbia



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to Board of Education of School District No. 37 (Delta SD or DSD) Information Request (IR) No. 1	Page 1

1 1.0 During the FortisBC Energy Inc. (FEI) Application for a Certificate of Public Convenience
2 and Necessity for Approval of Contracts and Rate for Public Utility Service to Provide
3 Thermal Energy Service (TES) to Delta School District No. 37 (SD) regulatory review
4 process, IR 1.2.2 asked "In the event that some of FEI's investment to serve the SD, or
5 to develop TES in general, becomes impossible to recover from the SD or other TES
6 customers, who will bear the financial loss? Are there any possible circumstances in
7 which FEI will apply to have its other ratepayers share in the loss?"

8 FEI stated that:

9 TES customer rates will be set to recover, over time, the costs of production, generation,
10 distribution of the thermal energy including an allowance for overheads, and amortization
11 of the TES deferral account. According to the 2010-2011 NSA (Order No. G-141-09,
12 Appendix A, page 9) revenue received from customers for all TES projects, based on
13 contracts approved by the Commission are to be recorded in the Thermal Energy
14 Service Deferral Account. The risk of non-recovery of amounts in the Thermal Energy
15 Service Deferral Account is not to be borne by natural gas ratepayers. Therefore, on the
16 assumption that the Delta SD and other TES customer agreements are approved by the
17 Commission as per Order G-141-09, should FEI be unsuccessful in recovering costs or
18 generating revenues for TES as a whole, then any shortfall is at the risk of the
19 shareholder, not customers of other classes of service i.e., not natural gas customers
20 (reference AES Inquiry, Exhibit B-11, page 18, response to BCUC IR 1.4.2).

21 With the Delta School District Deferral Account currently projected to be at \$1,408,000
22 by 30 June 2016, the Delta School District would like FAES to confirm that the financial
23 risk associated with potential non-recovery of this amount will be borne by FAES
24 shareholders, and not the Delta School District.

25

26 **Response:**

27 Under the agreement, any deferral account balance that remains at the end of the initial term
28 will only be recoverable from the Delta SD if the Delta SD renews its agreement with FAES.

29



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to Board of Education of School District No. 37 (Delta SD or DSD) Information Request (IR) No. 1	Page 2

1 2.0 The BCUC IR 1.38.5 asked: "What factors or criteria should FEI consider before
2 triggering the need to apply to the Commission to charge the cost of service rate?"

3 FEI stated that:

4 "The only way that FEI will make a unilateral submission to the Commission to move the
5 SD to cost of service is if the SD and FEI have a disagreement about when the switch
6 should occur. Given that both parties expect that the cost of service will provide
7 advantages, and both parties desire those advantages, FEI does not expect to be
8 making a submission to move the SD to the cost of service. In short, the provision is
9 necessary as a dispute resolution mechanism in the event that the parties cannot
10 agree."

11 With the gap between the Cost of Service Rate and Market Rate currently projected to
12 reach \$0.097/kWh by 30 June 2016, the Delta School District would like FAES to confirm
13 that it is not seeking approval from the BCUC to convert the Thermal Energy Rate from
14 the Market Rate to the Cost of Service Rate now and that FAES will only make such an
15 application if it can clearly demonstrate that it is in the best interest of the Delta School
16 District to switch to the Cost of Service Rate.

17

18 **Response:**

19 FAES confirms that it is not seeking approval from the BCUC to convert the Thermal Energy
20 Rate from the Market Rate to the Cost of Service Rate in this Application.

21 The agreement between FAES and the Delta SD sets out a process and conditions for FAES to
22 seek approval from the BCUC if and when the change of the Cost of Service Rate is
23 contemplated. FAES will comply with the agreement provisions if and when it contemplates
24 such an application. FAES will endeavor to work with the Delta SD to achieve a mutually
25 desirable approach.

26

Exhibit DD



10th Floor, 1111 West Georgia Street
Vancouver, B.C. V6E 4M3

June 23, 2015

Via Email
Original via Mail

British Columbia Utilities Commission
Sixth Floor
900 Howe Street
Vancouver, B.C.
V6Z 2N3

Attention: Ms. Erica M. Hamilton, Commission Secretary

Dear Ms. Hamilton:

Re: FortisBC Alternative Energy Services Inc. (FAES)

**Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and
Cost of Service Rate for Thermal Energy Service (the Application)**

**Response to the British Columbia Utilities Commission (BCUC or the
Commission) Information Request (IR) No. 1**

On April 29, 2015, FAES filed the Application referenced above. In accordance with Commission Order G-85-15 setting out the Regulatory Timetable for the review of the Application, and Exhibit A-4 granting FAES' request for an extension to the deadline for filing responses to IR No. 1, FAES respectfully submits the attached response to BCUC IR No. 1.

If you require further information or have any questions regarding this submission, please contact Julie Tran at (604) 443-6567.

Sincerely,

FORTISBC ALTERNATIVE ENERGY SERVICES INC.

Original signed:

Julie Tran
Senior Manager, Alternative Energy Solutions

Attachments

cc (email only): Registered Parties

This is Exhibit " DD " referred to in the
affidavit of FRANK GENEL
made before me on AUGUST 20, 18
Erica Campbell
A Commissioner for taking Affidavits
for British Columbia



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 1

1 **1.0 Reference: Exhibit B-1, p. 5**

2 **Delta School District (SD) site details**

3 FAES' Application on page 5 states: "...during which the service has been provided to all
4 21 sites of the DSD..."

5 1.1 Please provide a list of all sites including a minimum of the following information
6 for each site:

- 7 • Load Forecast
- 8 • Nameplate capacity of heat pumps
- 9 • Number of sites with heat pumps FAES planned to install (forecasted in
10 the CPCN), compared to what has actually been installed

11 **Response:**

12 Table 1 below provides the nameplate capacity of the heat pumps for the sub-set of sites that
13 have heat pumps. Table 2 provides, for all sites, the load forecast information for Fiscal
14 2015/16, as well as a comparison of Thermal Energy System that FAES planned to install
15 versus what it has installed.
16

17 **Table 1: Nameplate Capacity of Heat Pumps**

School Name	Heat Pump	Serial #	MBTUH Rating
Richardson	HP-1	120901429	360
Neilson Grove	HP-1	014953-0113	360
Delta Manor Centre	HP-1	120901428	360
Pinewood	HP-1	130101154	360
English Bluff	HP-1	130100896	240
Delta	HP-1	130400973	360
	HP-2	130400974	540
South Delta	HP-1	130100897	240
	HP-2	130100898	240
South Park	HP-1	130302423	60
	HP-2	130302424	60
North Delta	AWHP-1	2MAM022629	1380
Delview Junior	ASHP Module 1	AC09-180	360
	ASHP Module 2	AC09-181	360



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 2

1

Table 2: 2015/16 Load Forecast, and CPCN vs. Current Heat Pump Sites

School	Load Forecast (kWh) for Fiscal 2015/16	CPCN Forecasted Thermal Energy System	Current Thermal Energy System
Annieville	346,149	Meter installation	Meter installation
Beach Grove.	105,424	BUG	BUG
Chalmers.	213,356	BUG	BUG
Cliff Drive.	211,872	BUG	BUG
Delta Manor Centre	265,691	GSHP (Closed loop)	GSHP (Closed loop)
Delta	1,021,383	GSHP (Closed loop)	GSHP (Closed loop)
Delview Junior	421,434	GSHP (Open loop)	ASHP
Devon Gardens	174,472		Meter Installation
English Bluff	202,816	GSHP (Closed loop)	GSHP (Closed loop)
Heath	197,282	BUG	BUG
Holly	154,912	BUG	BUG
Ladner	109,713	BUG	BUG
Neilson Grove	130,173	GSHP (Closed loop)	GSHP (Closed loop)
North Delta	669,173	GSHP (Open loop)	ASHP
Pinewood	228,050	GSHP (Closed loop)	GSHP (Closed loop)
Richardson	204,082	GSHP (Closed loop)	GSHP (Closed loop)
School Board Office	129,317	GSHP (Closed loop)	GSHP (Closed loop)
South Delta	237,282	GSHP (Closed loop), New ASHP RTU	GSHP (Closed loop)
South Park	251,989	GSHP (Closed loop)	GSHP (Closed loop)
Sunshine Hills	232,657		Meter Installation
Tilbury Maintenance Facility	194,256	BUG	BUG

2

3 **BUG** – Boiler System Retrofit/Upgrade4 **GSHP** – Ground Source Heat Pump5 **ASHP-RTU** - Air Source Heat Pump Rooftop Unit6 **ASHP** – Air Source Heat Pump



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 4

1

Table 2: Data from the 2015/16 RRA

	2015/16 RRA				
	Year	1	2	3	4
	Actual	Actual	Actual / Forecast	Forecast	Forecast
Thermal Energy Sales MWh	673	4,626	5,443	5,701	5,701
Market Rate (\$/kWh)	\$ 0.084	\$ 0.097	\$ 0.090	\$ 0.087	\$ 0.087
Cost of Natural Gas	\$ 23	\$ 249	\$ 213	\$ 180	\$ 180
Cost of Electricity	\$ -	\$ 34	\$ 25	\$ 33	\$ 33
Operation and Maintenance	\$ 3	\$ 129	\$ 145	\$ 172	\$ 172
Property Taxes	\$ -	\$ -	\$ -	\$ 4	\$ 4
Depreciation Expense	\$ 6	\$ 106	\$ 129	\$ 130	\$ 130
Amortization Expense	\$ -	\$ -	\$ -	\$ -	\$ -
Income Taxes	\$ -	\$ -	\$ -	\$ -	\$ -
Earned Return	\$ 22	\$ 274	\$ 391	\$ 380	\$ 380
Cost of Service (\$,000's)	\$ 54	\$ 792	\$ 903	\$ 898	\$ 898
SD37 Deferral Account (\$,000's)	\$ 10	\$ 437	\$ 989	\$ 1,408	\$ 1,408

2

3

4 The original CPCN filing predicted a balance in the SD37 Deferral Account of \$228,000 by the
5 end of the fourth year of service, not \$1,408,000.

6 It is important to note that the CPCN Application was submitted by FortisBC Energy Inc. (FEI),
7 meaning that the Capital Cost Allowance benefits would have been monetized in the years that
8 they occurred, rather than the losses carried forward as they are now. Income taxes were
9 forecast to be a credit over the first four years totalling \$988,000 as shown in Table 1 in relation
10 to the "Income Taxes" line. As FAES does not generate enough taxable income to recognize
11 these amounts in current taxes, FAES reduces the taxes to zero and carries the balance
12 forward for offsetting future taxes. As such, FAES is forecasting a balance of \$2,212,000 of tax
13 loss carry forwards associated with the Delta SD service (Exhibit B-1, Appendix B, Schedule 6,
14 line 24).

15

16

17



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 6

1 occurs in both formal processes, such as the review process for this Application, as well as
 2 informal processes such as meetings and phone conversations necessary to operate the
 3 equipment.

4
 5

6

7 2.4 Please explain FAES' intended method for the clearing of (i.e. amortization of)
 8 this deferral account. When does FAES anticipate it to be fully amortized?

9

10 **Response:**

11 Each year, FAES includes a forecast amortization amount for the SD37 Deferral Account in the
 12 Cost of Service (COS) rates (Page 3, Table 1, line 11 of Exhibit B-1). The number of years that
 13 the deferral account is amortized over equals the remaining years in the initial term or ten
 14 years, whichever is greater, if the switch to COS rates has not occurred. Once the COS switch
 15 has occurred, the number of years that the deferral account is amortized over equals the
 16 remaining years in the initial term if the switch occurs in the first ten years of service, or ten
 17 minus the number of years since the COS switch has occurred if the switch to COS rates
 18 occurred after the first ten years of service.

19 Currently there are 17 years left to the initial term so the amortization period is 17 years.

20 To further illustrate how the amortization works, if the switch occurred in the 14th year of the 20
 21 year term, then the amortization would be 10 years starting in that year, not six years, which is
 22 the remainder of the term and there would be four years of amortization left at the end of the
 23 term. Until the Delta SD elects to switch to the cost of service rate, the forecast amortization
 24 simply remains in the deferral account and is then updated in the next fiscal period. This means
 25 that there may be a balance in the deferral account at the end of the first term.

26 For further information please also refer to the response to BCUC IR 1.37.7 from Exhibit B-3 in
 27 the CPCN Application.

28

29

30

31

32 In the original CPCN application,¹ FEI stated that: "The SD will pay this market rate for
 33 thermal energy until they elect to switch to the cost of service rate, with variances

¹ FEI Application for a CPCN for Approval of Contracts and Rates for Public Utility Service to Provide Thermal Energy Service to Delta School District 37 (original CPCN application), Exhibit B-1, pp. 2–3.



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 7

1 captured in the SD37 Deferral Account” and “The RDA contemplates using a deferral
2 account (the “SD37 Deferral Account”) to capture variances between the forecast cost of
3 service and the revenues, with the balance being recovered in rates in subsequent years
4 as part of the cost of service.”

5 The following IR was asked during the original CPCN application:² “Given that the
6 special rider is a reduction in actual revenues to be received from the SD, the reduced
7 revenues would ultimately contribute to the variance that is recorded in the SD37
8 deferral account.... Please confirm that although SD 37 may receive a special rider
9 discount in its initial term, they end up paying for this discount throughout the life of the
10 contract.”

11 In response, FEI stated that “If the SD pool does not grow to include other customers
12 then, as suggested, they would end up paying for the discount throughout the life of the
13 contract.”

14 2.5 Please clarify which party holds the ultimate responsibility of this deferral account
15 balance. If there is a clause in the service agreements to support this
16 understanding then please provide the excerpt.

17
18 **Response:**

19 FAES holds the ultimate responsibility for the risk of non-recovery of the SD37 Deferral Account
20 if there is a balance in the deferral account at the end of the term, and the Delta SD does not
21 renew the service.

22

23

24

25 2.6 If the market rate continues to widely differ from the calculated cost of service
26 rate, please discuss what decision making criteria will be relevant for FAES in
27 determining the level of and timing of the recovery of this deferral balance.

28

29

Response:

30 The lower thermal energy sales experienced to date relative to the CPCN forecast affects the
31 cost of fuel but not the fixed costs of the thermal energy systems. In 2015/16, the fourth year of
32 service, FAES is forecasting total fuel costs of \$213,000 rather than \$358,000 as forecast in the
33 CPCN Application. However, thermal energy revenues are also less while on the market rates.
34 At this time, FAES and Delta SD are working together to increase the efficiency of the systems

² BCUC IR 2.44.3 in the original CPCN application.



<p style="text-align: center;">FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)</p>	<p style="text-align: center;">Submission Date: June 23, 2015</p>
<p style="text-align: center;">Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1</p>	<p style="text-align: center;">Page 8</p>

1 to the design parameters. Should the total thermal energy sales remain below the forecast, it is
2 important to note that total costs remain in line with the forecasts, meaning that the costs per
3 unit of thermal energy may also have been higher than originally forecast.

4 Given that this service represents an innovation in the thermal energy market, it provides an
5 important benchmark for future analysis and evolution of the thermal energy service. The rate
6 design for Delta SD provided an opportunity for the customer to participate in the retrofit of
7 renewable technology into their existing buildings without taking on the ultimate risks of a
8 potential failure of the technology. The incentives clearly rest on FAES to optimize the service
9 delivery to have an opportunity to recover the deferral account.

10 Also, FAES would like to stress that the rate design specifically contemplated expansion of the
11 rate pool to other school districts and customers, which would have allowed both Delta SD and
12 others to share in the benefits and risks of introducing innovative new technologies. The BCUC
13 Decision related to Oder G-31-12 denied the expansion of the rate pool to sites beyond the
14 Delta SD but noted that "*This rejection does not imply that the pooling concept could not
15 become feasible as TES markets evolve*"³. FAES believes that this rate design is working as
16 intended by protecting the Delta SD from the risks of retrofitting new technology into their
17 buildings. Further, the expansion of the rate pool to other sites would allow the lessons learned
18 at this initial service to be applied to other sites. In this way, the Delta SD would retain its
19 benefits, would have an opportunity to share in any additional benefits that would arise from
20 other projects whose design would have been significantly informed by the Delta SD decision to
21 advance with this project first. Also, FAES would gain an opportunity to balance the risks of
22 recovery of the deferral account by increasing the size of the overall rate pool. Limiting the pool
23 of assets to the Delta SD only has resulted in an increased risk to the deferral account, thereby
24 increasing the risks of the project to FAES relative to the risks described in the CPCN
25 Application.

26 Ultimately, now that the systems are built and operating, the terms of the contract along with the
27 actuals will determine the ultimate costs of thermal energy and market rates for thermal energy,
28 as well as the deferral account balance that FAES bears the risk for.

29 Please also refer to the response to Delta SD IR 1.2.

30
31

32
33

34 The current year's amortization of the deferral account is calculated to be \$15 thousand,
35 as shown in Line 11 of Schedule 1.

³ BCUC Decision, Order G-31-12, page 48



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 9

1 2.7 Given that the Delta SD has not given notice to switch to the cost of service rate
2 at this time, please confirm that the forecast amortization simply remains in the
3 deferral account and then updated at the next fiscal period. If not confirmed,
4 please explain how the amortization is treated.

5

6 **Response:**

7 Confirmed. Please refer to the response to BCUC IR 1.2.4.

8

9

10

11 2.8 What is FAES' interpretation of the Commission's jurisdiction on the enforcement
12 of rates? Could the Commission direct FAES to commence charging of the cost
13 of service rates at any time in order to reduce the balance in the deferral
14 account?

15

16 **Response:**

17 FAES does not wish to take a position on this matter, at this time, in the absence of particular
18 facts upon which to make an informed submission. Should the Commission wish to make such
19 a direction, then FAES would anticipate being provided with reasonable notice of this intention
20 and an opportunity to be heard regarding this matter, before any such direction is made. FAES
21 would also expect that the Delta SD would wish to make submissions regarding such a
22 direction.

23 The Delta SD's IR No. 1 to FAES highlights the two areas of concern to the Delta SD. First, the
24 Delta SD wants confirmation that the financial risk associated with potential non-recovery of the
25 balance in the deferral account will be borne by FAES' shareholders, and not the Delta SD.
26 Second, the Delta SD wants confirmation that FAES is not seeking approval from the
27 Commission to convert the Thermal Energy Rate from the Market Rate to the Cost of Service
28 Rate now and that FAES will only make such an application if it can clearly demonstrate that it is
29 in the best interest of the Delta SD to switch to the Cost of Service Rate.

30 In response to the Delta SD IRs, FAES confirmed that the statements are correct.

31 Therefore, if the Commission were to direct FAES to commence charging the Cost of Service
32 Rates "at any time in order to reduce the balance in the deferral account", the Delta SD would
33 likely be very concerned to start having to pay the Cost of Service Rate with the sole objective
34 to reduce the balance in the deferral account, the non-recovery of which FAES confirmed is at
35 the risk of its shareholder.



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 10

1

2

3

4 2.9 Based on the current financial forecast and schedules, what is the 20-year
5 levelized rate for the Delta SD project?

6

7

Response:

8 Using the actual data from Table 2 in the response to BCUC IR 1.2.1, along with the original
9 data for the remaining years, would result in a level rate of \$0.120/kWh in 2015 dollars. This
10 compares to the CPCN Application forecast of \$0.106/kWh in 2015 dollars.

11

12

13

14

15 FAES notes that its financial model shows the historical actuals for the each fiscal
16 period, comprising various months of actual data and forecast data.

17 2.10 Please clarify whether the deferral account is updated monthly as each additional
18 month's "actuals" become available. Otherwise, is the deferral account adjusted
19 only on an annual basis?

20

21

Response:

22 The deferral account is updated monthly once the monthly actuals become available.

23

24

25

26 2.11 Please clarify whether AFUDC is calculated on the ending annual balance each
27 year, on the monthly balance or on the mid-year balance.

28

29

Response:

30 While FAES has the ability to recognize AFUDC on the SD 37 deferral account, FAES also
31 recognizes the risk of recovery of this deferral account and as a result has not recognized any
32 AFUDC until this point.



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 12

1 **4.0 Reference: Exhibit B-1, p. 7; Financial Schedule 1**

2 **Market rate calculation**

3 Using the formula where: $A/[(112-X)/100]+1$ Staff recalculates each of the market rates
4 according to information provided by FAES in the Application. Please clarify the
5 discrepancies highlighted in yellow in the tables below, or provide corrections, if
6 necessary. If the variances are due to rounding, please clarify FAES' standard practice
7 of rounding.

8 4.1 Referring to the data in Table 3 of the Application on page 7:

9

	*FAES 2014/15	Staff calculation 2014/15
[A] Initial Market Rate \$/kWh	0.089	0.089
[X] Natural Gas Index	120.2	120.2
Market Rate \$/kWh	0.096	0.097
SD 37 Rate Rider	-0.018	-0.018
Thermal Energy Rate Less Rider	0.078	0.079

(*reference: Table 3, Application, p.7)

10

11 **Response:**

12 The Natural Gas Index value refers to a relative change in natural gas prices in British Columbia
13 since 2002. In other words 2002 prices represent 100 on the index value.

14 When the contract with the DSD was negotiated, the index value was 112.0. If the index value
15 is 120.2, then the change in prices since the index value was 112.0 is calculated as
16 $120.2/112.0$, which equals 107.32 per cent. Alternatively, this calculation can be derived as
17 follows: $[(120.2-112)/112]+1$ or generically: $[(X-112)/112]+1$. Therefore, 107.32 per cent of
18 $\$0.089/\text{kWh}$ equals $\$0.096/\text{kWh}$ (or $\$0.0955$, rounded to the third decimal).

19 The calculation $1/((112.0-120.2)/100)+1$ can be restated in simplified form as equals 108.9%
20 and is not an accurate reflection of the change in prices since the index value was 112.0.

21 The second discrepancy highlighted in the table above simply flows from the first discrepancy,
22 as a fixed amount (*i.e.*, the SD 37 Rate Rider at $\$0.018/\text{kWh}$) has been subtracted from the
23 Market Rate.

24

25

26



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 13

1
2 4.2 Referring to Schedule 1 of the Financial Schedules in Appendix B of the
3 Application:
4

	FAES*	Staff	FAES*	Staff	FAES*	Staff	FAES*	Staff
	2012/13	calculation	2013/14	calculation	2014/15	calculation	2014/15	calculation
[A] Initial Market Rate								
[X] \$/kWh	0.089	0.089	0.089	0.089	0.089	0.089	0.089	0.089
Natural Gas Index	105.5	105.5	121.9	121.9	113.2	113.2	110.1	110.1
Market Rate \$/kWh	0.084	0.084	0.097	0.099	0.090	0.090	0.087	0.087
SD 37 Rate Rider	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018	-0.018
Thermal Energy Rate								
Less Rider	0.066	0.066	0.079	0.081	0.072	0.072	0.069	0.069

(*reference: Schedule 1,
Application, App.B)

5
6 **Response:**

7 Please refer to the response to BCUC IR 1.4.1.

8 The calculation should be 121.9/112.0 which equals 108.84 per cent. 108.84 per cent of
9 \$0.089/kWh equals \$0.097/kWh (or \$0.0968/kWh, rounded to the third decimal), less
10 \$0.018/kWh equals \$0.079/kWh.

11
12

13
14

15 4.3 Appendix A contains the January 2015 CPI table, however in last year's rate
16 filing, FAES provided the most recent CPI table (March 2014). Please provide the
17 most recently available CPI table and recalculate the market rate using this most
18 recent information.

19
20 **Response:**

21 Please refer to the table below for the most recent natural gas index. In April 2015, the value for
22 the index was 98.4.

23 Please refer to the response to BCUC IR 1.4.1.

24 The calculation should be 98.4/112.0, which equals 0.88 per cent. 0.88 per cent of \$0.089/kWh
25 equals \$0.078/kWh, less \$0.018/kWh equals \$0.060/kWh.



FortisBC Alternative Energy Inc. (FAES)
Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of
Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)

Submission Date:
June 23, 2015

Response to British Columbia Utilities Commission (BCUC or the Commission)
Information Request (IR) No. 1

Page 14

The Consumer Price Index – April 2015

Table 9-10
The Consumer Price Index, major components, selected sub-groups and special aggregates, provinces, Whitehorse
and Yellowknife, not seasonally adjusted — British Columbia

	CANSIM vector number	Indexes			Percentage change	
		April 2014	March 2015	April 2015	March 2015 to April 2015	April 2014 to April 2015
		2002=100			%	
All-items	(v41882482)	118.0	118.8	119.8	-0.2	0.6
Special aggregates						
All-items excluding food	(v41692587)	117.1	117.1	117.0	-0.1	-0.1
All-items excluding food and energy	(v41692588)	112.7	113.9	113.9	0.0	1.1
All-items excluding energy	(v41692593)	115.6	117.3	117.2	-0.1	1.4
All-items excluding gasoline	(v41692655)	116.5	116.0	117.9	-0.1	1.2
Energy ¹	(v41692594)	158.9	152.5	151.1	-0.9	-10.5
All-items (1992=100)	(v41713427)	140.3	141.2	140.8	-0.2	0.4
Food	(v41882483)	126.8	133.6	132.7	-0.8	3.0
Food purchased from stores	(v41692464)	128.3	134.2	132.5	-1.0	3.5
Meat	(v41692465)	131.3	142.4	141.8	-0.4	8.0
Dairy products	(v41692475)	132.0	135.5	134.3	-0.9	1.7
Bakery and cereal products (excluding baby food)	(v41692480)	129.0	141.7	141.9	0.1	2.1
Fresh fruit	(v41692484)	130.2	135.8	131.1	-3.5	0.7
Fresh vegetables	(v41692487)	118.9	135.1	124.6	-7.8	4.8
Food purchased from restaurants	(v41692494)	129.0	131.3	131.7	0.3	2.1
Shelter	(v41882485)	114.8	114.0	113.7	-0.3	-1.0
Rented accommodation	(v41692496)	114.5	115.6	115.8	0.2	1.1
Owned accommodation	(v41692498)	108.6	107.9	107.5	-0.4	-1.3
Homeowners' replacement cost	(v41692499)	110.1	108.9	106.9	-1.8	-2.9
Homeowners' home and mortgage insurance	(v41692501)	167.2	169.1	169.1	0.0	1.1
Homeowners' maintenance and repairs	(v41692502)	126.7	125.1	125.1	2.4	1.1
Water, fuel and electricity	(v41692503)	149.8	146.5	146.2	-0.2	-2.4
Electricity	(v41692504)	153.4	153.6	162.2	5.5	5.7
Natural gas	(v41692506)	120.2	110.1	98.4	-10.6	-18.1
Fuel oil and other fuels	(v41692507)	258.2	217.5	209.9	-3.5	-18.7
Household operations, furnishings and equipment	(v41882508)	112.2	114.6	114.8	0.8	2.3
Household operations	(v41692509)	121.9	125.8	125.9	0.1	3.3
Telephone services	(v41692511)	105.1	110.5	110.5	0.0	5.1
Internet access services (2002=100)	(v41692226)	128.8	139.1	139.1	0.0	8.0
Household furnishings and equipment	(v41692516)	95.3	94.1	95.0	1.0	-0.3
Clothing and footwear	(v41882523)	102.8	105.8	106.6	0.8	2.8
Women's clothing	(v41692525)	87.1	91.3	92.4	1.2	6.1
Men's clothing	(v41692526)	97.4	99.3	98.5	-0.8	1.1
Footwear	(v41692528)	103.0	104.7	105.7	1.9	3.6
Transportation	(v41882531)	128.0	128.2	128.1	-0.1	-2.2
Private transportation	(v41692532)	128.7	125.5	125.0	-0.4	-2.9
Purchase and leasing of passenger vehicles	(v41692534)	93.4	95.5	95.1	-0.4	1.8
Gasoline	(v41692537)	156.9	168.2	165.8	-1.4	-15.9
Passenger vehicle insurance premiums	(v41692540)	138.9	142.0	142.0	0.0	2.2
Public transportation	(v41692542)	132.0	132.3	134.5	1.7	1.9
Health and personal care	(v41882547)	113.2	113.8	113.8	0.0	-0.2
Health care	(v41692548)	117.2	115.7	116.8	0.1	-0.3
Personal care	(v41692554)	108.4	108.7	108.7	0.0	0.3
Recreation, education and reading	(v41882557)	112.4	114.0	113.4	-0.8	0.8
Recreation	(v41692558)	96.1	97.4	96.5	-0.9	0.4
Education and reading	(v41692565)	168.1	171.3	171.3	0.0	1.9
Alcoholic beverages and tobacco products	(v41882578)	136.1	138.8	137.1	-0.1	1.6
Alcoholic beverages	(v41692571)	115.3	115.5	115.8	0.3	0.4
Tobacco products and smokers' supplies	(v41692577)	157.3	172.5	172.5	0.0	3.1

Note(s): See "Data quality, concepts and methodology — Explanatory notes for tables" section.



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 15

1

2 **5.0 Reference: Exhibit B-1, pp. 8–9**3 **Natural gas consumption**

4 FAES' Application on page 8 states "The cost of natural gas is now forecasted to be
 5 \$213,000 for 2014/15, a significant increase from the \$97,000 that FAES forecasted last
 6 year... This is due to a significant increase in the forecast natural gas consumption for
 7 2014/15, compared to last year's forecast."

8 Further, Cost of Electricity section, page 9 states: "FAES' primary focus was ensuring
 9 end user comfort and, at times, that translated into higher use of natural gas boilers that
 10 were able to provide thermal energy in a short time window."

11 5.1 Please describe the factors contributing to the significant increase in the forecast
 12 natural gas consumption. Based on the above statement from the Cost of
 13 Electricity section, has natural gas consumption increased as a result of meeting
 14 the thermal energy demands?
 15

16 **Response:**

17 The original forecast for natural gas consumption was based on engineering assessment and
 18 assumptions regarding anticipated seasonal efficiencies of the retrofitted systems. The current
 19 forecast for natural gas consumption is based on the actual performance. In the past two years,
 20 much of the thermal energy was supplied with the use of natural gas due to various operational
 21 issues⁴, which resulted in higher than anticipated use of natural gas. The ongoing continuous
 22 optimization of the thermal energy systems is aimed at increasing the utilization of the heat
 23 pumps during the early Fall and late Spring. These changes should result in a lower
 24 consumption of natural gas.

25

26

27

28 5.2 Please discuss the relationship between natural gas consumption and thermal
 29 energy demand.
 30

31

31 **Response:**

32 Delta SD is a retrofit project that currently operates at a seasonal efficiency of approximately 70
 33 per cent overall. Given the fact that approximately 50 per cent of the sites consist of boilers and
 34 the other 50 per cent consist of boiler/heat pump systems, this efficiency is expected to improve.
 35 As the efficiency of the boiler/heat pump sites improves, through ongoing optimization efforts,

⁴ Application, pages 8-9



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 16

- 1 the heat pumps are expected to supply the majority of the thermal energy during the early Fall
- 2 and the late Spring. This will reduce the use of natural gas and increase the overall system
- 3 efficiency.



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 20

1 return water temperature, status of the equipment, thermal energy, electricity and it can
 2 generate data trends that will be used for the continuous optimization of the thermal energy
 3 systems. The information collected by the EMS will allow FAES to review performance, monitor
 4 energy trends, setup equipment and system alarms when abnormal system conditions are
 5 encountered. This knowledge will aid in adjusting system parameters to meet the thermal
 6 energy demand and optimize the efficiency of thermal systems. The operational data will also
 7 be used in the predictive maintenance aspect of operation resulting in minimizing equipment
 8 down time.

9
 10

11

12 7.4 Please clarify which party has paid for this equipment (asset and installation).
 13 Otherwise has it been included as an addition to the Delta SD rate base?

14

15 **Response:**

16 The EMS will be used for all FAES thermal energy sites. The cost of software and licenses of
 17 approximately \$30,000, which were incurred in 2014, has been allocated to the TESDA because
 18 it will serve all the assets and therefore is not included in the Delta SD rate base.

19

20

21

22 7.5 Given the operational issues suggested by FAES and Delta SD, please provide
 23 itemized details of the thermal infrastructure that is not currently used being
 24 utilized.

25

26 **Response:**

27 All thermal energy infrastructure is currently utilized.



<p style="text-align: center;">FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)</p>	<p style="text-align: center;">Submission Date: June 23, 2015</p>
<p style="text-align: center;">Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1</p>	<p style="text-align: center;">Page 22</p>

1 **9.0 Reference: Exhibit B-1, pp. 8–9**

2 **Cost of natural gas**

3 The FAES Application on page 9 states “FAES and the DSD had previously agreed that,
4 on annual basis, the DSD would credit FAES an amount equal to 2,720 GJ (756 MWh)
5 of natural gas. The DSD and FAES had also agreed to review this amount from time to
6 time to ensure that it accurately reflects the non FAES natural gas load.”

7 9.1 Please clarify whether the existing natural gas meters at each site are owned and
8 operated by FAES.

9
10 **Response:**

11 The existing natural gas meters and their respective natural gas accounts are owned by FAES.

12

13

14

15 9.2 Please explain why Delta SD has agreed to credit FAES an amount equal to
16 2,720 GJ (756 MWh) of natural gas on an annual basis?

17

18 **Response:**

19 The existing natural gas meters owned by FAES measure natural gas supplied to FAES owned
20 equipment as well as equipment owned by Delta SD. Currently, there are no natural gas sub-
21 meters that would measure the amount of natural gas used by Delta SD. Recognizing this,
22 Delta SD and FAES agreed to use an amount equal to 2,720 GJ to be the estimated amount of
23 natural gas used by Delta SD to credit FAES. This amount will be reviewed in 2015 and
24 adjusted as required.



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 23

1 **10.0 Reference: Exhibit B-1, p.5; Financial Schedule 1**

2 **Other cost of service**

3 FAES has included a provision for property taxes in 2015/16 although property taxes
 4 have not yet been levied against FAES for the thermal service.

5 10.1 If the Commission denies the inclusion of the property tax forecast, please
 6 confirm that FAES would be able to adjust this part of the COS in its deferral
 7 account at the next rate application.

8
 9 **Response:**

10 Confirmed.

11
 12
 13
 14 In Financial Schedule 1, capitalized overhead is calculated on Line 17 as a reduction to
 15 gross O&M.

16 10.2 For 2014/15, the capitalized overhead amount is \$24 thousand. In last year's rate
 17 application, this amount was zero. Please explain the difference in the forecast
 18 provided.

19
 20 **Response:**

21 In Financial Schedule 5 of the 2015/16 Revenue Requirement Application, the capitalized
 22 overhead amount is \$24,000 for fiscal year 2014/15. In last year's application, this amount was
 23 zero because at the time of filing the 2014/15 Revenue Requirement Application, FAES did not
 24 expect to have any capital additions or capital replacements. However, FAES is expected to
 25 have spent \$108 thousand in capital additions for the period ending June 30, 2015 (Schedule 9,
 26 Line 10).

27 In Commission Order G-71-12, the Commission accepted FAES' methodology of calculating
 28 overhead at 14 per cent of gross project operating and maintenance costs only for the years
 29 where capital additions or capital replacements are expected (Directive 1a).

30 Therefore, when FAES filed its 2015/16 Revenue Requirement Application on April 29, 2015,
 31 FAES revised the information for 2014/15 and calculated the capitalized overhead amount at 14
 32 per cent of the total gross Operations and Maintenance Expenses to comply with Commission
 33 Order G-71-12.



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 24

1 **11.0 Reference: Appendix B, Financial Schedule 7**

2 **Capital cost allowance**

3 11.1 Please explain why Schedule 7 in the current application widely differs from the
 4 same schedule filed in last year's rate application. In particular, there are
 5 additional asset classes which were not included last year (Mechanical room
 6 Piping, Structures, Intrasystem Piping, Meter Low CCA).
 7

8 **Response:**

9 In last year's original rate application, dated May 13, 2014, some rows in the live model for
 10 Schedule 7 (CCA) were inadvertently hidden in the working Excel model and failed to show up
 11 in Schedule 7 of the pdf financial schedules included in the original filing. This issue was
 12 rectified, and a complete set of updated financial schedules were included in last year's G-100-
 13 14 compliance filing filed on August 8, 2014. The updated Schedule 7 included in the set of
 14 financials as part of the G-100-14 compliance filing agrees to Schedule 7 that was filed in the
 15 current financial schedules.

16

17

18

19 11.1.1 Did FAES split out the previous assets into further asset classes? If so,
 20 please explain why.
 21

22

22 **Response:**

23 Please refer to the response to BCUC IR 1.11.1.

24

25

26

27 11.2 Please discuss and provide a reconciliation to show how these further asset
 28 classes may have impacted depreciation for each of the past fiscal periods, if
 29 any.
 30

31

31 **Response:**

32 Please refer to the response to BCUC IR 1.11.1.

33

34



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 25

1

2

11.2.1 Please identify where FAES has corrected for this adjustment in the
Financial Schedules.

3

4

5 **Response:**

6 Please refer to the response to BCUC IR 1.11.1.



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: June 23, 2015
Response to British Columbia Utilities Commission (BCUC or the Commission) Information Request (IR) No. 1	Page 26

1 **12.0 Reference: Exhibit B-1, Schedules 7, 9, 10, 11**

2 **Financial Schedules**

3 In FAES' Application under Schedule 7, 8, 9, 10, and 11, there are references to costs
 4 allocated to "Pumps" and "Loop Field (Ground Source Heat Exchanger)".

5 12.1 Please clarify whether the costs under "Pumps" refer to heat pumps specifically.
 6 If not, please provide costs separately for heat pumps, water pumps related to
 7 the ground loop and other pumps.

8
 9 **Response:**

10 The costs under "Pumps" in Schedules 7, 9, 10 and 11 do not refer to heat pumps specifically.
 11 The contract for the completion of the Delta SD project was a design build contract, and
 12 therefore, FAES does not have a breakdown of costs for heat pumps, water pumps related to
 13 the ground loop and other pumps.

14

15

16

17 12.2 Please confirm which sites use "Loop Field (Ground Source Heat Exchange)."

18

19 **Response:**

20 Please refer to the response to BCUC IR 1.1.1.

21

22

23

24 12.3 Please provide the AFUDC rate for the 2014/15 and 2015/16 fiscal periods

25

26 **Response:**

27 The AFUDC rate for Fiscal 2014/15 is 5.83 per cent and for Fiscal 2015/16 is 5.64 per cent.

Exhibit EE

06 July 2015

British Columbia Utilities Commission
Sixth Floor, 900 Howe Street
Vancouver, BC V6Z 2N3

Attention: Erica Hamilton, Commission Secretary
(via BCUC website posting)

Dear Ms. Hamilton:

Re: FortisBC Alternative Energy Services Inc. (FAES) Delta School District F2015-16 Revenue Requirements and Rates Application, Project No. 3698838

Intervener Information Request No. 2 to FAES

FAES DELTA SD F15-16 RR & RATES
EXHIBIT C1-3

This is Exhibit "FE" referred to in the
affidavit of FRANK BEVEL

made before me on AUGUST 10 2015

Erica Campbell

A Commissioner for taking Affidavits
for British Columbia

The Board of Education of School District No. 37 (Delta), hereinafter referred to as the "Delta School District" or "District" and as the sole customer affected, has reviewed the Response to the Delta School District No. 37 (Delta SD or DSD) Information Request (IR) No. 1, dated 23 June 2015 and requests the following information from FAES:

1. In the FAES response to the Delta School District IR 1.1.0, which asked "With the Delta School District Deferral Account currently projected to be at \$1,408,000 by 30 June 2016, the Delta School District would like FAES to confirm that the financial risk associated with potential non-recovery of this amount will be borne by FAES shareholders, and not the Delta School District", FAES stated:

"Under the agreement, any deferral account balance that remains at the end of the initial term will only be recoverable from the Delta SD if the Delta SD renews its agreement with FAES."

The Delta School District would like FAES to confirm that any recovery of any balance remaining in the Deferral Account, should the District renew its agreement with FAES after the initial term, would be by way of the Annual Cost of Service Rate, should such rate have been switched to from the Market Rate as the effective Thermal Energy Rate. This confirmation is sought to clear up any uncertainty on the public record as to whether the recovery would be by this method as opposed to a lump sum payment.

2. In the FAES response to the Delta School District IR 1.2.0, which asked "With the gap between the Cost of Service Rate and Market Rate currently projected to reach \$0.097/kWh by 30 June 2016, the Delta School District would like FAES to confirm that it

- 2 -

is not seeking approval from the BCUC to convert the Thermal Energy Rate from the Market Rate to the Cost of Service Rate now and that FAES will only make such an application if it can clearly demonstrate that it is in the best interest of the Delta School District to switch to the Cost of Service Rate”, FAES stated:

“FAES confirms that it is not seeking approval from the BCUC to convert the Thermal Energy Rate from the Market Rate to the Cost of Service Rate in this Application.

The agreement between FAES and the Delta SD sets out a process and conditions for FAES to seek approval from the BCUC if and when the change of the Cost of Service Rate is contemplated. FAES will comply with the agreement provisions if and when it contemplates such an application. FAES will endeavor to work with the Delta SD to achieve a mutually desirable approach.”

The Delta School District would like FAES to confirm on public record, in keeping with prior correspondence between the parties, that:

- The District will only move to the Annual Cost of Service Rates if there are demonstrably clear benefits to the District for the switch.
- At the present time, the District should not consider the switch because the Cost of Service Rate is much higher than the Market Rates and the thermal energy systems are not yet running as efficiently as both parties expect they will shortly.
- If there are demonstrably clear benefits to the District to switch to the Cost of Service Rate switch, but the District does not agree to make the switch and any other mutually desirable approach cannot be achieved, only then will FAES consider at least raising the question of whether the switch should occur with the BCUC for its consideration.

The Delta School District again appreciates the opportunity to provide input into the subject application by way of the public hearing process.

Yours truly,



F.J. (Frank) Geyer, PEng, FMA
Director of Facilities & Planning

c.c. J. Strain, Secretary-Treasurer

Exhibit FF



10th Floor, 1111 West Georgia Street
Vancouver, B.C. V6E 4M3

July 16, 2015

Via Email
Original via Mail

Board of Education of School District No. 37 (Delta)
4585 Harvest Drive
Delta, BC
V4K 5B4

Attention: Mr. F.J. (Frank) Geyer, Peng, FMA

Dear Mr. Geyer:

Re: FortisBC Alternative Energy Services Inc. (FAES)
Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application)
Response to the Delta School District No. 37 (Delta SD or DSD) Information Request (IR) No. 2

On April 29, 2015, FAES filed the Application referenced above. In accordance with Commission Order G-113-15 setting out the Regulatory Timetable for the review of the Application, FAES respectfully submits the attached response to Delta SD IR No. 2, one day in advance of the deadline.

If you require further information or have any questions regarding this submission, please contact Julie Tran at (604) 443-6567.

Sincerely,

FORTISBC ALTERNATIVE ENERGY SERVICES INC.

Original signed:

Julie Tran
Senior Manager, Alternative Energy Solutions

Attachments

cc: Commission Secretary
Registered Parties (email only)

This is Exhibit " FF " referred to in the affidavit of FRANK GEYER made before me on AUGUST 10 20 18
Erika Campbell
A Commissioner for taking Affidavits
for British Columbia



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: July 16, 2015
Response to Board of Education of School District No. 37 (Delta SD or DSD) Information Request (IR) No. 2	Page 1

1 1.0 In the FAES response to the Delta School District IR 1.1.0, which asked "*With the Delta*
2 *School District Deferral Account currently projected to be at \$1,408,000 by 30 June*
3 *2016, the Delta School District would like FAES to confirm that the financial risk*
4 *associated with potential non-recovery of this amount will be borne by FAES*
5 *shareholders, and not the Delta School District*", FAES stated:

6 "*Under the agreement, any deferral account balance that remains at the end of the initial*
7 *term will only be recoverable from the Delta SD if the Delta SD renews its agreement*
8 *with FAES.*"

9 The Delta School District would like FAES to confirm that any recovery of any balance
10 remaining in the Deferral Account, should the District renew its agreement with FAES
11 after the initial term, would be by way of the Annual Cost of Service Rate, should such
12 rate have been switched to from the Market Rate as the effective Thermal Energy Rate.
13 This confirmation is sought to clear up any uncertainty on the public record as to whether
14 the recovery would be by this method as opposed to a lump sum payment.

15

16 **Response:**

17 Confirmed.

18

19

20

21 2.0 In the FAES response to the Delta School District IR 1.2.0, which asked "*With the gap*
22 *between the Cost of Service Rate and Market Rate currently projected to reach*
23 *\$0.097/kWh by 30 June 2016, the Delta School District would like FAES to confirm that it*
24 *is not seeking approval from the BCUC to convert the Thermal Energy Rate from the*
25 *Market Rate to the Cost of Service Rate now and that FAES will only make such an*
26 *application if it can clearly demonstrate that it is in the best interest of the Delta School*
27 *District to switch to the Cost of Service Rate*", FAES stated:

28 "*FAES confirms that it is not seeking approval from the BCUC to convert the Thermal*
29 *Energy Rate from the Market Rate to the Cost of Service Rate in this Application.*"

30 *The agreement between FAES and the Delta SD sets out a process and conditions for*
31 *FAES to seek approval from the BCUC if and when the change of the Cost of Service*
32 *Rate is contemplated. FAES will comply with the agreement provisions if and when it*
33 *contemplates such an application. FAES will endeavor to work with the Delta SD to*
34 *achieve a mutually desirable approach.*"

35 The Delta School District would like FAES to confirm on public record, in keeping with
36 prior correspondence between the parties, that:



FortisBC Alternative Energy Inc. (FAES) Delta School District Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service Rate for Thermal Energy Service (the Application or F2015-16 RRA)	Submission Date: July 16, 2015
Response to Board of Education of School District No. 37 (Delta SD or DSD) Information Request (IR) No. 2	Page 2

- 1 • The District will only move to the Annual Cost of Service Rates if there are
2 demonstrably clear benefits to the District for the switch.
3
4 • At the present time, the District should not consider the switch because the Cost of
5 Service Rate is much higher than the Market Rates and the thermal energy systems
6 are not yet running as efficiently as both parties expect they will shortly.
7
8 • If there are demonstrably clear benefits to the District to switch to the Cost of Service
9 Rate switch, but the District does not agree to make the switch and any other
10 mutually desirable approach cannot be achieved, only then will FAES consider at
11 least raising the question of whether the switch should occur with the BCUC for its
12 consideration.
13

14 **Response:**

15 FAES confirms that:

- 16 1. FAES understands that the District intends to make its election to switch to the Cost of
17 Service Rates only if there are demonstrably clear benefits to the District to make the
18 switch;
- 19 2. FAES understands that the District currently is not considering the Cost of Service
20 switch on the basis that the Cost of Service Rates are much higher than the Market
21 Rates and that the thermal energy systems are not yet running as efficiently as both
22 parties expect they will; and
- 23 3. If FAES believes that the District should switch to Cost of Service rates, then prior to
24 raising the issue with the Commission for its consideration, FAES will endeavor to work
25 with Delta SD to achieve a mutually desirable approach with the District. For additional
26 clarity, in a situation where FAES felt that there were demonstrably clear benefits to the
27 District to switch to Cost of Service rates, and the DSD did not agree to the switch,
28 FAES would consider raising the issue to the Commission in accordance with the
29 provisions of the agreement between the parties.

30

Exhibit GG

Dionysios Rossi
T 604.640.4110
F 604.622.5810
drossi@blg.com

Borden Ladner Gervais LLP
1200 Waterfront Centre
200 Burrard St, P.O. Box 48600
Vancouver, BC, Canada V7X 1T2
T 604.687.5744
F 604.687.1415
blg.com

BLG
Borden Ladner Gervais

File No. 551952/000002

August 4, 2015

BY ELECTRONIC FILING

British Columbia Utilities Commission
Sixth Floor, 900 Howe Street
Vancouver, BC V6Z 2N3

Dear Sirs/Mesdames:

**Re: FortisBC Alternative Energy Services Inc. (FAES) Delta School District
Number 37 Fiscal 2015/16 Revenue Requirements and Cost of Service
Rate for Thermal Energy Service**

We are the solicitors to Delta School District No. 37, and write in regard to the above-noted matter.

In accordance with the Commissioner's correspondence of June 30, 2015 in this proceeding (Exhibit A-5), we enclose for filing the electronic version of Delta School District No. 37's final submissions.

Hard copies of the enclosed will follow by courier.

If you have any questions, please do not hesitate to contact the undersigned directly.

Yours truly,

Borden Ladner Gervais LLP



Dionysios Rossi

DKR:mec
Enclosure

This is Exhibit "GG" referred to in the affidavit of FRANK GELER made before me on AUGUST 20 15
Erin Lambert Shind
A Commissioner for taking Affidavits for British Columbia

FORTISBC ALTERNATIVE ENERGY SERVICES INC.

**DELTA SCHOOL DISTRICT NO. 37 FISCAL 2015-16 REVENUE REQUIREMENTS
AND COST OF SERVICE RATE FOR THERMAL ENERGY SERVICE – PROJECT
NO. 3698838**

**WRITTEN REPRESENTATIONS OF
DELTA SCHOOL DISTRICT NO. 37**

Counsel for the Intervener Delta School
District No. 37

Dionysios Rossi
Borden Ladner Gervais LLP
1200 Waterfront Centre
200 Burrard Street
Vancouver, BC V7X 1T2
Telephone: (604) 640-4110
Facsimile: (604) 687-1415

A. INTRODUCTION

1. These are the final submissions of Delta School District No. 37 (“DSD”) with respect to the 2015-2016 revenue requirements and cost of service rate application of FortisBC Alternative Energy Services Inc. (“FAES”) dated April 29, 2015. FAES provides thermal energy to DSD pursuant to B.C. Utilities Commission (“Commission”) Order G-31-12 dated March 9, 2012, and various subsequent Commission orders.¹

2. As set out more fully below, while DSD takes no position on the orders sought by FAES in this application, it does so without prejudice to its right to oppose any additional such orders sought by FAES in respect of future fiscal years.

3. Moreover, DSD wishes to clarify its position on a number of issues that have arisen in this proceeding concerning the respective contractual obligations of FAES and DSD in the Energy Rate Development Agreement between those parties dated September 26, 2011 (the “Rate Agreement”), the deferral account that FAES has established pursuant to that agreement (the “Deferral Account”), as well as the above-noted Commission Orders.

4. Specifically, DSD confirms its position that:

- (a) DSD is not contractually obligated to switch from a “market rate” to a “cost of service rate” (as those terms are defined in the Rate Agreement) in respect of the thermal energy services provided to it by FAES unless and until DSD determines that such an election would be in its own best interest;
- (b) FAES may only apply to the Commission for approval to charge DSD the cost of service rate if there are clear and demonstrable benefits to DSD in doing so; and
- (c) in the event that DSD does not switch from the market rate to the cost of service rate during the term of the Rate Agreement, and DSD elects not to renew the Rate Agreement, FAES shareholders will be solely responsible for any and all amounts that have accrued in the Deferral Account during the term of the Rate Agreement.

¹ See B.C. Utilities Commission Orders G-71-12 (dated June 5, 2012); G-88-12 (dated June 25, 2012); G-81-13 (dated May 23, 2013); and G-100-14 (dated July 24, 2014).

5. DSD's position is based on the terms and conditions of the Rate Agreement; collateral representations made by FAES to DSD confirming the rights and obligations of the parties to the Rate Agreement; and the evidence and written submissions of FAES in this proceeding.

6. Taken together, the foregoing confirms that there is no reason for the Commission to consider unilaterally compelling DSD to switch from the market rate to the cost of service rate at this time. It bears emphasis neither FAES nor DSD has sought such relief in this proceeding, or been afforded an adequate opportunity to fully address this issue. Accordingly, DSD submits that it would be procedurally unfair for the Commission to consider issuing an order on such terms.

7. More importantly, DSD maintains that any such intervention by the Commission would unduly interfere with the contractual allocation of risk in the Rate Agreement, by fundamentally altering the bargain between the parties absent any overriding public interest considerations that would warrant such drastic action. Lastly, it would result in serious financial prejudice to DSD, as well as the very rate volatility that DSD originally sought to avoid by initially entering into the Rate Agreement. For all of these reasons, DSD submits that any unilateral intervention by the Commission is unwarranted and would not be just and reasonable.

B. PROCEDURAL HISTORY

8. FAES and DSD entered into the Rate Agreement on September 26, 2011.

9. By Commission Order No. G-31-12 dated March 9, 2012 (the "CPCN Decision") the BCUC granted FAES a Certificate of Public Convenience and Necessity (a "CPCN") in respect of the thermal energy services that FAES provides to the DSD.

10. There are two aspects of the CPCN Decision that DSD submits are of critical importance in these proceedings. First, the parties specifically designed the thermal energy project to accommodate DSD's onerous budgetary and financial constraints. Second, there was an underlying assumption that, during the early stages of the contract, the cost of service would fall below that of the market rate, making it financially advantageous to DSD to switch to cost of service rate (the "Rate Assumption").

11. It is evident from the CPCN proceedings that adopting the Deferral Account would only meet the DSD's budgetary requirements if the Rate Assumption held true – that is, if, at some point early in the agreement, it would be advantageous for the DSD to switch to cost of service rate. To this end, in its final submission during the CPCN application proceedings, FEI stated that it would be “in the interests of the DSD to switch to the cost of service rate as soon as possible because it is ultimately less expensive”.² FEI also stated that “[b]oth FEI and the SD have satisfied themselves reasonably that the cost of service will provide overall benefits to the SD but require a mechanism to ease the transition to the cost of service that respects the nature of the relationship between market rates and cost of service.”³

12. Throughout its CPCN application submissions, FEI made clear that the DSD's unique and challenging budgetary constraints were a key factor in its rate design for the thermal energy services project. Specifically, FEI represented to the Commission that “[t]he operating budgets at the SD [i.e. the DSD] are very tight and any increases in energy costs come out of the total budget. Therefore, the SD must operate within this budget and desires to minimize the potential volatility of these rates as well.”⁴

13. In the CPCN Decision, the Commission itself likewise acknowledged the need to accommodate DSD's financial limitations. To this end, the Commission noted that “Delta SD's budgetary constraints were influential factors in the proposal”⁵ and that the primary goal of the project was to “reduce Delta SD's GHG emission while meeting its budgetary constraints.”⁶ The Commission further expressly acknowledged DSD's evidence that “there is a recent history of funding shortfalls so Delta SD ‘has to take whatever steps necessary to balance its operating budget and not incur additional costs’.”⁷

14. As noted in the CPCN Decision, the Deferral Account was designed to track the amount by which the actual cost of the thermal energy service that FAES provided exceeded the market

² FEI Final Submissions (dated February 2, 2012) at para. 67; FortisBC Energy 2011 Delta School District 37 Thermal Energy Service Contracts CPCN (the “FEI CPCN Proceeding”).

³ Exhibit B-3, FEI Response to Commission Information Request No. 1 (dated January 5, 2012) at 38.5, p. 126, FEI CPCN Proceeding.

⁴ Exhibit B-1, FEI CPCN Application (dated November 28, 2011), at Section 1.2.3., p.3, FEI CPCN Proceeding.

⁵ CPCN Decision, p. 1.

⁶ CPCN Decision, p. 70 (with emphasis added).

⁷ CPCN Decision, p. 81.

rate that DSD paid. As the Commission stated: “[i]n order to accommodate Delta SD’s limited budget, the proposed rate structure transfers costs to future years through a deferral account...”⁸

15. As the Commission also noted in the CPCN Decision, FEI originally anticipated that DSD would elect to switch from the market rate to the cost of service rate within two-to-five years. Importantly, DSD notes that period of time that has not yet elapsed.⁹

16. DSD further notes that the Rate Agreement contains an alternative provision that would allow FAES to apply to the Commission for an order requiring DSD to switch to the cost of service rate if the DSD does not elect to make the switch. As FEI confirmed in response to a Commission information request during the CPCN application proceedings, however, FEI (now FAES) can only invoke this provision if it believes it would be in the best interest of DSD to switch to cost of service rate and DSD refuses to do so. As FEI then stated:

The only way that FEI will make a unilateral submission to the Commission to move the SD to cost of service is if the SD and FEI have a disagreement about when the switch should occur. Given that both parties expect that the cost of service will provide advantages, and both parties desire those advantages, FEI does not expect to be making a submission to move the SD to the cost of service. In short, the provision is necessary as a dispute resolution mechanism in the event that the parties cannot agree.¹⁰

17. As this statement suggests, the only circumstances in which the Rate Agreement contemplates FEI/FAES making such an application to the Commission is in the event that FEI/FAES and DSD disagree on whether there would be a demonstrable “advantage” to the DSD in switching to the cost of service rate.

18. Since entering into the Rate Agreement, FAES has made a number of collateral representations to DSD to this effect.¹¹

⁸ CPCN Decision, p. 59.

⁹ CPCN Decision, p. 53.

¹⁰ Exhibit B-3, FEI Response to Commission Information Request No. 1, at Section 38.5, p. 126, (with emphasis added), FEI CPCN Proceeding.

¹¹ Exhibit C1-2, FAES Delta SD F15-16 RR & Rates proceeding (“FAES 2015 Rates Proceeding”) DSD Information Request No. 1 (dated June 2, 2015); and Exhibit C1-3, DSD Information Request No. 2, (dated July 6, 2015).

19. In response to Commission Information Request No. 1 in this proceeding, FAES again confirmed the narrow circumstances in which it could apply to the Commission to switch DSD to the cost of service rate, under the terms of the Rate Agreement:

The Delta SD's IR No. 1 to FAES highlights the two areas of concern to the Delta SD. First, the balance in the deferral account will be borne by FAES' shareholders, and not the Delta SD. Second, the Delta SD wants confirmation that FAES is not seeking approval from the Commission to convert the Thermal Energy Rate from the Market Rate to the Cost of Service Rate now and that FAES will only make such an application if it can clearly demonstrate that it is in the best interest of the Delta SD to switch to the Cost of Service Rate.

In response to the Delta SD IRs, FAES confirmed that the statements are correct.

Therefore, if the Commission were to direct FAES to commence charging the Cost of Service Rates "at any time in order to reduce the balance in the deferral account", the Delta SD would likely be very concerned to start having to pay the Cost of Service Rate with the sole objective to reduce the balance in the deferral account, the non-recovery of which FAES confirmed is at the risk of its shareholder.¹²

C. THE CURRENT APPLICATION

12. As FAES has confirmed in this proceeding, the Rate Assumption has not yet been satisfied. Put simply, the cost of service remains significantly higher than the market rate.

13. The implications of the foregoing are unambiguous. To date, it has not been advantageous for DSD to switch from the market rate to the cost of service rate. Secondly, the Deferral Account is growing at a faster rate than FEI originally anticipated at the time of the CPCN Application.¹³

14. Despite this, both FAES and DSD continue to expect that the Rate Assumption will be satisfied and that the cost of service will decrease over time. To this end, DSD confirms that it has been working with FAES to increase the efficiency of the thermal energy system so as to reduce the cost of service.¹⁴

¹² Exhibit B-4, FAES Response to Commission Information Request No. 1 (dated June 26, 2015), at Section 2.8, p. 9 (with emphasis added), FAES 2015 Rates Proceeding.

¹³ Exhibit B-4, FAES Response to Commission Information Request No. 1 (dated June 26, 2015), at Section 2.1, p. 4, FAES 2015 Rates Proceeding.

¹⁴ Exhibit B-4, FAES Response to Commission Information Request No. 1 (dated June 26, 2015), at Section 2.6, pp. 7-8, FAES 2015 Rates Proceeding.

15. Given the terms and conditions of the Rate Agreement, the subsequent collateral representations by FAES to DSD, and the various submissions of FEI and FAES to the Commission on this point, DSD maintains that FAES can only seek to compel DSD to switch to the cost of service rate if doing so would be in the best interest of DSD.

16. Pursuant to the Rate Agreement, if the Rate Assumption is not borne out and there is never an incentive for DSD to switch to the cost of service rate, DSD cannot be held contractually liable to FAES for any costs that have accrued in the Deferral Account during the term of the Rate Agreement. Instead, (as FEI and FAES have repeatedly confirmed) such costs would be directly borne solely by FAES' shareholder, and not DSD.

17. It bears emphasis that the rights and obligations of the Rate Agreement were freely negotiated by the parties. The Commission subsequently approved the provision of thermal energy services by FAES to DSD on those terms. At all times material to the various Commission proceedings concerning the provision of thermal energy services by FAES to DSD, DSD has proceeded on the understanding that the contractual obligations set out in the Rate Agreement would be honoured by FAES and enforced by the Commission, except in the event of an overriding public interest that would warrant the Commission's intervention. It would be wholly unfair for the Commission to now fundamentally alter the terms of the bargain between the parties absent any request by the parties for such intervention, and absent any overriding public interest considerations that would justify such drastic action. To the contrary, DSD submits that all of the relevant public interest considerations militate in favour of continued non-intervention by the Commission.

18. If DSD (a public body) is compelled to switch to the cost of service rate in a manner that is inconsistent with the terms and conditions of the Rate Agreement (and absent any clear and demonstrable benefits), the result could be financially disastrous. Given its well-documented financial constraints (which were known to both FAES and the Commission at the time of the CPCN Decision) DSD may not be able to bear the resulting expenses (either on a lump sum basis or amortized over the remaining term of the Rate Agreement). This would result in exactly the type of rate volatility that DSD was originally attempting to avoid by initially entering into the Rate Agreement.

19. Furthermore, it bears emphasis that any risks associated with the Rate Assumption will be borne by FAES shareholders, rather than its ratepayers. DSD submits that this also militates against any drastic unilateral intervention by the Commission on public interest grounds. As FEI stated in the original CPCN application proceedings:

The risk of non-recovery of amounts in the Thermal Energy Service Deferral Account is not to be borne by natural gas ratepayers... should FEI be unsuccessful in recovering costs or generating revenues for TES as a whole, then any shortfall is at the risk of the shareholder, not customers of other classes of services i.e., not natural gas customers.¹⁵

20. In this proceeding, FAES has again confirmed that the balance in the deferral account “will be borne by” FAES’ shareholder, which is solely “at risk” for the non-recovery of any such amounts.¹⁶

21. In any event, FAES has also confirmed that it is currently accumulating “tax loss carry forwards” that will reduce the balance in the Deferral Account in future years, which would ameliorate any financial prejudice suffered by FAES’ shareholder should DSD not switch to the cost of service rate.¹⁷

22. For all of these reasons, DSD submits that any unilateral intervention by the Commission that would require DSD to switch to the cost of service rate is unwarranted at the present time. Unilaterally compelling DSD to switch to the cost of service rate would be procedurally unfair. More importantly, there are no overriding public interest considerations that would justify such drastic action by the Commission. To the contrary, all of the relevant public interest considerations militate in favour of respecting and enforcing the terms and conditions of the Rate Agreement in accordance with the expectations of the parties.

D. RELIEF SOUGHT

28. DSD takes no position on the orders sought by FAES in this application.

¹⁵ FortisBC Energy 2011 Delta School District 37 Thermal Energy Service Contracts CPCN, Exhibit B-3, Response to BCUC IR No. 1, 2.2, p. 6.

¹⁶ Exhibit B-4, FAES Response to Commission Information Request No. 1 (dated June 26, 2015), at Section 2.8, p. 9 (with emphasis added), FAES 2015 Rates Proceeding.

¹⁷ FAES Final Submissions (dated July 27, 2015), FAES 2015 Rates Proceeding.

ALL OF WHICH IS RESPECTFULLY SUBMITTED

Dated at Vancouver, this 4 day of August, 2015.

BORDEN LADNER GERVAIS LLP

A handwritten signature in black ink, appearing to be 'Dionysios Rossi', written over a horizontal line.

Dionysios Rossi
Solicitors for Delta School District No. 37

Exhibit III

This is Exhibit " HHL " referred to in the
 affidavit of FRANK STEIN
 made before me on AUGUST 10 2018
Enka Campbell
 A Commissioner for taking Affidavits
 for British Columbia

From: David Curtis [<mailto:dcurtis@fasken.com>]
Sent: August-10-15 1:43 PM
To: Rossi, Dionysios
Cc: Collins, Mary-Ellen
Subject: RE: FAES Rate Application - B.C. Utilities Commission

Hi Dionysios

I called and emailed you this afternoon in order to discuss your email below regarding your client Delta School District, and mine FAES. I received an automatic reply indicating that you are in meetings for most of the day. In light of the 5 p.m. deadline set out below for a response, I thought I would send an email regarding my instructions so that we have provided a response.

In response to the concerns raised in your email below, FAES would like to have a meeting with DSD. Some of the key people for FAES are currently traveling, and as a result I do not have a specific date (or dates) for your client to consider, but I expect to get a proposed date(s) shortly, which I will forward to you for consideration.

If you are able to call this afternoon please do so, or let me know by email if this is an acceptable approach for your client.

Regards,

Dave

David Curtis | Associate

T. +1 604 631 4827 | F. +1 604 632 4827
dcurtis@fasken.com | www.fasken.com

Fasken Martineau DuMoulin LLP
 2900 - 550 Burrard Street, Vancouver, British Columbia V6C
 0A3

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From: Rossi, Dionysios [<mailto:DRossi@blq.com>]
Sent: August-07-15 3:40 PM
To: David Curtis

Cc: Collins, Mary-Ellen

Subject: FAES Rate Application - B.C. Utilities Commission

Dave,

I hope you are doing well. I write in regard to the above-noted matter. As you know, BLG has been retained by Delta School District No. 37 to represent it in its ongoing dealings with FAES before the B.C. Utilities Commission.

DSD is in receipt of FAES' most recent reply submissions before the Commission, dated August 7, 2015. DSD remains very concerned that FAES may be interpreting the Rate Agreement to state that FAES is contractually entitled to apply to the Commission to compel DSD to switch from the market rate to the cost of service rate absent any demonstrable benefits to DSD in doing so. As set out in its final submissions dated August 4, 2015, DSD maintains that under the terms of the Rate Agreement, FAES cannot compel DSD to make the switch in these circumstances. Moreover, I understand that FAES representatives have repeatedly confirmed this to their DSD counterparts on a number of occasions. Given this, DSD is understandably apprehensive about what appears to be FAES' about-face (or, at the very least, silence) on this key issue.

DSD's main concern is that in a scenario where the cost of service never drops below the market rate during the term of the agreement, and the amounts in the Deferral Account continue to accrue, FAES will apply to the Commission to switch DSD to the cost of service rate. This, of course, will result in DSD being obligated to pay all of the accrued amounts in the Deferral Account, with interest, either on a lump-sum basis or over the remaining term of the agreement. The further along in the term of the agreement that this occurs, the more serious the financial repercussions will be for DSD. Accordingly, DSD requires clarification on FAES' position on this point forthwith.

Does FAES maintain that it can compel DSD to switch to the cost of service rate in the above-noted scenario?

DSD requires this information in order to make informed decisions about both its position on the present FAES application and its commercial relationship with FAES moving forward. Depending on the form and content of the response that FAES provides, DSD may subsequently require a more formal confirmation of FAES' position.

Lastly, please note that DSD has deliberately instructed me to make this request outside of the ongoing B.C. Utilities Commission proceedings in order to afford FAES an opportunity to confirm its position without unduly prolonging or complicating the proceedings, and as a courtesy to FAES. That said, should FAES fail to provide DSD with a response by 5:00 p.m. on Monday August 10, 2015, DSD has instructed me to seek leave of the Commission to make further submissions on this issue in light of FAES' most recent reply submissions.

I am in the office for the remainder of the afternoon if you would like to have a call about this.

Regards,

Dino



Dionysios (Dino) Rossi

Partner

T 604.640.4110 | F 604.622.5810 | drossi@blg.com

1200 Waterfront Centre, 200 Burrard St, P.O. Box 48600, Vancouver, BC, Canada V7X 1T2

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Exhibit II

10 Sep 15

- Pre-meeting w/ FAES (JS, JV, NC, DE, F6)
 - F6 discussed background of R4EA
 - JV discussed our inability to influence COS rate - no increased customer base, ineffective project implementation, operational issues
 - Will BCUC be sympathetic? Not likely.
 - this is FAES' meeting, in response to BGC's email possibly seeking leave of the BCUC process.

Meeting w/ FAES (D'Saut, Bierlmeier, Bakeske), JS, JV, NC, DE, F6.

- DS: put together 20 year agreement, how to make it work, go to 30-40 years.
- confrontational process in front of BCUC, better to meet to resolve differences
- how to get system to work properly, lowest cost, eliminate rate argument.
- FAES look at this early stage, lumpy, usually a deferral account, smoothed out over 20-30 years.
- goal to get the system to work properly, then rate for 20+ years.

- all deferral accounts + or - get amortized over 10⁺ years. BLUE does not like to impose "rate shock" on customers.
- some operational things to sort out.
- increase in gas prices = eating away at deferral account.
- JS - we're in awkward position. GB said last time we met that rate change would be made if in 5737 best interest (DS agreed). Only other forum we have is next R&RA when we say COS rate too high. We need something in writing from FAES that confirms change in rate application only if advantageous to 5737. If COS rate imposed, need to cut educational services.
- DS - FAES needs to work on scenarios, cost models to show 5737 and let us know what to expect, what can be done, cost savings.
- K - unless advantageous to the Trust, no FAES unilateral rate application - this is starting point. Need something in writing from FAES.
- DS - given all regulated businesses, very problematic to issue written confirmation to one of the businesses.

162

GB - how did we get here, need to remind.

Contract has fiscal year of July 1 - June 30. FAES did not bring up R&RA

to ST37 prior to going to BCUC this past year, will do it in the future. BCUC called ST37, concern re. deferral account

- market rate indexed to natural gas, smoothing mechanism to eventually get to COS rate. Nat. gas went down in price.

RVA does allow FAES to ask ~~BCUC~~ BCUC for switch. Large CCA tax deferral balance (> deferral account).

- Under what conditions would FAES make application? FAES has to advise ST37, give copy of application, Unilateral that BCUC would approve the switch unless in best interest of ST37.

FB - concern that BCUC may not consider ST37's best interests, suggested it could impose the rate change, more interest in deferral account

JS - we need certainty, that's why we intervened. Going forward?

BS - look at cost efficiencies, modelling, different scenarios, expectations

FB - min. 10 year amortization?

BS - yes, then get back together to review.

if wheels coming off, then how to deal with it.

GB - did not apply for rate change at this time, not the right time. Contract working the way we wanted it to. We can't say we'll never apply for switch when market rate < COS rate.

JS - time frame? DS - within weeks, not months.

DE - having no control of COS rate has us losing sleep. Cost of repairing deficiencies - built into COS rate? What if equipment craps out ahead of schedule?

JB - NVSS issues + CI cost, not FPE's cost. Need to work through system optimization.

FG - are service issues part of deferral account? We have no say in what goes into deferral account.

DS - concern that BAUC may not allow recovery of deferral account if FPE's could've foreseen avoidable costs.

HV - is it reasonable that all costs are going towards deferral account? Original contract process mucked up, no confidence in selection of contractor (CI) or that we're even close to optimizing system operation.

KS - at the time of contract negotiation, we all expected more SVs to sign on. Didn't happen. SV37 got preferred rate. Scary that all start-up costs not shared with other customers, all in SV37 deferral account. How to contain costs

DS - will be transparent as to where costs have gone, how deferral account made up.

DE - concern that all eggs in one basket re: dCI. JB - change in dCI team - project \rightarrow operating. DE - should we get 3rd party to review? JB - yes.

JS - we get complaints from schools re: temp. Will cost efficiencies mean more suffering?

JB - no, not going to compromise comfort. Slow progress. Don't want to have away from dCI, mindful of adding costs to deferral account. Quarterly review w/ SV37? DE - yes.

JS - if our COs only SVs or? DS - had other SVs ready to go, but AES inquiry & Ameresco curtailed that.

NC - need to show in BAW analysis what costs are not attributable directly to SV37

GB - in this for the long haul.

DS - have other geothermal systems, all separate agreements across BC.

GB - still a desire to expand to other markets.

JS - would be lying if said we're happy with what we heard today, but looking forward to review of costs.

RS - if any rate change, we'll discuss with SD37 first. Cannot impose rate w/o BCUC approval first.

GB - would consider ~~best~~ interest before making rate change application.

DS - never saw BCUC unilateral rate change before.

GB - FAES carrying all risk, need to fix ~~the~~ growing deferral account in order to get reward of recouping it.

- 2.2M in tax credits - no impact on taxpayers.

FAES does not have enough taxable ~~input~~ income, no access to tax credit at this time, has not yet been monetized.

EG - don't want another summer like the last. GB - will send draft RPA to

SD37 by end of Feb. (No. mid-Feb) during budget process - end of Jan. Will present it to SD37 in person. Look at letter from SD37 to include in RPA to possibly avoid

166

heating. \$1.4M deferred is a forecast,
\$400K now. Scenarios to be presented in
October.

LB - quarterly reviews w/ SD37 m to e.

JV - if cannot meet heating demand,
turn on the heat! Regardless of control
efficiency.

Exhibit JJ



10-1111 West Georgia Street
 Vancouver, BC V6E 4M3
www.fortisbc.com

September 15, 2017

This is Exhibit "JJ" referred to in the
 affidavit of FRANK BEIER

made before me on AUGUST 10 20 18

Erin Campbell-Smyth

A Commissioner for taking Affidavits
 for British Columbia

Joe Strain
 Secretary Treasurer
 Delta School District #37
 4585 Harvest Drive, Delta, BC
 V4K 5B4

Dear Joe,

Re: Delta School District Thermal Energy Service

Further to our meeting on September 11, 2017, Fortis Alternative Energy Inc. (FAES) and the Delta School District (DSD) have been engaged in discussions since April 26, 2017 aimed at finding a resolve to the growing disparity between the Cost of Service (COS) and Market Rate (MR). With mutual satisfaction that we have fully explored and exhausted efforts, I respectfully provide notice of FAES's desire to charge the COS Rate under Section 1.1 (n) of our contract.

FAES intends to file an application with the BCUC to move to the COS rate no less than 90 days from the date of this letter. FAES will send DSD a copy of the application prior to its submission. If you have any questions or concerns, please don't hesitate to contact me directly at (604) 443-8515.

Sincerely,

Doug Slater
 General Manager
 FortisBC Alternative Energy Services Inc.

This is the 1st Affidavit
of Donald Poole in this case
and was made on 2nd of August 2018

IN THE MATTER OF

The Utilities Commission Act, RSBC 1996, Chapter 473

and

FortisBC Alternative Energy Services Inc.
Application for Approval of the Fiscal 2018/2019 Revenue Requirements and Cost of Service Rates for the Thermal
Energy Service to Delta School District No. 37

BEFORE:

W. M. Everett, QC, Panel Chair/Commissioner
A. K. Fung, QC, Commissioner
M. Kresivo, QC, Commissioner

AFFIDAVIT

I, DONALD POOLE, with an office at 201-1715 Dickson Avenue, Kelowna, British Columbia, V1Y 9G6, SOLEMNLY AFFIRM AND SAY THAT:

1. I am a mechanical engineer (P. Eng.) registered and in good standing with the Association of Professional Engineers and Geoscientists of BC. I have over twenty-five years of experience providing engineering services to both private corporations and public authorities regarding a range of mechanical systems including heating, ventilating, air conditioning, plumbing, fire sprinklers, fire protection, systems automation, energy use analysis and project evaluation. I have special expertise evaluating the performance of mechanical systems in school buildings, making recommendations to improve the performance of such systems and executing the upgrades needed to implement the recommendations.
2. From 2000 to 2014, I was the Principal in Charge of Poole and Associates Mechanical Engineering Ltd. in Kelowna, British Columbia. From 2014 to the present date, I have been a Principal at Falcon Engineering Ltd. in Kelowna, British Columbia.

3. I have personal knowledge of the facts and matters hereinafter deposed, save and except where the same are stated to be based on information and belief, and where so stated, I verily believe them to be true.

The Involvement of Poole and Associates Mechanical Engineering Ltd. in the Project

4. Sometime in 2011 or early 2012, nine Delta School District No. 37 (“**DSD**”) buildings (South Delta Secondary, Delta Secondary, Delta School Board Office, Delta Manor, South Park, English Bluff, Pinewood, Richardson, and Nelson Grove) were identified as being suitable for connection to closed loop geothermal heat pump systems (“**Geothermal Heat Pump Systems**”) and inclusion in the DSD thermal energy project (the “**Project**”). I was not involved in selecting any of these buildings for inclusion in the Project or in undertaking any of the due diligence required to select these buildings for inclusion in the Project. I became involved in the Project in or around May of 2012 when Geo-Energie Inc. (“**Geo-Energie**”), an engineering company based in Quebec, asked Poole and Associates Mechanical Engineering Ltd. to participate in a bid for the provision of engineering services by Geo-Energie regarding the design, construction and installation of the Geothermal Heat Pump Systems for the Project. At this time, Poole and Associates Mechanical Engineering Ltd. had entered into a sub-consultant agreement with Geo-Energie. Under the terms of the agreement, Poole and Associates Mechanical Engineering Ltd. was to be paid for its work on an hourly basis.
5. On or around May 9, 2012, Geo-Energie submitted a detailed engineering proposal to Johnson Controls L.P. (“**JCLP**”) for the provision of engineering services regarding the design, construction and installation of Geothermal Heat Pump Systems for the Project (the “**Engineering Proposal**”). The Engineering Proposal states that a portion of the work covered by the Engineering Proposal will be undertaken by Geo-Energie’s local sub-consultants, Poole and Associates Mechanical Engineering Ltd., Altum Engineering and JDQ Engineering (all engineering companies in British Columbia), under Geo-Energie’s supervision. I did not receive a copy of the complete Engineering Proposal until the President of Geo-Energie, Patrick Lambert, emailed it to me on May 19, 2012.

6. The work covered by the Engineering Proposal can be divided into five categories: (i) the soil and geothermal field assessment, (ii) the detailed engineering for the geothermal field, (iii) the detailed engineering for the mechanical room, (iv) installation supervision and (v) Project start up. Poole and Associates Mechanical Engineering Ltd. was intended to assist with the detailed engineering for the mechanical room and installation supervision.
7. Attached hereto and marked as Exhibit "A" to this my affidavit is a true copy of the Engineering Proposal.
8. On or around May 19, 2012, Mr. Lambert, advised me by email that JCLP had conditionally awarded Geo-Energie a contract for the provision of mechanical engineering services to JCLP regarding the design, constructional and installation of Geo-Exchange Heat Pump Systems for the Project. A copy of the Engineering Proposal was attached to his email.
9. Attached hereto and marked as Exhibit "B" to this my affidavit is a true copy of the email from Mr. Lambert dated May 19, 2012.
10. On or around May 25, 2012, I sent an email to Louis-Michel Raby, a JCLP representative, outlining the information I required from DSD to evaluate DSD's existing buildings for suitability for connection to Geothermal Heat Pump Systems and to complete specification for the insllation of new mechanical systems. At that point, I was very concerned about the operating parameters of DSD's existing terminal equipment. As a result of my past experience, I knew that the potential for energy saving is very small when a low temperature heat pump is used to supply energy (heat, in this case) to a building that has terminal equipment that is designed for high temperature. It is a basic principle of thermodynamics that, in order for heat to flow, heat must go from a high temperature to a lower temperature. This means that a low temperature heat pump system that supplies energy to a high temperature terminal equipment won't work effectively.
11. Attached hereto and marked as Exhibit "C" to this my affidavit is a true copy of the email I sent Mr. Raby on May 25, 2012.

12. On or around May 29, 2012, I toured the nine DSD buildings that had been selected by JCLP for connection to Geothermal Heat Pump Systems along with Mr. Lambert and two representatives from DSD (one was Debra Eng and the other's name I do not recall). At the time, I was concerned that a number of DSD buildings that had been selected for connection to Geothermal Heat Pump Systems would only be suitable for connection to Geothermal Heat Pump Systems if the high temperature terminal equipment located in such buildings was upgraded to work with the low temperature Geothermal Heat Pump Systems (by, for example, replacing the high temperature coils in such equipment with low temperature coils). During the tour, I advised Mr. Lambert that I was concerned that the Project did not include any upgrades to existing terminal equipment outside the DSD's mechanical room, nor were there any plans to employ any high temperature heat pump systems which would operate efficiently with DSD's high temperature terminal equipment. Mr. Lambert heard my concerns but did not provide any response to my concerns at the time.

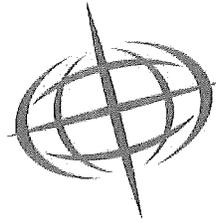
13. After the tour of the DSD buildings on May 29, 2012, I wrote a series of emails to Mr. Lambert in which I tried to encourage Mr. Lambert to:
 - a. Reconsider the order of 'in depth review' of the DSD buildings that had been selected for connection to Geothermal Heat Pump Systems based on the likelihood that the existing DSD buildings' terminal equipment could be reconfigured to accept energies from Geothermal Heat Pump Systems (Exhibit 'D1').

 - b. Reaffirm that the ten items of information requested on May 25, 2012 were needed to fully understand the temperatures for which the terminal equipment was designed to operate (Exhibit 'D2').

 - c. Substitute into the list of DSD buildings selected for connection to Geothermal Heat Pump Systems two DSD buildings with recently upgraded boilers (Annieville Elementary and Sunshine Hills Elementary) that the existing terminal equipment could be easily upgraded to Geothermal Heat Pump Systems (Exhibit 'D3').

- d. Upgrade all existing high temperature, cast iron hydrotherm style boilers at the DSD buildings selected for connection to Geothermal Heat Pump Systems as these boilers are energy inefficient, incompatible with Geothermal Heat Pump Systems and cannot operate at the lower temperatures that Geothermal Heat Pump Systems provide (Exhibit 'D4').
 - e. Either (i) upgrade the existing high temperature terminal equipment at the DSD buildings selected for connection to Geothermal Heat Pump Systems so that such equipment would work efficiently with the low temperature Geothermal Heat Pump Systems; or (ii) consider utilizing high temperature heat pump systems that would work efficiently with the existing high temperature terminal equipment in the DSD's buildings (Exhibit 'D5').
 - f. Review the coil shop drawings for English Bluff Elementary as the building was relatively new and the coils could have been specified to be compatible with lower geothermal temperatures (Exhibit 'D6').
 - g. Review a building that utilized a high temperature heat pump system (Exhibit "D7").
14. Attached hereto and marked as Exhibits "D1" through "D7" to this my affidavit are true copies of the emails I sent Mr. Lambert on May 29, 2012.
15. Mr. Lambert responded to my emails of May 29, 2012 with a single email in which he advised that:
- a. The role of Geo-Energie and its sub-consultants in the Project was solely to implement the Geothermal Heat Pump Systems within the mechanical room. Geo-Energie and its sub-consultants would not address any concerns regarding DSD's terminal equipment outside the mechanical room.
 - b. JCLP had already selected the DSD buildings that would be connected to Geothermal Heat Pump Systems.

- c. JCLP had already determined that the low temperature Geothermal Heat Pump Systems would provide enough heat to satisfy the energy targets without any upgrades or changes to the terminal equipment in DSD's buildings.
16. Attached hereto and marked as Exhibit "E" to this my affidavit is a true copy of the response email I received from Mr. Lambert on May 29, 2012.
17. On or around June 6, 2012, I sent an email to Mr. Lambert in which I reiterated that my questions relating to the operating temperatures for which the existing terminal equipment in the DSD's buildings had been designed had still not been addressed. I needed to know the operating temperatures for which the existing terminal equipment had been designed in order to assess whether such equipment would work with (or work effectively with) the Geothermal Heat Pump Systems that were intended to be installed.
18. Attached hereto and marked as Exhibit "F" to this my affidavit is a true copy of my email to Mr. Lambert dated June 6, 2012.
19. On or around June 7, 2012, I sent an email to Mr. Lambert in which I provided him with more information regarding high temperature heat pumps. I was (and still am) of the opinion that only high temperature heat pumps would perform or operate efficiently with the high temperature terminal equipment in DSD's buildings.
20. Attached hereto and marked as Exhibit "G" to this my affidavit is a true copy of my email to Mr. Lambert dated June 7, 2012.
21. As of June 16, 2012, I thought that the design of the Project was proceeding without consideration for the disconnect between low temperature Geothermal Heat Pump Systems and high temperature terminal equipment.
22. On or around June 16, 2012, I sent an email to Mr. Lambert in which I tried to illustrate, through the use of graphs attached to my email: (i) the capacity reduction of terminal equipment, if selected at high temperature and operated at low temperature and (ii) the effect on heat pump efficiency when forced to operate at higher temperatures. In other



Geo-Energie inc.
GEOTHERMIA

This is Exhibit " A " referred to in the
affidavit of DONALD POOLE
made before me on AUGUST 2, 2018
ERIKA LAMBERT-SHIRZAD
A Commissioner for taking Affidavits
for British Columbia



ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor

BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
PO Box 46400, Vancouver, Canada V7X 1T2
604-692-3431

Project: JCI-Fortis BC; School Districts Geothermal +
HVAC system implementation and retrofit

DETAILED HVAC SYSTEM'S ENGINEERING PROPOSAL

Tender # S-851

PRESENTED TO: Mr Louis-Michel Raby p. eng.

May 9th, 2012
(Valid for a period of thirty (30) days)

p.1

GEO-ENERGIE Inc.

1351 Gay-Lussac, Boucherville, QC J4B 7K1

Tel : 450-641-9128 Fax : 514-221-3243

patrick.lambert@geo-energie.com www.geo-energie.com



Boucherville, May 9th, 2012
Mr. Louis-Michel Raby
Western Canada Project Manager
Johnson Controls L.P.
395 Avenue Sainte Croix #100
St. Laurent, QC, H4N 2L3

OBJECT: DETAILED HVAC System's Engineering PRoposal
Project: JCI-Fortis, British Columbia School Districts HVAC system's retrofit

Dear Mr Raby,

Following our recent discussions and meeting, we are pleased to present you with our engineering proposal. This proposal presents our packages of engineering services that could be required to evaluate, design and implement various Energy Efficient Measures in a certain number of pre-qualified Institutional Facilities. These facilities mainly consist of schools and related school board's District Building, located in areas of British Columbia served by Fortis BC. It is our understanding that all the buildings we would have to work on, have already been pre-qualified by JCI to receive a ground source heat pump system (geo-exchange technology).

We present to you, within this document, all relevant details pertaining to the said service proposal. More particularly, you will find a definition of the working scope, a description of the suggested engineering services as well as the terms of agreement.

We wish to thank you for the confidence that you bestow upon us and remain available for any and all additional information. Please accept, Mr Raby, our most sincere best wishes.

Patrick Lambert, p. eng, CGD
President

p.2



Please note that all the information contained in this proposal is based on evaluation by GEO-ENERGIE and that all the information must be kept confidential unless otherwise accepted by written consent from GEO-ENERGIE's administration.

By offering us the present mandate, Johnson Controls L.P. recognises that the drawings and specifications prepared by GEO-ENERGIE within the framework of this mandate will only be used for this present mandate. Johnson Controls L.P. recognises that GEO-ENERGIE remains sole intellectual proprietor of these drawings and specifications and therefore cannot be copied, used as is or reproduces in part or in whole without written approval by a GEO-ENERGIE official.





WORKING SCOPE

You are currently starting an energy savings project with Fortis BC. This project now tackles two (2) School Districts in British Columbia; Delta SD (9 buildings) and Abbotsford SD (7 buildings). This ambitious project for JCI is a first project to include ground source heat pumps for JCI in British Columbia. At term this first Fortis-JCI relation could encompass more than four (4) School Districts and over seventy buildings for which geothermal systems are strongly considered.

DELTA SD:

Among all the buildings Delta SD manages, nine (9) have been clearly identified for closed loop geothermal systems:

Building Name:	GSHP System Size (tons) Anticipated	Type of building: New / Retrofit
South Delta Secondary	135	Retrofit
Delta Secondary	135	Retrofit
Delta School Board Office	45	Retrofit
Delta Manor	45	Retrofit
South Park	45	Retrofit
English Bluff	45	Retrofit
Pinewood	45	Retrofit
Richardson	45	Retrofit
Nelson Grove	20	Retrofit

In total, a rough capacity of 560 tons (1 960 kW) is estimated as the geothermal heat pump capacity to be installed globally for these nine (9) buildings. The nine (9) projects are being realized in a retrofit framework. The construction phase is scheduled to span from autumn 2012 to autumn 2013. It is preliminarily planned that up to two (2) buildings will undergo retrofit simultaneously.



No retrofit system will be used to provide space cooling. Only space heating requirements will be provided for. The existing heating systems, mainly consisting of centralized gas boilers, will be kept operational in order to provide backup or full heating requirements in extreme cold weather. No significant ductwork modifications are planned.

All the HVAC modifications/implementations will solely be achieved within the existing mechanical rooms (for the mechanical hardware installation) and outside the buildings in grassy areas (for the geothermal fields).

ENGINEERING FRAMEWORK

This proposal fits your demands by offering you a detailed and adaptive engineering framework.

Since 2007, Johnson Controls has trusted Geo-Energie to evaluate, design and commission most of its geothermal projects. Geo-Energie is proud to have been mandated by JCI to complete over twenty-five (25) geothermal designs in various buildings, ranging from schools to health care centers and hospitals.

Throughout this professional relationship, a reciprocal coordination understanding has flourished. The outcome of this cooperation is a very efficient communication stream and designs that are perfectly tailored to fit Johnson Controls' projects.

Geo-Energie's professional staff of engineers has a thorough understanding of British-Columbia's geothermal market and established installation strategies. This reality, combined with our reputable field experience, can only benefit JCI's project by integrating a western Canada adapted design with an already known Johnson Controls' twist. Geo-Energie's principal engineers are accredited as *Commercial Geothermal Designers* under the Qualification Program ® of the Canadian Geo-Exchange Coalition.

Although Delta is distanced from Montreal, Johnson Controls will continue benefiting from the usual pro-active response from Geo-Energie, in a timely manner. Geo-Energie has developed collaboration agreements with three (3) local engineering firms, each renowned in British Columbia for their extensive experience in such geothermal projects as well as energy efficiency retrofit programs for School Districts. These firms are:

- **Altum Engineering** (Daniel Booy, p. eng.)
 - o Site supervision, design and coordination
- **JDQ Engineering** (Jeff Quibell p. eng.)
 - o Soil and geological properties assessments
- **Pooles and Associates** (Don Poole, p. eng.)
 - o HVAC Design



Most part of the engineering and the entire general project management will be done by Geo-Energie, either from its head office in Boucherville, Qc. or on site. This work should mainly consist of the design of the geothermal field as well as the interior mechanical HVAC design as well as general coordination, documentation management and meeting assistance.

However an appreciable portion of the work will be ensured by one or more of our local partners, under Geo-Energie's keen supervision, as they will be our front runners on the project as well as our eyes and ears on the site. This work should mainly consist of Geological assessment, Site Take-offs, site supervision, meeting attendance and commissioning support.

Any issues arising during the design or the installation process will be professionally addressed just as swiftly and professionally as JCI has come to expect from Geo-Energie.

To suit Johnson Controls' process, this proposal is divided in five (5) distinct sections:

- 1- Soil and geothermal field assessment**
- 2- Geothermal field (Closed Loop) detailed engineering (for construction)**
- 3- Mechanical room detailed engineering (for construction)**
- 4- Installation supervision**
- 5- Assistance to project start-up**

These sections will now be individually presented and explained:

1- Soil and geothermal field assessment

The scope of the Soil and Geothermal Field Assessment is to establish, in first place, the implementation strategy for the geothermal field. It provides crucial information such as geological and soil conditions, useful to decide optimal type of field for the site project and will help define immediately which implementation strategy to retain or to discard. It will also prove to be very useful in identifying the proper trades for the implementation phase.

- a. Drilling Program Development (in Situ drilling/trenching tests coordination)
- b. Soil Assessment
- c. Hydrogeological potential limited¹ assessment
- d. In Situ Geothermal Conductivity test's result interpretation²
- e. Geological analysis of drill cuttings and/or excavated material, as required (site specific)
- f. Geothermal field implementation strategy based on each site's soil conditions and land availability

¹ No physical interventions included

² Thermal Conductivity test is not included in the base proposal



2- Geothermal field (Closed Loop) detailed engineering (for construction)

The Geothermal Field Detailed Engineering phase will furnish all the required calculation and design steps to provide a cost effective geothermal design. Like in all our projects, Geo-Energie's strength will serve at providing very functional and simple design with ample details on plans as well in specifications, to facilitate the different trade's work while reducing the risk of errors due to misinterpretation of construction guidelines.

All our work will be presented in accessible English. All the measurements will be provided using metric first then imperial in parentheses.

As always, Johnson Controls will be responsible of providing us with accurate thermal load evaluation (hourly analysis preferable, but monthly analysis is acceptable). JCI will also manage the exterior survey of the site, with proper marking of the geothermal field potential placement.

The scope of the geothermal field engineering is to design the geothermal field and its piping connexion, including the exterior field itself and the connecting piping, up to its building entry.

- g. Thermal load³ interpretation
- h. Loop field sizing (either Vertical or Horizontal), given available area definitions and existing plans
- i. Geothermal field design (plans and written specifications)
- j. Cost evaluation
- k. Identification and pre-qualifying of potential bidders for the geothermal field portion
- l. Detailed engineering drawings showing geothermal field (closed loop) layout, site preparation and excavation, piping layout, borehole design, header sizing, antifreeze concentration, purging, flushing, quality control tests, pumping requirements and installation materials specifications
- m. Thermal performance calculation encompassing design's flow and temperature parameters
- n. Performance modelling of the geothermal system over a 10 year period
- o. Shop drawing review

³ As calculated and provided by JCI



3- Mechanical Room Detailed Engineering (for construction)

As for the Exterior portion, the Mechanical Room Detailed Engineering will provide JCI with the same level of information quality. We will present the mechanical room layout in a 2D format, with various cuts and a general installation schematic, showing the integration of new equipment with the existing equipment to be kept.

As an option, we can also provide a 3D modeling (pipe and equipment volume) to better represent the physical installation in superposition with the existing one, easing the implementation process and reducing the risk of interference.

The scope of the Mechanical Room Detailed Engineering is to design the geothermal heat pump systems and their associated components. It is our understanding that the projects will have between 1 to 3 heat pumps each (between 20 to 45 tons each, water to water), as described in JCI's Mechanical Work Description document. Such heat pumps will be located in existing mechanical room, near the existing heating systems. The installation strategy is to connect the geothermal system on the return side of the existing heating water loop, before the boilers, within the mechanical room.

It will present all the new heat pumps, pumps, piping network, accessories, pump and control ports. It will present the demolition sections of the existing equipment (if required) and/or the re-location of some existing equipment. The design will start at the geothermal piping penetration into the building up to the connection point of the geothermal system and the existing main heating pipes.

- p. Mechanical room take offs
- q. Space planning in 2D, (3D solid optional)
- r. As built schematic collection/production
- s. Interior piping design (plans and written specifications)
- t. Complete piping system design made necessary to connect the new geothermal heat pumps to the existing heating circuit.
- u. Heat pump installation layout, including the associated pumps, strainers, control point insertion and thermal insulation
- v. Detailed engineering drawings showing the new mechanical room layout in the vicinity of the heat pump hook up, new piping arrangement, purging, flushing, quality control tests, pumping requirements and installation materials specifications
- w. Production of a written control specification
- x. Production of Tie-up specification and plans
- y. Production of general specifications
- z. On going discussions and meeting with JCI project team
- aa. Identification and pre-qualifying of potential bidders for the interior portion
- bb. Seismic installation guideline preparation
- cc. Shop drawing review

p.8

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4- Installation supervision

Geo-Energie will work alongside Johnson Controls, in doing the following supervision tasks: The installation supervision is considered to be on a punctual basis. Therefore, there will not be a permanent presence on site. Rather, we propose JCI to visit the sites at pre-identified milestones.

Task 1: Supervise on a "on call" basis the drilling-trenching and grouting processes of the geothermal field outlined in the original design.

Task 2: Supervise on a "on call" basis the horizontal layout of the geothermal piping in the trenches and their insertion into the building

Task 3: Participate in some important job site meetings

Task order may change based on scenarios encountered in the field. Some of the meetings and coordination processes may be achieved remotely through teleconference.

- dd. Daily technical support, as required (remote technical support)
- ee. Site inspections, given a pre-established task schedule
- ff. Site meeting attendance, if required
- gg. Preparation of deficiency lists and site instructions

5- Assistance to project start-up

We offer Johnson Controls to assist them in their commissioning and start-up procedures. Having been involved in the entire design and installation processes, it is natural that we provide valuable inputs during the start-up and testing of the installation. This involvement will help the convergence to a fully adjusted and fine tuned system.

As an option, we offer JCI to act as their external commissioning agent for this project.

- hh. Documentation gathering
- ii. As-built drawings collection (as prepared by trades)
- jj. Start-up coordination planning, attendance and supervision
- kk. Start-up troubleshooting
- ll. Act as a Commissioning Agent (optional)



This engineering proposal is based on the following considerations and limitations:

- The analysis will be based on Canadian Standards and Codes
- The concepts will be based on the CSA C448-02 Standard
- This engineering mandate will be conducted under the supervision of Geo-Energie's engineering team.
- The plans, specifications and coordination communications will be done in English
- Any engineering or supervision work not described above is considered not included.
- Civil, Electrical, Fire and Safety Engineering is not included
- Thermal response tests, contaminated soil and asbestos remediation engineering is not included
- JCI will provide us with surveyed plans for each site
- JCI will provide us with scaled plans of every mechanical room or roof layout for each site
- Our responsibility is tributary to the precision and the quality of the information we are being provided with
- Geo-Energie will not assume any responsibility for errors or omissions caused by incorrect or imprecise information that JCI could have provided us with
- Geo-Energie will not assume any responsibility for the actual installation costs
- Geo-Energie will not assume any responsibility for installation work done without its supervision
- JCI will keep Geo-Energie informed in all due diligence of working schedules, meeting dates and any extraordinary elements that may arise during the construction and commissioning phases of this project.
- Modifications of the original plans and specifications that may be required during the construction phase will be done as supplemental work.

p.10

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COSTING SCHEDULE:

This proposal aims at offering engineering services for multiple buildings and is to be executed in a relatively short period of time. This fact is governing our costing schedule as it is forecasted that some scale economy will be achievable. Scale economy will arise from tasks that require site presence like:

- Site survey
- Take offs
- Meetings
- Site inspections

We herein consider that at least half the sites will be available at the same time for those tasks, thereby reducing traveling time and increasing productivity.



The costing schedule for the engineering mandate is as follows:

Tender: S-851 Delta SD Geothermal project

Mandate Portion	Price
Section - 1 : Soil Assessment	
Section - 2 : Geothermal Field Detailed Engineering	
Section - 3 : Mechanical Room Detailed Engineering	
Section - 4 : Site Supervision	
Section - 5 : Assistance to Start-up and Commissioning	
Supplemental work you could request during this mandate	

Note: Prices indicated do not include taxes.

INVOICING PROCEDURES:

Payments distributed as follows:

- 1 – Upon agreement signature
- 2 - During the course of execution: Progressive monthly invoicing

No financial retainer will be imputed on this engineering mandate

Yours sincerely,

Patrick Lambert, p. eng, CGD
President

Accepted by : _____ Place and date : _____

p.12

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ANNEX #1:
Thermal Conductivity Testing

p.13

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This following section presents the proposal for the realisation of a thermal conductivity test in British Columbia.

Work Scope :

Johnson Controls is planning the realization of thermal conductivity testing on various sites in British Columbia, in order to properly size the foreseen geothermal fields.

The current practice for a geothermal installation strongly recommends that a geothermal conductivity test be completed for any project over a 25 ton capacity. The Canadian standard C-448.1-02, section 6.3, requires that the ground's thermal performance be validated for all commercial scale geothermal projects.

Geothermal conductivity test specification:

The conductivity test will follow the International Ground Source Heat Pump Association (IGSHPA) standards, '2000; 1B.3, and be in accordance with the earth energy ASHRAE textbook, section 3.5., all this in conformity with the CSA 448-02 norm.

The test will be carried out by qualified personnel having followed the Canadian GeoExchange™ Coalition Installers Course® for residential and commercial geothermal systems. Furthermore, the test will be supervised and analyzed by a duly trained professional engineer, having a vast experience in conductivity tests as well as in geothermics, certified as a "Geothermal Designer" by the Association of Energy Engineers (AEE).

- A mobile conductivity test unit will be installed on the project site to test a closed loop geothermal borehole. This unit will be equipped with an adjustable heat source, pumps and required monitoring equipment. The testing unit will be connected to the geothermal ground loop by way of thermal fusion.
- The testing unit will measure and record water flow (LPM/GPM), intake and return temperatures (°C/°F), current on each phase, power load (W) and time, as well as the thermal contribution from the circulating pumps. The current through the Neutral line shall also be measured with an RMS type probe. These measurements will be recorded via an industrial computer every thirty (30) seconds. The data can be extracted at any time, but the final result can only be known when the test as been completed.
- A recently calibrated volumetric flow meter shall be used. A copy of the calibration certificate will be provided with the report.
- The testing unit will be installed in a closed and locked vehicle.



- A technician will regularly be present on site to make sure the test is going according to plan.
- For the test duration, a stable and constant power source of 120-240V, two (2) source lines, one (1) neutral and one (1) ground of more than 50 amps is required.
- Prior to starting the test:
 - o A professional purge of the geothermal ground loop will be performed to make sure the loop is air and dirt free.
 - o A dynamic pressure test will be carried out so as to make sure that the pipe's dimensional integrity is intact, as well as verifying that the pipe is not obstructed in any way.
 - o The loop will then be pressurized to 50 Psi.
- The connections between the testing unit and the ground loop will be thermally insulated, minimum R-10, for best results. Particular attention will be brought to these temporary connections so as to insure they are perfectly fused and sealed.
- The minimum desired test precision is of ninety five percent (95%) or, alternately, a 48 hour duration, whichever comes first.
- Finally, the data will be processed and analyzed to extract the ground's conductivity factor "K" (btu/h-ft.°F) of the tested well.
- The "K" value is the test result.
- A report will be produced explaining the different steps taken, the methodology used, the test result (value of "K"), an evaluation of the borehole's thermal diffusivity and the initial ground temperature.
- 1- Prior to the test, a test hole drilling specification (vertical option) or a trenching specification (horizontal option) will be prepared and issued for tender to pre-qualified local contractors.

For the duration of the test, you must supply us with:

- 2- Free access to the site for the test duration; generally three (3) days.
- 3- The site ground stability must be suitable for two-wheel drive truck (2WD 20' moving van).

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Work included:

- Test unit rental;
- Closed motorized transport;
- Purging unit rental;
- Test unit installation;
- Power generator rental
- Purge and pressure test of the geothermal loop;
- Piping thermal insulation during the test;
- Regular follow-ups by a technician;
- Dismantling of the equipment after the test completed; fusing two (2) caps on the loop ends and geothermal loop pressurization at 30 psi;
- Data analysis and report compilation presented in English

The following work is not included in our proposal:

- All work not described above;
- Drilling and preparation of the test borehole;
- Work permits;

IMPORTANT NOTES:

- The methods presented hereafter are based on the hypothesis that the site is available for proceeding with the test upon our arrival on site. Any delay out of our control (other than a naturally occurring catastrophe) will be invoiced at our hourly rate to the client.
- The installation of a fence around the job site (drilling and testing procedure) is the client's responsibility.
- It is the client's responsibility to provide a path suitable for a two (2) wheel drive truck (2WD 20' moving van) prior to our mobilization. All expenses and loss of time due to the test borehole inaccessibility will be charged extra.



Terms (prices do not include tax): Check off your choice(s)

S-851 JCI BC

One (1) conductivity test, 48 hours or 95% precision and report : Including traveling to and from job site	8 360\$ per test
Two (2) CONSECUTIVE conductivity tests, 48 hours or 95% precision and report: Including traveling to and from job site	7 900\$ per test
Three (3) CONSECUTIVE conductivity tests, 48 hours or 95% precision and report: Including traveling to and from job site	7 400\$ per test
Four (4) and more CONSECUTIVE conductivity tests, 48 hours or 95% precision and report: Including traveling to and from job site	6 900\$ per test
Electric Generator rental for the duration of one (1) test, Including delivery, insurance and fuel.	1 550\$ per test (100\$ discount if more than two consecutive tests)
Per diem for travel in the region: (3 nights included. Nights not required will be credited \$225 / night on the final invoice)	675.00\$
<i>Fee for all supplemental work or travel required during the mandate (excluding travel for the foreseen test site visits) :</i>	<i>150.00\$ / hour + 0.60\$ / km 225.00\$ of per diem per day</i>

PAYMENT METHOD:

- 20% deposit on signature;
- Balance on report presentation

Execution periods:

- Test execution:**
- minimum one (1) week following the borehole completion (to give the grout time to thermally stabilize)

- Report compilation:**
- One (1) week following the test completion

We hope this proposal meets your requirements and remain at your disposal for any questions you may have.

A handwritten signature in black ink, appearing to read "A. St-Pierre", is written over a horizontal line.

Alexandre St-Pierre, ing. (#OIQ : 135156)
Engineering department director

Accepted by: _____ the _____, 2012
Name: Mr. Louis-Michel Raby



ANNEX #2:
Engineering Collaborators Presentation



The following section contains a short presentation of our local Engineering collaborators.

Geo-Energie has selected these seasoned individuals and firms for their reputed skills in the geothermal / HVAC domain. They all have extensive and proven experience in projects of similar magnitude, mainly located in British Columbia.

Having the privilege to know most of them for several years, we came into a collaboration agreement with their firms for this specific project.

Final element worth mentioning, all these firms know each other and have a reciprocal respect and have been working together on various occasions in the past.





Daniel Booy, P.Eng., Dipl.T., LEED™ AP, President
Merville, BC, Canada

Personal Experience Synopsis:

Daniel Booy is a registered professional engineer, has a degree in mechanical engineering from the University of Victoria and a diploma in mechanical engineering technology from Camosun College.

Daniel has worked in the GeoExchange™ industry since 2001. He has experience in R&D of thermal conductivity testing equipment specifically for GeoExchange applications, design of commercial systems (including district earth energy systems), use and creation of specialized software tools, site surveys / site services, installation / commissioning services, project management and equipment R&D / manufacturing. Daniel has worked with municipalities, schools, mechanical contractors, developers, architects and engineering consultants across Canada and the United States to ensure the appropriate design and installation of residential and commercial GeoExchange systems.

Daniel has served on the executive board of GeoExchange BC and was one of the founding members of the organization.

In 2001 Daniel was introduced to the technology by a geological engineer (Jeff Quibell, P.Eng.) and immediately discovered the potential benefits and limitations of the technology. He forged a new cooperative education position through the University of Victoria. The 8-month work term allowed Daniel to become familiar with various geological engineering aspects of GeoExchange systems. He designed and built a formation thermal conductivity testing apparatus and several bench-scale thermal conductivity testing devices, which then led into full-time post-graduation employment with Mr. Quibell.

In 2004, Daniel accepted a position as Western Region Manager for Ice Kube Systems and assisted project architects, engineers, developers, installers and owners with the development of specialized GeoExchange systems, with a focus on district-scale earth energy applications. Ice Kube Systems specialized in fabrication and design of GeoExchange systems designed for low temperature operation used in integrated geothermal refrigeration / heating, ventilating and air conditioning (HVAC/R) systems. Projects Daniel worked on included ice rinks, office buildings, churches, schools, and industrial buildings. System types included hybrid GeoExchange ice storage systems and conventional GeoExchange heating and cooling systems ranging in size from single family homes to district energy systems.

In 2005 Daniel moved on to work with Cobalt Engineering (formerly VEL Engineering) in Vancouver, BC. In this position he was able to gain consulting engineering experience on many large-scale GeoExchange projects and some very intriguing residential / small commercial projects.

Daniel is now the President of Altum Engineering Ltd., a consulting firm specializing in the design of renewable residential, commercial and industrial energy and water systems. Altum consults with architects, building owners, municipal governments, engineering firms and developers.

Significant Projects:

- **Cawston Cold Storage Controlled Atmosphere Facility, Cawston, BC** – Altum recently completed a feasibility study and design for a controlled atmosphere (CA) cold storage facility that is now in the construction stage. The facility will have relatively large refrigeration system energy loads. Groundwater will be used for cooling during times when the outside air will be very warm and the groundwater will be relatively cool. The use of efficient water-cooled refrigeration equipment combined with lower temperature groundwater heat rejection will reduce energy consumption

drastically compared to similar air-cooled equipment. In addition to the refrigerating efficiencies, waste heat will be reclaimed for CA room dehumidification and geothermal / heat reclaim heat pump based space heating. The complex nature of the energy load profiling presented many challenges in modelling. Those challenges were effectively overcome by working with various players in the CA industry to gather industry-specific data and synthesize it into a detailed, parametric model. Altum then developed a robust and cost competitive HVAC/R system design.

- **Houston Arena, Pool and District Earth Energy System, Houston, BC** - Altum was retained to provide a district system feasibility study and a detailed ground heat exchanger (GHX) design. Altum provided construction / PM services for the installation of the GHX. Altum then completed a design and detailed budget for the construction of the ice arena and curling arena mechanical systems and the rink floor that is a thermal energy source for the GHX. The design included HVAC systems that are compatible with ground source heat pump technology and ammonia refrigeration thermal energy reclaim. The GHX is used to provide heating and cooling for the nearby swimming pool building and, in future phases, other nearby buildings. This project is in operation, successfully making ice while simultaneously heating the swimming pool and arena buildings. The project was completed on schedule to make ice in September, 2009 after a fast-tracked project delivery.
- **Whistler 2010 Olympic Athlete's Village, Whistler, BC** – This entirely new neighbourhood of Whistler has a district-scale GeoExchange system that is based on low-grade waste-heat reclaim from the nearby wastewater treatment plant effluent stream before it is discharged into the Cheakamus River. Daniel and Jeff Quibell were two of the principal authors of a feasibility study that assessed the GeoExchange options and made recommendations to the Resort Municipality of Whistler and Terasen Utility Services to use the effluent stream as an energy source. Daniel then worked with Terasen to assess the technical and economic attributes of the proposed system, from the energy services contracting (ESCo) perspective.
- **Urban Plains Complex and Community, Fargo, ND, USA** - Altum provided feasibility study and schematic design services for the local, lead mechanical (traditional HVAC) engineering firm on this large-scale complex that was planned to house five NHL-sized ice surfaces. One of the arena areas was designed to service approximately 5,000 occupants. Designs included significant ice storage for hydronic-based dehumidification with wholesale peak electrical consumption reduction in an area with time of use rates and appreciable electric demand charges. In the design, energy reclaimed from ice-making, dehumidification and space cooling would be directly used for domestic hot water heating, space heating, outdoor snow melt, ice re-surfacing machine snow melt and, if not needed in the complex, for district earth energy system thermal re-charging. The HVAC systems in the building were all designed to be compatible with ground source heat pump technology, including radiant panel technology. Excess energy that would be rejected from the facility refrigeration system was planned to be discharged into a large man-made pond, or distributed to other nearby buildings in this 300+ acre development.
- **Hesquiaht School, Hot Springs Cove, BC** – This LEED™ school is in a remote coastal region of BC where most of the energy systems are based on diesel that is shipped into the community by barge. Daniel participated in a feasibility study that examined the various earth coupling options available onsite. The team eventually recommended the installation of a pond loop heat exchanger in the storm water retention pond (the region receives an average of 3,000+ mm of precipitation per year). He then developed a Matlab™ based hourly heat transfer analysis program that modelled the thermal response of the pond when subjected to rainwater injection, heat transfer to the building, heat transfer with the surroundings and other pertinent parameters. The pond size was determined so as to not allow freezing during the winter, which would compromise the storm water retention capability. The mechanical engineer of record was Daniel's direct supervisor at Cobalt Engineering and Daniel also managed the construction phase of the project.

- **Flatiron, Vancouver, BC** – As an EIT, Daniel was a lead designer (under supervision of a P.Eng.) for this 29-storey residential building in the downtown core of Vancouver. The design included a radiant heating / cooling GeoExchange system with radiant panels in the floors and ceilings. Daniel developed the design to directly reclaim cooling energy into domestic hot water storage and to directly heat and cool the building without use of the heat pumps when the ground heat exchanger temperature is appropriate. Daniel dealt with the developer and Terasen (now FortisBC) to develop a utility-based plan to fairly bill energy to each separate dwelling unit. FortisBC currently operates the system.

Industry Associations:

Daniel is or has been involved in the following pertinent associations:

- The Association of Professional Engineers and Geoscientists of BC (APEGBC): Professional Engineer registered in British Columbia
- The American Society of Heating, Refrigeration and Air Conditioning Engineers (ASHRAE), with contributions to the following Technical Sub-committees:
 - TC 06.08 – Geothermal Energy Utilization
 - TC 06.09 – Thermal Storage
 - TC 10.02 – Automatic Ice Making Plants / Skating Rinks
- GeoExchange BC
- The Canadian GeoExchange Coalition (CGC)
- The Canadian Design Build Institute
- The Canadian Green Building Council
- The Recreation Facility Association of BC
- The Thermal Environmental Comfort Association

Altum Company Background:

“Altum” is Latin for support, sustain, maintain. As leaders in sustainable infrastructure design and construction, our name reflects the changes that we make in the world. In addition to design and construction, we support and mentor others with open sharing of information to better the energy industry.

Altum was founded in 2007 to provide sustainable development consulting and installation services to engineers, architects, developers, building owners, commercial / industrial processors and agricultural clients. We also provide education for designers, owners and installers. The services include:

- District, commercial, agricultural and residential energy and water system design services
- Modelling the energy consumption of buildings and processes
- Design of building HVAC/R systems
- Modelling the interactions of energy systems with other system components and industrial processes (including integration of GeoExchange with other renewable energy systems)

Altum also provides studies showing the feasibility of a GeoExchange project with consideration to the local geological conditions, the local utility rate structures, and the cost of building and maintaining an appropriate GeoExchange system.

The company works with designers and contractors familiar with GeoExchange and renewable energy design and installation in Canada and internationally to facilitate cost-effective design, construction and commissioning of renewable energy based projects.

Our experience in design, construction and commissioning ensures that our follow-through into the operation of our systems complements our detailed designs to the benefit of our clients. We believe that one of our greatest assets is our well-rounded skill set, including years of field and farm experience to complement our in-office design ingenuity. Daniel believes that well-rounded designers deliver informed engineering services. He earned a mechanical engineering technologist (with co-op) diploma before moving on to complement those skills with his mechanical engineering degree and advanced education.

STATEMENT OF QUALIFICATIONS

HISTORY AND BACKGROUND

JDQ Engineering is a specialized energy consulting firm based in Vernon, BC. The company is a direct descendant of Groundsolar Geotechnics started in 1999 in Victoria, BC by Jeff Quibell. Groundsolar was the first consulting engineering firm in western Canada to provide specialized services for supporting geexchange heating/cooling applications. Groundsolar introduced several innovations for improving geexchange project delivery, particularly relating to adapting design and installation methods to account for and overcome extremely varied and often complex geological settings common in BC. Key innovations and accomplishments:

- Introduced structured geexchange option analysis evaluations beginning in 2001 to comparatively evaluate suitability of different types of ground heat exchangers for specific sites.
- Pioneered the use of in-situ thermal property testing in Western Canada beginning in 2000, to measure actual thermal exchange properties of soil and/or bedrock at specific sites.
- Promoted technology transfer from the BC mineral exploration drilling sector to the geexchange sector to develop more cost-effective drilling options in BC's unique and varied geological conditions.
- Designed or supported many of the earliest commercial/institutional scale geexchange applications in BC and western Canada.
- Led the development of design guidelines for GeoexchangeBC (provincially) and a key contributor to Canadian Geexchange Coalition (CGC) design and installation training materials (nationally).

With growing demand for services, Groundsolar merged its operations with larger firms during two separate periods (2002-2004, Hemmera Energy, Victoria/Vancouver) and 2006-2008 (EBA Engineering, Kelowna). In 2009, Jeff Quibell returned to independent practice under the name JDQ Engineering reflecting a more general scope of practice.

JDQ Engineering provides energy engineering and water resource engineering consulting services to public and private clients, architects, and other engineering firms. Key services include evaluation, analysis, and design of geexchange systems and other renewable energy technologies.

JDQ Engineering is led by Jeff Quibell, P.Eng. in Vernon, BC. He has over 20 years of consulting engineering experience and is currently registered to practice engineering in BC, Alberta, Manitoba, and Ontario. Jeff is joined by Adam James, Ph.D., in Trail, BC as a senior analyst and designer. Adam has worked with Jeff on an ongoing basis since 2005.

SELECTED GEOEXCHANGE PROJECTS - GROUNDSOLAR/JDQ ENGINEERING

- Manitoba Hydro Place Headquarters Office Tower; evaluation, analysis, and design of ground heat exchange system, Winnipeg, MB (2005/06).
- Multi-unit housing for Whistler Housing Authority; evaluation, analysis, design of ground heat exchange system, Whistler, BC (2001).
- Community Centre and Field House, Resort Municipality of Whistler; evaluation, design, analysis, construction management of ground heat exchange system, Whistler, BC (2001/02).

- City of Vancouver Works Yard; initial geoexchange feasibility evaluation and onsite testing, Vancouver, BC (2001/02).
- Whitehorse auto dealership, geoexchange evaluation and analysis, Yukon Energy Solutions Centre, Whitehorse, YT (2002).
- Waverley West Residential Development, evaluated feasibility for servicing 15,000 home residential development with an integrated geoexchange utility on behalf of Manitoba Hydro, Winnipeg, MB (2005/2006/2007).
- Multi-unit residential housing, evaluation, analysis, and design of ground heat exchange system, Okanagan Geothermal, Sicamous, BC (2006).
- Industrial building in northern climate, analysis and design of overall radiant heat geoexchange system, Peace Country Geothermal, Dawson Creek, BC (2009).
- District energy options evaluation, Corix Utilities for Toronto District School Board, Toronto, ON (2010/2011).
- Geoexchange supplement to district energy system, feasibility evaluation; Corix Utilities for Toronto Community Housing Corporation, Toronto, ON (2010/2011).
- Evaluation of flooded mine-workings as geoexchange heat source, Altum Engineering for Vancouver Island University, Nanaimo, BC (2009/2010).
- Stage 1 geoexchange suitability assessment of several school sites, School District #43, Coquitlam, Port Moody, and Port Coquitlam, BC (2010/2011).
- M.V. Beatty School, geoexchange evaluation, analysis, design, School District #83, Enderby, BC.
- J.V. Humphries School, geoexchange evaluation, analysis, design, School District No. 8, Kaslo, BC (2009/2010/2011).
- Many other geoexchange evaluation, investigation, analysis and design projects across Western Canada.

KEY PERSONNEL

Short-form biographical profiles are provided here. Longer-form resumes can be provided by request.

Jeff Quibell, P.Eng. – Principal

Jeff has 21 years consulting engineering experience managing and conducting engineering investigations, engineering design, and construction management for a wide variety of projects in Canada and the United States. In the early part of his career, he was involved in investigating the source and extent of soil and groundwater contamination resulting from past release of industrial wastes, and designing systems to contain, treat, or otherwise manage the contamination. In the late 1990s he managed several large investigation projects conducted for the United States Navy as part of the Base Reallocation and Closure (BRAC) program to decommission military facilities.

For the past 11 years he has been focused entirely on energy engineering practice primarily relating to geoexchange system design and implementation. He designed several of the first large-scale institutional/commercial GSHP systems in Western Canada in Vancouver, Whistler, Winnipeg and other locations. He has conducted hundreds of geoexchange suitability evaluations and site investigations to verify ground thermal properties. His work often involves evaluating suitability of geoexchange technology for specific applications as stand-alone systems or as a platform for leveraging other technologies such as solar thermal or waste heat recovery.

Jeff has been active in promoting improved geexchange design and installation practices in the following capacities:

- Founding committee member Geoexchange BC industry association (at the time a partnership initiative between BC Hydro and the Greater Vancouver Regional District); 2002/2003.
- Engaged by Geoexchange BC to co-author *Professional Design Guidelines for Geoexchange Systems in British Columbia* (First Edition); 2004.
- Served on Canadian Geoexchange Coalition (CGC) Technical Committee tasked to review development of training materials for national geexchange training program, 2005/2006.
- Engaged by CGC on a 4-member national sub-committee to conduct Third Stage Review to review and improve geexchange design and installation training materials, 2006.
- Engaged to co-author Part 1 of the Geoexchange BC guideline series – *Part 1 – Assessing Site Suitability and Ground Coupling Options*, 2006/2007.
- Engaged to update the original 2004 BC design guideline to become part of the Geoexchange BC guideline series as *Part 2 – Design; Professional Guidelines for Geoexchange Systems in British Columbia*, Geoexchange BC, 2007.
- Engaged as co-author and project manager to develop a guide to help geexchange project coordinators improve procurement practices for developing geexchange systems. The guide was published as *Procurement Resource Guide; Professional Guidelines for Geoexchange Systems in British Columbia*, Geoexchange BC, 2011.
- Presented numerous formal presentations at conferences, conducted technical seminars (e.g., community colleges), and informal public information events.

Adam James, Ph.D. – Lead Designer

For the last 10 years, Adam has focused on achieving GHG emission reductions in the built environment through the use of ground-source heating systems, solar hot water, and building envelope improvements. He has worked on hundreds of renewable energy feasibility studies, system designs, and installation projects throughout Canada with major clients including Manitoba Hydro, FortisBC, Corix Utilities, and numerous municipalities and school districts. Adam has also used his skills to assist local governments with carbon emissions inventories, carbon neutral energy and emission reduction planning, and project implementation.

RESUMES

Long form resumes can be provided by request.

POOLE AND ASSOCIATES
MECHANICAL ENGINEERING LTD.

CORPORATE PROFILE
Mechanical Consulting Services

Geothermal Upgrades

Geo-Energie Inc.

May 10, 2012

#107, 2293 Leckie Road, Kelowna, BC V1X 6Y5
Telephone: (250) 762-6116
Fax: (250) 762-2343
dpoole@pooleandassociates.bc.ca

'SPECIALIZING IN HVAC AND FIRE SAFETY'

INTRODUCTION

This submission responds to the Request for Proposal, Fortis Geothermal Upgrades.

THE COMPANY

Poole and Associates Mechanical Engineering Ltd., maintains an office in Kelowna, B.C. to carry on the practice of Consulting Professional Engineering. The firm provides service in mechanical systems including heating, ventilating, air conditioning, plumbing, fire sprinklers, fire protection, systems automation, energy use analysis, and project evaluation.

A professional level of service is provided from preliminary design stages, through to final design, development of working drawings and specifications, tender period services, construction period services, turnover and project wrap up.

EXPERIENCE

The principal and senior personnel of Poole & Associates Mechanical Engineering Ltd. have acquired a great deal of experience in many different types of facilities, including Acute Care Hospitals, Extended and Intermediate Care Homes, Colleges, Secondary and Elementary Schools, Swimming Pool Complexes, Recreational Complexes, Office Buildings, Hotels, Restaurants, and other institutional and commercial projects. The firm is, or has been involved in projects covering the entire southern portion of British Columbia, ranging from Vancouver to Sparwood, and as far north as Port Hardy and Williams Lake.

The list of clients with whom this experience has been developed includes Architects, School Districts, Hospital Boards, Regional Districts, Provincial and Federal Government Agencies, Utility Companies and private concerns.

PROJECT TEAM

Don Poole, P. Eng.
Derrick Huber, P. Eng.

METHODOLOGY

The professional attitude of Poole & Associates Mechanical Engineering Ltd. has been developed to provide our clients with the quality of service expected of the engineering profession. We believe proper attention to client's wishes and desires, with proper analysis of governing circumstances such as economics, of installation, operating, or replacement, coupled with good Engineering practice, will lead to the ultimate success of the project.

Construction period services include maintaining control over portions of the project designed by Poole and Associates Mechanical Engineering Ltd. Review of construction schedules, equipment specifications, installation standards, verification of progress draws, confirmation of a completed project, and instructions to operating staff are standard services.

The project remains an ongoing task after the construction period is over. A constant dialogue is continued with the owners and operating staff, other consultants, and the contractors involved. This ensures that the installed systems are fine tuned and operating to the level of the original specification.

SUSTAINABILITY and ENERGY EFFICIENCY

We have been involved extensively with a number of School Districts in regards to energy conservation. This involves evaluating energy consumption rates District wide, evaluating the performance of the mechanical systems and making recommendations to improve performance and executing the upgrades within budgets available.

Poole and Associates have completed a number of schools with LEED and LEED Equivalency as detailed on our attached "Related School Experience" which also outlines our success with energy usage.

Don Poole - Falcon Engineering Ltd.**ERIKA LAMBERT-SHIRZAD***Barrister & Solicitor*

From: Patrick Lambert <Patrick.Lambert@geo-energie.com>
Sent: May-19-12 6:54 AM
To: daniel.booy; Jeff Quibell; dpoole@pooleandassociates.bc.ca
Cc: Alexandre St-Pierre
Subject: JCI project update
Attachments: image001.jpg; S-851 Engineering proposal BC projects 2012.pdf
Importance: High

BORDEN LADNER GERVAIS LLP
 1200 Waterfront Centre, 200 Burrard Street
 P.O. Box 48600, Vancouver, Canada V7X 1T2
 604-632-3461

This is Exhibit " B " referred to in the
 affidavit of DONALD POOLE

made before me on AUGUST 2 20 18

ERIKA LAMBERT-SHIRZAD

A Commissioner for taking Affidavits
 for British Columbia

Hello All,

IT'S A GO! ☺

Johnson Controls (JCI) western Manager called us Friday to inform us that we were Conditionally awarded the contract for their Fortis-BC projects.

Our team was chosen among 3 teams to kick start JCI' energy project incursion in Western Canada.

There is ONE condition attached to the deal however and it is: "Prove us that your team can do the job"

So, their intention is to award only one school first, if our team delivers, then we get Delta and Abotsford projects. If it continues going well, then we get all the rest.

Obviously, this "Test" is not free of charges. Actually it will help both JCI and us to evaluate and fine tune the effort required to deliver a quality job, with respect to JCI-Fortis expectations.

Please find attached the proposal sent to JCI. There is no price attached to the proposal. The proposal defines the work to be done and present your 3 firms as our first line of action on site, with respect to key intervention, this might change depending on the project and the time frame.

Johnson Controls is planning a kick off coordination meeting this coming Wednesday. JCI wants all of us to participate at the meeting so we can introduce ourselves to their project management team and to discuss about the strategy to put in place.

Agenda :

1) Team experience and availability

2) Steps :

- 1- Soil and geothermal field assessment
- 2- Geothermal field (Closed Loop) detailed engineering (for construction)
- 3- Mechanical room detailed engineering (for construction)
- 4- Installation supervision
- 5- Assistance to project start-up

3) Price

4) Schedule

Meeting time is set at 11 am Pacific time, via phone conference

Before this meeting, we need to get together to discuss about the project.

I propose either Monday (I am available all day) or Tuesday (I am available between 7h00 AM and 10 AM PT, and then from 1 PM to 6 PM PT)

Please reply to this email giving at least 2 windows of availability so we can have every one on the line for our meeting.

I'll come back to you with a call in number.

Cheers!

Patrick Lambert, ing. CGD

Président

Geo-Energie inc.

1351 Gay-Lussac

Boucherville, QC, J4B 7K1

T: 450-641-9128

F: 514-221-3243

www.geo-energie.com



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The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

Don Poole - Falcon Engineering Ltd.

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: May-25-12 12:23 PM
To: Louis-Michel.Raby@jci.com
Cc: 'Patrick Lambert'; Jeff Quibell
Subject: Delta - Question

This is Exhibit "C" referred to in the affidavit of DONALD POOLE made before me on AUGUST 2 20 18 ERIKA LAMBERT-SHIRZAD
A Commissioner for taking Affidavits for British Columbia

Louis-Michel

To review the mechanical systems it will be helpful to have access to:

1. 3 years of energy data.
2. Ministry asset area - so that we can compare energy data to other facilities.
3. Key plans for the schools. Usually on pdf. Usually have room numbers. Usually 11x17s.
4. ACAD drawings of floor plans.
5. Scans, pdf, of mechanical drawings.
6. Scans of selective sections of the maintenance manuals. Balancing reports. Shop drawings for all primary and terminal components that are part of the hydronic systems.
7. Owners preferred balancing agent. To confirm flows and pressure drops if pertinent.

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48800, Vancouver, Canada V7X 1T2
604-632-3461

To complete specification of mechanical systems it will be helpful to know:

8. Owners preferred chemical treatment supplier.
9. Owners preferred pump supplier.
10. Owner ok with Victaulic couplings with glycol systems.

Thanks

Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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This is Exhibit " DL " referred to in the affidavit of DONALD POOLE made before me on AUGUST 2 2018

ERIKA LAMBERT-SHIRZAD
A Commissioner for taking Affidavits for British Columbia

32

Don Poole - Falcon Engineering Ltd.

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: May-29-12 9:21 AM
To: Patrick Lambert
Cc: Jeff Quibell
Subject: Delta - Likely Candidates from a mechanical standpoint

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48600, Vancouver, Canada V7X 1T2
604-632-3461

Patrick

My sense from the tour that the buildings to start in depth review are:

1. English Bluff
2. School Board office/Delta Manor (I almost see this as one project because conceptually, we could make that a common field)
3. Neilson Grove
4. South park
5. Delview
6. North delta

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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Don Poole - Falcon Engineering Ltd.

From: patrick.lambert@geo-energie.com
Sent: May-29-12 10:19 AM
To: Don; Alexandre St-Pierre; Patrick Lambert
Cc: 'Jeff Quibell'
Subject: Re: Delta - Data needed for in depth review

Hello Don,

Thanks for your pertinent questions.

I'll address them as soon as I can, this week. We already got all plans info from Delta SD and are starting a more in depth review of some sites this morning, which will serve at better understanding our scope of work.

Best regards,

PI

Envoyé par mon BlackBerry Wireless Handheld

From: "Don" <dpoole@pooleandassociates.bc.ca>
Date: Tue, 29 May 2012 09:26:29 -0700
To: 'Patrick Lambert' <Patrick.Lambert@geo-energie.com>
Cc: 'Jeff Quibell' <jquibell@jdaqeng.com>
Subject: Delta - Data needed for in depth review

Patrick

I don't know what was said at the meeting but this question still stands.

To do an **in-depth review** the mechanical systems it will be helpful to have access to:

1. 3 years of energy data.
2. Ministry asset area - so that we can compare energy data to other facilities.
3. Key plans for the schools. Usually on pdf. Usually have room numbers. Usually 11x17.
4. ACAD drawings of floor plans.
5. Scans, pdf, of mechanical drawings.
6. Scans of selective sections of the maintenance manuals. Balancing reports. Shop drawings for all primary and terminal components that are part of the hydronic systems.
7. Owners preferred balancing agent. To confirm flows and pressure drops if pertinent.

To complete specification of mechanical systems it will be helpful to know:

8. Owners preferred chemical treatment supplier.
9. Owners preferred pump supplier.
10. Owner ok with Victaulic couplings with glycol systems.

It seems to me that Debra Eng with the Delta School district would be the best suited to provide the answers, but really that is up to them.

Thanks

Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

This is Exhibit "D2" referred to in the affidavit of DONAUD POOLE made before me on AUGUST 2 20 18

DP

ERIKA LAMBERT-SHIRZAD

A Commissioner for taking Affidavits for British Columbia

Don Poole - Falcon Engineering Ltd.

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: May-29-12 9:26 AM
To: Patrick Lambert
Cc: Jeff Quibell
Subject: Delta - Data needed for in depth review

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48600, Vancouver, Canada V7X 1T2
604-692-8461

Patrick

I don't know what was said at the meeting but this question still stands.

To do an **in-depth review** the mechanical systems it will be helpful to have access to:

1. 3 years of energy data.
2. Ministry asset area - so that we can compare energy data to other facilities.
3. Key plans for the schools. Usually on pdf. Usually have room numbers. Usually 11x17.
4. ACAD drawings of floor plans.
5. Scans, pdf, of mechanical drawings.
6. Scans of selective sections of the maintenance manuals. Balancing reports. Shop drawings for all primary and terminal components that are part of the hydronic systems.
7. Owners preferred balancing agent. To confirm flows and pressure drops if pertinent.

To complete specification of mechanical systems it will be helpful to know:

8. Owners preferred chemical treatment supplier.
9. Owners preferred pump supplier.
10. Owner ok with Victaulic couplings with glycol systems.

It seems to me that Debra Eng with the Delta School district would be the best suited to provide the answers, but really that is up to them.

Thanks

Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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This is Exhibit "D3" referred to in the affidavit of DONAUD POOLE made before me on AUGUST 2 2018 ERIKA LAMBERT-SHIRZAD A Commissioner for taking Affidavits for British Columbia

Don Poole - Falcon Engineering Ltd.

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: May-29-12 9:34 AM
To: Patrick Lambert
Cc: Jeff Quibell
Subject: Delta - other schools to consider for possible GSHP

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48600, Vancouver, Canada V7X 1T2
604-622-8481

Patrick

Upgrading the building that utilize the "max air" style of unit may be the least invasive.

I had discussed with Jim and Debra the other schools that use Max air unit and the mentioned:

- 1. Annieville Elementary – apparently boilers have been recently upgraded
- 2. Sunshine Hills Elementary – apparently boilers have been recently upgraded

You may want to consider reviewing those sites as well while you are there.

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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This is Exhibit "D4" referred to in the affidavit of DONALD POOLE

made before me on AUGUST 2 20 18

ERIKA LAMBERT-SHIRZAD

A Commissioner for taking Affidavits for British Columbia

Don Poole - Falcon Engineering Ltd.

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: May-29-12 9:40 AM
To: Patrick Lambert
Cc: Jeff Quibell
Subject: Delta - Boilers

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48600, Vancouver, Canada V7X 1T2
604-632-3461

Patrick

All the building that have the cast iron hydrotherm style boilers, should be considered for upgrade as part of this program.

They are energy inefficient , incompatible with ground systems and also create issues with B52.

It may not have been part of the program before but that is not our fault, nor is it correct.

It should be added now.

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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This is Exhibit "05" referred to in the affidavit of DONALD POOLE made before me on AUGUST 2 20 18
~~ERIKA LAMBERT-SHIRZAD~~
A Commissioner for taking Affidavits for British Columbia

37

Don Poole - Falcon Engineering Ltd.

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: May-29-12 9:48 AM
To: Patrick Lambert
Cc: Jeff Quibell
Subject: Delta - Budgeting

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48600, Vancouver, Canada V7X 1T2
604-632-3481

Patrick

I don't know how or where the original budgets were made but my sense is that it does not matter in a overall sense.

Now that we have a opportunity to take a sober second look, with some detailed engineering, that we should do our own estimates based on our own requirements.

We should respect that we are fundamentally creating a supply side energy management system, but we have to recognize that there may be work required for the terminal system to accept conventional geothermal temperatures.

On the other hand, some consideration should be made for higher temperature supply systems, if we consider that upgrading the terminal systems is too invasive.

The final option would be, if we determine that upgrading the primary and terminal system is too costly to make sense, then a boiler upgrade alone will still achieve significant savings...

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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This is Exhibit "06" referred to in the affidavit of DONALD POOLE made before me on AUGUST 2 2018 ERIKA LAMBERT-SHIRZAD

38

Don Poole - Falcon Engineering Ltd.

A Commissioner for taking Affidavits for British Columbia

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: May-29-12 9:53 AM
To: Patrick Lambert
Cc: Jeff Quibell
Subject: Delta - English Bluff - Max Air Shop drawings.

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48600, Vancouver, Canada V7X 1T2
604-632-3461

Patrick

There is an outside chance that the coils in the max air units were sized for EWT of 120 DegF.

While you are there, see if you can get a copy of the shop drawings. we can make quick determination if this will be an easy install from a mechanical standpoint.

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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made before me on AUGUST 2 20 18

ERIKA LAMBERT-SHIRZAD
A Commissioner for taking Affidavits
for British Columbia

Don Poole - Falcon Engineering Ltd.

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: May-29-12 10:09 AM
To: Patrick Lambert
Cc: Jeff Quibell
Subject: Delta - Non conventional GSHP
Attachments: MH Applications.pdf

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48600, Vancouver, Canada V7X 1T2
604-632-3461

39

Patrick

There may be a facility worth reviewing in your neck of the woods. For all I know you designed it.

Either way, worth considering.

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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From: Tom Simpson [mailto:tom.simpson@engineeredair.com]
Sent: 29-May-12 10:01 AM
To: 'Don'
Subject: FW: MH applications / EngA heat only heat pump

Hi Don

I asked our product manager to forward a couple references. See attached. The retirement home north of Montreal is a good one. If you need any more specifics please let me know.

Johan Martenson is the founder of Creotech which EngA purchased a couple years ago and he is based out of Barrie, Ontario. He travels frequently, and if the need arises, he could meet with your 'guys' in Montreal to discuss the specifics of the application. Also, Johan will be assisting us with presentations in Vancouver in early July and we could possibly meet with you and/or the group from Delta.

Regards,

Tom Simpson, ASCT
Engineered Air - Vancouver
Office 604-736-2420
Cel 604-230-0273

From: Johan Martensson [mailto:johan.martensson@engineeredair.com]
Sent: Tuesday, May 29, 2012 7:23 AM
To: 'Tom Simpson'
Subject: MH applications

Toni

Here are the write up on two of the MH applications

Regards,

Johan Martensson
Product Manager – Creotech
Engineered Air
Barrie, Ontario
O – 705-725-1096 x-201
C – 705-796-6240

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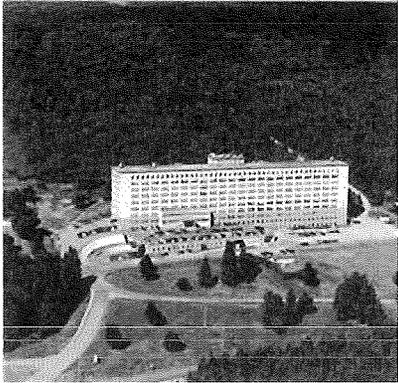
The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

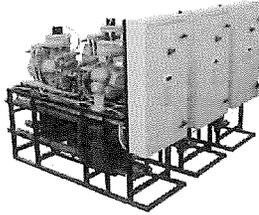
EngA ENGINEERED AIR

Creotech **MH**

HEAT RECOVERY



**(3) MH8042/W/C Units
1,230 MBH
Producing 160F water
For Kitchen/Laundry/Space heating
From ground source 32F**



**Replace Oil boilers
Piping & radiators/fan-coils reused**

**CSSS Antoine-Labelle
(Mont-Laurier, QC) Retirement Complex**

This installation is a retirement complex in the Laurentian Mountains ~2 hours north of Montreal.

Previously they had oil boilers providing the heat for the facility. Being in the mountains there was no natural gas available.

The MH units generate 160F water. The 160F allows the pump and piping to be reused and thereby make the ROI of the project that much better.

When the heat load is not as high then the set point is lowered. This means the pressure ratio of the compressor is less and the COP that much higher.

The MH units are used for the kitchen, Laundry and some common areas.

EngA ENGINEERED AIR

Creotech **MH**

HEAT RECOVERY

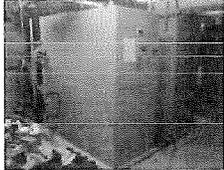
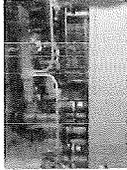
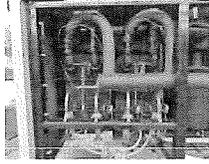
(2) MH802 Units
Producing 150F water
for pool and domestic hot water




Port Hawkesbury NS
SAERC Pool/arena

Source

- Cond loop from Ice Rink Chiller
- Ground loop

Dual Source
1 or 2 evap
Maximize performance

Sports complex in Port Hawkesbury in NS

There are two ice pads, pool, gym and common areas

The ice making machines have it condensing loop run under the parking lot with in a horizontal loop

They wanted to take some of that heat and use it to heat up the pool and also the domestic water

The domestic water has two storage tanks which require a minimum temperature of 140F

Hence the MH units are operating at 150F, which allows room for the secondary HX and oscillation in the control temperature.

Also when the ice machines are off and the loop temperature runs at approx 45F instead of the higher 90F we have a second evaporator with a second TXV on each loop to take more increase the glycol flow and end up with the same capacity.

Don Poole - Falcon Engineering Ltd.

From: Patrick Lambert <Patrick.Lambert@geo-energie.com>
Sent: May-29-12 10:34 PM
To: Don
Cc: Jeff Quibell; Daniel Booy; Alexandre St-Pierre
Subject: RE: Delta - Non conventional GSHP
Attachments: image001.jpg

Hello Don,

I was not aware that Creotec was bought by Eng Air.,

Thanks for the info.

Best regards,

Patrick Lambert, ing. CGD

Président

Geo-Energie inc.

1351 Gay-Lussac

Boucherville, QC, J4B 7K1

T: 450-641-9128

F: 514-221-3243

www.geo-energie.com



De : Don [mailto:dpoole@pooleandassociates.bc.ca]

Envoyé : 29 mai 2012 13:00

À : Patrick Lambert

Cc : 'Jeff Quibell'

Objet : Delta - Non conventional GSHP

Patrick

There may be a facility worth reviewing in your neck of the woods. For all I know you designed it.

Either way, worth considering.

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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From: Tom Simpson [mailto:tom.simpson@engineeredair.com]
Sent: 29-May-12 10:01 AM
To: 'Don'
Subject: FW: MH applications / EngA heat only heat pump

Hi Don

I asked our product manager to forward a couple references. See attached. The retirement home north of Montreal is a good one. If you need any more specifics please let me know.

Johan Martenson is the founder of Creotech which EngA purchased a couple years ago and he is based out of Barrie, Ontario. He travels frequently, and if the need arises, he could meet with your 'guys' in Montreal to discuss the specifics of the application. Also, Johan will be assisting us with presentations in Vancouver in early July and we could possibly meet with you and/or the group from Delta.

Regards,

Tom Simpson, AScT
Engineered Air - Vancouver
Office 604-736-2420
Cel 604-230-0273

From: Johan Martensson [mailto:johan.martensson@engineeredair.com]
Sent: Tuesday, May 29, 2012 7:23 AM
To: 'Tom Simpson'
Subject: MH applications

Tom

Here are the write up on two of the MH applications

Regards,

Johan Martensson
Product Manager – Creotech
Engineered Air
Barrie, Ontario
O – 705-725-1096 x-201
C – 705-796-6240

This is Exhibit "E" referred to in the affidavit of DONALD POOLE made before me on AUG 7 20 18

Don Poole - Falcon Engineering Ltd.

From: Patrick Lambert <Patrick.Lambert@geo-energie.com>
Sent: May-29-12 10:15 PM
To: Don
Cc: Jeff Quibell; Alexandre St-Pierre; Daniel Booy
Subject: Delta SD update
Attachments: image001.jpg

ERIKA LAMBERT - SHIRZAD
A Commissioner for taking Affidavits
for British Columbia

45

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
PO, Box 48800, Vancouver, Canada V7X 1T2
604-632-3461

Hello Don,

Today, we did a closer review of 3 sites:

- Delta Head office
- Delta Manor (beside Head office)
- Neilson Grove

These will be the 3 sites we will first work on.

This will allow every one to:

- Better understand the project scope
- Better understand our role and responsibilities, as the engineering team of JCI for those projects
- Better understand the limitation of our role, as the engineering team of JCI for those projects
- Ask questions
- Get answers
- Adjust our intervention strategies
- Give us time to come up with presentable first drafts, for discussions (JCI – Fortis) to establish a solid framework.

Things that are becoming clearer are the following:

- 1- Our role, as the engineering team for this project, for JCI, is solely to implement the geothermal system within the mechanical room.
 - a. JCI made it clear today that, for example, if we see something in the mechanical room installation that prevents the actual (presently in place, as it is) heating system to operate properly (as the undersize pump Daniel pointed out today at Delta HQ) our role is limited to raising the flag to JCI (What is concerned, how it does affect potentially the system operation, how could it as affect the geothermal system, what could be done do solve it). JCI will then address it to Fortis who will decide if and how this situation will be addressed.
- 2- We will not address any elements with regards to distribution system outside the mechanical room, (within the framework of this mandate), it could eventually be addressed differently, but its way too early in the project development for JCI to address it with Fortis
- 3- We will not address any other energy efficiency measures than the one regarding the production of space heating hot water, through geothermal heat pump, within the mechanical rooms. (For examples DHW pre-heat is not considered and wont probably ever be, nor fresh air pre-heating, etc)

This may sound awkward, but we need to get the full picture of the agreement and the strategies being developed here before making judgments.

Simply put this is how it goes:

- Fortis bought Mechanical room setup from SD.
- Fortis rents back the room to SD on a watt-hour output basis (More output = more revenues)
- JCI mandate, is to minimize the input to the mechanical room , in order to achieve the output.
- Our role is to design a geothermal system that will allow the reduction of that input.

- Both JCI and Fortis made their due diligence, to preliminary select which school would better be fitted for this project.
- Fortis, Delta SD, and JCI are aware of the importance of making this project a success, as a lot of attention is being attracted by this new type of energy-financial approach.
- JCI will provide us with their guidelines, they already started that, but more will be coming as we develop the project. That's why we are only starting with 3 sites, on a very preliminary approach.
- One key factor will come from output temperature required per sites.
- Preliminary information from JCI and Delta SD tends to confirm that a 55C output would be able to do all the job the geothermal heat pump is anticipated to do, which would be to provide most of the heat, up to 50% peak load.
- Even if the heat pump would then be turned off at that point, it would not be a major issue.

Today, we were able to preliminarily establish suitable location on 3 sites for heat pumps, key piping arrangement elements, preliminary piping entry points to the building and geothermal headers location.

We will send you shortly all the notes we took (Daniel) and the electronic version of the plans for all sites.

I am looking forward discussing this verbally with you all in the next couple of days

Best regards,

Patrick Lambert, ing. CGD

Président

Geo-Energie inc.

1351 Gay-Lussac

Boucherville, QC, J4B 7K1

T: 450-641-9128

F: 514-221-3243

www.geo-energie.com



De : Don [mailto:dpoole@pooleandassociates.bc.ca]
Envoyé : 29 mai 2012 12:45
À : Patrick Lambert
Cc : 'Jeff Quibell'
Objet : Delta - English Bluff - Max Air Shop drawings.

Patrick

There is an outside chance that the coils in the max air units were sized for EWT of 120 DegF.

While you are there, see if you can get a copy of the shop drawings. we can make quick determination if this will be an easy install from a mechanical standpoint.

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

This is Exhibit " F " referred to in the
affidavit of DONALD POOLE
made before me on AUGUST 20 18
ERIKA LAMBERT-SHIRZAD
A Commissioner for taking Affidavits
for British Columbia

Don Poole - Falcon Engineering Ltd.

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: June-06-12 6:21 PM
To: patrick.lambert@geo-energie.com
Subject: RE: Delta - Data needed for in depth review

Patrick

June 19th will come pretty fast.

If we need to expedite some answers on the mechanical side for the 19th on the three project, we can attend site.

If one of the school district personnel (Debra Eng has a mechanical background if I recall) could assist us with the record search, we could likely get the Information needed quickly and efficiently.

On the other hand, Daniel is local and if time available, he may be in a better position to assist.

As you say, you have item 5, we only need items 1,2,3,4 and 6 for the meeting.

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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From: patrick.lambert@geo-energie.com [mailto:patrick.lambert@geo-energie.com]
Sent: 29-May-12 10:19 AM
To: Don; Alexandre St-Pierre; Patrick Lambert
Cc: 'Jeff Quibell'
Subject: Re: Delta - Data needed for in depth review

Hello Don,

Thanks for your pertinent questions.

I'll address them as soon as I can, this week. We already got all plans info from Delta SD and are starting a more in depth review of some sites this morning, which will serve at better understanding our scope of work.

Best regards,

Pl

Envoyé par mon BlackBerry Wireless Handheld

From: "Don" <dpoole@pooleandassociates.bc.ca>
Date: Tue, 29 May 2012 09:26:29 -0700

To: 'Patrick Lambert' <Patrick.Lambert@geo-energie.com>
Cc: 'Jeff Quibell' <jquibell@jrdqeng.com>
Subject: Delta - Data needed for in depth review

Patrick

I don't know what was said at the meeting but this question still stands.

To do an **in-depth review** the mechanical systems it will be helpful to have access to:

1. 3 years of energy data.
2. Ministry asset area - so that we can compare energy data to other facilities.
3. Key plans for the schools. Usually on pdf. Usually have room numbers. Usually 11x17.
4. ACAD drawings of floor plans.
5. Scans, pdf, of mechanical drawings.
6. Scans of selective sections of the maintenance manuals. Balancing reports. Shop drawings for all primary and terminal components that are part of the hydronic systems.
7. Owners preferred balancing agent. To confirm flows and pressure drops if pertinent.

To complete specification of mechanical systems it will be helpful to know:

8. Owners preferred chemical treatment supplier.
9. Owners preferred pump supplier.
10. Owner ok with Victaulic couplings with glycol systems.

It seems to me that Debra Eng with the Delta School district would be the best suited to provide the answers, but really that is up to them.

Thanks

Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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_____ Information from ESET NOD32 Antivirus, version of virus signature database 7201 (20120606) _____

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_____ Information from ESET NOD32 Antivirus, version of virus signature database 7271 (20120704) _____

The message was checked by ESET NOD32 Antivirus.

This is Exhibit " G " referred to in the affidavit of DONALD POOLE made before me on AUGUST 20 18 ERIKA LAMBERT-SHIRZAD

A Commissioner for taking Affidavits for British Columbia

50

Don Poole - Falcon Engineering Ltd.

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: June-07-12 8:36 AM
To: Patrick Lambert
Cc: Jeff Quibell; Adam James; daniel.booy
Subject: FW: Delta Schools Project - MH heater brochure
Attachments: MH BROCHURE.pdf

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48600, Vancouver, Canada V7X 1T2
604-632-3461

Patrick

Please find attached some technical data on the 160 DegF Chillers. Might be a good fit once we figure out the temperature requirements of the terminal equipment.

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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From: Tom Simpson [mailto:tom.simpson@engineeredair.com]
Sent: 6-Jun-12 4:36 PM
To: 'Don'
Subject: Delta Schools Project - MH heater brochure

Hi Don

Attached is a better copy of the complete MH brochure that can be distributed, as requested.

We still want to handle every case as a custom selection but at least this gives you an idea of the listed capacities. The model number shows *nominal* capacity and compressors i.e. MH3002W = 300 MBH (25 tons), 2 compressors. That same unit at 30 F source water and generating 160 F provides approx. 170 MBH (14 tons). All our high temp units will use R134A refrigerant and reciprocating semi-hermetic compressors (likely Bitzer). The EngA MH series heating only heat pump has all the same modular benefits as the MC series chiller.

Let me know when you are ready to run the selection specifics.

Tom Simpson, ASCT
Engineered Air - Vancouver
Office 604-736-2420
Cel 604-230-0273

Information from ESET NOD32 Antivirus, version of virus signature database 7201 (20120606)

MH SERIES

COMMERCIAL & INDUSTRIAL WATER-TO-WATER HEATING HEAT PUMPS



Features / Options:

- Water temperatures up to 160°F (71.1°C) from source fluid temperatures as low as 30°F (-1.1°C)
- Single stand alone heater or up to 12 units in a modular configuration
- Service any module while the rest of the system continues to heat
- Display showing descriptive system information on each module
- Controller automatically removes serviced unit
- Victaulic water-header connections
- Fits through doors and into elevators
 - Low and Mid temperature models – 28" (711 mm) wide doors
 - High temperature models – 34" (864mm) wide doors
- Easy access to major components
- Simple system expansion
- Match capacity at any load with multiple units
- Master controller for control of modular configurations



Intertek

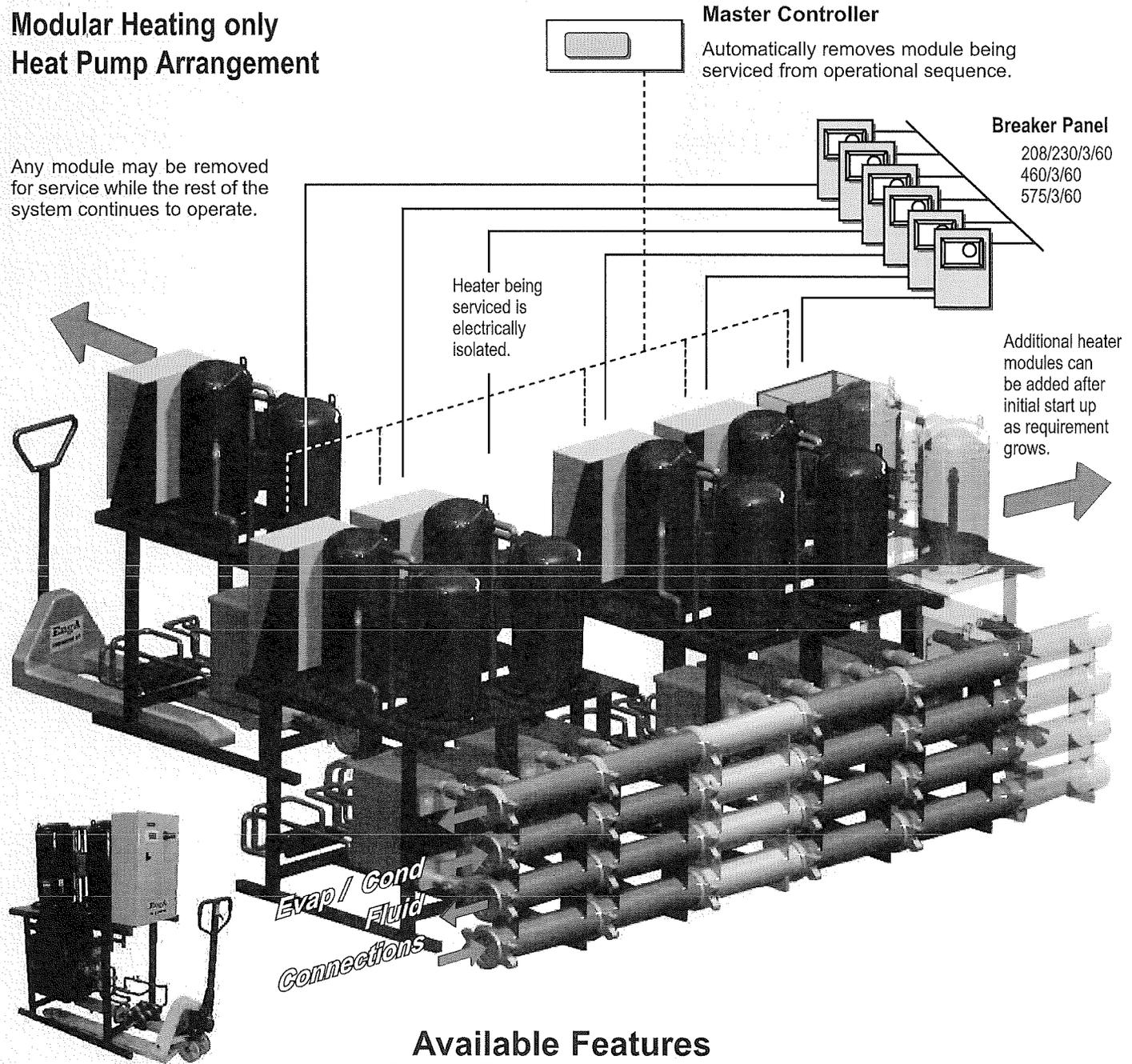
EngA®

ENGINEERED AIR®

Creotech

Modular Heating only Heat Pump Arrangement

Any module may be removed for service while the rest of the system continues to operate.



Available Features

(s = Standard Features, o = Optional Features)

CASING / FINISHES

- s 2" (51 mm) square tubing
- s Black tubing / gray control panel
- o Acoustical housing
- o Special corrosion protection
- o Epoxy paint

REFRIGERANT SIDE

- s R-134a or R-410A refrigerant
- o Hot gas bypass valves

WATER SIDE

- s 6" (152 mm) headers with isolation valves
- o Automatic isolation valves
- o Y- strainers
- o Water regulating valves

CONTROLS

- s Dedicated logic controller
- s Dead front disconnect
- s Hours of operation
- o Phase loss detection
- o BACnet
- o Various control strategies



Sales Offices Throughout North America

Manufacturing Facilities:

Newmarket, Ontario
FORM MH0CT11

Calgary & Edmonton, Alberta
www.engineeredair.com

DeSoto, Kansas

Due to continuous product development, dimensions and capacities are subject to change without notice.

**150°F (65.6°C) Heating Fluid Temperature ⁽¹⁾ (Leaving Condenser)
 50°F (10°C) Source Fluid Temperature ⁽²⁾ (Entering Evaporator)
 High Temperature Heat Pump Performance Data ⁽³⁾**

Model	Heating Capacity		Power Input ⁽⁴⁾ kW	COP ⁽⁵⁾	Heating Fluid		Source Fluid		Heating Fluid		Source Fluid	
	MBH	kW			US gpm	Press. Drop ⁽⁶⁾ ft. of H ₂ O	US gpm	Press. Drop ⁽⁶⁾ ft. of H ₂ O	Flow Rate L/s	Press. Drop ⁽⁶⁾ kPa	Flow Rate L/s	Press. Drop ⁽⁶⁾ kPa
MH922/W	91.6	26.8	12.0	2.24	19.0	7.3	20.0	5.2	1.2	21.8	1.3	15.5
MH1112/W	111.4	32.6	13.9	2.34	23.0	6.9	25.0	6.2	1.5	20.6	1.6	18.5
MH1292/W	128.8	37.7	15.5	2.43	26.0	6.7	30.0	6.8	1.6	20.0	1.9	20.3
MH1572/W	157.4	46.1	18.9	2.43	32.0	7.7	36.0	6.9	2.0	23.0	2.3	20.6
MH1862/W	186.0	54.5	21.7	2.51	38.0	6.9	43.0	7.2	2.4	20.6	2.7	21.5
MH2162/W	216.0	63.3	25.5	2.49	44.0	7.7	50.0	8.3	2.8	23.0	3.2	24.8
MH2592/W	259.2	75.9	30.3	2.51	53.0	8.0	60.0	4.5	3.3	23.9	3.8	13.4
MH3002/W	300.0	87.9	35.0	2.51	61.0	9.2	69.0	4.7	3.8	27.5	4.4	14.0
MH3482/W	348.2	102.0	40.7	2.51	71.0	9.5	80.0	4.8	4.5	28.4	5.0	14.3
MH3862/W	386.2	113.2	44.8	2.53	79.0	9.4	89.0	4.9	5.0	28.1	5.6	14.6
MH4522/W	452.0	132.4	52.4	2.53	92.0	9.6	104.0	5.0	5.8	28.7	6.6	14.9
MH5262/W	526.0	154.1	60.8	2.53	107.0	10.1	121.0	5.3	6.8	30.2	7.6	15.8
MH6262/W	626.0	183.4	73.0	2.51	127.0	10.8	143.0	9.2	8.0	32.2	9.0	27.5
MH7162/W	716.0	209.8	83.4	2.52	146.0	11.1	163.0	9.2	9.2	33.1	10.3	27.5
MH8382/W	838.0	245.5	97.4	2.52	171.0	11.4	191.0	6.4	10.8	34.0	12.1	19.1

- Notes: (1) Heating (condenser) fluid data is based on water and a 10°F (5.6°C) ΔT.
 (2) Entering source (evaporator) fluid data is based on water and a 6°F (3.3°C) ΔT.
 (3) Shaded values are in SI units.
 (4) Power input includes compressors and control circuit.
 (5) To convert COP to EER, use: EER = 3.413 X COP.
 (6) Pressure drops are for the heat exchanger only. They do not include the common 6" (152 mm) diameter fluid header.

Due to continuous product development, dimensions and capacities are subject to change without notice.

Performance Data for High Temperature Heating Only Heat Pumps ^(1,2,3)

Model	Entering Source (Evap.) Fluid Temp. ^(5,6,7,8)	Heating Fluid Temperature ⁽⁴⁾ (Leaving Condenser)											
		140°F (60.0°C)				150°F (65.6°C)				160°F (71.1°C)			
		Heating Capacity		Power Input ⁽⁹⁾	COP ⁽¹⁰⁾	Heating Capacity		Power Input ⁽⁹⁾	COP ⁽¹⁰⁾	Heating Capacity		Power Input ⁽⁹⁾	COP ⁽¹⁰⁾
		MBH	kW	kW		MBH	kW	kW		MBH	kW	kW	
°F (°C)	MBH	kW	kW	MBH	kW	kW	MBH	kW	kW	kW	COP ⁽¹⁰⁾		
MH922/W	30 (-1.1)	61.4	18.0	9.1	1.99	56.8	16.6	9.2	1.81	52.2	15.3	9.4	1.63
	40 (4.4)	78.2	22.9	10.3	2.22	73.0	21.4	10.7	2.01	68.0	19.9	11.0	1.82
	50 (10)	97.6	28.6	11.5	2.49	91.6	26.8	12.0	2.24	85.6	25.1	12.5	2.01
	60 (15.6)	110.4	32.3	12.1	2.66	103.8	30.4	12.7	2.39	97.2	28.5	13.3	2.14
	70 (21.1)	134.2	39.3	13.1	3.01	126.4	37.0	13.9	2.67	118.8	34.8	14.6	2.38
MH1112/W	30 (-1.1)	75.8	22.2	10.8	2.06	71.4	20.9	11.2	1.87	67.4	19.7	11.6	1.71
	40 (4.4)	95.4	28.0	12.1	2.31	90.0	26.4	12.6	2.10	85.0	24.9	13.1	1.90
	50 (10)	117.8	34.5	13.3	2.60	111.4	32.6	13.9	2.34	105.2	30.8	14.6	2.12
	60 (15.6)	133.0	39.0	14.0	2.79	125.8	36.9	14.7	2.51	118.8	34.8	15.4	2.26
	70 (21.1)	161.2	47.2	15.0	3.15	152.6	44.7	15.9	2.82	144.2	42.3	16.7	2.52
MH1292/W	30 (-1.1)	84.6	24.8	11.5	2.15	76.8	22.5	11.5	1.95	69.4	20.3	11.5	1.77
	40 (4.4)	110.6	32.4	13.4	2.42	101.0	29.6	13.5	2.19	91.6	26.8	13.6	1.98
	50 (10)	140.4	41.1	15.2	2.70	128.8	37.7	15.5	2.43	117.4	34.4	15.6	2.20
	60 (15.6)	160.4	47.0	16.3	2.88	147.6	43.2	16.7	2.60	134.8	39.5	16.9	2.34
	70 (21.1)	197.8	58.0	17.9	3.23	182.8	53.6	18.5	2.90	167.4	49.0	18.9	2.60
MH1572/W	30 (-1.1)	104.4	30.6	14.1	2.17	94.8	27.8	14.1	1.97	85.2	25.0	14.0	1.78
	40 (4.4)	135.4	39.7	16.4	2.42	123.8	36.3	16.6	2.19	112.4	32.9	16.6	1.99
	50 (10)	171.2	50.2	18.6	2.70	157.4	46.1	18.9	2.43	143.4	42.0	19.1	2.20
	60 (15.6)	195.2	57.2	19.8	2.88	180.0	52.7	20.3	2.60	164.4	48.2	20.6	2.34
	70 (21.1)	240.0	70.3	21.8	3.22	222.2	65.1	22.6	2.89	203.6	59.7	23.0	2.60
MH1862/W	30 (-1.1)	122.0	35.7	16.1	2.22	110.6	32.4	16.1	2.02	99.2	29.1	16.0	1.82
	40 (4.4)	159.2	46.6	18.7	2.49	145.6	42.7	19.0	2.25	132.0	38.7	19.1	2.03
	50 (10)	202.0	59.2	21.3	2.78	186.0	54.5	21.7	2.51	169.8	49.8	22.1	2.25
	60 (15.6)	230.8	67.6	22.7	2.97	213.0	62.4	23.4	2.67	195.0	57.1	23.8	2.40
	70 (21.1)	284.6	83.4	25.0	3.33	263.6	77.2	25.9	2.98	242.2	71.0	26.7	2.66
MH2162/W	30 (-1.1)	141.0	41.3	18.6	2.23	128.0	37.5	18.6	2.01	115.6	33.9	18.7	1.81
	40 (4.4)	184.4	54.0	21.8	2.48	168.8	49.5	22.1	2.24	153.4	44.9	22.3	2.02
	50 (10)	234.6	68.7	24.9	2.76	216.0	63.3	25.5	2.49	197.4	57.8	25.9	2.23
	60 (15.6)	268.4	78.6	26.7	2.95	247.8	72.6	27.4	2.65	227.0	66.5	28.0	2.37
	70 (21.1)	331.6	97.2	29.5	3.29	307.0	90.0	30.6	2.94	282.2	82.7	31.5	2.63
MH2592/W	30 (-1.1)	171.6	50.3	22.4	2.25	159.8	46.8	22.9	2.05	148.6	43.5	23.4	1.86
	40 (4.4)	220.2	64.5	25.8	2.50	206.0	60.4	26.6	2.27	192.4	56.4	27.4	2.05
	50 (10)	276.2	80.9	29.1	2.78	259.2	75.9	30.3	2.51	242.6	71.1	31.5	2.26
	60 (15.6)	313.8	91.9	31.0	2.97	294.8	86.4	32.4	2.67	276.2	80.9	33.9	2.39
	70 (21.1)	384.2	112.6	33.8	3.33	361.4	105.9	35.7	2.96	339.0	99.3	37.6	2.64
MH3002/W	30 (-1.1)	199.4	58.4	25.9	2.25	184.8	54.1	26.3	2.06	170.4	49.9	26.6	1.88
	40 (4.4)	255.8	74.9	30.0	2.50	238.4	69.9	30.7	2.27	221.0	64.8	31.4	2.06
	50 (10)	321.0	94.1	33.8	2.78	300.0	87.9	35.0	2.51	279.4	81.9	36.1	2.27
	60 (15.6)	364.8	106.9	36.1	2.96	341.4	100.0	37.5	2.67	318.4	93.3	38.9	2.40
	70 (21.1)	446.0	130.7	39.6	3.30	418.0	122.5	41.4	2.96	391.0	114.6	43.4	2.64
MH3482/W	30 (-1.1)	234.4	68.7	30.5	2.25	216.8	63.5	31.0	2.05	199.4	58.4	31.4	1.86
	40 (4.4)	298.8	87.5	35.0	2.50	277.6	81.3	35.8	2.27	256.4	75.1	36.5	2.06
	50 (10)	373.4	109.4	39.4	2.78	348.2	102.0	40.7	2.51	322.6	94.5	41.8	2.26
	60 (15.6)	424.0	124.2	42.0	2.96	395.8	116.0	43.6	2.66	367.2	107.6	45.0	2.39
	70 (21.1)	518.0	151.8	46.2	3.29	484.0	141.8	48.4	2.93	450.0	131.8	50.2	2.63
MH3862/W	30 (-1.1)	252.4	74.0	32.5	2.27	233.4	68.4	33.0	2.07	215.6	63.2	33.5	1.89
	40 (4.4)	327.4	95.9	38.1	2.52	304.4	89.2	39.0	2.28	282.6	82.8	39.9	2.07
	50 (10)	414.0	121.3	43.4	2.79	386.2	113.2	44.8	2.53	359.4	105.3	46.2	2.28
	60 (15.6)	472.0	138.3	46.4	2.98	440.0	128.9	48.2	2.67	410.0	120.1	50.0	2.40
	70 (21.1)	580.0	169.9	51.0	3.33	542.0	158.8	53.4	2.97	506.0	148.3	55.8	2.66

Due to continuous product development, dimensions and capacities are subject to change without notice.

Performance Data for High Temperature Heating Only Heat Pumps ^(1,2,3)

Model	Entering Source (Evap.) Fluid Temp. ^(5,6,7,8)	Heating Fluid Temperature ⁽⁴⁾ (Leaving Condenser)														
		140°F (60.0°C)				150°F (65.6°C)				160°F (71.1°C)						
		Heating Capacity		Power Input ⁽⁹⁾		COP ⁽¹⁰⁾	Heating Capacity		Power Input ⁽⁹⁾		COP ⁽¹⁰⁾	Heating Capacity		Power Input ⁽⁹⁾		COP ⁽¹⁰⁾
		MBH	kW	kW	MBH		kW	kW	MBH	kW		kW				
°F (°C)																
MH4522/W	30 (-1.1)	301.0	88.2	38.9	2.27	279.4	81.9	39.5	2.07	258.2	75.7	39.9	1.89			
	40 (4.4)	385.4	112.9	45.0	2.51	359.4	105.3	46.0	2.29	333.6	97.7	47.0	2.08			
	50 (10)	482.0	141.2	50.6	2.79	452.0	132.4	52.4	2.53	420.0	123.1	54.0	2.28			
	60 (15.6)	548.0	160.6	54.0	2.97	514.0	150.6	56.0	2.69	478.0	140.1	58.0	2.41			
	70 (21.1)	670.0	196.3	59.2	3.32	628.0	184.0	62.0	2.97	586.0	171.7	64.6	2.66			
MH5262/W	30 (-1.1)	353.6	103.6	45.4	2.28	327.4	95.9	46.2	2.08	301.4	88.3	46.6	1.90			
	40 (4.4)	450.0	131.8	52.4	2.52	420.0	123.1	53.6	2.30	388.4	113.8	54.6	2.08			
	50 (10)	562.0	164.7	59.0	2.79	526.0	154.1	60.8	2.53	488.0	143.0	62.6	2.28			
	60 (15.6)	638.0	186.9	62.8	2.98	596.0	174.6	65.2	2.68	554.0	162.3	67.2	2.42			
	70 (21.1)	778.0	228.0	68.8	3.31	728.0	213.3	72.0	2.96	680.0	199.2	74.8	2.66			
MH6262/W	30 (-1.1)	426.0	124.8	54.8	2.28	391.6	114.7	55.2	2.08	357.8	104.8	55.4	1.89			
	40 (4.4)	540.0	158.2	62.8	2.52	500.0	146.5	64.0	2.29	460.0	134.8	65.0	2.07			
	50 (10)	672.0	196.9	70.8	2.78	626.0	183.4	73.0	2.51	578.0	169.4	74.8	2.26			
	60 (15.6)	762.0	223.3	75.6	2.95	710.0	208.0	78.2	2.66	658.0	192.8	80.8	2.39			
	70 (21.1)	930.0	272.5	83.2	3.28	870.0	254.9	87.0	2.93	810.0	237.3	90.6	2.62			
MH7162/W	30 (-1.1)	478.0	140.1	60.8	2.30	438.0	128.3	61.8	2.08	402.0	117.8	63.2	1.86			
	40 (4.4)	614.0	179.9	70.8	2.54	566.0	165.8	72.0	2.30	520.0	152.4	73.4	2.08			
	50 (10)	774.0	226.8	81.2	2.79	716.0	209.8	83.4	2.52	660.0	193.4	85.2	2.27			
	60 (15.6)	880.0	257.8	87.4	2.95	818.0	239.7	90.2	2.66	756.0	221.5	92.6	2.39			
	70 (21.1)	1080.0	316.4	97.4	3.25	1008.0	295.3	101.2	2.92	934.0	273.7	104.6	2.62			
MH8382/W	30 (-1.1)	562.0	164.7	71.4	2.31	514.0	150.6	72.2	2.09	468.0	137.1	73.4	1.87			
	40 (4.4)	722.0	211.5	83.2	2.54	664.0	194.6	84.4	2.31	606.0	177.6	85.4	2.08			
	50 (10)	906.0	265.5	95.4	2.78	838.0	245.5	97.4	2.52	768.0	225.0	99.0	2.27			
	60 (15.6)	1030.0	301.8	102.4	2.95	954.0	279.5	105.2	2.66	878.0	257.3	107.4	2.40			
	70 (21.1)	1258.0	368.6	113.6	3.24	1170.0	342.8	117.6	2.92	1082.0	317.0	121.0	2.62			

- Notes: (1) Contact your Engineered Air Sales Representative for performance selections outside the tabulated ranges.
(2) Shaded values are in SI units.
(3) Ratings may be interpolated - extrapolation is not allowed.
(4) Heating (condenser) fluid data is based on water.
(5) Entering source (evaporator) fluid temperatures below 60°F (15.6°C) are based on a 6°F (3.3°C) ΔT.
(6) Entering source (evaporator) fluid temperatures 60°F (15.6°C) and above are based on a 10°F (5.6°C) ΔT.
(7) Data for source fluid temperatures 50°F (10°C) and lower are based on 30% glycol / 70% water mixture.
For source fluid temperatures above 50°F (10°C), data is based on water.
(8) A suitable anti-freeze fluid must be used for leaving chilled fluid temperatures below 40°F (4.4°C).
(9) Power Input includes compressors and control circuit.
(10) To convert COP to EER, use: EER = 3.413 X COP.

Due to continuous product development, amperages and weights are subject to change without notice.

Electrical Data for High Temperature Heating Only Heat Pumps

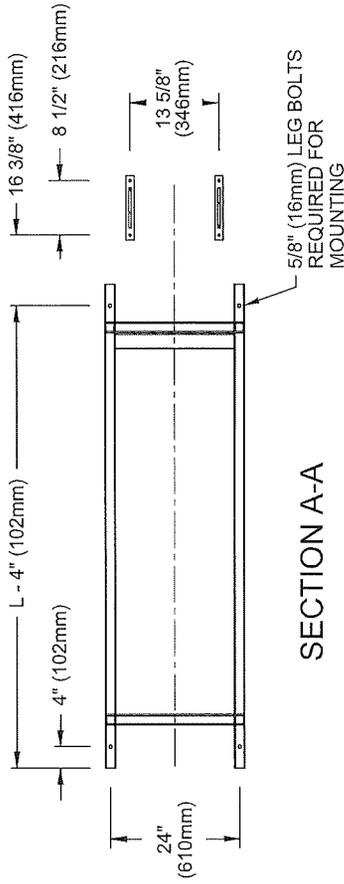
Model	Minimum Circuit Ampacity (Amps)			Maximum Time Delay Fuse (Amps)		
	208 / 3 / 60	460 / 3 / 60	575 / 3 / 60	208 / 3 / 60	460 / 3 / 60	575 / 3 / 60
MH922/W	64.4	31.0	20.4	90	45	30
MH1112/W	70.1	33.2	24.9	100	45	35
MH1292/W	91.4	45.4	36.4	125	60	50
MH1572/W	100.0	49.9	39.8	150	70	60
MH1862/W	114.4	57.1	45.8	175	80	70
MH2162/W	134.6	67.0	54.8	200	100	80
MH2592/W	143.2	71.5	56.6	200	100	80
MH3002/W	174.9	87.2	69.5	250	125	100
MH3482/W	206.6	103.2	82.5	300	150	125
MH3862/W	229.8	114.7	91.1	350	175	125
MH4522/W	241.3	120.5	95.6	350	175	125
MH5262/W	322.1	160.8	128.6	450	225	175
MH6262/W	327.9	163.7	130.2	450	225	175
MH7162/W	N/A	204.0	163.3	N/A	300	225
MH8382/W	N/A	233.0	186.5	N/A	350	250

Note: Amperage ratings include compressors and control circuit.

Unit Weights (Approximate) for High Temperature Units

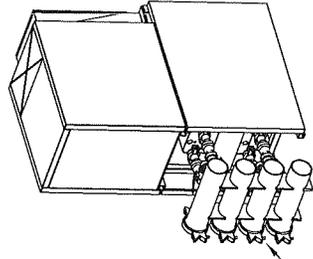
Model	Shipping Wt.	Operating Wt.	Shipping Wt.	Operating Wt.
	(lbs)	(lbs)	(kg)	(kg)
MH922/W	1550	1480	705	673
MH1112/W	1570	1490	714	677
MH1292/W	1830	1740	832	791
MH1572/W	1850	1760	841	800
MH1862/W	1870	1780	850	809
MH2162/W	1920	1830	873	832
MH2592/W	2150	2050	977	932
MH3002/W	2230	2120	1014	964
MH3482/W	2260	2160	1027	982
MH3862/W	2460	2340	1118	1064
MH4522/W	2510	2390	1141	1086
MH5262/W	2550	2430	1159	1105
MH6262/W	2650	2520	1205	1145
MH7162/W	3330	3170	1514	1441
MH8382/W	3520	3360	1600	1527

Note: Shaded values are in SI units.

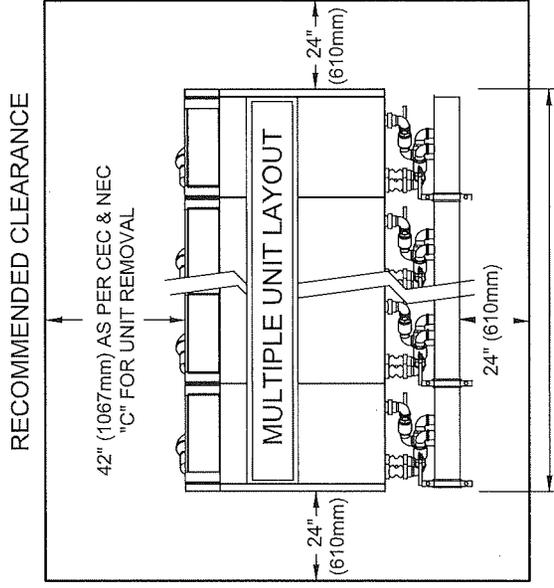


SECTION A-A

5/8" (16mm) LEG BOLTS
REQUIRED FOR
MOUNTING



SHOWN WITH OPTIONAL
REMOVABLE ENCLOSURE
76" H x 34" W x L + 2"
1930mm H x 864mm W x L + 51mm

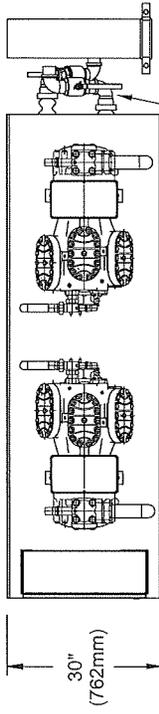


RECOMMENDED CLEARANCE

42" (1067mm) AS PER CEC & NEC
'C' FOR UNIT REMOVAL

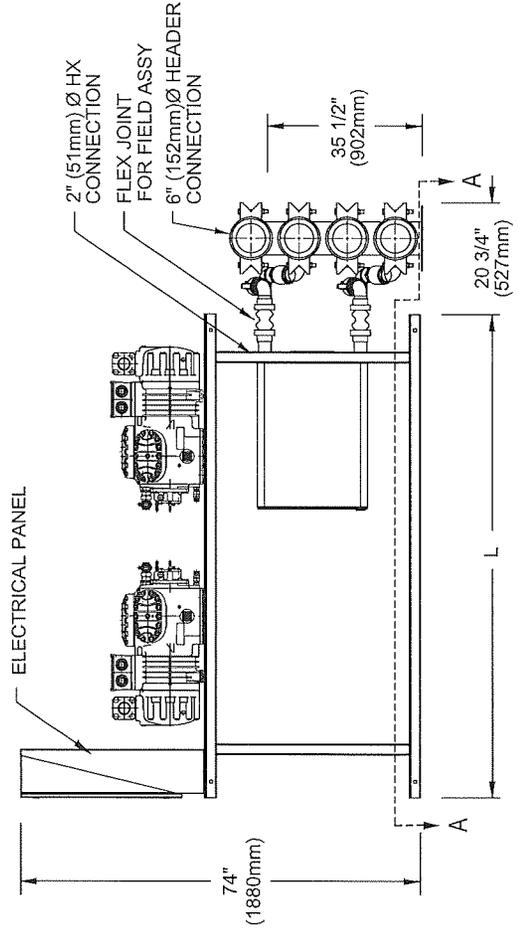
MULTIPLE UNIT LAYOUT

ISOLATION
VALVES



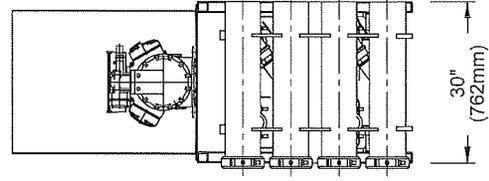
MODEL	L	C
MH9222W - MH3482W	84" (2134mm)	92" (2337mm)
MH3862W - MH5262W	90" (2286mm)	98" (2489mm)
MH7162W - MH8382W	100" (2540mm)	108" (2743mm)

WIDTH WITH ENCLOSURE = N X 30" (762mm) + 4" (102mm)
WHERE N = NUMBER OF MODULAR UNITS

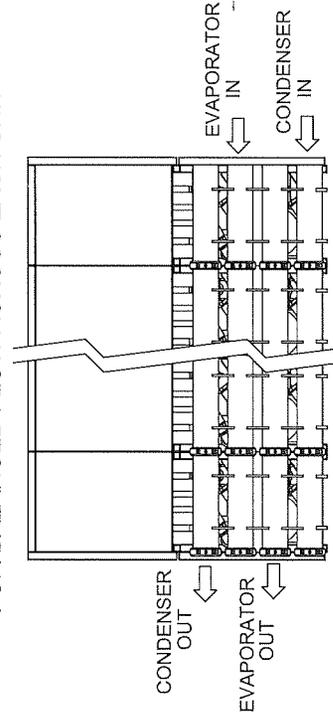


ELECTRICAL PANEL

2" (51mm) Ø HX
CONNECTION
FLEX JOINT
FOR FIELD ASSY
6" (152mm) Ø HEADER
CONNECTION



RECOMMENDED PIPING HOOK-UP TO HEADER
FOR BALANCED FLOW ACROSS EACH UNIT



NOTES:

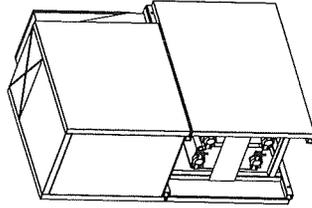
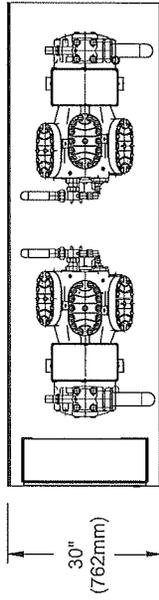
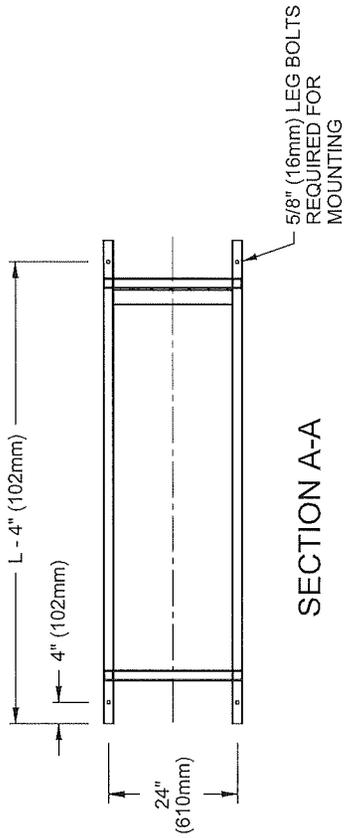
- 1 - DIMENSIONS SHOWN IN INCHES AND MILLIMETERS.
- 2 - HEADER ASSEMBLY SHIPPED LOOSE.



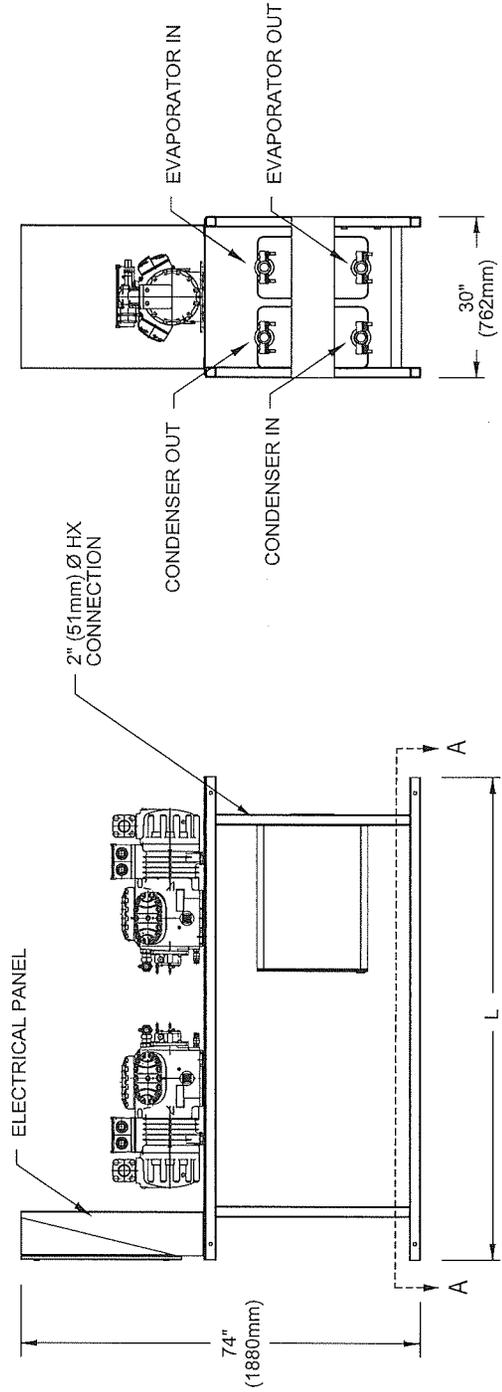
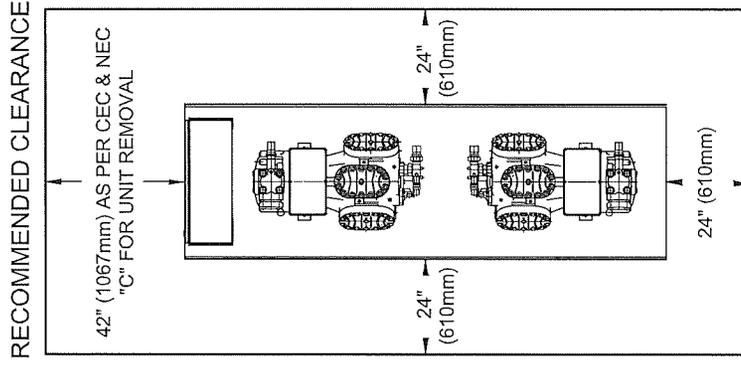
MODULAR HIGH TEMPERATURE HEATING HEAT PUMP
MH SERIES - MULTIPLE UNIT CONFIGURATION

REVISIONS: REVISIONS:

DATE:	DRN.BY:	CHKD.BY:	DRWG.NO.:
MAR 07 2012	MA	AF	MH-MW-102



SHOWN WITH OPTIONAL
REMOVABLE ENCLOSURE
76" H x 34" W x L + 2"
1930mm H x 864mm W x L + 51mm



MODEL	L	C
MH922/W - MH3482/W	84" (2134mm)	92" (2337mm)
MH3862/W - MH5262/W	90" (2286mm)	98" (2489mm)
MH7162/W - MH8382/W	100" (2540mm)	108" (2743mm)

NOTES:

1 - DIMENSIONS SHOWN IN INCHES AND MILLIMETERS.

REVISIONS:

DATE:	DRN.BY:	CHKD.BY:	DRWG.NO.:
MAR 07 2012	MA	AF	MH-SW-102

MODULAR HIGH TEMPERATURE HEATING HEAT PUMP
MH SERIES - SINGLE UNIT CONFIGURATION

Eng'g AIR®

Eng'g AIR®

Don Poole - Falcon Engineering Ltd.

From: Patrick Lambert <Patrick.Lambert@geo-energie.com>
Sent: June-07-12 12:22 PM
To: Don
Cc: Jeff Quibell; Adam James; daniel.booy; Alexandre St-Pierre
Subject: RE: Delta Schools Project - MH heater brochure
Attachments: image001.jpg

Hello Don,

PS: Please always put Alexandre St-Pierre in CC.

Thanks!

For the moment, this is where we are at:

- 1- Geo-Energy and Altum made a site survey for the 3 first sites:
 - a. School Board Office (SBO)
 - b. Delta Manor (DM)
 - c. Neilson Grove (NG)
- 2- During this survey we did:
 - a. Mechanical room measurements of boundaries and fixed equipment (Walls, ceiling, main pipes, headers, boilers, DHW, etc.)
 - b. Mechanical room main equipment information (model, make, capacity, etc.)
 - c. Main heating system piping arrangement takeoff (Flow diagram)
- 3- Now Geo-Energie is proceeding with:
 - a. Putting all the information gathered for the 3 sites in a clean format
 - b. Opening and organizing files, binders, forms, for all sites

During the survey, we also retrieved from Delta SD all their construction plans, either in PDF or .dwg format. We did not have the opportunity to go through all of it and to extract what is pertinent. But this will come shortly, at least for the 3 first sites.

We will provide to you all the pertinent information, I hope tomorrow.

With regards to Heat pump selection. Although JCI is not attached, they seem to have a preferred HP manufacturer for this project.

One of the main issues that still need to be answered one way or another is the design building loop temperature condition. This needs to be first provided by JCI (from an energetic/energy savings perspective), then be validated by us, from a functionality perspective. Once we get the answer, we will be able to start selecting the proper HP. I expect most sites to remain at 120°F LWT.

Best regards,

Patrick Lambert, ing. CGD

Président

Geo-Energie inc.

1351 Gay-Lussac

Boucherville, QC, J4B 7K1

T: 450-641-9128

F: 514-221-3243

www.geo-energie.com



De : Don [mailto:dpoole@pooleandassociates.bc.ca]
Envoyé : 7 juin 2012 11:30
À : Patrick Lambert
Cc : 'Jeff Quibell'; 'Adam James'; 'daniel.booy'
Objet : FW: Delta Schools Project - MH heater brochure

Patrick

Please find attached some technical data on the 160 DegF Chillers. Might be a good fit once we figure out the temperature requirements of the terminal equipment.

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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From: Tom Simpson [mailto:tom.simpson@engineeredair.com]
Sent: 6-Jun-12 4:36 PM
To: 'Don'
Subject: Delta Schools Project - MH heater brochure

Hi Don

Attached is a better copy of the complete MH brochure that can be distributed, as requested.

We still want to handle every case as a custom selection but at least this gives you an idea of the listed capacities. The model number shows *nominal* capacity and compressors i.e. MH3002W = 300 MBH (25 tons), 2 compressors. That same unit at 30 F source water and generating 160 F provides approx. 170 MBH (14 tons). All our high temp units will use R134A refrigerant and reciprocating semi-hermetic compressors (likely Bitzer). The EngA MH series heating only heat pump has all the same modular benefits as the MC series chiller.

Let me know when you are ready to run the selection specifics.

Tom Simpson, AScT
Engineered Air - Vancouver
Office 604-736-2420
Cel 604-230-0273

_____ Information from ESET NOD32 Antivirus, version of virus signature database 7201 (20120606)

The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

_____ Information from ESET NOD32 Antivirus, version of virus signature database 7203 (20120607)

The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

_____ Information from ESET NOD32 Antivirus, version of virus signature database 7204 (20120607) _____

The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

This is Exhibit " H " referred to in the affidavit of DONAVD POOLE made before me on AUGUST 2 2018



Don Poole - Falcon Engineering Ltd.

From: Don <dpoole@pooleandassociates.bc.ca>
Sent: June-16-12 8:33 PM
To: Patrick Lambert
Cc: Adam James; Daniel Booy; Jeff Quibell; Alexandre St-Pierre
Subject: Delta Schools - Existing Heating vs Heatpump Selection
Attachments: Heating Capacity of Equipment when Selected at 200 DegF.pdf
Heat Pumps when Selected at ELT of 30 DegF.pdf

ERIKA LAMBERT-SHIRZAD
A Commissioner for taking Affidavits for British Columbia

02

ERIKA LAMBERT-SHIRZAD
Barrister & Solicitor
BORDEN LADNER GERVAIS LLP
1200 Waterfront Centre, 200 Burrard Street
P.O. Box 48800, Vancouver, Canada V7X 1T2
604-681-8441

Patrick

I don't know how far you got with surveying the existing heating equipment, or if that is even important for the 19th meeting.

We will eventually need to have some consideration of effects of the temperature rating of the existing heating equipment on the selection of the future heat pumps....or should we call them chillers.

Please find a couple of helpful charts to start some discussion. These charts are meant for internal discussion.

Is there any chance of having a quick discussion on the topic Monday?

Regards
Don Poole, P. Eng

Tel: (250) 762-6116 Fax: (250) 762-2343

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Information from ESET NOD32 Antivirus, version of virus signature database 7226 (20120616)

The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

Information from ESET NOD32 Antivirus, version of virus signature database 7232 (20120619)

The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

Information from ESET NOD32 Antivirus, version of virus signature database 7277 (20120706)

The message was checked by ESET NOD32 Antivirus.

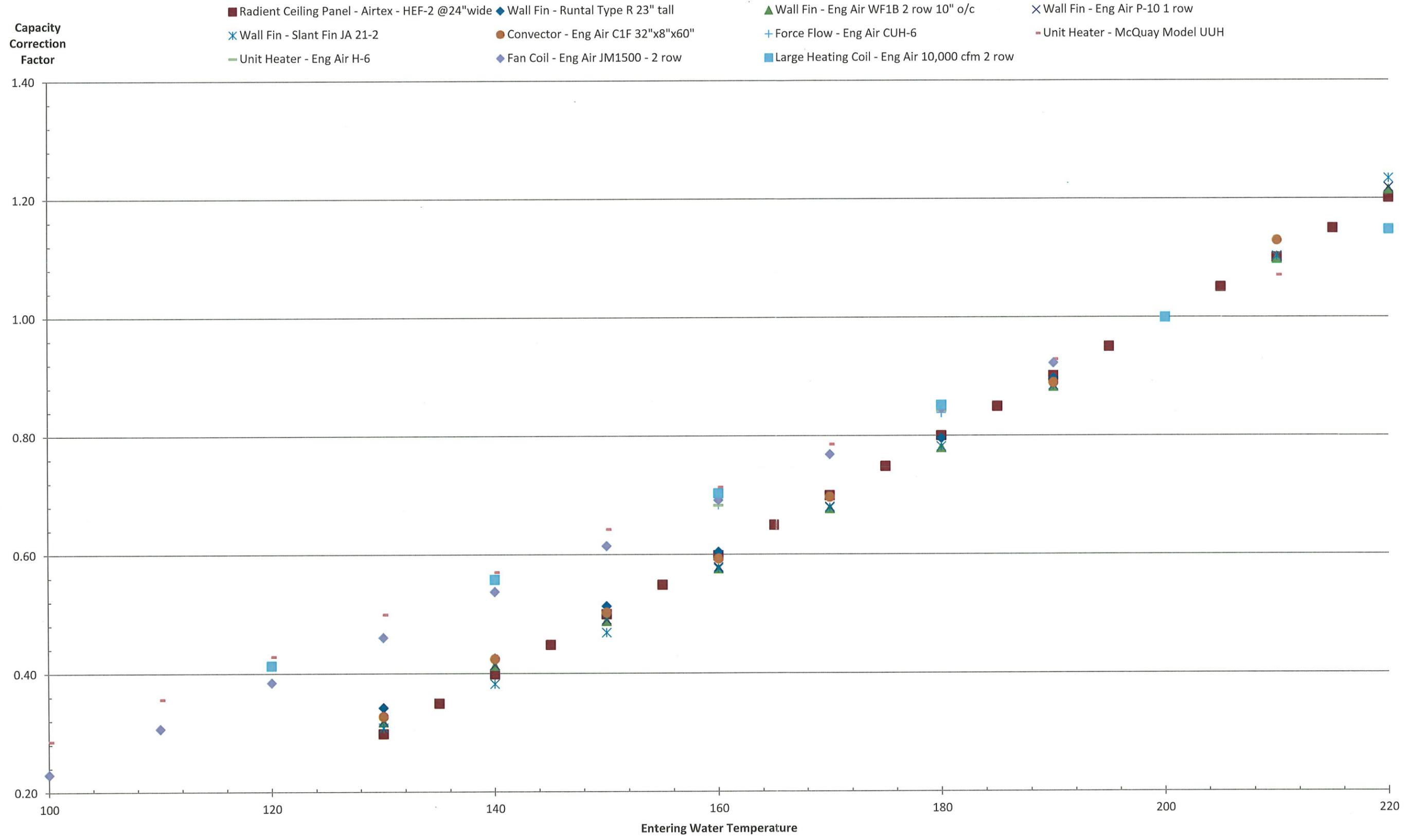
<http://www.eset.com>

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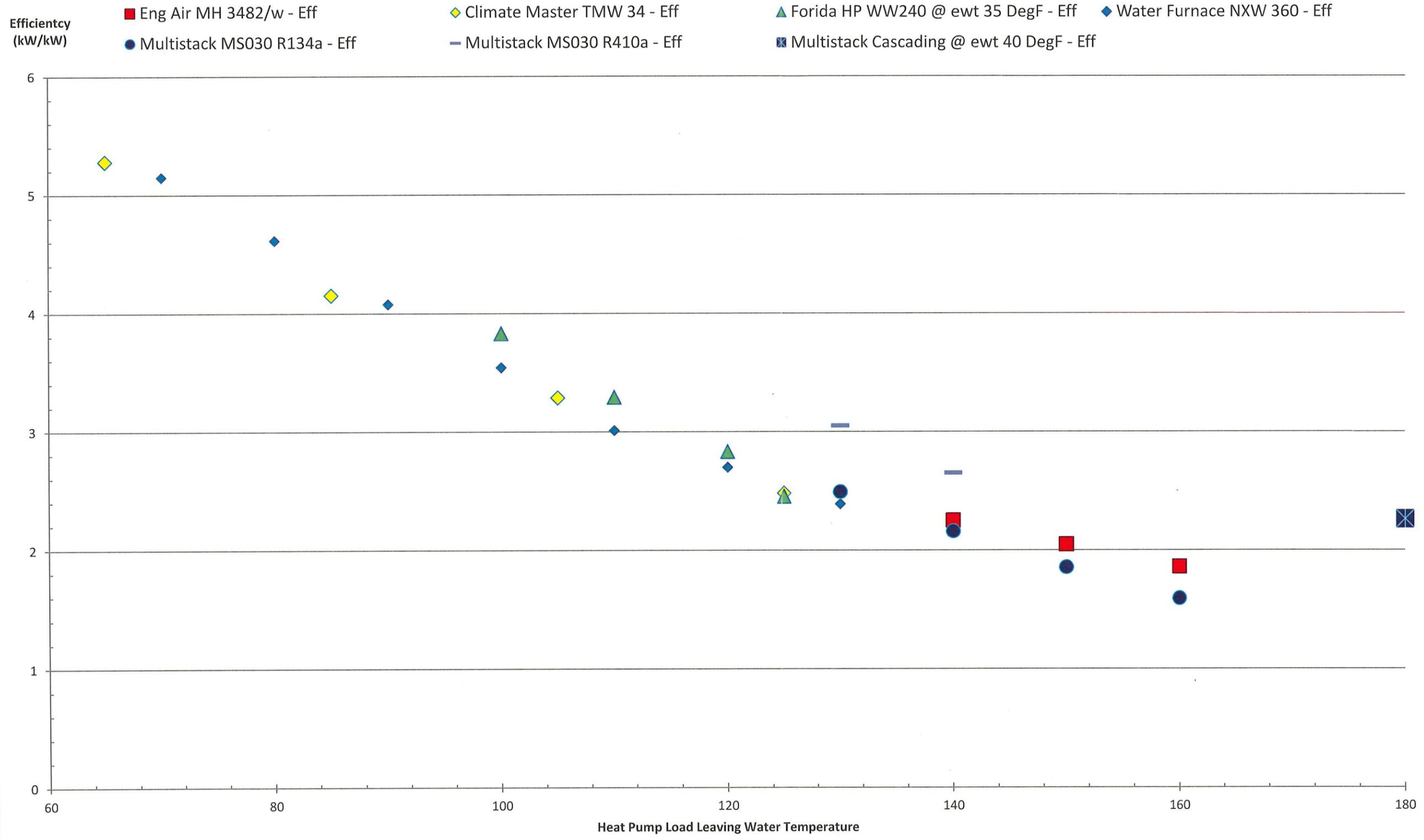
The message was checked by ESET NOD32 Antivirus.

<http://www.eset.com>

Heating Capacity Correction of Various Equipment when Selected at Entering Water Temperature at 200°F



Heating Efficiency and Range of Various Heat Pumps at Entering Source Water Temperature of 30°F



**BEFORE THE
BRITISH COLUMBIA UTILITIES COMMISSION**

IN THE MATTER OF

**AN APPLICATION BY FORTISBC ALTERNATIVE ENERGY SERVICES INC. FOR
2018/2019 REVENUE REQUIREMENTS AND COST OF SERVICE RATES FOR THE THERMAL
ENERGY SERVICE TO DELTA SCHOOL DISTRICT NO. 37**

BCUC PROJECT NO. 1598949

PREPARED TESTIMONY OF

WILL CLEVELAND

ON BEHALF OF

DELTA SCHOOL DISTRICT NO. 37

AUGUST 10, 2018

BEFORE THE
BRITISH COLUMBIA UTILITIES COMMISSION

IN THE MATTER OF
An Application by FortisBC Alternative Energy Services Inc. for
2018/2019 Revenue Requirements and Cost of Service Rates for the
Thermal Energy Service to Delta School District No. 37
BCUC PROJECT NO. 1598949

PREPARED TESTIMONY OF
WILL CLEVELAND
ON BEHALF OF
DELTA SCHOOL DISTRICT NO. 37

AUGUST 10, 2018

1 Introduction and Authorship

2 My name is Will Cleveland and I am a principal at Reshape Infrastructure Strategies, a Vancouver-based
3 consulting firm active in the utility sector. I have prepared this report in response to a request from
4 Borden Ladner Gervais (“BLG”) for an opinion regarding the issues set out below, related to FortisBC
5 Alternative Energy Service Inc.’s¹ (“FAES”) thermal energy service provided to Delta School District No.
6 37 (the “Project”).

7 I am aware that I have a duty to assist the British Columbia Utilities Commission (“BCUC”) and not be an
8 advocate for any party. I have prepared this report in conformity with my duty to the BCUC. If I am
9 called upon to give oral or written testimony in relation to this matter, I will give that testimony in
10 conformity with my duty to the BCUC. I am solely responsible for the content of this report and the
11 opinions expressed herein.

12 Qualifications

13 I graduated from Georgetown University with an undergraduate degree in 2004. I received a Master’s
14 Degree from the London School of Economics in 2008. Since 2010 I have worked as a consultant in the
15 utility sector. My work includes financial and business case analysis, utility regulation, contract
16 negotiation, and strategic planning. The majority of my work has been with regulated energy systems in
17 British Columbia.

¹ The Project was originally developed by FortisBC Energy Inc. (“FEI”) before being moved from FEI to FortisBC Alternative Energy Service Inc. (“FAES”). For simplicity, throughout this report I have referred to the utility providing the Project as FAES.

1 I have previously provided expert testimony to the BCUC as part of Creative Energy's Application for a
2 CPCN for a Low Carbon Neighbourhood Energy System for Northeast False Creek and Chinatown
3 Neighbourhoods of Vancouver, and as part of FortisBC Inc.'s application for 2017 Cost of Service Analysis
4 and Rate Design.

5 My full CV is attached as Appendix A.

6 **Issues, Instructions, and Facts & Assumptions**

7 I have provided an opinion on the unit cost of service from the Project, the thermal energy forecast for
8 the Project, and the cost of energy from the heat pump-based sources included in the Project. My
9 instructions are set out in a letter from BLG, which I have attached to this report as Appendix B.

10 In developing this report, I have relied on the record from the current proceeding and prior proceedings
11 related to the Project including the original 2011 CPCN Proceeding, the 2013/14 Revenue Requirements
12 and Cost of Service Rate Application, and the 2015/16 Revenue Requirements and Cost of Service Rate
13 Application.

14 **Opinion**

15 This is a complex project, so before addressing the questions in Appendix B, I would like to provide some
16 definitions and clarify some terminology.

17 *Definitions and Terminology*

18 ***End-Use Thermal Energy vs Fuel Input.*** "End-use energy" or "end-use thermal energy" refers to
19 the actual thermal energy service provided by the Project. "Fuel use" is the fuel input used to
20 produce the thermal energy output. In the case of gas boilers, the fuel input (natural gas)
21 exceeds the thermal energy output due to losses. In the case of heat pump-based systems, the
22 fuel input (electricity) is or should be less than the thermal energy output, as a share of energy is
23 provided by an additional source such as a ground source loop. Both thermal energy and fuel
24 inputs are measured in energy units. To minimize confusion, I have used the term "energy" to
25 refer to thermal energy unless otherwise indicated. I use the terms "fuel" or "fuel input" when
26 referring to fuel.

27 ***Annual Revenue Requirement vs Unit Revenue Requirement.*** A thermal energy utility's annual
28 revenue requirement can be thought of in absolute terms (i.e. the total dollar amount, per year)

1 or in unit cost terms (i.e. \$ per MWh of end-use energy). An annual revenue requirement does
2 not necessarily tell the entire story because low output from a project can lead to significantly
3 higher costs per unit of energy.

4 **Primary Side vs Secondary Side.** Thermal energy utility service is typically referred to as the
5 “primary side”. The configuration of the thermal energy distribution system within the building
6 is typically referred to as the “customer side” or “secondary side”. The secondary side is
7 important in design and operations. For example, the secondary side may be configured in a
8 way that requires the primary side to supply heat at a minimum temperature. This in turn can
9 restrict the utility’s ability to rely on lower temperature resources that may not be able to meet
10 the temperature requirements of the secondary side.

11 Additionally, I would like to identify several issues and unusual features specific to the Project, and offer
12 some observations that are relevant to the rest of my report.

13 *Project-Specific Issues and Observations*

14 **DSD Equipment and Gas Reimbursement Amounts.** When developing the Project, the parties
15 understood that there would be ongoing natural gas consumption by equipment (“DSD
16 Equipment”) owned by the Delta School District (“DSD”). As part of the operation of the Project,
17 FAES receives the entire gas bill for each of the sites but some of the gas consumption is
18 associated with DSD Equipment. This gas is not metered separately so the parties developed an
19 estimate of the gas consumption by DSD Equipment (“gas reimbursement”). The billing breaks
20 this out separately from FAES’ cost of service². The gas reimbursement amounts have not been
21 updated; as discussed in more detail below, it is likely that they under-estimate the gas
22 consumption by DSD Equipment.

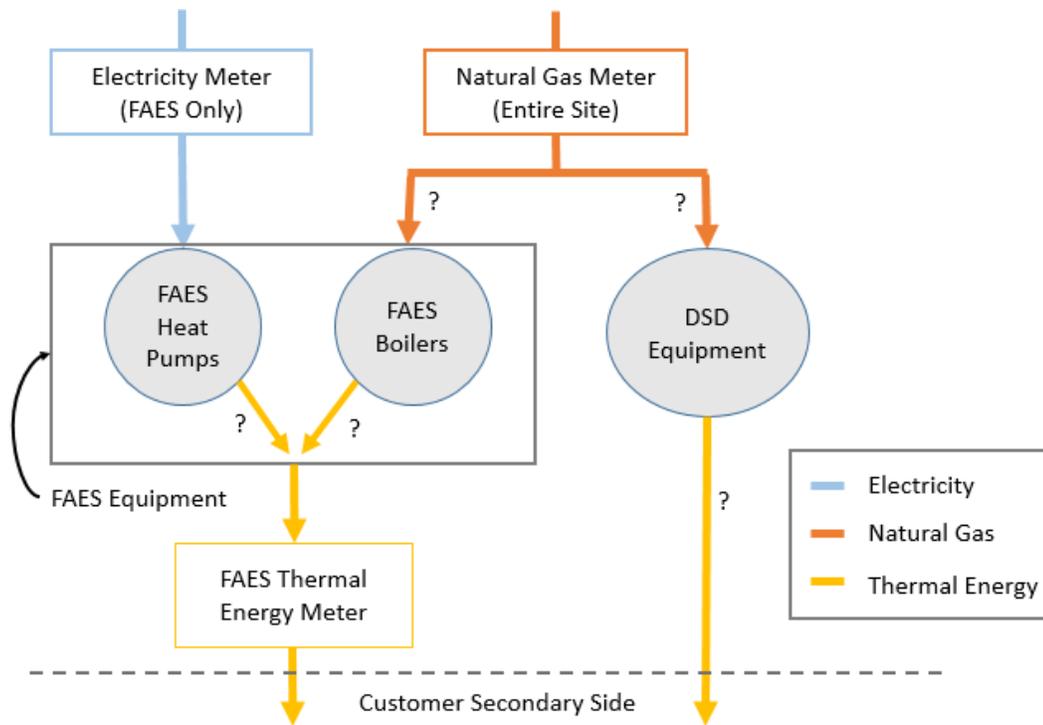
23 **Limited Meter Data.** The above issue highlights a general challenge in evaluating the Project,
24 which is that there is a limited amount of metered data. Figure 1 illustrates the flow of fuel and
25 thermal energy, and the meter locations for a typical Project site with heat pump-based
26 systems³. The only things actually being metered are: electricity consumption by the FAES
27 Equipment, total natural gas consumption (including, without any sub-metering, FAES

² Original CPCN Proceeding, Exhibit B-1, S. 6.3.8 (pp 46-47 including sample bill).

³ For a Project site without heat pump-based systems, this diagram would look very similar except the electricity meter and heat pump portions would be removed.

1 Equipment and DSD Equipment), and thermal energy delivered by the FAES Equipment. There is
2 no information available on sub-metered gas consumption, no metered breakdown of how
3 much thermal energy is provided by the FAES heat pumps vs by the FAES boilers, and no meter
4 data on how much thermal energy is being provided by the DSD Equipment. There was also
5 very limited meter data available before the Project was set up. The only information available
6 was on fuel consumption. This potential source of forecast error has contributed to the above-
7 described gas reimbursement issue, and also makes it challenging to confirm equipment output
8 and efficiencies.

9 *Figure 1: Meter Locations, Typical Project Site with Heat Pump Systems*



10
11 **District Deferral Account.** FAES has a deferral account, which referred to as the District Deferral
12 Account (“DDA”). It accumulates all differences between the cost of service and the revenues
13 received from DSD. Thus far, all revenues have been based on the Market Rate (“MR”), which is
14 tied to a natural gas price index. The revenues collected have been lower than anticipated for
15 two reasons: the level of the index has fallen, and the Project has provided far less thermal
16 energy to DSD than forecast. To date, all shortfalls between revenue collected under the MR
17 and the annual cost of service (no matter the reason for the variance) have accumulated in the
18 DDA.

1 **Cost of Service and Rate Design Complexity.** In addition to the gas reimbursement amounts
2 described above, the Project includes a complicated discount. The “SD 37 Rate Rider” is a
3 discount of \$18 per MWh of end-use thermal energy. This was negotiated by the parties and has
4 been applied to the MR. What is unusual is that this discount appears to continue even if the
5 Project has switched to Cost of Service rates. For each year, FAES calculates a cost of service,
6 adds the amortization of the DDA balance, adds the recovery of the prior year’s discount, and
7 then credits the discount for the current year⁴. This is a significant additional complication, and
8 it is not clear to me what purpose it serves. The Cost of Service Rate (as used in FAES’ materials)
9 includes the amortization of the DDA and the recovery of the prior year’s discount, but does not
10 include the discount applied in the current year. To avoid confusion, in my response to Question
11 1 I refer to the “unit cost of service”, which is the annual cost of service before the amortization
12 of the DDA, divided by thermal energy sales in MWh. This enables an apples-to-apples
13 comparison of the underlying cost drivers of the Project.

14

15 **Question 1: Please compare the original projection of the cost of service for the thermal energy**
16 **project with DSD (the “Project”) with the actual cost of service for the Project.**

17 The original CPCN application included a working spreadsheet with the unit cost of service (\$ per unit of
18 energy) before the amortization of the DDA. I have compared that against the most recent unit cost of
19 service information provided by FAES, again excluding the amortization of the DDA⁵. I present all values
20 in \$ per MWh.

21 The original cost of service projection was based on a range of assumptions. Some of them are within
22 FAES’ control and some of them are not. One thing outside FAES’ control is the rate paid for fuel inputs
23 such as natural gas and electricity⁶. Using the most recent information in the current application, I have

⁴ See e.g. Current Application, Exhibit B-1-1, Appendix A, Table 3 (p 6). The “Cost of Service Rate” includes amortization of the DDA and the “Prior Year Rate Rider Discount”, i.e. the recovery from DSD of the discount from the prior year, but does not include the current year’s discount. For 2018/19 (when FAES is seeking the Cost of Service Rate), the “Effective Rate” is less than the “Cost of Service Rate” because the Effective Rate includes the discount applied to the rate in the current year.

⁵ Based on the updated information provided in Exhibit B-1-1 of the Current Application.

⁶ It is important to note that total fuel costs are a combination of the rates paid for fuel inputs, and the efficiency of the FAES Equipment and the way the FAES Equipment is dispatched (i.e. the use of boilers vs heat pumps). While the rates paid for fuel are out of FAES’ control, the efficiency of the FAES Equipment and the ability to dispatch the FAES Equipment is much more within FAES’ control.

1 extracted the actual rates paid for fuel by the Project since the first year of service and re-calculated
 2 what the original cost of service projection would have been if at the time FAES had perfect information
 3 about future natural gas and electricity rates. This is a way to correct for variances in natural gas and
 4 electricity rates, indicating whether the difference between the original projected unit cost of service
 5 and the actual unit cost of service is due to variances in these rates, or other factors.

6 The updated information is based on the current application. It includes actual values through 2016/17,
 7 an updated forecast for 2017/18, and a weather-adjusted forecast for 2018/19. I have modified FAES'
 8 cost of service information to exclude the amortized cost of the DDA. In my view, this enables a
 9 comparison between the original projection and the actuals, based on the fundamental cost drivers of
 10 the Project.

11 Table 1 provides all of these values as well as the ratio of the actual unit cost of service (excluding the
 12 DDA amortization) against the original projected unit cost of service updated for fuel cost variances.

13 Figure 2 charts the unit cost of service values.

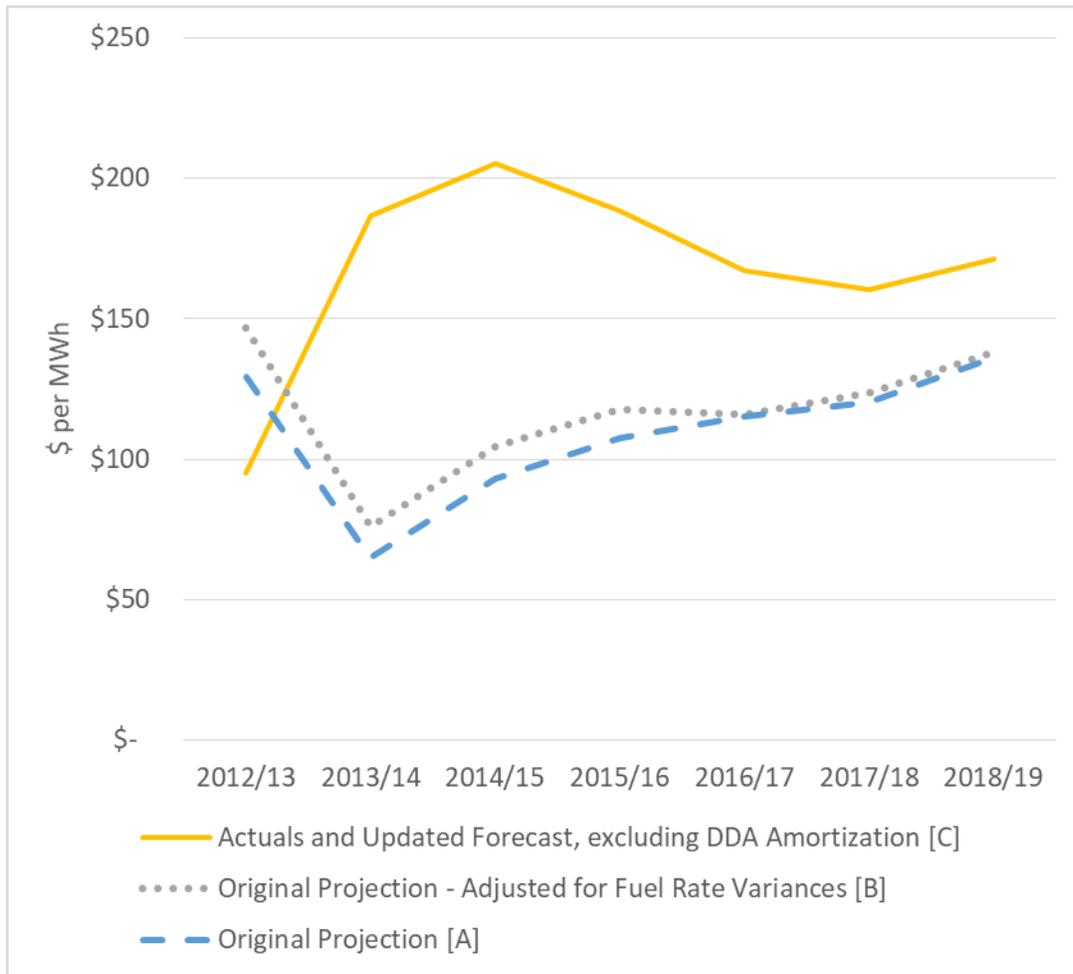
14 *Table 1: Unit Cost of Service: Original Projection vs Actuals. All values \$ per MWh.*

	2012/13	2013/14	2014/15	2015/16	2016/17	2017/18	2018/19
A - Original Projection	\$ 129	\$ 65	\$ 93	\$ 107	\$ 115	\$ 120	\$ 136
B - Original Projection - Adjusted for Fuel Rate Variances	\$ 147	\$ 76	\$ 105	\$ 118	\$ 116	\$ 124	\$ 138
C - Actuals and Updated Forecast, excluding DDA Amortzation	\$ 95	\$ 187	\$ 205	\$ 189	\$ 167	\$ 161	\$ 171
C / B	65%	246%	196%	160%	144%	130%	124%

15

1

Figure 2: Unit Cost of Service



2

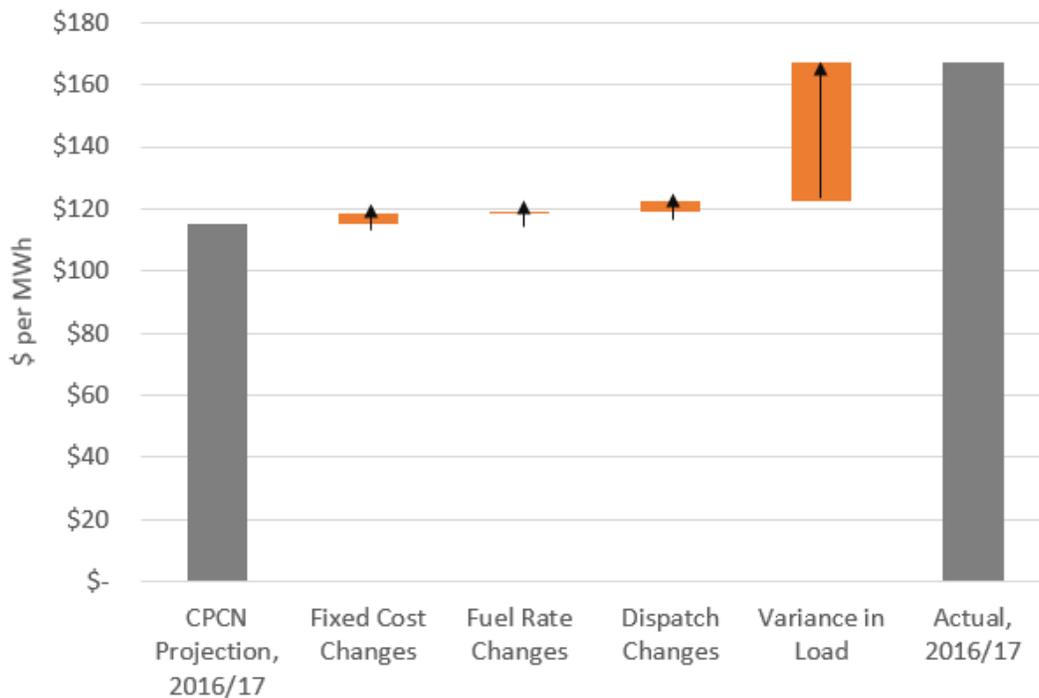
3 As of 2018/19, the Original Projection and the Original Projection – Adjusted for Fuel Rate Variances are
4 virtually identical. Natural gas prices have been significantly lower than originally forecast, but electricity
5 costs have been higher, and these impacts appear to have offset one another. If the Project was
6 operating as expected (in terms of total energy produced, and the reliance on gas boilers vs heat pumps)
7 the unit cost of service would be very similar to the original projection.

8 As of 2016/17 (the most recent year for which actuals are available), the unit cost of service (excluding
9 the amortization of the DDA) was 44% higher than the original forecast unit cost of service adjusted for
10 fuel rate variances. Based on FAES' projection for 2018/19, the unit cost of service excluding the
11 amortization of the DDA will be 24% higher than the adjusted original forecast.

12 One key question is: what are the drivers of the higher-than-forecast unit cost of service? I have broken
13 down the sources of the variance for 2016/17, the most recent year for which actual numbers are

1 available. For 2016/17, variances in fixed costs, the rates paid for fuel, and equipment dispatch (i.e. the
2 greater reliance on boilers vs heat pumps) have had a combined impact on the unit cost of service of
3 +\$7 per MWh. The load forecast errors had a combined impact on the unit cost of service of+\$45 per
4 MWh. Figure 3 is a waterfall chart showing the relative contribution of each of these types of changes to
5 the variance between the CPCN projection, and the actual unit cost of service, for 2016/17.

6 *Figure 3: Sources of Variance Between Original Forecast and Actual 2016/17 Unit Cost of Service per MWh (underlying cost of*
7 *service only - excludes amortization of DDA)*



8
9 I will also note that the variances discussed above and shown in Figure 3 do not reflect the entire
10 financial variance from the standpoint of DSD. Firstly, they do not reflect the amortization of the DDA
11 balance. If DSD had been charged the Cost of Service Rate in 2016/17, total revenues recovered from
12 DSD would have included the underlying unit cost of service and the amortization of the DDA balance, as
13 well as the impact of other parts of the rate. The effective rate charged to DSD would have been
14 significantly higher: \$184 per MWh. For comparison, the effective rate for 2016/17 under the original
15 CPCN Projection (again, including the amortization of the original projected DDA balance, as well as the
16 impact of other parts of the rate such as the discount) would have been \$120 per MWh. Comparing
17 these effective rates for 2016/17, the variance from forecast to actual was 54%.

1 Secondly, one of the main justifications for the Project was that it would reduce DSD's greenhouse gas
2 emissions. As a Public Sector Organization (PSO), DSD is required to purchase offsets for all of its
3 greenhouse gas emissions. As discussed in more detail in the response to Question 3, the Project is
4 largely reliant on gas boilers (not heat pumps), and has not achieved the targeted level of environmental
5 performance. This has resulted in higher offset costs for DSD than it would otherwise have incurred. I
6 have not captured this above as these costs are outside the cost of service, but they are directly related
7 to the Project. This issue is discussed further in the response to Question 3.

8 Detailed calculations and sources for the response to Question 1 are shown in Appendix C, and Appendix
9 C – Attachment 1.

10

11 **Question 2: Please opine on whether FEI/FAES made any errors in its thermal energy load forecast**
12 **when designing the Project. If you are of the opinion that FEI/FAES made errors in its thermal energy**
13 **load forecast when designing the Project, please describe the nature and impact of those errors.**

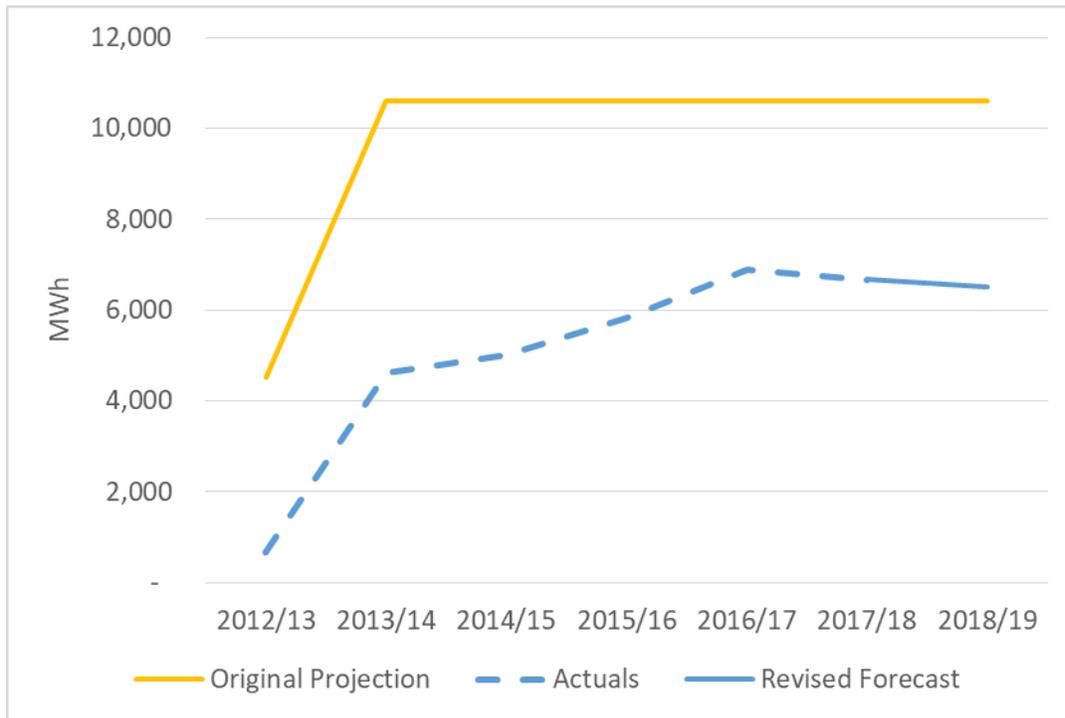
14 The record is clear that FAES made errors in its thermal energy load forecast. FAES' original forecast was
15 that the Project would provide 10,605 MWh of thermal energy, but FAES' current estimate is that the
16 weather-normalized thermal energy produced by the Project has stabilized at 6,504 MWh per year⁷ (a -
17 39% variance from the original projection). Moreover, during prior years, the variance in the load
18 forecast was even greater as shown in Figure 4. In 2013/14, the variance was -56%. Moreover, this large
19 variance in load has occurred despite the parties having added two sites to the Project. While the
20 Project was originally intended to serve 19 sites, it now serves 21 sites⁸.

⁷ Current Application, Exhibit B-4, response to BCUC IR 1.5.1, p 30, lines 20-22.

⁸ Current Application, Exhibit B-3, Attachment 1.4, "Thermal Energy" tab has the complete list of sites. Devon Gardens and Sunshine Hills are the two sites that were not included in the original CPCN application.

1

Figure 4: Thermal Energy Load Served by FAES, Original Projection vs Actuals



2

3 The -39% variance in the load forecast can be attributed to two different errors that I have labeled Load
4 Forecast Error 1 and Load Forecast Error 2:

- 5
- 6 • **Load Forecast Error 1** – FAES over-estimated how much of the DSD sites thermal energy would
7 be supplied by the FAES Equipment, rather than by the DSD Equipment. This error represents
8 actual load that the DSD sites have had and continue to have, and which FAES represented could
9 and would be met by FAES Equipment but which cannot be met by the FAES Equipment due to
10 the pre-existing secondary side configuration of the DSD sites, and instead is met by DSD
11 Equipment. In my view this error is particularly problematic as it is actual, existing load that FAES
12 represented would be met by the Project.
 - 13 • **Load Forecast Error 2** – FAES over-estimated the total thermal energy demand of the DSD sites
14 (i.e. they did not develop an accurate estimate of the weather-adjusted thermal energy load of
15 the sites). Thermal energy load was estimated using gas consumption from prior years, so FAES
16 likely over-estimated the efficiency of the existing equipment⁹. In prior proceedings, FAES has
mentioned the impact of the BC Teachers’ Strike¹⁰, but this was a one-off event that occurred in

⁹ Current Application, Exhibit B-3, response to DSD IR 1.1.1, p 3, lines 12-19.

¹⁰ 2015-16 DSD RRA Proceeding, Exhibit B-1, pp 7-8.

1 2014 and could not have impacted FAES' original load forecast or the variance in the Project's
2 other years. I see no evidence in the BCUC filings for this Project that DSD's load has been
3 reduced through demand-side measures such as building envelope upgrades.

4 Unfortunately, there is not sufficient information on the record to determine how much of the load
5 forecast variance is due to Load Forecast Error 1 vs Load Forecast Error 2. However, there is evidence to
6 support the conclusion that both of these types of errors contributed to the -39% variance in load
7 served by the Project.

8 As noted above, FAES receives all of the gas bills for each site, but some of that gas is consumed by DSD
9 Equipment, not FAES Equipment. As shown in Line 3 of Table 2, the original estimated gas
10 reimbursement amount was 757 MWh per year. The original financial model for the Project assumed
11 that the DSD's pre-existing gas-fired equipment had an efficiency of 65%¹¹. I have assumed that the gas
12 reimbursement amounts were originally assumed to be for DSD Equipment providing thermal energy,
13 and I have applied that same 65% efficiency to the 757 MWh of gas reimbursement to arrive at an
14 original projected thermal energy output by DSD Equipment of 493 MWh. This implies that at the time
15 of the original analysis, the total thermal energy demand of the DSD sites, including estimated thermal
16 energy to be provided by the Project plus that thermal energy provided by DSD Equipment, was forecast
17 to be 11,098 MWh per year, of which 10,605 MWh would be served by the Project via FAES Equipment.

¹¹ Original CPCN Application, Exhibit B-1, Appendix D, "Energy System Summary" tab, cell O22 shows the assumption for the school district's pre-existing gas consumption: 58,607 GJ per year or 16,280 MWh. This was assumed to provide 10,605 MWh of thermal energy service. $10,605 / 16,280 = 65\%$ efficiency. In Exhibit B-3, response to DSD IR 1.1.1 in the current application, FAES cites a slightly different efficiency number which also includes electricity as an input. For the purposes of this calculation, the efficiency of converting natural gas to thermal energy is the relevant number. In all references to Original CPCN Application, Exhibit B-1, Appendix D, I am referring to the live spreadsheet model.

1 *Table 2: Estimated Original Projection of Total Thermal Energy Demand Including from Non-Project Equipment*

Line	Item	Amount	Source
1	Total Gas Reimbursement per Month [GJ]	227	¹²
2	Total Gas Reimbursement per Year [GJ]	2,724	Line 1 x 12
3	Total Gas Reimbursement per Year [MWh]	757	Line 2 / 3.6
4	Original Efficiency Assumption for DSD's Existing Gas-Fired Equipment	65%	¹³
5	Assumed Output from DSD Equipment [MWh]	493	Line 3 x Line 4
6	Original Projected Thermal Energy from FAES [MWh]	10,605	¹⁴
7	Original Forecast of Total DSD Thermal Energy Demand Implied by Original Assumptions [MWh]	11,098	Line 5 + Line 6

2

3 The actual result has been quite different. FAES estimates that the thermal energy service provided by
 4 the Project has stabilized at 6,504 MWh. As illustrated in Figure 1 and noted above, due to the limited
 5 amount of metered data, there are multiple possible reasons for this large variance. In theory, it all
 6 could be due to Load Forecast 2. However, there are two pieces of evidence that suggest that the
 7 variance is at least in part due to Load Forecast Error 1:

8 **1. Prior Statement by FAES.** By the time of the 2015-16 Revenue Requirement proceeding for the
 9 Project, FAES had already once reduced the forecast thermal energy load, from 10,605 MWh down to
 10 7,892 MWh. In the 2015-16 proceeding, FAES reduced the thermal energy load forecast further to 5,443
 11 MWh and offered the following statement:

12 “FAES believes that the following factors contributed to the variance between the 2014/15
 13 thermal load it submitted last year (7,892 MWh) and the one found in this Application. First,
 14 based on the review of the design files, it would appear that despite best attempts by the design
 15 team, the previous load forecast included thermal load supplied by equipment other than FAES’

¹² Current Application, Exhibit B-3, Attachment 1.4, "Reimbursements" tab, cell B23. In all references to Current Application, Exhibit B-3, Attachment 1.4, I am referring to the working spreadsheet.

¹³ Original CPCN Application, Exhibit B-1, Appendix D, "Energy System Summary" tab, cell R22

¹⁴ Based on year 2, when thermal energy output is fully phased in. Original CPCN Application, Exhibit B-1, Section 6.3.3, Table 4, total Thermal Energy value at bottom of table.

1 thermal energy systems. Equipment such as gas-fired Make-Up-Air or Air Source Heat Pumps
2 with natural gas peaking and backup are owned and operated by the DSD and are not part of
3 the thermal energy systems owned by FAES. As a result, the previous forecast has been
4 overestimated [i.e. Load Forecast Error 1]. Second, FAES notes that the 2014/15 thermal load is
5 partly based on historical data. Therefore, the 2014 summer load was affected by the teachers'
6 strike and the cancellation of evening classroom sessions, factors contributing to the thermal
7 load being less than forecast. FAES anticipates that with more historical data available as the
8 systems operate the load forecast will become more refined in subsequent DSD RRA
9 submissions.¹⁵

10 In other words, FAES has acknowledged that it did not properly capture how much thermal energy load
11 the FAES Equipment would be serving due to the configuration of the DSD sites.

12 In the current proceeding, FAES has claimed that all of the error in the load forecast is due to FAES
13 having over-estimated the efficiency of DSD's existing equipment (i.e. due to Load Forecast Error 2)¹⁶.
14 However FAES has provided no explanation for its earlier admission. Additionally, and as noted below,
15 the actual gas consumption data is further evidence that Load Forecast Error 1 contributed to the overall
16 load forecast variance.

17 **2. Actual Gas Consumption Data.** The natural gas consumption by the Project is very high, compared to
18 the amount of thermal energy being provided by FAES. As shown in Table 3, if the gas reimbursement
19 amounts are correct (i.e. Load Forecast Error 1 was zero), then the efficiency of the FAES boilers would
20 be only 66%. While not impossible, this would be much lower than FAES' forecast average boiler
21 efficiency of 93.6%¹⁷.

¹⁵ 2015-16 DSD RRA Proceeding, Exhibit B-1, pp 7-8.

¹⁶ Current Application, Exhibit B-3, p 3, lines 7-27.

¹⁷ See Appendix D, Attachment 2, Tab 1, cell E36.

1 *Table 3: Updated Estimate of Total Thermal Energy Demand Including from Non-Project Equipment (Based on Stable, Weather-*
 2 *Adjusted Demand as of 2018/19)*

Line	Item	Amount	Source
1	FAES Weather-Adjusted Thermal Energy Sales [MWh]	6,504	Current Application, Exhibit B-4, p 30 lines 20-22.
2	FAES Heat Pump Thermal Energy with Stabilized Load [MWh]	746	See Appendix D, Attachment 2, Tab 3, Row 28
3	FAES Gas-Fired Thermal Energy [MWh]	5,758	Line 1 – Line 2
4	Gas Consumption Included in Cost of Service [MWh]	8,706	This is after the removal of the gas reimbursement volume ¹⁸
5	Efficiency of FAES Boilers, if Gas Reimbursement Amounts were Accurate and Load Forecast Error 1 were zero	66%	Line 3 / Line 4

3
 4 A possible alternative explanation is that the total gas consumption seems high because the DSD
 5 Equipment is far less efficient than was assumed. This would mean that the load served by the DSD
 6 Equipment is the same as FAES had originally forecast (and therefore Load Forecast Error 1 is zero), but
 7 the gas consumption by the DSD Equipment is higher due to lower-than-expected efficiency of the DSD
 8 Equipment. However, in my view this is unlikely given the scale of the variance in gas consumption. If
 9 the efficiency of the gas-fired FAES Equipment is 93.6% as was projected by FAES, then the direct gas
 10 consumption by the FAES Equipment is 6,152 MWh, which implies an additional 2,554 MWh of gas
 11 consumption that is unaccounted for. This is so much larger than the 757 MWh included in the gas
 12 reimbursement estimate that it is unlikely that low efficiency in the DSD Equipment could be the only
 13 source of the variance and further suggests that Load Forecast Error 1 contributed to the variance.

14 Unfortunately, given the limited metered data available, it is not possible to assess how much of the
 15 load forecast variance is due to Load Forecast Error 1 vs Load Forecast Error 2.

16 Utilities' loads can vary from forecast amounts for a variety of reasons. Load forecast variances are best
 17 divided into two categories: short-term volatility, and inaccurate estimates of the underlying weather-
 18 adjusted load. Volatility includes the impact of weather as well as short-term variances such as a
 19 temporary strike. Inaccurate estimates of the underlying weather-adjusted load can be due to
 20 insufficient due diligence. Existing utilities may also face step changes in the weather-adjusted load. For

¹⁸ Exhibit B-1-1, Appendix A, Schedule 3, Line 4. This shows 31,344 GJ of gas consumption for 2018/19. 31,344 GJ x 0.2778 MWh / GJ = 8,706 MWh.

1 a thermal energy utility, this might be due to the customer upgrading their building's envelope, which
2 permanently reduces the need for thermal energy (and of which I have seen no evidence).

3 Load forecast variances can be mitigated by utilities undertaking load forecast planning, either with top-
4 down forecasts based on statistical and econometric techniques, or bottom-up forecasts based on
5 information or assumptions about the specific equipment requiring energy services. For a small system
6 like the Project, top-down statistical forecasting is not appropriate. A bottom-up forecast is required, and
7 this was FAES' approach. FAES developed specific site-by-site load forecasts which took into account each
8 site's "unique building characteristics relating to the size, layout, age and physical location of the
9 building¹⁹". This is generally an appropriate approach for a project of this type, but in my view FAES'
10 accuracy is outside a reasonable range, and the magnitude of the errors suggests a reasonable participant
11 could have made a more accurate forecast.

12 As illustrated in the response to Question 1, the variance in load served by the Project is the main driver
13 of the unit cost of service being so much higher than originally forecast. In addition, the Market Rate has
14 been much lower than originally projected as it is based on a natural gas price index and natural gas
15 prices have declined significantly. I would assume these combined factors are why the DSD has
16 continued to take service at the Market Rate instead of switching to the Cost of Service Rate. As noted
17 previously, the structure of FAES' deferral account means that all shortfalls between the Market Rate
18 revenue and the annual cost of service (including shortfalls due load variances) accumulate in the DDA,
19 the balance of which was forecast to reach \$3.8 M by the end of June 2018²⁰.

20 FAES' position appears to be that DSD should bear 100% of the risk and cost impacts of the load forecast
21 error as well as the related impact of the MR being lower than forecast. If DSD is required to pay the
22 entire deferral account balance including FAES' earned return, not only would FAES not bear any costs
23 for its errors, but FAES would actually be rewarded for its load forecast errors by getting to earn its full
24 return on the deferral account balance.

25 **Question 3: Please compare the original projected cost of energy from heat pump-based sources**
26 **included in the Project against the actual cost of energy from heat pump-based sources included in**
27 **the Project.**

¹⁹ Original CPCN Application, S. 2.4.2 p 18.

²⁰ Current Application, Exhibit B-1, S. 3.3, p 17, lines 15-17.

1 As discussed previously, it is important to use appropriate metrics for evaluation. In my view, the
2 levelized cost of energy is an appropriate metric to compare the performance of the heat pump-based
3 sources against the original forecast. Levelized cost is widely used in the utility industry, and the
4 approach I have used is consistent with that used both by large utilities such as BC Hydro, as well as with
5 analysis presented in other recent TES projects reviewed by the Commission, such as UniverCity, River
6 District Energy, the UBC Neighbourhood District Energy System, and the Burnaby Mountain DE Utility.

7 A levelized value converts a stream of unit values over time into an equivalent stream of constant unit
8 values over the same time period. If done correctly, the present value of the two streams is exactly the
9 same. The reason to levelize is to provide a convenient way to compare different streams of values by
10 taking into account the time value of money. Levelization can be used to compare project alternatives
11 and is defined as the present value of a project's costs, divided by the present value of the stream of
12 energy produced by the project, with both present value calculations relying on the same discount rate.

13 Levelized cost of energy can be used to assess not only the overall performance of a project, but also the
14 performance of sub-elements of a project, such as the heat pump-based systems used to serve several
15 DSD sites. The cost of energy from the heat pump systems²¹ includes the following:

- 16 • Capital costs for all components of the heat pump based systems. These systems include not
17 only the heat pumps themselves, but also the ground source loop fields, the circulation pumps
18 for the loop fields, and intrasystem piping and mechanical room piping required to integrate the
19 heat pump systems with the rest of the thermal energy system.
- 20 • Electricity costs. This includes electricity consumed by the heat pumps as well as electricity
21 consumed by the circulation pumps for the ground loops.
- 22 • Maintenance and non-fuel operating costs for the heat pumps, circulation pumps, loop fields,
23 and associated piping.

24 Calculating the levelized cost of energy from the heat pump systems requires the above-described
25 information on costs as well as the total amount of energy produced by the heat pump systems in each
26 year. I have used a methodology described in detail in Appendix D to calculate:

- 27 • the original projected levelized cost of energy from the heat pump-based systems; and

²¹ Most of the heat pump systems are ground-source heat pumps, but there are some air-source heat pumps.

- 1 • an updated levelized cost of energy from heat pump-based systems based on actual information
2 to date and a forecast going forward.

3 As the operation of the Project has now stabilized²², it is reasonable to calculate an updated projection
4 of the cost of energy from the heat pump-based resources. Some assumptions are required, but they
5 can be aligned to provide an apples-to-apples comparison. The full details of these calculations are
6 included in Appendix D. Key issues are noted below:

- 7 • **Annual Output from Heat Pump-Based Sources.** The thermal energy produced by the heat
8 pump-based sources is not directly metered. That said, there is significant information available
9 on forecast electricity consumption and actual electricity consumption that can be used to
10 estimate output from the heat pump units. In the CPCN, the Project was forecast to consume
11 3,095 MWh of electricity per year, of which 2,889 MWh would be used by the sites with heat
12 pump-based systems²³. FAES has forecast that actual electricity consumption will stabilize at 301
13 MWh per year, so clearly the utilization of the heat pump systems has been much lower than
14 forecast. I have used a methodology described in Appendix D to estimate the original forecast
15 output from the heat pump-based systems and the actual level of output.
- 16 • **Capital Costs for Heat Pump-Based Systems.** The record does not include a full breakdown of all
17 of the forecast or actual capital costs associated with the heat pump-based systems. As noted
18 above, the total capital cost includes not only the heat pumps but also the ground source loop
19 fields, the circulation pumps for the loop fields, and intrasystem piping and mechanical room
20 piping required to integrate the heat pump systems with the rest of the thermal energy systems.
21 There is information available on the capital cost of the loop fields and the heat pumps, so this is
22 what I have included in my calculation of levelized costs. The result is that my calculations do
23 not capture all capital costs and almost certainly under-estimate both the original projection
24 and the updated calculation. Moreover, my calculations assume actual capital costs are lower
25 than the original projection, but this is not necessarily the case as I am simply limited by the
26 available information. However, my expectation is that including all capital costs in each
27 calculation would not significantly impact the relative results. If the Commission is of the view
28 that some or all of the capital costs associated with the heat pump-based systems should be

²² Current Application, Exhibit B-4, p 62, lines 22-23.

²³ Based on the stabilized project in year 2.

1 disallowed, then more information is required to identify all capital costs associated with the
 2 heat pump-based systems.

- 3 • **Electricity Rates.** Electricity rates have not exactly matched the assumptions used in the original
 4 projection. To remove this source of discrepancy, I have used the same electricity rates in each
 5 calculation, based on actual electricity rates since the Project’s first year of operations, and an
 6 updated forecast that assumes 3% escalation per year.

7 Details of the assumptions and calculations are shown in Appendix D, and Appendix D – Attachment 2.

8 *Table 4: Levelized Cost of Heat Pump-Based Systems: Original Projection, and Actuals with Updated Projection*

Item	Calculation #1 – Original Projection	Calculation #2 – Actuals to Date and Updated Projection
Ground Loop Fields	\$2,629,000	\$2,044,000
Heat Pumps	\$688,000	\$688,000
Other Pumps (Loop Circulation Pumps, etc)	Unknown	Unknown
Intrasystem Piping	Unknown	Unknown
Mechanical Room Piping	Unknown	Unknown
Known Capital Costs for Heat Pump-Based Sources	\$3,317,000	\$2,732,000
Stabilized, Weather- Adjusted Annual Output from Heat Pump Sources	7,160 MWh	746 MWh
Total Annual Thermal Energy	10,605 MWh	6,504 MWh
Annual Share of Thermal Energy from Heat Pumps	68%	11%
Discount Rate	7.10%	7.10%
20 Year Levelized Cost	\$95 per MWh	\$471 per MWh

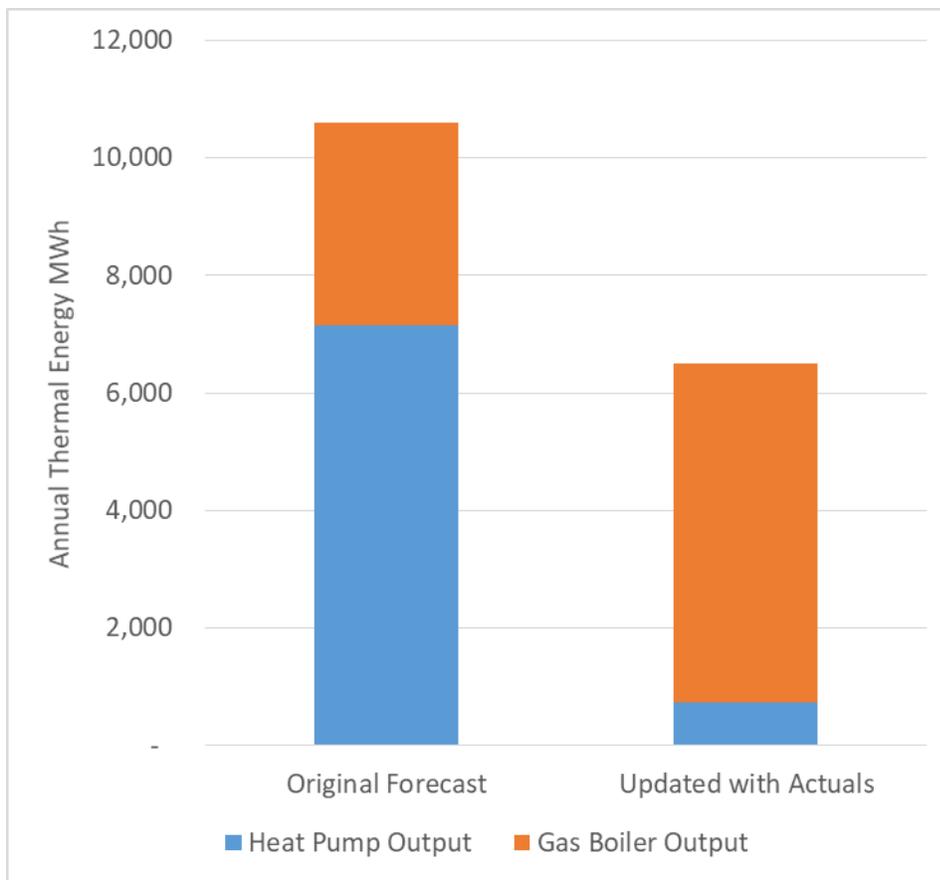
9

10 Due to low utilization, the levelized cost of energy from the heat pump-based systems has been far
 11 higher than the levelized cost implied in the original forecast. In theory, this can be at least partially

1 explained by the reduction in overall thermal energy load, but the load variance is only -39% and the
2 variance in output from the heat pump systems is -90%²⁴.

3 Figure 5 illustrates the combined impact of the variance in load described in the response to Question 2,
4 and the low utilization of the heat pump systems described in the response to Question 3. The Project
5 was originally intended to provide 10,605 MWh of thermal energy, mostly from the heat pump-based
6 systems. The project is forecast to stabilize at 6,504 MWh of thermal energy output, nearly all of which
7 is provided by gas boilers.

8 *Figure 5: Original Projected Thermal Energy Output vs Updated Thermal Energy Output (both based on stabilized, weather-*
9 *adjusted output)*



10

11 Due to the low utilization of the heat pump systems, the greenhouse gas (GHG) emission reductions
12 from the Project have been lower than originally forecast. Table 5 shows the DSD facilities' GHG
13 emissions before the Project, and Table 6 shows their emissions after the Project was implemented. The

²⁴ For a discussion of the load variance, see the response to Question 2. Actual stabilized heat pump output of 746 MWh / original target output of 7,160 MWh = 10%, or a -90% variance.

- 1 total GHG reduction achieved by the Project is 1,233 tonnes or 42%. Per the CPCN Application, the
- 2 intended level of reduction was over 70%²⁵.

3 *Table 5: GHG Emissions Before Implementation of the Project*

Line	Item	Amount	Source
1	Direct DSD Natural Gas MWh	16,280	CPCN Application, Exhibit B-1, Appendix D, "Energy System Summary" tab, cell O22 = 58,607 GJ or 16,280 MWh.
2	FAES Equipment Natural Gas MWh	0	Before the Project, so zero gas consumption for FAES Equipment
3	Total Natural Gas MWh	16,280	Line 1 + Line 2
4	Electricity MWh	1,301	CPCN Application, Exhibit B-1, Appendix D, "Energy System Summary" tab, cell N22 = 4,684 GJ or 1,301 MWh.
5	Natural Gas GHG Intensity (Tonnes / MWh)	0.1795	²⁶
6	Electricity GHG Intensity (Tonnes / MWh)	0.009	²⁷
7	Tonnes GHG	2,934	Line 3 x Line 5 + Line 4 x Line 6

4

²⁵ Original CPCN Application, Exhibit B-1, S. 1.2.4, p 3, second paragraph.

²⁶ See <https://www2.gov.bc.ca/assets/gov/environment/climate-change/cng/methodology/2016-17-pso-methodology.pdf> p 12, Table 1. 49.87 kg CO₂e / GJ natural gas x 3.6 GJ / MWh = 179.5 kg CO₂e / MWh natural gas or 0.1795 tonnes / MWh natural gas.

²⁷ See <https://www.bchydro.com/content/dam/BCHydro/customer-portal/documents/corporate/environment-sustainability/environmental-reports/ghg-intensities-2007-2015.pdf> 2015 is the most recent year for which BC Hydro has provided a combined GHG intensity. I have used the 2015 "Total Electricity Generation" value of 9 tonnes CO₂e / GWh of electricity, equivalent to 0.009 tonnes / MWh.

1 *Table 6: GHG Emissions Post-Implementation of the Project (Based on stabilized, weather-adjusted demand)*

Line	Item	Amount	Source
1	Direct DSD Natural Gas MWh	757 MWh	See Table 2, Line 3 for source and calculation
2	FAES Equipment Natural Gas MWh	8,706 MWh	Current Application, Exhibit B-1-1, Appendix A, Schedule 3, Line 4.
3	Total Natural Gas MWh	9,464 MWh	Line 1 + Line 2
4	Electricity MWh	301	Current Application, Exhibit B-1-1, Appendix A, Schedule 4, Line 3.
5	Natural Gas GHG Intensity (Tonnes / MWh)	0.1795	See Table 5
6	Electricity GHG Intensity (Tonnes / MWh)	0.009	See Table 5
7	Tonnes GHG	1,701	Line 3 x Line 5 + Line 4 x Line 6
8	Reduction in GHG Tonnes	1,233	Table 5 Line 7 – Table 6 Line 7
9	Reduction %	42%	Table 6 Line 8 / Table 5 Line 7

2

3 This also means the DSD has incurred higher offset costs than it expected to, as offset costs are a
 4 function of the price of offsets and the level of emissions by the school district’s facilities, so the
 5 variance between projected and actual GHG reductions directly translates to greater offset costs by
 6 DSD. A 70% reduction in GHG emissions would have translated to 2,053 tonnes of reductions per year.
 7 Actual reductions are 1,233, or 820 tonnes less than the target. This shortfall translates to a cost impact
 8 on the DSD of over \$20,000 per year using the current offset price of \$25 per tonne.

Appendix A



RESHAPE
STRATEGIES

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Vancouver, B.C. V6C 1T2 Canada
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reshapestrategies.com

Will Cleveland, MSc, Principal

Summary

- Experience with pricing and contract negotiation for complex projects
- High level of analytical skills including business case financial modeling, statistical analysis and risk analysis.
- Broad sector experience including thermal energy systems, water utilities, electricity generation, and land use and development.
- Project management experience involving diverse, interdisciplinary teams.
- Experience with regulatory principles and practice for regulated utilities.

Education

2008	Masters of Real Estate Economics and Finance London School of Economics, London UK
2004	Bachelor of Science in Foreign Service Georgetown University, Washington DC

Summary of Professional Experience

2013 – Present	Principal	Reshape Infrastructure Strategies Ltd
2010 – 2013	Associate	Compass Resource Management Ltd
2009	Analyst	Cloudworks Energy Inc.
2004 – 2006	Analyst	The Fordham Company, Chicago, IL

Select Assignments

- Part of advisory team to Creative Energy on applying for a Certificate of Public Convenience and Necessity (CPCN) from the BC Utilities Commission for the redevelopment of the Beatty Plant site.
- Economic and contract negotiation advisor to Metro Vancouver on effluent heat recovery project in North Vancouver
- Economic and contract negotiation advisor to Vancouver-based developer to negotiate district energy service contracts for new projects in Calgary and Toronto

- Part of advisory team to Creative Energy on applying for a Certificate of Public Convenience and Necessity (CPCN) from the BC Utilities Commission for the Northeast False Creek Neighbourhood Energy System.
- Part of team for Creative Energy's feasibility study for a low-carbon fuel switch of the Vancouver steam network. This study work was co-funded by the City of Vancouver and a grant from the Federation of Canadian Municipalities.
- Part of advisory team to Simon Fraser University Facilities regarding shared plant with Corix' University district energy system.
- Advisor to ENMAX on district energy expansion opportunities.
- Advisor to Surrey City Energy on developing a Rate Review Panel.
- Part of advisory team to Creative Energy Canada on purchase of Central Heat in Vancouver, BC and on expansion opportunities throughout downtown Vancouver.
- Advisor to City of Chilliwack on rate design for the City's municipal water utility.
- Phase 1 screening study for Metro Vancouver Housing Corporation on district energy opportunities related to redevelopment of Heather Place site. Technical options include integration with Vancouver General Hospital plant.
- Advisor to Central Heat, City of Vancouver, and Port Metro Vancouver on alternative energy options for the existing Central Heat network and large industrial users on Burrard Inlet.
- Phase 2 screening analysis for University of British Columbia on district energy opportunities in the South Campus area, including waste heat recovery from the Triumf accelerator.
- Advisor to Parklane Homes on development of business case for River District Energy and on negotiations with Metro Vancouver regarding use of waste heat. Provided support for RDE's application to the BC Utilities Commission for a Certificate of Public Convenience and Necessity, and support on responses to information requests.
- Advisor to City of Surrey on district energy opportunities in the Central City area, including the new City Hall geexchange system and a proposed large-scale system in Central City. Provided ongoing support to staff during project implementation.
- Developed business cases for Capital Regional District for multiple waste heat recovery opportunities from trunk sewers in the Greater Victoria area.
- Screening analysis for fuel switch opportunity for Lower Mainland Consolidated Health Authorities for a large hospital campus in Vancouver, BC, and continued support for the Health Authorities as they have negotiated with a proponent and sought internal approval for implementing the project.
- Provided support and quantitative analysis for phase 2 screening analysis of waste heat recovery opportunity in Saint John, NB.
- Provided analytical support for phase 2 analysis of district heating opportunity in Yellowknife, NT, including use of waste heat from an abandoned mine.
- Provided analytical support for pre-feasibility study for expansion of district energy system in Revelstoke, BC.

- Screening analysis (Phase 2) for district energy in the Northeast False Creek area of Vancouver, including integration with existing district energy systems and opportunities to supplement with alternative energy sources.
- Screening analysis (Phase 1) of district energy opportunities and options for South Waterfront redevelopment area of Portland, including Oregon Health Sciences University Schnitzer Campus (Portland Development Commission and OHSU).
- Supported phase 2 analysis of district heating opportunities in Squamish, BC, with technical options including biomass and ocean heat recovery.
- Developed financial proformas for multiple run-of-river hydroelectric opportunities in British Columbia for Vancouver-based independent power producer.

Appendix B

Letter from BLG

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F 604.622.5810
drossi@blg.com

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File No. 551952/000002

PRIVILEGED AND CONFIDENTIAL

July 16, 2018

Delivered by Email

Reshape Strategies
409 Granville Street, Suite 925
Vancouver, BC V6C 1T2

Attention: Will Cleveland, Principal

Dear Sirs/Mesdames:

Re: Application of Fortis Alternative Energy Services Inc. for Approval to Charge the Cost of Service Rate to Delta School District No. 37 (the “Application”)

As you are aware, BLG has been engaged to represent Delta School District No. 37 (“DSD”) in the Application proceedings before the British Columbia Utilities Commission (the “BCUC”).

Opinion Sought

We confirm that you have been retained by our offices on behalf of DSD to opine on the following matters:

1. Please compare the original projection of the cost of service for the thermal energy project with DSD (the “**Project**”) with the actual cost of service for the Project.
2. Please opine on whether FEI/FAES made any errors in its thermal energy load forecast when designing the Project. If you are of the opinion that FEI/FAES made errors in its thermal energy load forecast when designing the Project, please describe the nature and impact of those errors.
3. Please compare the original projected cost of energy from heat pump-based sources included the Project against the actual cost of energy from heat pump-based sources included in the Project.

Duty of Expert

In giving an opinion to the BCUC, an expert retained by one or more parties has a duty to assist the BCUC and is not to be an advocate for any party.

In your report please include following statement:

I am aware that I have a duty to assist the BCUC and not be an advocate for any party. I have prepared this report in conformity with my duty to the BCUC. If I am called upon to give oral or written testimony in relation to this matter, I will give that testimony in conformity with my duty to the BCUC.

Form of Report

Please include the following information in your report under the following headings:

- (a) INTRODUCTION – Your report should include a statement that you have prepared the report in response to a request from Dionysios Rossi of BLG for an opinion regarding the issues set out above.
- (b) AUTHORSHIP – Experts are required to state that they are solely responsible for the content of the report and the opinions expressed herein or provide the names of other contributing authors to the report if this is not the case.
- (c) QUALIFICATIONS – Experts are required to state their name, address and area of expertise. Please describe your qualifications, your area of expertise, relevant post-secondary education and any courses taught or publications authored so that we may seek to have you certified as an expert by the BCUC. Please attach your Curriculum Vitae to your report. If you have been accepted as an expert in other BCUC proceedings, please include such information in this section of your report.
- (d) ISSUES – Experts are required to state the nature of the opinion being sought and the issues to which the opinion relates. Please ensure your report reproduces the issues you are asked to address as stated above.
- (e) INSTRUCTIONS – Experts are required to state their instructions in relation to the proceedings. Please state that your instructions are set out in a letter from BLG attached to your report and attach a copy of this letter accordingly.
- (f) FACTS AND ASSUMPTIONS – Experts are required to state the facts and assumptions upon which they base their opinion. Please identify any information, including any documents, on which you rely in forming your opinion, or any other assumptions you have made. Please do not hesitate to include any additional documents or information you believe will better enable the BCUC to understand your opinion, whether it is information about procedures, pertinent literature or otherwise, and then identify that you have relied on this information or these documents in preparing your opinion.
- (g) OPINION – This section should be the most substantive part of the report and explain your opinion on each of the issues identified, considering the facts and assumptions identified by you. The integrity of the opinion is directly related to its objectivity and independence. As set out in the certification of an expert, you are

not an advocate for either party and you must be scrupulous in ensuring that your opinion is both impartial and objective.

If you refer or rely on any technical or other information, please set out that information here, your interpretation of it and why you rely on it. The report should be written in a manner easily understandable to a lay person and should “stand on its own”. That is, someone who is not experienced in these issues should be able to read and understand the report without further explanation or information.

You are only being asked to give your opinion on the issues which are within your area of expertise. While expert evidence is admissible to assist the BCUC in making a judgment on technical or scientific matters, an expert is not permitted to usurp or otherwise overtake the role of the BCUC by expressing an opinion on the very issue to be decided by the BCUC. Accordingly, you should not advance legal arguments or state legal conclusions.

Confidential & Independent File

Any correspondence and materials relating to the preparation of your written expert report, and the report itself, including all copies and drafts, should be labelled “**Privileged – Prepared for Counsel**” and should be placed in an independent file labelled “**Privileged – Report Prepared for Counsel**”. If DSD files your written expert report with the BCUC, your independent file will be subject to review by the BCUC and opposing counsel.

Remuneration

The terms of your remuneration will be governed by this retainer letter. Your fees will be based on your hourly rates, as adjusted over the period of the engagement. Mr. Cleveland’s current rate is \$185/hour.

Conclusion

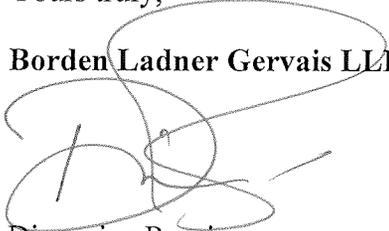
Before you begin drafting your report, please telephone us to discuss your preliminary opinion.

We require a copy of your report to be delivered to us by no later than August 6, 2018. We also require you to be available to testify during the hearing of this matter, on a date and at a time that is convenient for you.

We thank you in advance for your assistance with this matter. Please let us know if you have any questions or comments about this matter, including questions about the form of your requested report or this letter generally.

Yours truly,

Borden Ladner Gervais LLP



Dionysios Rossi
DR

1 **Appendix C**

2 This Appendix, including the attached spreadsheet (Attachment 1), provides supporting calculations and
3 sources for the information presented in my response to Question 1. In Attachment 1, all inputs drawn
4 from elsewhere are highlighted, and I have included notes with my sources.

5 Tab 1 provides the original projected unit cost of service, and updates it to reflect actual fuel rates.

6 Tab 2 provides the actual unit cost of service, excluding the amortization of the DDA.

7 Tab 3 has a table and chart illustrating the values calculated on Tab 1 and Tab 2.

8 Tab 4 calculates the sources of the variance in the unit cost of service for a sample year (2016/17).

9 Tab 5 has notes with my sources.

10 One note on the calculations: the original projected cost of service (shown in Attachment 1, Tab 1)
11 includes a line for "Amortization". This line has negative values. This does not represent the
12 amortization of the DDA. Instead, this represents the amortization of the contribution in aid of
13 construction (CIAC) provided by the DSD. In the actual cost of service values (shown in Attachment 1,
14 Tab 2) the impact of the CIAC is captured within the other capital charges such as Depreciation and
15 Earned Return; it is not broken out separately.

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Appendix D

This appendix, including the attached spreadsheet (Attachment 2), provides calculations of the original projected levelized cost of energy from the heat pump-based systems, and an updated levelized cost of energy from the heat pump-based systems based on actuals to date and an updated forecast, as discussed in the response to Question 3.

Attachment 2 has the detailed calculations. In Attachment 2 all inputs drawn from elsewhere are highlighted and I have included notes with my sources.

On Tab 1, I use information from the original CPCN Application to calculate the original projected thermal energy output from the heat pump-based systems, and the original projected efficiency of the heat pump-based systems (referred to as Coefficient of Performance or COP). The original application did not explicitly identify the thermal energy output from the heat pump-based systems, so I have calculated it using the following steps:

1. Calculate thermal energy output at sites without heat pump-based systems (i.e. sites heated only by gas boilers) [2,582 MWh]
2. Calculate gas input at sites without heat pump-based systems [2,760 MWh fuel]
3. Calculate assumed gas boiler efficiency at sites without heat pump-based systems (Step 1 / Step 2). I have assumed this same gas boiler efficiency applies to all sites served by the Project [93.6%]
4. Multiply total gas consumption at all sites by gas boiler efficiency (calculated in Step 4) to calculate total gas boiler thermal energy output. [3,444 MWh]
5. Subtract gas boiler thermal energy output from total thermal energy output of 10,605 MWh to calculate thermal energy output from heat pump-based systems. [7,160 MWh]
6. Calculate electricity input at sites with heat pump-based systems [2,889 MWh]
7. Divide thermal energy output from heat pump-based systems by electricity input at heat pump-based system sites to calculate COP of heat pump-based systems [2.48]

On Tab 2 I use the information calculated on Tab 1 plus available information on capital costs and O&M costs, to calculate the original projected levelized cost of energy. This has been updated with actual electricity prices and a revised electricity price forecast, to remove electricity prices as a source of variance.

On Tab 3 I use the information calculated on Tab 1 plus other available information to calculate an updated levelized cost of energy reflecting actuals to date, and an updated forecast. This calculation uses the same stream of electricity prices as is used in Tab 2.

Tab 4 calculates the actual effective rate paid for electricity and provides a forecast future effective rate assuming 3% escalation per year. BC Hydro has not provided a long-term rate forecast. In my view this is a reasonable forecast for the foreseeable future.

One methodology note: the original application used calendar years (i.e. 2012, 2013, etc) but FAES' reporting now uses the DSD fiscal year, which ends June 30. In the table I have compared the first year of actual values provided by FAES (2012/13) with the first year of projected values in the original CPCN (2012), etc.

1 Other observations:

- 2 • **Heat Pump Coefficient of Performance.** As shown in Tab 1, the information included with the
3 original CPCN Application implied a COP for the heat pump-based systems of 2.48. In a later
4 proceeding, FAES was asked about COPs and its response assumed a COP of 3.5¹. However, FAES
5 also stated it did not have thermal energy output information, and it did not provide any backup
6 for this COP value, so I have used the COP assumption from the original CPCN application as I
7 have calculated on Tab 1.
- 8 • **Gas Boiler Efficiency.** The financial model included with the original CPCN Application provided a
9 column with efficiency values for the Project by site², but these values were calculated as
10 [Thermal Energy Output] / [Gas Input + Electricity Input]. Calculating the amount of thermal
11 energy provided by natural gas requires using [Thermal Energy Output] / [Gas Input], and that is
12 the approach I have used to arrive at the gas boiler efficiency of 93.6%.

¹ 2015/16 Proceeding, Exhibit B-6, p 6 lines 33-36.

² Original CPCN Application, Exhibit B-1, Attachment D, "Energy System Summary" tab, column S.

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G.A. PEREZ P.Eng.
J. PEREZ-STONE P.Eng.
S. PIPER P.Eng.
S. REABURN P.Eng.
A. ROTOFF C.E.T.
J. SMITH
C. TRAVIS C.E.T.
B. TYSOE P.Eng.
S. VAN WONDEREN P.Eng.
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P. WILSON P.Eng.

Associates

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R. GREGG P.Eng.
G. LOVELY P.Eng.
P. SUM P.Eng.

Attention: Mr. Dionysios Rossi (drossi@blg.com)
Borden Ladner Gervais

Re: **Delta School District Mechanical Expert Witness Report
MCW Project No. 5129**

1.0 Introduction

Borden Ladner Gervais (BLG) retained MCW Consultants Ltd. (MCW) to provide expert opinion on mechanical systems arising from an application by Fortis Alternative Energy Services (FAES) to increase service rates for the plants FAES operates in the Delta School District.

1. This report has been prepared to provide an opinion on the following matters:

A detailed description of the engineering and related considerations that should reasonably have been taken into account by FEI/FAES (and its subcontractors) when:

Q.1.a. evaluating whether geo-exchange heat pump energy systems and air-source heating pump energy systems (the "**Heat Pump Systems**") were appropriate for use in the thermal energy project with DSD (the "**Project**"); and

Q.1.b. designing and building the Heat Pump Systems (including the control systems and mechanical equipment) for the Project.

2. Based on my site visits of the Heat Pump Systems located at Delview Secondary, Neilson Grove Elementary, and Richardson Elementary, and the review of the mechanical drawings for these systems and relevant British Columbia Utilities Commission (BCUC) filings regarding these systems, provide an opinion on:

Q.2.a. whether the engineering and related considerations described in the response to Question 1 above were in fact taken into account by FEI/FAES (and its subcontractors) when:

- i. evaluating whether the Heat Pump Systems were appropriate for use in the Project; and
- ii. designing and building the Heat Pump Systems (including the control systems and mechanical equipment) for the Project; and



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ENVIRONMENTAL
FOOTPRINT





Q.2.b. whether the Heat Pump Systems for the Project, as designed and constructed, can perform as promised by FEI/FAES in its application to the BCUC for a Certificate of Public Convenience and Necessity.

Refer to **(Appendix A)** for letter of request from Mr. Dionysios Rossi dated July 16, 2018.

2.0 Authorship

I, Willie Perez, am solely responsible for the content of the report and the opinions expressed herein. My area of expertise is Mechanical Engineering as it relates to mechanical systems in buildings. Please refer to my Curriculum Vitae in **(Appendix B)**.

3.0 Duty of Expert

In writing this report I am aware that I have a duty to assist the BCUC and not be an advocate for any party. I have prepared this report in conformity with my duty to the BCUC. If I am called upon to give oral or written testimony in relation to this matter, I will give that testimony in conformity with my duty to the BCUC.

4.0 Facts and Assumptions

.1 Drawings:

a) Neilson Grove Elementary **(Appendix C)**

- Issued for Tender Mechanical drawings prepared by Keen Engineering dated December 2, 1999
- Final Submission Mechanical drawings prepared by Geo-Energie dated August 28, 2012

b) Richardson Elementary **(Appendix D)**

- Issued for Tender Mechanical drawings prepared by Keen Engineering dated April 20, 1998
- Final Revision Mechanical drawings prepared by Geo Energie dated November 5, 2012

c) Delview Secondary **(Appendix E)**

- Mechanical drawings prepared by Quadra Pacific dated April 26, 1996
- Issued for Construction Mechanical drawings prepared by Geo Energie dated October 31, 2013

.2 Documents:

- a) FortisBC Energy Inc.: Application for a Certificate of Public Convenience and Necessity (CPCN) for Approval of Contracts and Rate for Public Utility Service to provide Thermal Energy Service to Delta School District Number 37 (The Application), dated November 28, 2011 **(Appendix F)**.
- b) FEI application for a Certificate of Public Convenience and Necessity (CPCN) for Approval of Contracts and Rates for Public Utility Service to Provide Thermal Energy Service to Delta School District 37 as part of IR No. 2 dated January 25, 2012 **(Appendix G)**.

.3 I completed site visits to review existing conditions on the following dates:

- a) Delview Secondary: site was visited July 16, 2018
- b) Neilson Grove Elementary: site was visited July 18, 2018
- c) Richardson Elementary: site was visited July 24, 2018



5.0 Answers to Questions:

.1 Q.1.

a) Preamble

On page 11 of the CPCN Application (**Appendix F**) it is stated that the total natural gas consumption for the 19 buildings included in the retrofit was 58,607 GJ/Annum with an estimated energy waste from plant inefficiencies of 25,114 GJ/Annum. Page 11 of the same document states that the Project will reduce the total energy necessary to produce the thermal energy that the DSD requires at these 19 buildings by utilizing higher efficiency gas boilers and heat pumps.

Table 2 part of FEI’s Response to BCUC Confidential Information Request No. 2 dated January 25, 2012 (**Appendix G**) there is a pre-retrofit natural gas consumption [GJ] and post-retrofit expected gas consumption [GJ]. From this table, the following information can be extracted:

School	Pre-retrofit NG [GJ]	Post-retrofit NG [GJ]	Expected NG Savings
Delview Secondary	5093	320	93%
Neilson Grove Elementary	1121	78	93%
Richardson Elementary	1891	117	93%

The expected 93% natural gas savings using a combination of high efficiency boilers and heat pumps is very aggressive and relies heavily on the usage of the heat pump system to reduce gas consumption.

b) Engineering factors that need to be considered to implement heat pump technology into a thermal energy plant.

i) Heating Temperatures Produced by Heat Pumps.

Air-to-water heat pumps, as used in Delview Secondary, draw heat from the atmosphere and transfer it to a hot water heating system by means of mechanical refrigeration.

Geothermal heat pumps, as used in Richardson and Neilson Grove Elementary, draw heat from the ground and transfer it to a hot water heating system by means of mechanical refrigeration.

From the drawings of (**Appendices C, D and E**) the heat pumps used in schools were designed to operate at the following conditions:

School	Entering Water Temperature	Leaving Water Temperature
Delview Secondary	48.8°C	54.4°C
Neilson Grove Elementary	42.7°C	48.8°C
Richardson Elementary	37.7°C	41.7°C

The term “*leaving water*” refers to the water that has been heated by the heat pump and goes to heating components in the building such as baseboards, radiant ceiling panels and heating coils.

The term “*entering water*” refers to the water coming back from the building heating components and entering the heat pump to be heated.

The type of heat pumps used by FAES in the 3 school retrofit projects supplying water between 48.8°C and 54.4°C are considered as “*low water temperature*” units.



ii) Heating Distribution Systems

Heating distribution systems are designed to operate at a certain supply water temperature. Heating components such as baseboards, radiant ceiling panels or heating coils are selected to provide a capacity that matches the peak heating load.

For instance, for the 3 schools, the original design temperature from **(Appendices C, D and E)** was 82°C. This meant that all heating components were selected to provide a capacity equal to heat the building at peak winter condition of -9°C outdoor temperature.

The heating capacity of different components is highly dependent on water temperature.

For example, the following **Table 1** illustrates different capacities of heating components at water temperatures of 75°C and 43°C.

TABLE 1

Heating Element in Building	Heating Capacity at 75°C (High temperature)	Heating Capacity at 43°C (Low Temperature)
Hot Water Baseboard	1152 [watts/M]	335 [watts/M]
Radiant Ceiling Panel	432 [watts/M]	85 [watts/M]
Heating Coils	1 row is sufficient	2 rows are required

Note: This table is produced from data from the following sources:

- “Rosemex” baseboards (100 x 100 aluminum fin with 25Ø copper pipe).
- “Airtex” 750 mm wide radiant panels

If a heating plant that can supply temperatures between 48.8°C and 54.4°C is connected to a heating system designed to operate at 82°C it can be seen from the table above, that the heating capacities necessary to meet the building heat load will not be achieved and that it is necessary to retrofit the heating elements by adding more baseboards/radiant panels and/or increase the size of coils in an air handler in order to meet the peak heating load.

Central plants using lower efficiency boilers such as atmospheric boilers (80% rated efficiency) are better suited to high water temperature systems (82°C and higher).

Central plants using high efficiency boilers (90% efficiency and higher) and/or heat pumps are better suited to low water temperature systems (55°C and lower).

In a thermal heating plant that tries to maximize the usage of heat pumps it is crucial that the heating elements of the building are sized large enough to work at low temperatures.

iii) Heating Water Flows and Boiler Loading

The thermal efficiency of a high efficiency boiler depends on:

- a) The temperature of water entering boiler, and
- b) The percentage of load at which the boiler operates.

Entering water temperature has the biggest impact on boiler efficiency.

In order to reduce the entering water temperature, the water flows in a heating system need to be reduced at partial building load. A partial load is a heating load lower than the peak heating load. Flows are reduced by using variable speed drives on the main heating pumps.



The boiler efficiency also increases when operating at partial loads. Lower loads increase the efficiency of the boiler. To reduce the load in a boiler, the plant has to use more than one high efficiency boiler. The graph above illustrates the effect of return temperature and partial load on boiler efficiency.

In summary, in order to determine if it was possible to achieve the forecasted 93% natural gas consumption savings, it would be the standard industry practice to consider the following factors in the evaluation and design of the heating system:

- .1 Heat pump supply temperature limits.
- .2 Type of heating distribution system that the heat pump was to be connected to.
- .3 Impact of return temperature and partial load on high efficiency boilers.
- .4 Results from an energy model conducted to ascertain that 93% gas energy savings would be possible.

An energy model is a computer model of a building created by using its actual geometry, building envelope data, lights, heating and ventilating systems with the purpose to inform the designer on energy use or optimization of thermal heating plants.

.2 Q.2.a

- 1) Based on my review of the design drawings indicated under item 4.1, the mechanical systems for the three schools are as follows:

.1 Delview Secondary

The original central plant consisted of 12 atmospheric boilers of 300 MBH input each with a rated thermal efficiency of 80%.

The heating distribution system consisted of hot water baseboards in the classroom and central air handlers with 1 row heating coils to provide ventilation.

The original central plant was a high temperature system designed to operate at 82°C water temperature.

The retrofit consisted of keeping 6 of the existing atmospheric boilers installed in 1969, and adding a single 850 MBH input high efficiency boiler plus two 30 tons air-to-water heat pumps.

Each heat pump had a capacity of 436 MBH at -1.1°C outside air temperature.

FAES did not make any changes to the heating distribution system.

As boilers accumulate operating hours, there is wear and tear of the different parts of the units which lowers the boiler efficiency. The retrofit was completed around 2013 and there is no evidence that after 44 years of service there was a detailed audit of the units to demonstrate the boilers would operate at the rated efficiency.

.2 Richardson Elementary

The original central plant consisted of 6 atmospheric boilers of 300 MBH input each with a rated thermal efficiency of 80%.

The heating distribution system consisted of radiant ceiling panels in the classroom and central air handlers with 1 row heating coils to provide ventilation.

The original central plant was a high temperature system designed to operate at 82°C water temperature.



The retrofit consisted of keeping 3 of the existing atmospheric boilers installed in 1999 and adding a single 500 MBH input high efficiency boiler and a single 30 tons water-to-water geothermal heat pump.

Heat pump has a capacity of 300 MBH at -1.1°C geothermal loop entering water temperature.

FAES did not make any changes to the heating distribution system.

There is no evidence that the existing boilers were retrofitted or serviced prior to the start-up of energy retrofit project.

.3 Neilson Grove Elementary

The original central plant consisted of 6 atmospheric boilers of 400 MBH input each with a rated thermal efficiency of 80%.

The heating distribution system consisted of a central air handling system with zone reheat coils. All coils are single row.

The retrofit consisted of keeping all six of the 400 MBH atmospheric boilers installed in 2000 and adding a single 30 tons water-to-water geothermal heat pump.

The original central plant was a high-temperature system designed to operate at 82°C.

Heat pump has a capacity of 270 MBH.

FAES did not make any changes to the heating distribution system.

There is no evidence that the existing boilers were retrofitted or serviced prior to the start-up of energy retrofit project.

2) Findings

a) Heat Pump Capacity Contribution

The following **Table 2** summarizes the installed capacities before and after the retrofit and the percentage contribution by the heat pumps at each school:

Table 2

School	Heating Capacity Before Retrofit	Heating Capacity after Retrofit	Capacity Contribution from Heat Pump
Delview Secondary	12 boilers @ 300 MBH = 3600 MBH	- Six boilers @ 300 MBH = 1800 MBH - One high efficiency boiler = 850 MBH - Two air-to-water heat pumps = 872 MBH - Total = 3522 MBH	Cap = $\frac{872}{3522}$ = 25%
Richardson Elementary	Six boilers @ 300 MBH = 1800 MBH	- Three boilers @ 300 MBH = 900 MBH - One high efficiency boiler = 500 MBH - Heat pumps = 300 MBH - Total = 1700 MBH	Cap = $\frac{300}{1700}$ = 18%
Neilson Grove Elementary	Six boilers @ 400 MBH = 2400 MBH	- Six boilers @ 400 MBH = 2400 MBH - Heat pump = 270 MBH	Cap = $\frac{270}{2400}$ = 13%

Based on **Table 2** from (**Appendix G**) the expected reduction in natural gas [GJ] consumption was 93% for all 3 schools.

FAES did not appear to do an energy model. However, it is apparent that heat pump capacity contributions of 13 to 25% would not provide the 93% of natural gas savings forecasted by FAES. A detailed energy model for each of the schools would have shown the actual material that could be expected for the project gas consumption savings.

b) Atmospheric Boilers (80% rated efficiency) Contribution

The retrofit project kept all or most of the original atmospheric boilers in the central plant. The heating capacity contribution from the atmospheric boilers for each of the schools after the retrofit was:

Delview Secondary: $1800 \text{ MBH} / 3522 \text{ MBH} = 51\%$
Richardson Elementary: $900 \text{ MBH} / 1700 \text{ MBH} = 53\%$
Neilson Grove Elementary: $2400-270 \text{ MBH} / 2400 = 89\%$

*These values are calculated using data **Table 2** above.*

High contribution from atmospheric boilers and low contribution from heat pumps make it not possible to achieve the forecasted 93% natural gas savings.

.3 Q.2.b.

- .1 The technical submissions from FAES do not explain in detail how the 93% natural gas savings were supposed to be achieved. It is my opinion that to determine this level of savings FAES should have completed an energy model for each of the schools to analyze the operation of the atmospheric boilers, high efficiency boilers and heat pumps. This is a standard industry practice for the design of thermal heating plants using a combination of boilers and heat pumps.
- .2 It is my opinion that achieving the forecasted 93% natural gas consumption savings was not possible in the schools that I examined because:
 - a) The heating distribution systems for the 3 schools were not changed. These systems were originally designed as high temperature system which meant the heat pumps, due to their temperature limitations, could not provide enough hours of operation in the heating season leading to significant reliance on boilers.
 - b) The central plant at each school lacked elements like variable speed drives in pumps to facilitate flow reduction at lower loads in order to maximize efficiency of the high efficiency boilers. Refer to item 5.1.b.iii.
 - c) The efficiency of the high efficiency boilers was reduced by failing to include more than one boiler. Refer to item 5.1.b.iii.
- .3 According to standard industry practice, it is my opinion that FAES should have known of the items mentioned above and that it should have determined whether a full heating system retrofit may be needed to meet the natural gas reduction targets.

Yours very truly,
MCW Consultants Ltd.



G.A. Willie Perez, P.Eng., LEED AP
Partner



Appendix A

Dionysios Rossi
T 604.640.4110
F 604.622.5810
drossi@blg.com

Borden Ladner Gervais LLP
1200 Waterfront Centre
200 Burrard St. P.O. Box 48800
Vancouver, BC, Canada V7X 1T2
T 604.687.5744
F 604.687.1415
blg.com



File No. 551952/000002

PRIVILEGED AND CONFIDENTIAL

July 16, 2018

Delivered by Email

MCW Consultants Ltd.
1400 – 1185 West Georgia St.
Vancouver, British Columbia V6E 4E6

Attention: Willie Perez, P. Eng., LEED AP

Dear Sirs/Mesdames:

Re: Application of Fortis Alternative Energy Services Inc. for Approval to Charge the Cost of Service Rate to Delta School District No. 37 (the "Application")

As you are aware, BLG has been engaged to represent Delta School District No. 37 ("DSD") in the Application proceedings before the British Columbia Utilities Commission (the "BCUC").

Opinion Sought

We confirm that you have been retained by our offices on behalf of DSD to opine on the following matters:

1. Please provide a detailed description of the engineering and related considerations that should reasonably have been taken into account by FEI/FAES (and its subcontractors) when:
 - a. evaluating whether geo-exchange heat pump energy systems and air-source heating pump energy systems (the "Heat Pump Systems") were appropriate for use in the thermal energy project with DSD (the "Project"); and
 - b. designing and building the Heat Pump Systems (including the control systems and mechanical equipment) for the Project.
2. Based on your inspection of the Heat Pump Systems located at Delview Secondary, Neilson Grove Elementary, and Richardson Elementary, and your review of the mechanical drawings for these systems and relevant BCUC filings regarding these systems, please opine on:

- a. whether the engineering and related considerations described in your response to Question 1 above were in fact take into account by FEI/FAES (and its subcontractors) when:
 - i. evaluating whether the Heat Pump Systems were appropriate for use in the Project; and
 - ii. designing and building the Heat Pump Systems (including the control systems and mechanical equipment) for the Project; and
- b. whether the Heat Pump Systems for the Project, as designed and constructed, can perform as promised by FEI/FAES in its application to the BCUC for a Certificate of Public Convenience and Necessity.

Duty of Expert

In giving an opinion to the BCUC, an expert retained by one or more parties has a duty to assist the BCUC and is not to be an advocate for any party.

In your report please include following statement:

I am aware that I have a duty to assist the BCUC and not be an advocate for any party. I have prepared this report in conformity with my duty to the BCUC. If I am called upon to give oral or written testimony in relation to this matter, I will give that testimony in conformity with my duty to the BCUC.

Form of Report

Please include the following information in your report under the following headings:

- (a) **INTRODUCTION** – Your report should include a statement that you have prepared the report in response to a request from Dionysios Rossi of BLG for an opinion regarding the issues set out above.
- (b) **AUTHORSHIP** – Experts are required to state that they are solely responsible for the content of the report and the opinions expressed herein or provide the names of other contributing authors to the report if this is not the case.
- (c) **QUALIFICATIONS** – Experts are required to state their name, address and area of expertise. Please describe your qualifications, your area of expertise, relevant post-secondary education and any courses taught or publications authored so that we may seek to have you certified as an expert by the BCUC. Please attach your Curriculum Vitae to your report. If you have been accepted as an expert in other BCUC proceedings, please include such information in this section of your report.
- (d) **ISSUES** – Experts are required to state the nature of the opinion being sought and the issues to which the opinion relates. Please ensure your report reproduces the issues you are asked to address as stated above.

- (e) **INSTRUCTIONS** – Experts are required to state their instructions in relation to the proceedings. Please state that your instructions are set out in a letter from BLG attached to your report and attach a copy of this letter accordingly.
- (f) **FACTS AND ASSUMPTIONS** – Experts are required to state the facts and assumptions upon which they base their opinion. Please identify any information, including any documents, on which you rely in forming your opinion, or any other assumptions you have made. Please do not hesitate to include any additional documents or information you believe will better enable the BCUC to understand your opinion, whether it is information about procedures, pertinent literature or otherwise, and then identify that you have relied on this information or these documents in preparing your opinion.
- (g) **OPINION** – This section should be the most substantive part of the report and explain your opinion on each of the issues identified, considering the facts and assumptions identified by you. The integrity of the opinion is directly related to its objectivity and independence. As set out in the certification of an expert, you are not an advocate for either party and you must be scrupulous in ensuring that your opinion is both impartial and objective.

If you refer or rely on any technical or other information, please set out that information here, your interpretation of it and why you rely on it. The report should be written in a manner easily understandable to a lay person and should “stand on its own”. That is, someone who is not experienced in these issues should be able to read and understand the report without further explanation or information.

You are only being asked to give your opinion on the issues which are within your area of expertise. While expert evidence is admissible to assist the BCUC in making a judgment on technical or scientific matters, an expert is not permitted to usurp or otherwise overtake the role of the BCUC by expressing an opinion on the very issue to be decided by the BCUC. Accordingly, you should not advance legal arguments or state legal conclusions.

Confidential & Independent File

Any correspondence and materials relating to the preparation of your written expert report, and the report itself, including all copies and drafts, should be labelled “**Privileged – Prepared for Counsel**” and should be placed in an independent file labelled “**Privileged – Report Prepared for Counsel**”. If DSD files your written expert report with the BCUC, your independent file will be subject to review by the BCUC and opposing counsel.

Remuneration

The terms of your remuneration will be governed by this retainer letter. Your fees will be based on your hourly rates, as adjusted over the period of the engagement. Mr. Perez’ current rate is \$220/hour.

Conclusion

Before you begin drafting your report, please telephone us to discuss your preliminary opinion.

We require a copy of your report to be delivered to us by no later than August 8, 2018. We also require you to be available to testify during the hearing of this matter, on a date and at a time that is convenient for you.

We thank you in advance for your assistance with this matter. Please let us know if you have any questions or comments about this matter, including questions about the form of your requested report or this letter generally.

Yours truly,

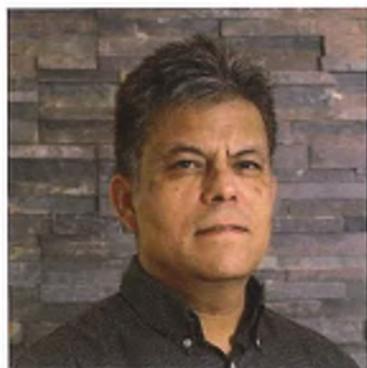
Borden Ladner Gervais LLP



Dionysios Rossi
DR



Appendix B



WILLIE PEREZ, P.Eng., LEED AP PARTNER



PROFILE

A mechanical engineer and project manager since 1982, Willie has a wide base of knowledge on institutional, residential, and commercial design, including for design-assist and design-build projects. He founded his own mechanical engineering firm, Perez Engineering, in 2005. In February 2013, Willie joined MCW as Principal. In December of that year, he was promoted to Partner.

ACTIVE PROFESSIONAL SINCE: 1982

EDUCATION

B.Sc. Mechanical
Engineering, Technical
University Federico Santa
Maria, CH, 1981

PROFESSIONAL AFFILIATIONS

LEED Accredited
Professional

Professional Engineer,
Engineers and
Geoscientists BC

Professional Engineer,
APEGA

Member, ASHRAE

Member, ASPE

Member, Chartered
Institution of Building
Services Engineers, UK

RELEVANT PROJECT EXPERIENCE

Recreational Projects

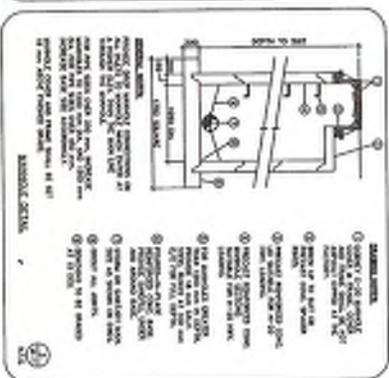
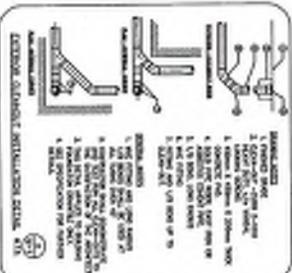
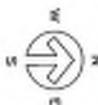
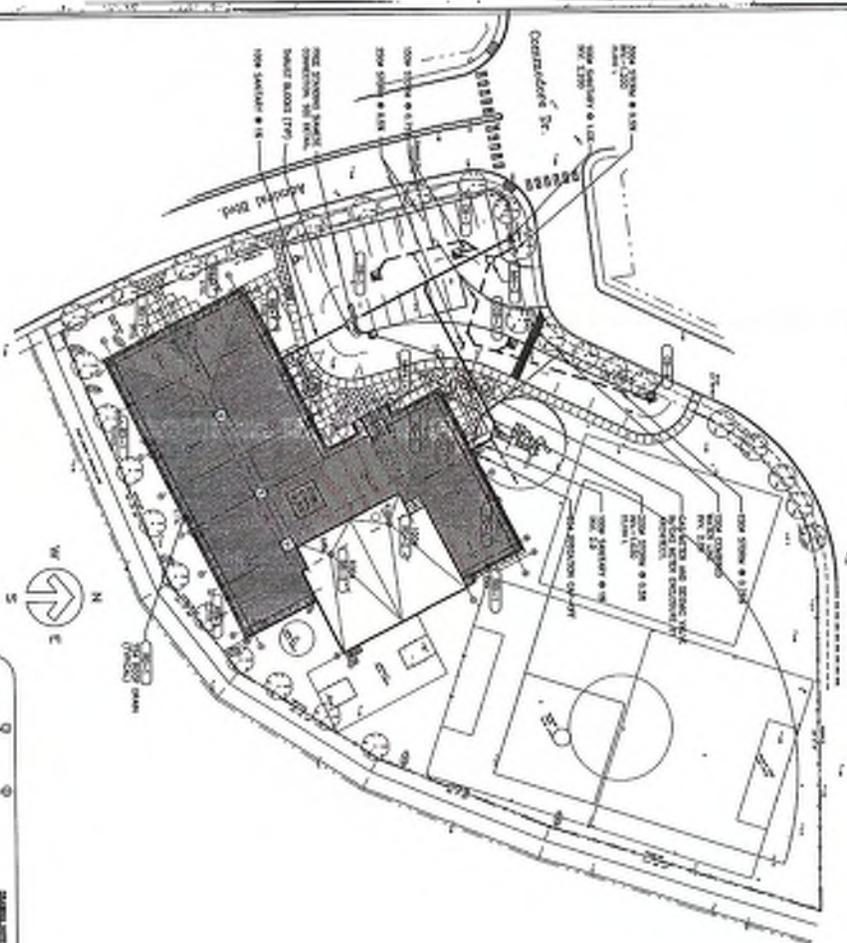
- Centrepont, Squamish, BC
- Kwadacha Nation Health & Community Building Fort Ware, BC
- Musqueam Community Centre, Vancouver, BC
- Sliammon Cultural Centre, Powell River, BC
- Ucluelet Community Centre and Daycare, Ucluelet, BC
- Nazko Health Centre, Quesnel, BC
- Tsartlip Health Centre, Saanich, BC
- UBCO The Hangar Fitness and Wellness Centre, Kelowna, BC

Institutional Projects

- Burnaby Village Museum, Burnaby, BC
- BC Showcase & Corporate Hosting Spaces, Vancouver, BC
- Canada Revenue Agency, Surrey, BC
- City of Vancouver Engineering Department – Crossroads, Vancouver, BC
- Gulf Islands Operations Centre, Sidney, BC
- JIBC Classroom and Facilities, Maple Ridge, BC
- Sechelt Justice Building, Sechelt, BC
- McGill Library, Burnaby, BC
- Thompson-Nicola Regional District Library, Kamloops, BC
- Burnaby Public Library – Tommy Douglas Branch, Burnaby, BC
- College of New Caledonia, Prince George, BC
- JIBC Classroom and Facilities, Maple Ridge, BC
- John M.S. Lecky UBC Boathouse, Richmond, BC
- Kwantlen University Admissions, Langley BC
- Langara College Building C, Vancouver, BC
- Langara Student Union Building, Vancouver, BC
- UBCO The Hangar Fitness and Wellness Centre, Kelowna, BC
- UNBC Northern Sport Centre, Prince George, BC



Appendix C



GENERAL NOTES

1. CONSULT THE CITY ENGINEER AND THE FIRE DEPARTMENT FOR ALL NECESSARY PERMITS AND APPROVALS.
2. THE SHOWER AND SINK ARE TO BE INSTALLED IN THE RESTROOMS.
3. PROVIDE CONCRETE WALL CURBS AT ALL EXTERIOR WALLS AND AT ALL EXTERIOR WALLS AT ALL EXTERIOR WALLS.
4. REFER TO ARCHITECTURAL DRAWINGS FOR ALL EXTERIOR OF EACH ROOM & SYMBOLS.

SPRINKLER DESIGN INFORMATION

THE BUILDING IS TO BE PROTECTED BY A DRY PIPED SPRINKLER SYSTEM WITH THE FOLLOWING CONDITIONS:

- WET PIPED SPRINKLER SYSTEM
- 1.5% SLOPE
- 1.5% SLOPE
- 1.5% SLOPE

BUILDING WATER SERVICE

DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
PIPE PROTECTION	200	FT	1.25	250.00
CONCRETE WATER	200	FT	1.25	250.00
WATER SERVICE LINE	200	FT	1.25	250.00

SANITARY LOAD

DESCRIPTION	UNIT	PRICE	TOTAL	
PIPE PROTECTION	200	FT	1.25	250.00
CONCRETE WATER	200	FT	1.25	250.00
WATER SERVICE LINE	200	FT	1.25	250.00

NATURAL GAS INFORMATION

DESCRIPTION	UNIT	PRICE	TOTAL	
PIPE PROTECTION	200	FT	1.25	250.00
CONCRETE WATER	200	FT	1.25	250.00
WATER SERVICE LINE	200	FT	1.25	250.00

STEEL BEARING GAS LOAD

DESCRIPTION	UNIT	PRICE	TOTAL	
PIPE PROTECTION	200	FT	1.25	250.00
CONCRETE WATER	200	FT	1.25	250.00
WATER SERVICE LINE	200	FT	1.25	250.00

STORM LOAD (BASED ON 50-YEAR RETURN PERIOD)

DESCRIPTION	UNIT	PRICE	TOTAL	
PIPE PROTECTION	200	FT	1.25	250.00
CONCRETE WATER	200	FT	1.25	250.00
WATER SERVICE LINE	200	FT	1.25	250.00

LOCAL DESCRIPTION
 LOT 1, DISTRICT LOT 4TH CIRCUIT 35
 NWD PLAN LAMP 300000
 CIVIC ADDRESS

DRAWING NOTES

1. THE BUILDING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF DELTA, GEORGIA, ORDINANCE 100-100-001, AS AMENDED.
2. THE BUILDING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF DELTA, GEORGIA, ORDINANCE 100-100-001, AS AMENDED.
3. THE BUILDING SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE CITY OF DELTA, GEORGIA, ORDINANCE 100-100-001, AS AMENDED.

PARAGON MECHANICAL LTD.
 WE HEREBY CERTIFY
 THESE DRAWINGS ARE
AS BUILT

SYMBOL SCHEDULE

SYMBOL	DESCRIPTION
1	CONCRETE WALL CURB
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50	CONCRETE WALL CURB

SITE / ROOF PLAN

PROJECT NO. 00020
 DRAWING NO. M1

CAPTAINS COVE
 ELEMENTARY SCHOOL,
 SCHOOL DISTRICT No. 37
 DELTA, B.C.

DESIGNED BY: KILLICK METZ BOWEN ROSE
 1100 W. 10th Street, Suite 100, Delta, BC V9C 5K6
 TEL: 250-261-1111

DATE: 11/11/11

SCALE: AS SHOWN

PROJECT NO. 00020

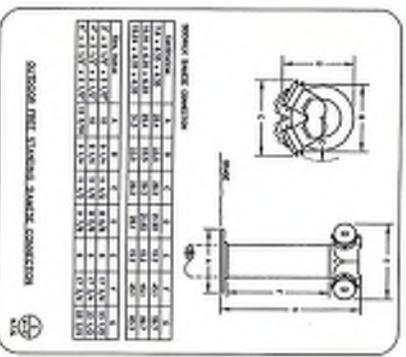
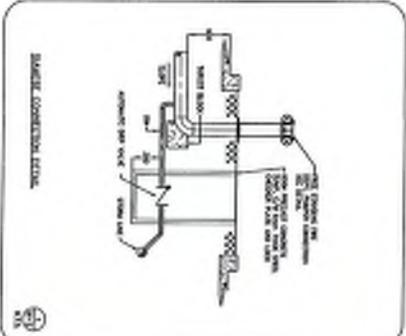
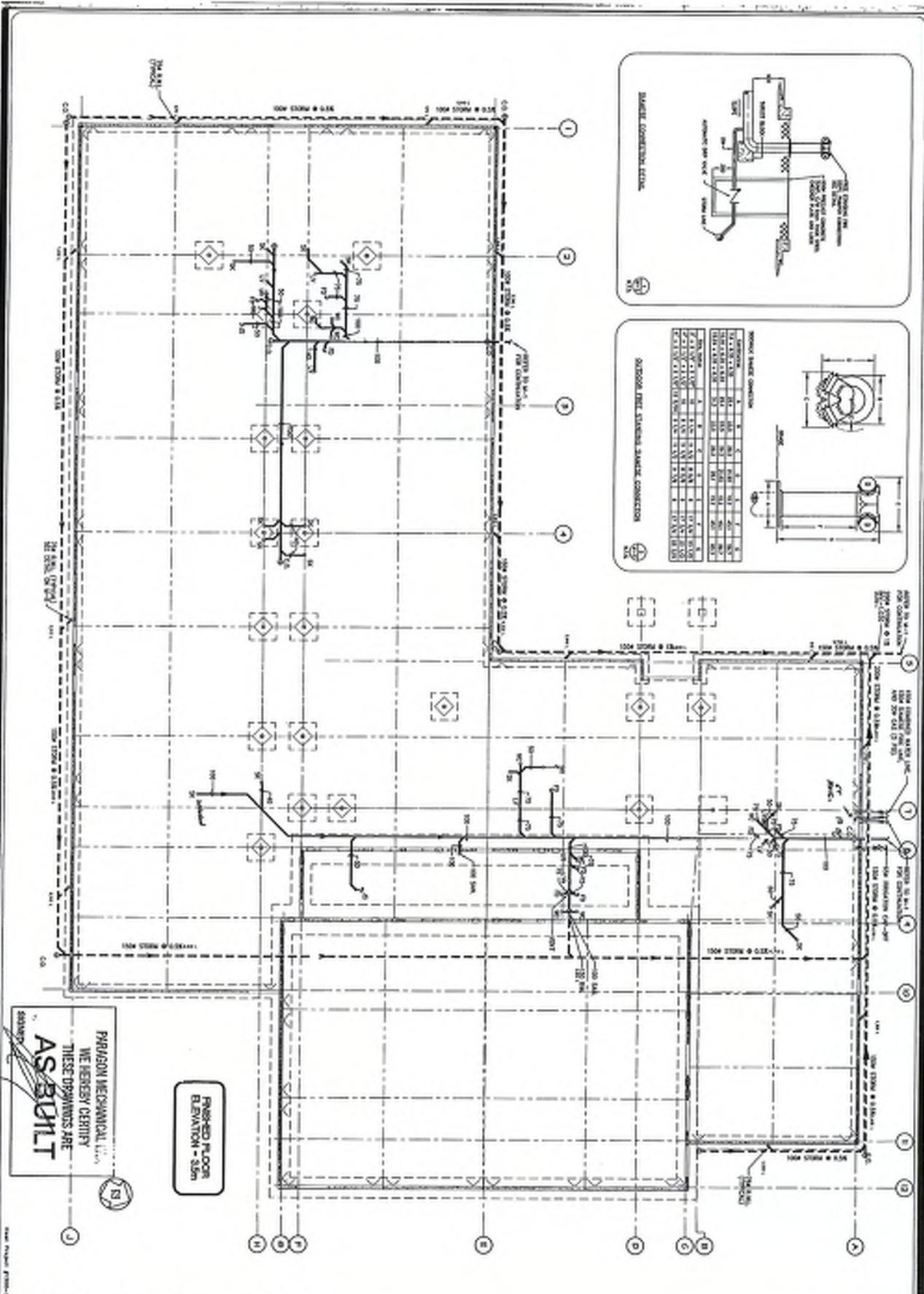
DATE: 11/11/11

SCALE: AS SHOWN

PROJECT NO. 00020

DATE: 11/11/11

SCALE: AS SHOWN



PARASON MECHANICAL LTD.
WE HEREBY CERTIFY
THESE DRAWINGS ARE
AS BUILT

FINISHED FLOOR
ELEVATION - 55M

FOUNDATION PLAN - PLUMBING

PROJECT NO.
98629
DRAWING NO.
M2

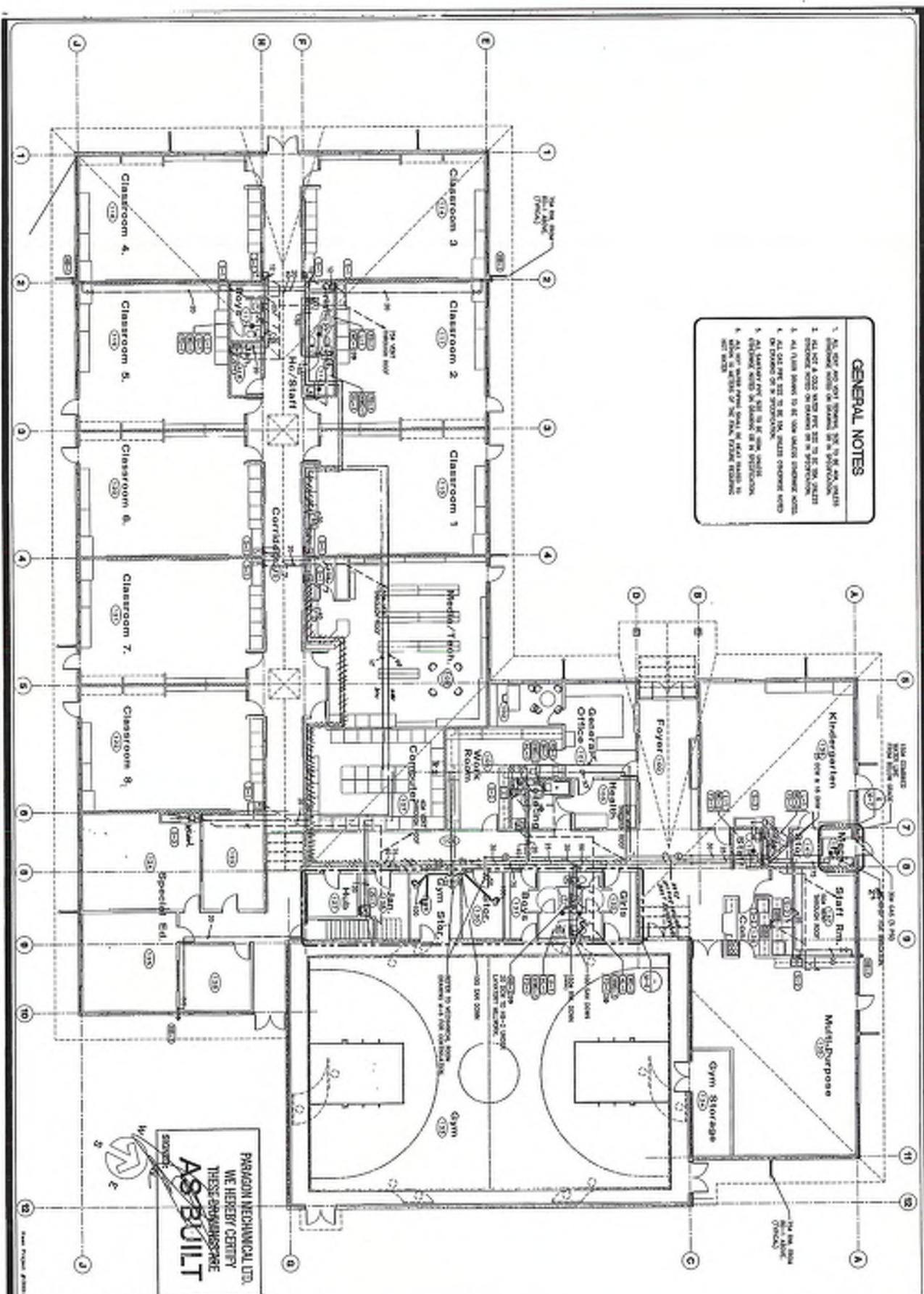
Delta School District
CAPTAINS COVE
ELEMENTARY SCHOOL
SCHOOL DISTRICT NO. 37
DELTA, B.C.

DESIGNED BY: M.A.
CHECKED BY: M.A.
SCALE: 1:100
DRAWING NO.: M2
DATE: 05.17.14
REVISED: 05.17.14

REVISIONS
REASON FOR CHANGE DATE BY

**KILICK
METZ
BOWEN
ROSE**
REGISTERED PLUMBERS B.C. 1971 & 1972 AND ARCHITECTS B.C. 1971 & 1972

KUBICO
MECHANICAL
1234 567 8901
2345 678 9012
3456 789 0123
4567 890 1234



- GENERAL NOTES**
1. ALL NEW AND EXISTING PIPING SHALL BE 1/2" N.P.S. UNLESS OTHERWISE NOTED.
 2. ALL NEW AND EXISTING PIPING SHALL BE 1/2" N.P.S. UNLESS OTHERWISE NOTED.
 3. ALL EXISTING PIPING TO BE USED UNLESS OTHERWISE NOTED.
 4. ALL NEW PIPING SHALL BE 1/2" N.P.S. UNLESS OTHERWISE NOTED.
 5. ALL EXISTING PIPING SHALL BE 1/2" N.P.S. UNLESS OTHERWISE NOTED.
 6. ALL NEW WATER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE 2018 FPLM CODE.
 7. ALL NEW SEWER PIPING SHALL BE INSTALLED IN ACCORDANCE WITH THE 2018 FPLM CODE.

FLOOR PLAN - PLUMBING

PROJECT NO. 08629
 DRAWING NO. M3
 DATE 11/17

DELTA SCHOOL DISTRICT
 CAPTAINS COVE
 ELEMENTARY SCHOOL
 SCHOOL DISTRICT No. 37
 DELTA, S.C.

DESIGNED BY: KILICK METZ BOWEN ROSE
 DRAWN BY: J. L. BOWEN
 CHECKED BY: J. L. BOWEN
 DATE: 11/17/2018

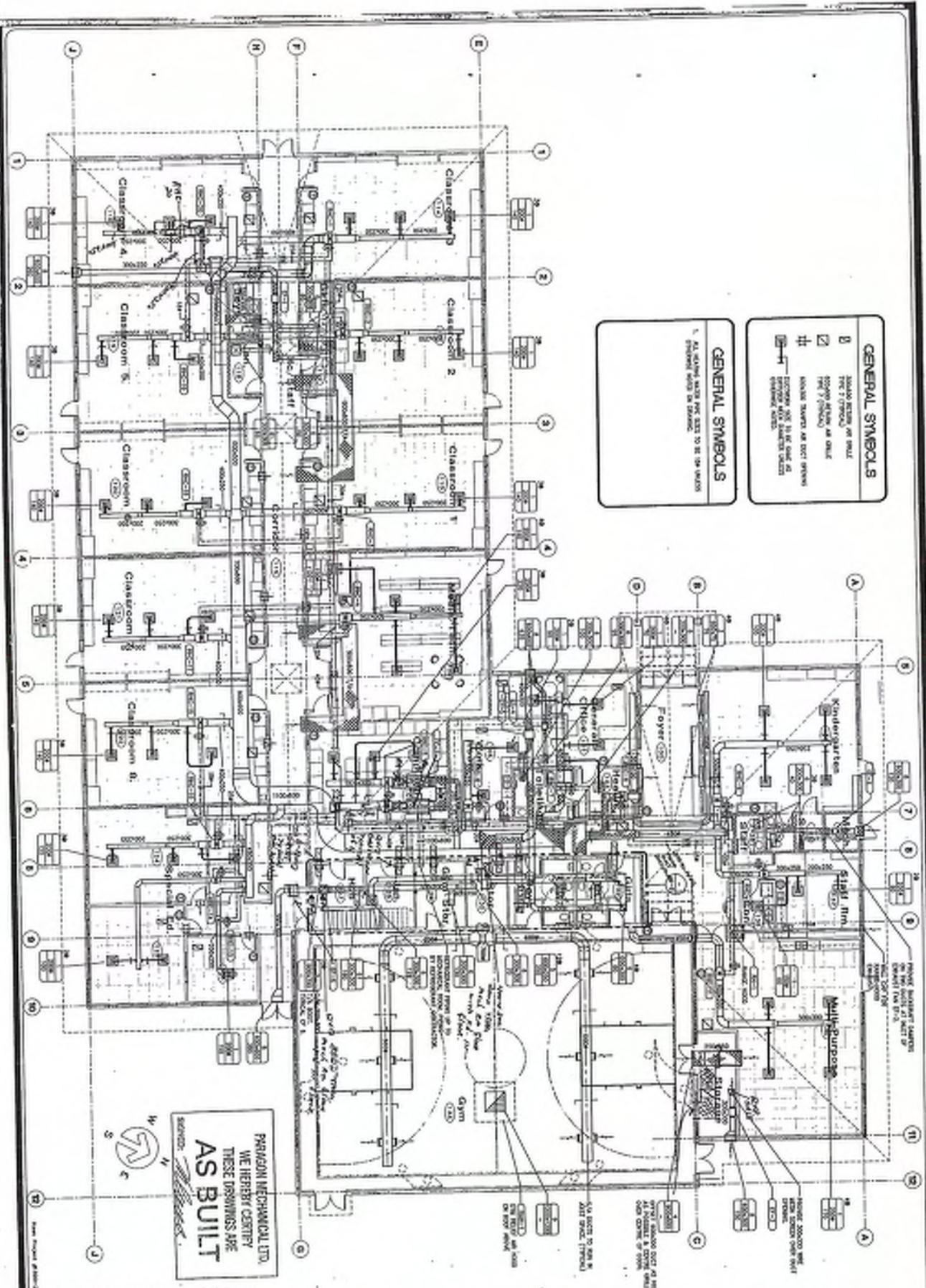
REVISIONS
 REVISION NO. 1
 REVISION DESCRIPTION: Revised for Trade Dist. 37/38

KILICK METZ BOWEN ROSE
 ARCHITECTS PLUMBERS INC. 1111 S. 11th St., Suite 100
 FAYETTEVILLE, NC 27033
 PHONE: 704.782.1111
 FAX: 704.782.1112

PARAGON MECHANICAL LTD.
 WE HEREBY CERTIFY
 THESE DRAWINGS WERE
AS BUILT

KUBOTA
 MECHANICAL
 1111 S. 11th St., Suite 100
 FAYETTEVILLE, NC 27033
 PHONE: 704.782.1111
 FAX: 704.782.1112

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GENERAL SYMBOLS	
	20000 BTU/hr FURNACE
	10000 BTU/hr FURNACE
	BOILER
	AIR HANDLER
	CONDENSER COIL
	EVAPORATOR COIL
	FAN
	DUCT
	DIFFUSER
	REGISTER
	RETURN GRILLE
	SUPPLY GRILLE
	EXHAUST GRILLE
	OUTDOOR AIR INTAKE
	OUTDOOR AIR EXHAUST
	FIRE STOP
	FIRE DOOR
	FIRE ALARM PULL STATION
	FIRE ALARM BELL
	FIRE ALARM CONTROL PANEL
	FIRE ALARM ZONE CONTROL UNIT
	FIRE ALARM NOTIFICATION APPLIANCE
	FIRE ALARM CONTROL PANEL WITH REMOTE ANNUNCIATOR
	FIRE ALARM CONTROL PANEL WITH REMOTE ANNUNCIATOR AND TROUBLE SIGNAL
	FIRE ALARM CONTROL PANEL WITH REMOTE ANNUNCIATOR AND TROUBLE SIGNAL AND TROUBLE SIGNAL

PRINSON MECHANICAL LTD.
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AS BUILT

FLOOR PLAN - HVAC

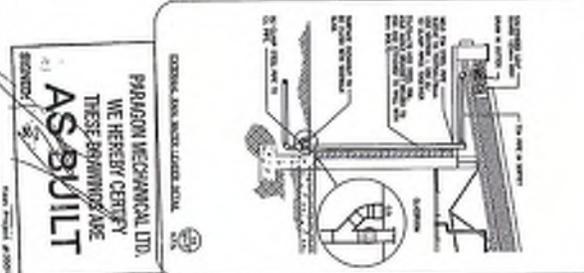
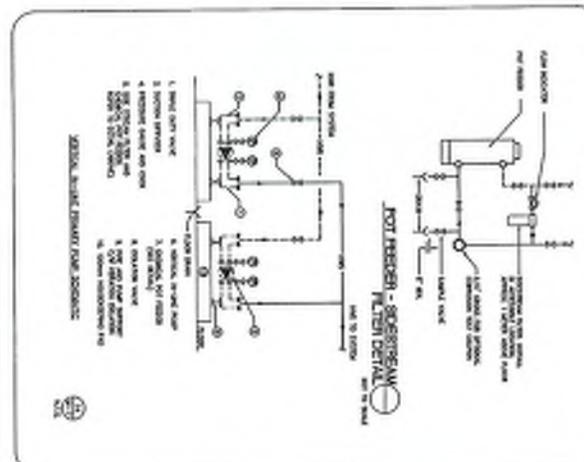
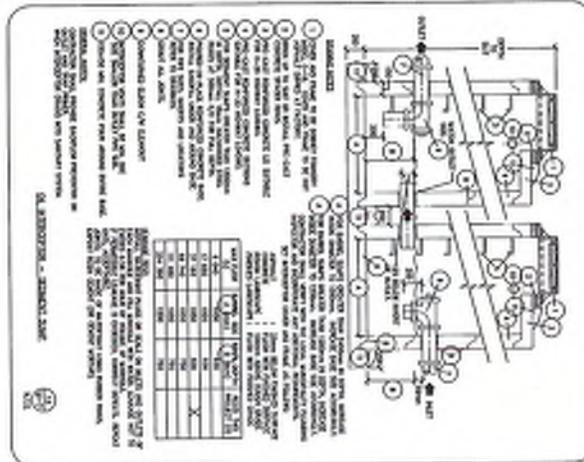
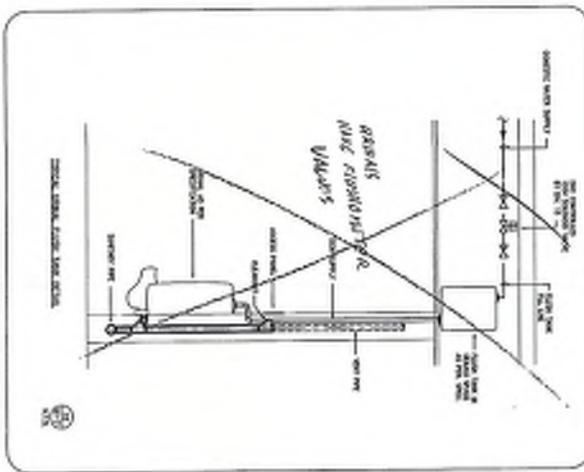
PROJECT NO.
 98629
 DRAWING NO.
M5
 17

CAPTAINS COVE
ELEMENTARY SCHOOL
 SCHOOL DISTRICT NO. 37
 DELTA, B.C.

DRAWN BY: H.L.
 CHECKED BY: H.L.
 DATE: 7-1-98
 SCALE: AS SHOWN
 APPROVED BY: H.L.
 PROJECT NO.: 98629-17-17

**KILLICK
 METZ
 BOWEN
 ROSE**

KROCOB
 MECHANICAL
 10000 BTU/hr FURNACE
 20000 BTU/hr FURNACE
 BOILER
 AIR HANDLER
 CONDENSER COIL
 EVAPORATOR COIL
 FAN
 DUCT
 DIFFUSER
 REGISTER
 RETURN GRILLE
 SUPPLY GRILLE
 EXHAUST GRILLE
 OUTDOOR AIR INTAKE
 OUTDOOR AIR EXHAUST
 FIRE STOP
 FIRE DOOR
 FIRE ALARM PULL STATION
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 FIRE ALARM CONTROL PANEL
 FIRE ALARM ZONE CONTROL UNIT
 FIRE ALARM NOTIFICATION APPLIANCE
 FIRE ALARM CONTROL PANEL WITH REMOTE ANNUNCIATOR
 FIRE ALARM CONTROL PANEL WITH REMOTE ANNUNCIATOR AND TROUBLE SIGNAL
 FIRE ALARM CONTROL PANEL WITH REMOTE ANNUNCIATOR AND TROUBLE SIGNAL AND TROUBLE SIGNAL

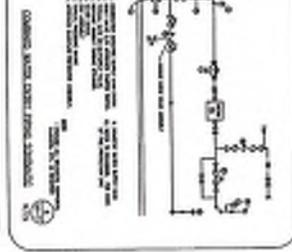
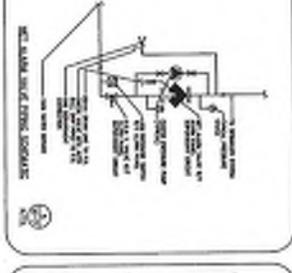
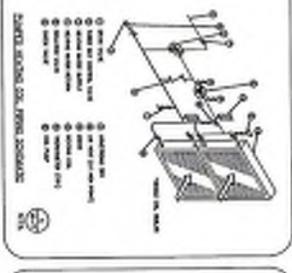
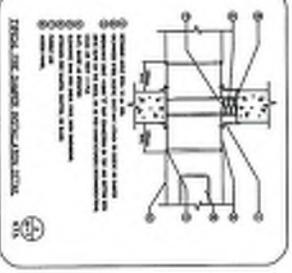
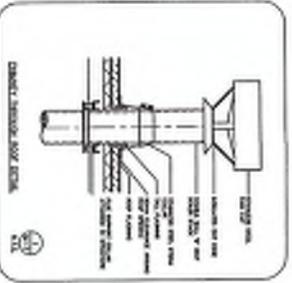
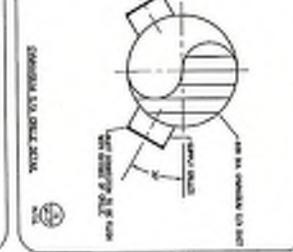
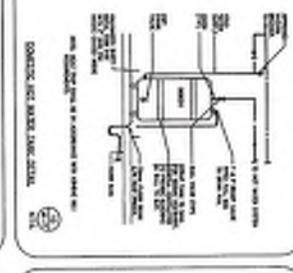
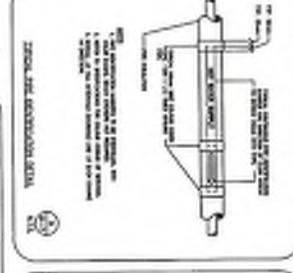
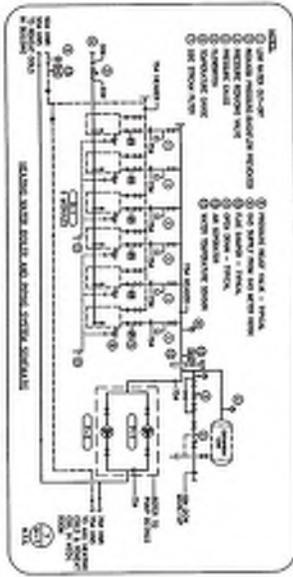


DETAILS

PROJECT NO. 90029
 DRAWING NO. M7
 DATE 11/20/17

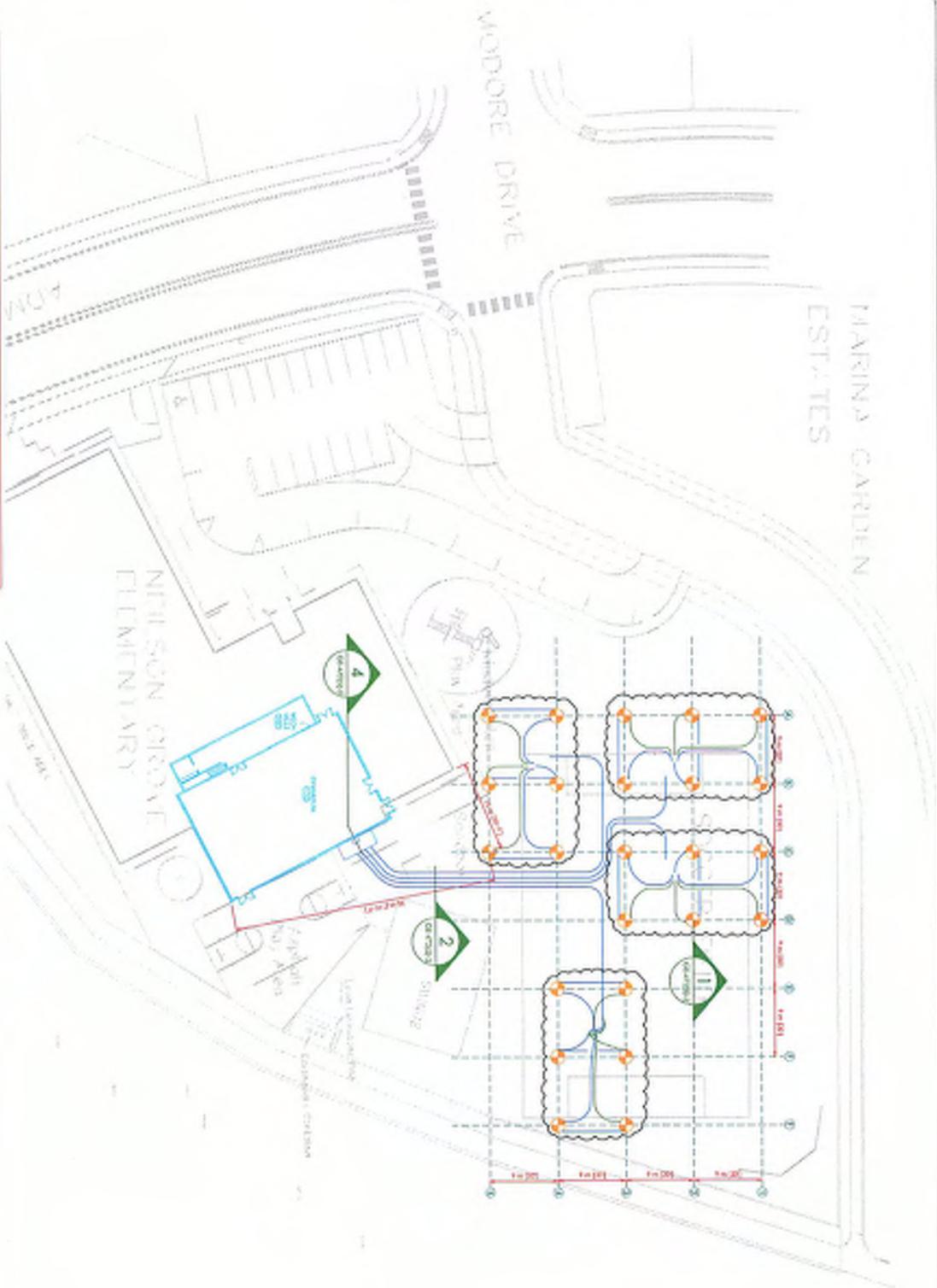
PARSON MECHANICAL LTD.
 WE HEREBY CERTIFY
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EXERCISE CARE AND READ ALL NOTES.
 ALL WORK SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND NOTES.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS.
 THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL UTILITIES AND STRUCTURES AT ALL TIMES.
 THE CONTRACTOR SHALL PROTECT ALL EXISTING UTILITIES AND STRUCTURES.
 THE CONTRACTOR SHALL MAINTAIN ALL RECORDS AND DRAWINGS UP-TO-DATE.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ACCURACY OF ALL INFORMATION PROVIDED.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLETION OF ALL WORK WITHIN THE SPECIFIED TIME FRAME.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE QUALITY OF ALL WORK AND MATERIALS.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF ALL PERSONNEL AND THE PUBLIC.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE ENVIRONMENTAL PROTECTION OF ALL AREAS.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL HISTORICAL AND CULTURAL RESOURCES.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ADJACENT PROPERTIES.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL NEIGHBORS.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL COMMUNITIES.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL COUNTRIES.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL HUMANITIES.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL LIFE FORMS.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL ECOSYSTEMS.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL BIOSPHERES.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL PLANETS.
 THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF ALL UNIVERSES.



KILICK METZ ROSE
 PROJECT NUMBER: 1711-18-001-0000-0000
 PROJECT NAME: CAPTAINS COVE ELEMENTARY SCHOOL
 PROJECT LOCATION: DELTA, B.C.
 PROJECT DATE: 11/20/17
 PROJECT DRAWING NO.: M7

REVISIONS
 1. 11/20/17
 2. 11/20/17
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 100. 11/20/17



NOTE:

Les dimensions et/ou terrain disponibles sont approximatifs, une localisation des services entoués doit que l'aspectologie du site devienne être effectués avant le positionnement final des puits.

horizontal piping between each well and the secondary headers must be of identical length, in order to prevent natural flow balancing.

tolerance: 8% between the longest and the shortest pipe supply/return included.

DESIGN INFORMATION:

- The geothermal exchanger supply pump must furnish 4.54 LPS @ 22.2 m TDH in peak heating mode. (Pressure head is calculated as of the building entry point (supply and return included).
- The expansion tank must have a volume capacity of 168 L.
- 25% vol. of propylene glycol.
- Booster piping total volume: 5490 L.
- Heatpump return temperature 31°F in heating mode.



1351 City-Landscape
Boucherville, QC
T: 450-641-9128
F: 514-221-3243
www.geo-energie.com

CLIENT:

Johnson Control LP
395 Avenue Sainte Croix #100
St. Laurent, QC H4N 2L3

PROJECT:

Nelson Grove
5550 Admiral Blvd
Delta, BC.

NO.	REVISION	DATE
01	Approval	2010-06-22
02	Approval	2010-08-11
03	Approval	2010-08-20
04	Submission	2010-09-28

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DATE	BY	FOR
2010-06-22	[Signature]	Client
2010-08-11	[Signature]	Client
2010-08-20	[Signature]	Client
2010-09-28	[Signature]	Client

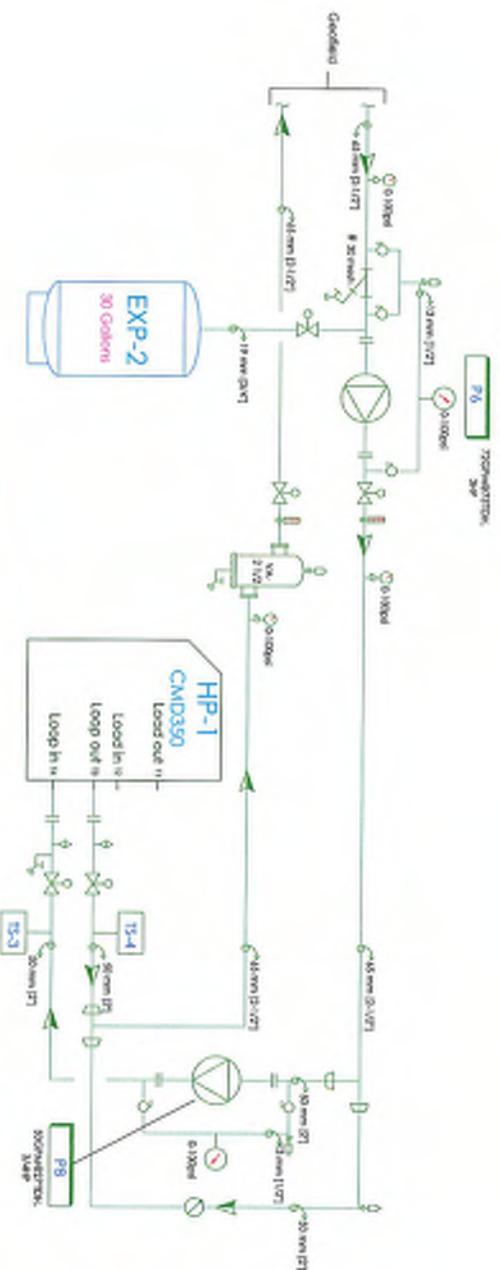
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Geothermal Field

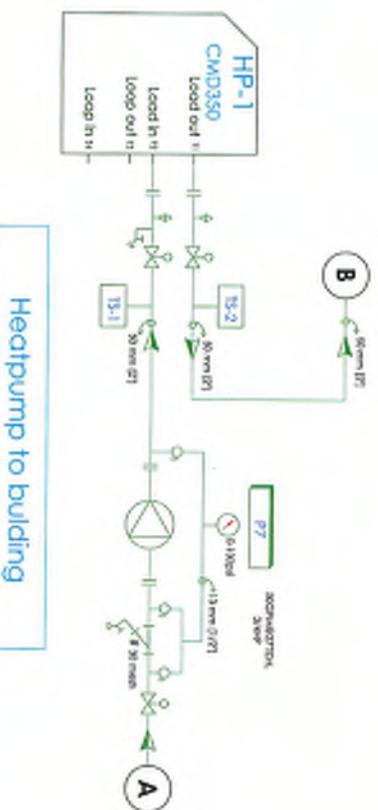
DRAWN BY: [Name] APPROVED BY: [Name]

SCALE: [Scale] DRAWING NO. [Number] PROJECT: [Project Name]

DATE: [Date] SHEET: [Number]



Heatpump to geofield



Heatpump to building

Geo-Energie
GEOENERGIE
PROJEKTE & DESIGN

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F: 514-221-3243
www.geo-energie.com

CLIENT:
Johnson Control LP
395 Avenue Sainte Croix #100
St. Laurent, QC H4N 2L3

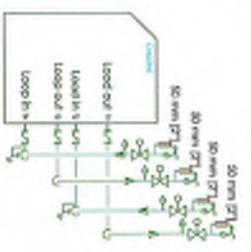
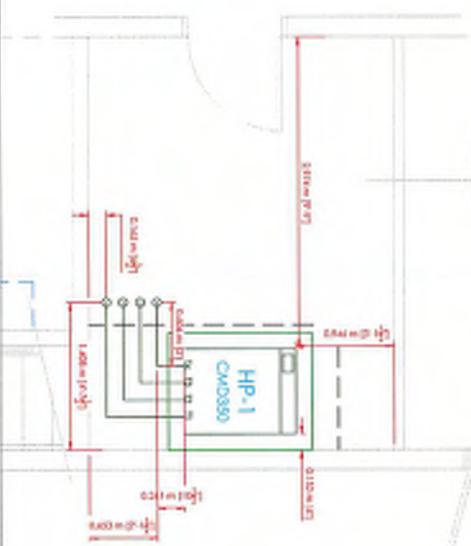
PROJECT:
Nelson Grove
5500 Admiral Blvd
Delta, BC.

NO.	REVISION	DATE
01	Preliminary	2013-04-02
02	Proprietary	2013-08-15
03	Proprietary	2013-08-21
04	Submission	2013-08-28

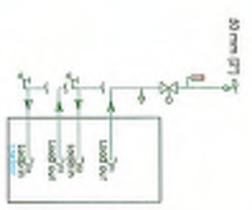
DRAWING TITLE		APPROVED:	
DESIGN BY	SKANAN BY	DATE	SCALE
A.E.P.	N.L.	PL	
SCALE	DRAWING NO.	PROJECT	DATE
NONE	SH-0213-4	DR-0709	

CUST
(128)

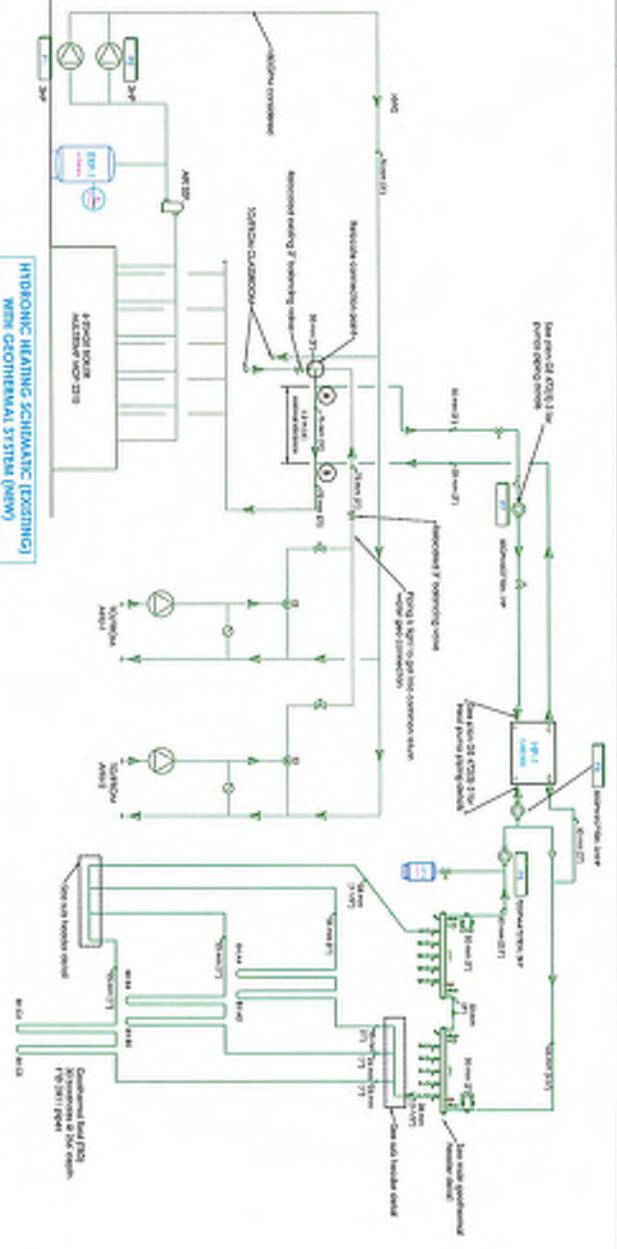
GYMNASIUM
(133)



Side view of the heat pump connections



Front view of the heat pump connections



HYDRAULIC SCHEMATIC (EXISTING) WITH GEOTHERMAL SYSTEM (NEW)

Geo-Energies
 GEOTHERMAL
 RESIDENTIAL DESIGN
 1351 GOLFURSGOCC
 Boucherville, QC
 T: 450-641-9128
 F: 514-221-3243
 www.geo-energies.com

CLIENT:
Johnson Control LP
 395 Avenue Sainte Croix #100
 St. Laurent, QC H4N 2L3

PROJECT:
Nelson Grove
 5500 Admiral Blvd
 Delta, BC.

NO.	REVISION	DATE
01	Preparation	2013-04-22
02	Preparation	2013-05-15
03	Preparation	2013-06-20
04	Submission	2013-08-26

DATE: 2013-08-26
 DRAWING NO.: 04-4218-3
 PROJECT: 04-4218

DESIGNED BY:	APPROVED BY:
MAHMOUD M. HASSAN	J.P.
SCALE: 04-4218-3	PROJECT: 04-4218

MECH
MEZZ

(200)

GENERAL NOTE

All pipe supports under the building must permit longitudinal and radial thermal expansion. Support and hanger must be in accordance with ASHRAE and codes presently in effect as well as with project requirements. All pipe supports and hanger systems must be non-corrosive. Mechanical room vibration isolators and pipe restraints must be coordinated with the HVAC Contractor. Sealing around any pipe wall piercing for piping penetration must be made to resist both original weather proofing, thermal cracking and the resistance of the wall.

GYMNASIUM
(103)

Sealant joint into the wall
must be designed on site,
between the ladder and
the other corner.

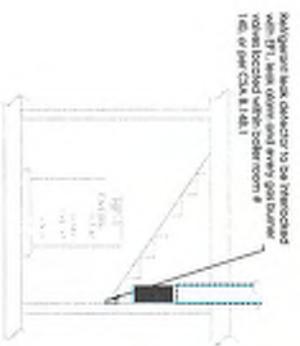
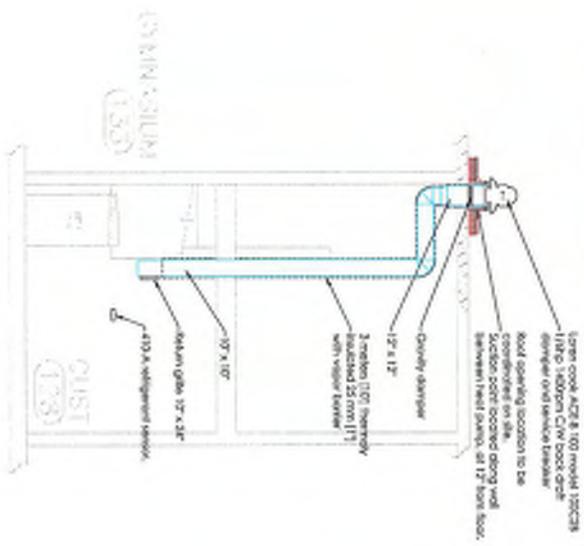
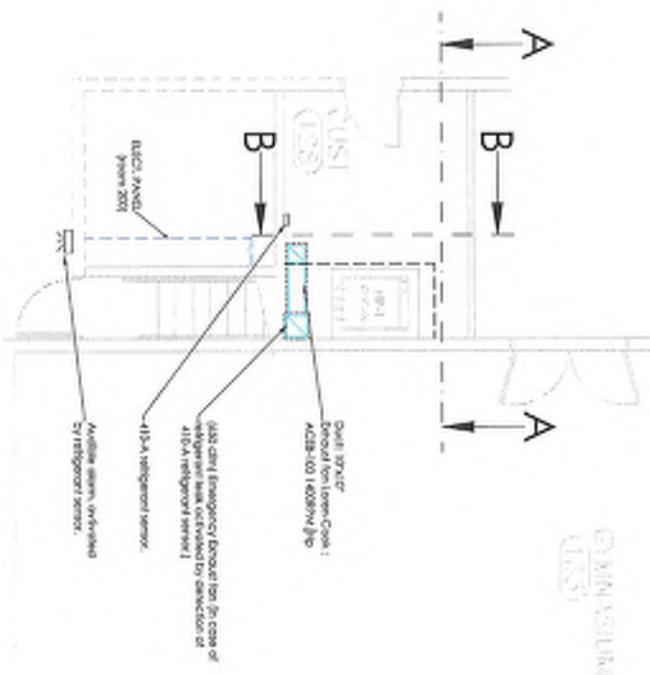
1/2" galv. stainless aluminum BS 110

ELECT PANEL

Ladder

Access

 Geo-Energie GEOTHERMIE ADHESIVE DESIGN			1351 GUY LUSBOC Beauharnois, QC, T: 450-541-9128 F: 514-221-3243 www.geo-energie.com		
CLIENT: Johnson Control LP 395 AVENUE SCOTIE CROIX #100 ST. LAURENT, QC H4N 2L3					
PROJECT: Nelson Grove 5500 Admiral Blvd Delta, BC,					
NO.	REVISION	DATE			
01	Preliminary	2012-04-23			
02	Preliminary	2012-06-14			
03	Preliminary	2012-08-21			
04	Submission	2012-08-29			
DRAWING TITLE: MECHANICAL ROOM DESIGNED BY: S.A.S. / N.L. SCALE: AS SHOWN DRAWING NO.: DR-K318-4 PROJECT: 04-0718					



B-B view

A-A view


Geo-Energie
 CONSULTANT
 mechanical design
 1331 Gey-Lussac
 Boucherville, QC
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 F: 514-221-5243
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CLIENT:
Johnson Control LP
 395 Avenue Sainte Croix #100
 St. Laurent, QC H4N 2L3

PROJECT:
Nelson Grove
 5500 Admiral Blvd
 Delta, BC,

No.	DESCRIPTION	DATE
01	Preliminary	2012.04.22
02	Preliminary	2012.04.14
03	Preliminary	2012.08.01
04	Submission	2012.08.28

DRAWING TITLE		APPROVED	
DESIGN BY	SKANON BY	DATE	
A.S.P.	N.L.		
SCALE	DRAWING NO.	PROJECT	
None	GE-K228.7	GE-K228	

HEAT PUMP SCHEDULE

TAG	TYPE	APPLICATION	MANUFACTURER	MODEL	HEATING CAP 30°F ENH/120°F LWS	FLOW RATE	VOLTS	HLA AMPS	MCA AMPS	MCA AMPS	MOP AMPS	LOAD FLOW RATE	SOURCE FLOW RATE	NOTES
HP-1	WATER/WATER	BUILDING HEATING	COMPAK	QW350	78201 W	SOURCE FLOW	208V/3W	200.2	120.6	150	315 US	8.18 US	-	

AIR SEPARATOR SCHEDULE

TAG	MANUFACTURER	TYPE	MALFUNCTIONS PREVENTED	MODEL NO	PIPING CONNECTION MM (INCHES)	ASME RATED	DRY HEIGHT M2	NOTES
AS-1/2	Armstrong	Threaded	1200 (348)	WA-1/2	62 (2.5)	YES	45	

EXPANSION TANK SCHEDULE

TAG	MANUFACTURER	MODEL OR SERIES	TANK VOLUME L (GALLONS)	MAX. STORAGE CAPACITY L (GALLONS)	PRESSURE MAX KPa (PSI)	ASME RATED	DIAPHRAGM	NOTES
EXP-1	Exel	AC-6001	180 (46.4)	85 (22.8)	80 (2.25)	YES	RETURN	

EXHAUST FAN SCHEDULE

TAG	MODEL	TYPE	APPLICATION/DESIGN BASED ON	FAN	ELECTRICAL DATA	OPERATING	NOTES					
BT-1	ACE-8-2002B	CENTRIFUGAL EXHAUST DOWN DISCHARGE	CENTRIFUGAL EXHAUST	FLOW L/S (CFM)	SPEED RPM	LOAD HP	MCA AMPS	MOCT AMPS	VOLTAGE V	WEIGHT KG (LBS)	INSTALL ELEVATION	NOTES
BT-1	ACE-8-2002B	CENTRIFUGAL EXHAUST DOWN DISCHARGE	CENTRIFUGAL EXHAUST	206 (806)	1400	1.8	2.98	2.98	208V	13.6 (30)		INSTALL EXHAUST DAMPER AND DOCUMENT

MECHANICAL PUMP SCHEDULE

TAG	TYPE	APPLICATION	FLOW RATE	HEAD	PIPE CONNECTION	FLUID DATA	MOTOR DATA	ELECTRICAL DATA	MANUFACTURER	HS MATERIAL	WPELLOR MATERIAL	WPELLOR SIZE (MM)	CHEATING	NOTES
			US	M (FEET)	INLET MM	OUTLET MM	RUN % EFF	HP LOAD	RPM SPEED	MCA AMPS	MOCT AMPS	VOLTAGE V	WEIGHT KG	NOTES
486-158	DISCHARGE	454	22.2 (79)	28	-	-	30%	3	3600	-	-	208V/3W	20	
547	HEAT PUMP	315	8.2 (27)	9.1	75	75	30%	3	3600	-	-	208V/3W	20	
547	HEAT PUMP	315	8.2 (27)	9.1	75	75	30%	3	3600	-	-	208V/3W	20	



1351 GUY-LUSBOC
BOULDERVILLE, QC
T: 450-641-9128
F: 514-221-2743
www.geo-energie.com

CLIENT:
Johnson Control LP
395 AVENUE SCOTIE CROIX #100
ST. LAURENT, QC H4N 2L3

PROJECT:
Nelson Grove
5000 Adelphi Blvd
Delta, BC

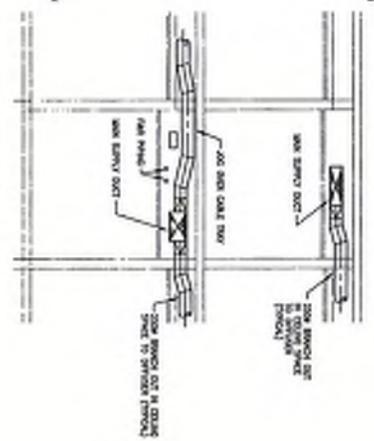
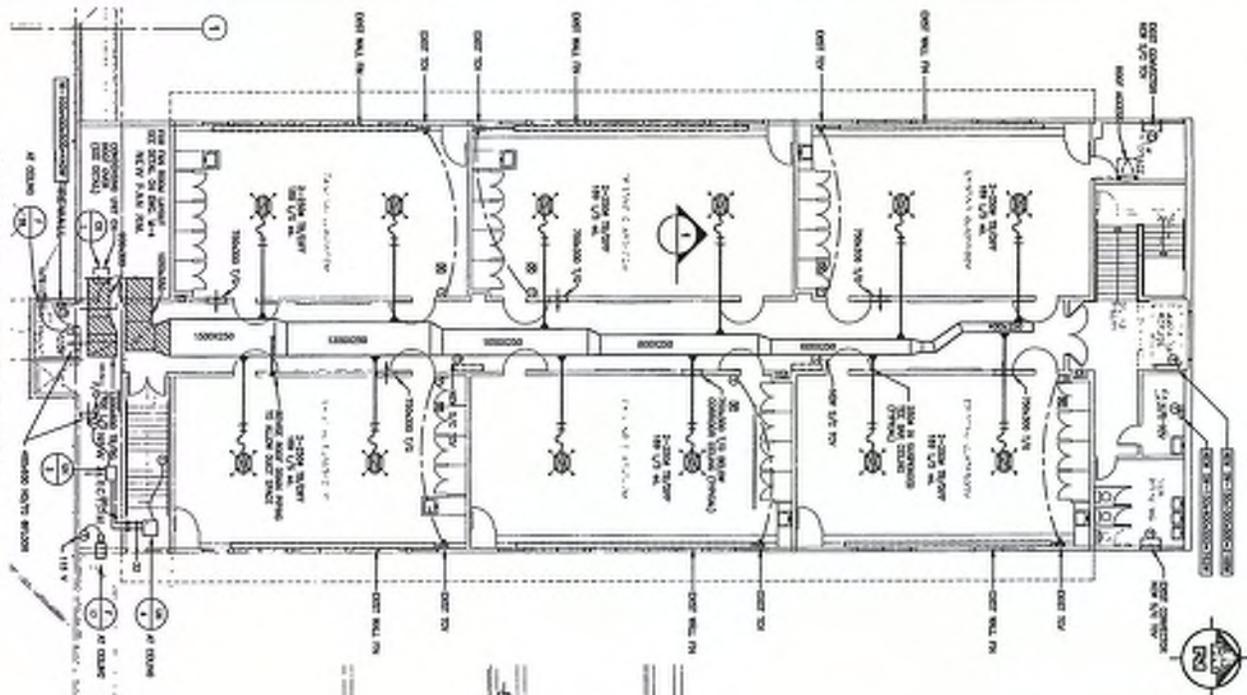
NO.	REVISION	DATE
01	Preliminary	2012-06-27
02	Preliminary	2012-06-14
03	Preliminary	2012-08-31
04	Issued for	2012-06-28

DESIGNER	ENGINEER	APPROVED
ASR	NL	FL
SCALE	DRAWING NO.	PROJECT
NONE	GE-0314	04-0708



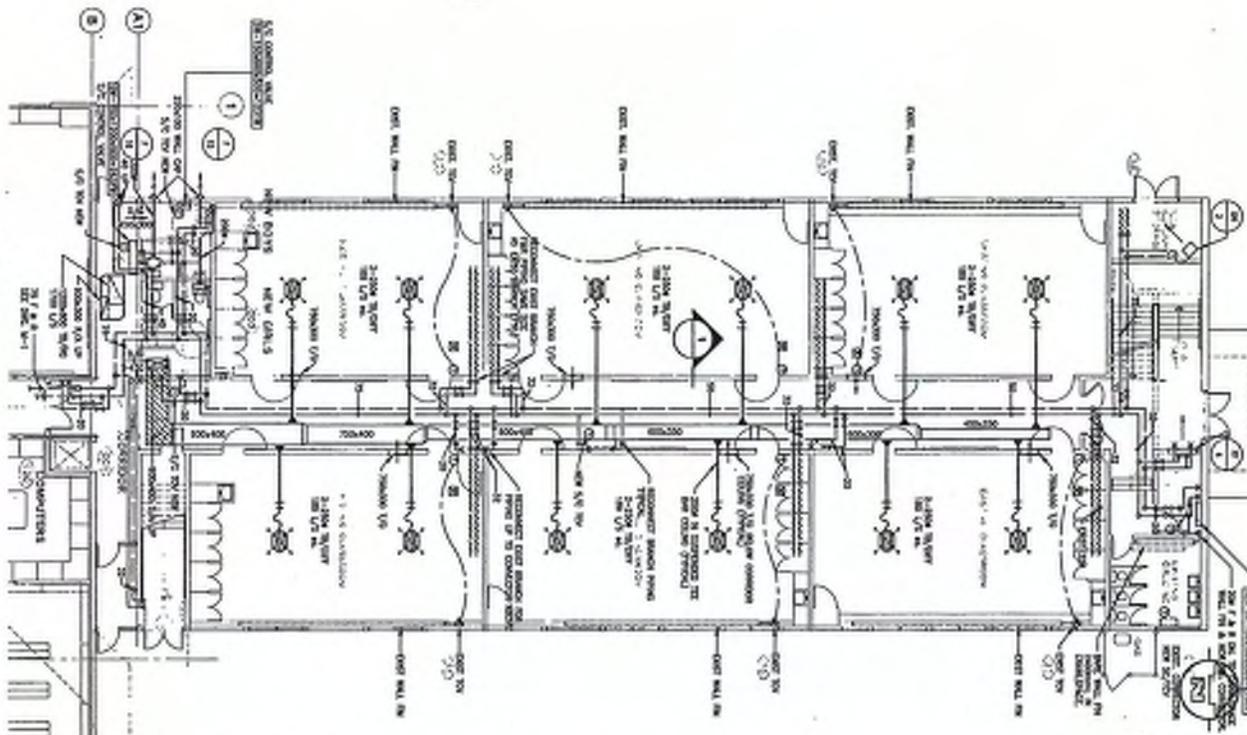
Appendix D

SECOND FLOOR PLAN

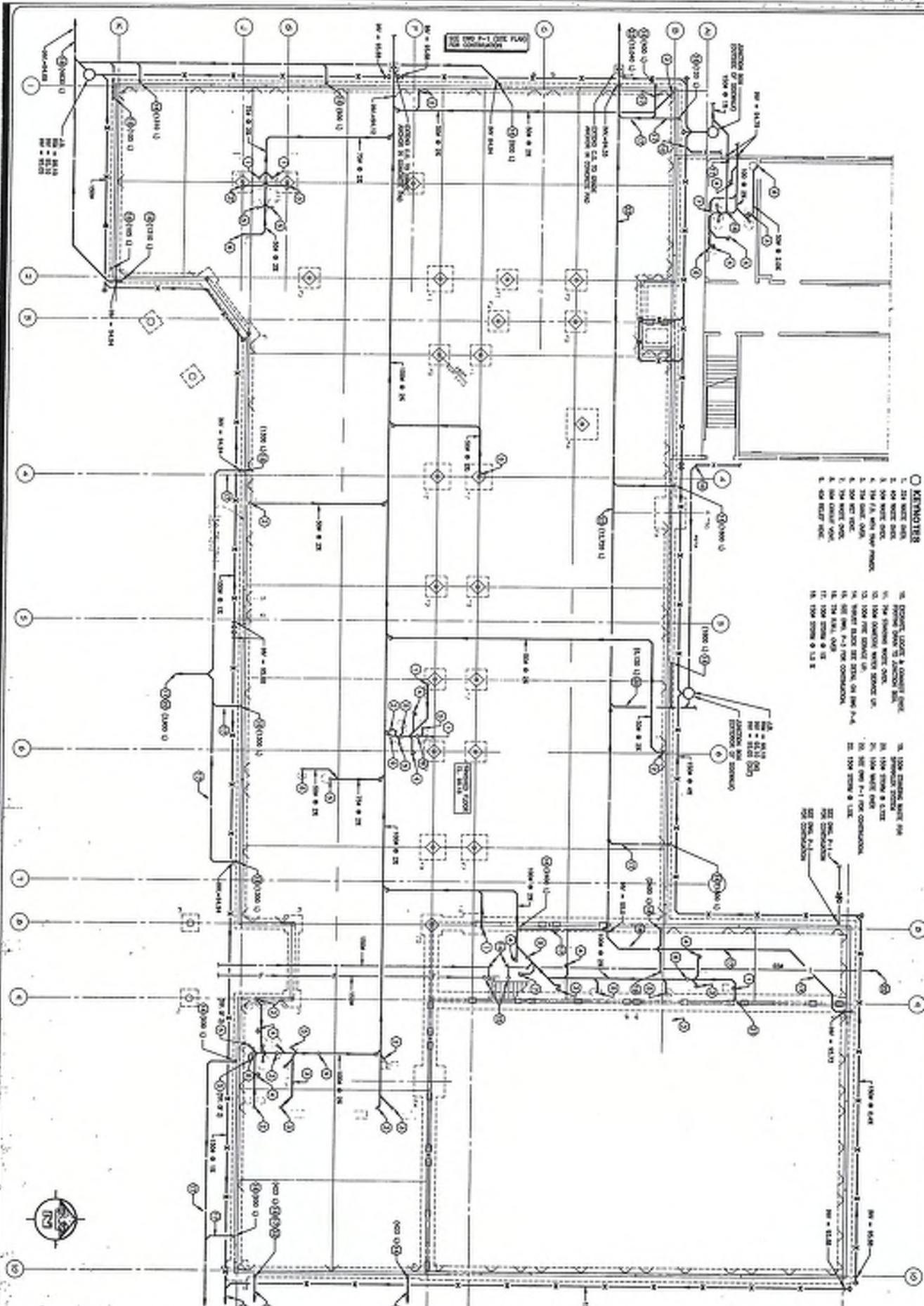


NOT TO SCALE. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL MECHANICAL CONTRACTING CODE (IMCC) AND THE 2000 INTERNATIONAL PLUMBING AND HEATING CODE (IPHC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL ELECTRICAL CODE (IEC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL BUILDING CODE (IBC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL FIRE AND SAFETY CODE (IFSC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL ENERGY CONSERVATION CODE (IECC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL SMOKE AND ALARM CODE (ISAC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL SOUND AND VIBRATION CODE (ISV). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL TRANSPORTATION CODE (ITC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL UNIFORM CODE BOOK (IUCB). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL WOOD PRESERVATION CODE (IWP). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL ZONING AND ORDINANCE CODE (IZOC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL ACCESSIBILITY STANDARDS AND GUIDELINES (IASG). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL GREEN BUILDING CONSTRUCTION CONVENTION (IGBC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL LEED GREEN BUILDING RATING SYSTEM (IGBC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL WELL-BEING AND PRODUCTIVITY CONVENTION (IWPC). ALL WORK SHALL BE IN ACCORDANCE WITH THE 2000 INTERNATIONAL WELL-BEING AND PRODUCTIVITY CONVENTION (IWPC).

GROUND FLOOR PLAN



HVAC LAYOUT - EXISTING



- KEYNOTES**
1. SEE NOTE 10
 2. SEE NOTE 11
 3. SEE NOTE 12
 4. SEE NOTE 13
 5. SEE NOTE 14
 6. SEE NOTE 15
 7. SEE NOTE 16
 8. SEE NOTE 17
 9. SEE NOTE 18
 10. SEE NOTE 19
 11. SEE NOTE 20
 12. SEE NOTE 21
 13. SEE NOTE 22
 14. SEE NOTE 23
 15. SEE NOTE 24
 16. SEE NOTE 25
 17. SEE NOTE 26
 18. SEE NOTE 27
 19. SEE NOTE 28
 20. SEE NOTE 29
 21. SEE NOTE 30
 22. SEE NOTE 31
 23. SEE NOTE 32
 24. SEE NOTE 33
 25. SEE NOTE 34
 26. SEE NOTE 35
 27. SEE NOTE 36
 28. SEE NOTE 37
 29. SEE NOTE 38
 30. SEE NOTE 39
 31. SEE NOTE 40
 32. SEE NOTE 41
 33. SEE NOTE 42
 34. SEE NOTE 43
 35. SEE NOTE 44
 36. SEE NOTE 45
 37. SEE NOTE 46
 38. SEE NOTE 47
 39. SEE NOTE 48
 40. SEE NOTE 49
 41. SEE NOTE 50
 42. SEE NOTE 51
 43. SEE NOTE 52
 44. SEE NOTE 53
 45. SEE NOTE 54
 46. SEE NOTE 55
 47. SEE NOTE 56
 48. SEE NOTE 57
 49. SEE NOTE 58
 50. SEE NOTE 59
 51. SEE NOTE 60
 52. SEE NOTE 61
 53. SEE NOTE 62
 54. SEE NOTE 63
 55. SEE NOTE 64
 56. SEE NOTE 65
 57. SEE NOTE 66
 58. SEE NOTE 67
 59. SEE NOTE 68
 60. SEE NOTE 69
 61. SEE NOTE 70
 62. SEE NOTE 71
 63. SEE NOTE 72
 64. SEE NOTE 73
 65. SEE NOTE 74
 66. SEE NOTE 75
 67. SEE NOTE 76
 68. SEE NOTE 77
 69. SEE NOTE 78
 70. SEE NOTE 79
 71. SEE NOTE 80
 72. SEE NOTE 81
 73. SEE NOTE 82
 74. SEE NOTE 83
 75. SEE NOTE 84
 76. SEE NOTE 85
 77. SEE NOTE 86
 78. SEE NOTE 87
 79. SEE NOTE 88
 80. SEE NOTE 89
 81. SEE NOTE 90
 82. SEE NOTE 91
 83. SEE NOTE 92
 84. SEE NOTE 93
 85. SEE NOTE 94
 86. SEE NOTE 95
 87. SEE NOTE 96
 88. SEE NOTE 97
 89. SEE NOTE 98
 90. SEE NOTE 99
 91. SEE NOTE 100

FOUNDATION PLAN

PROJECT NO. 97580
 DRAWING NO. D.2

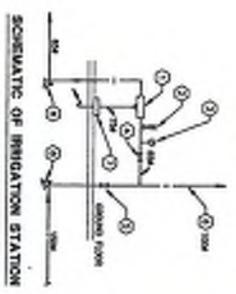
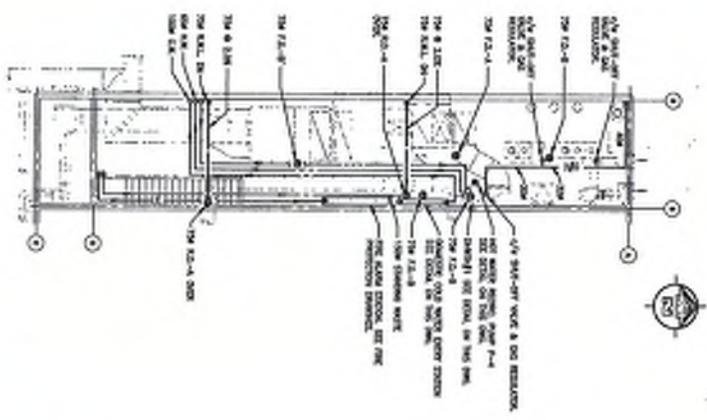
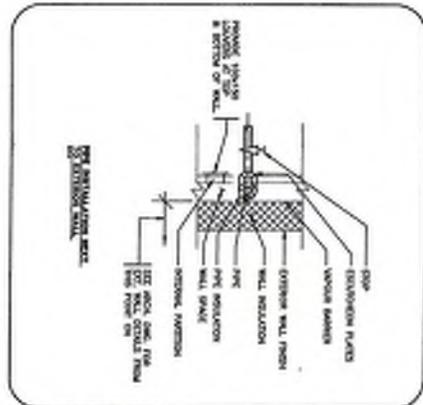
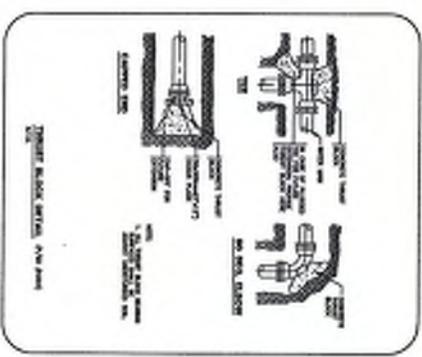
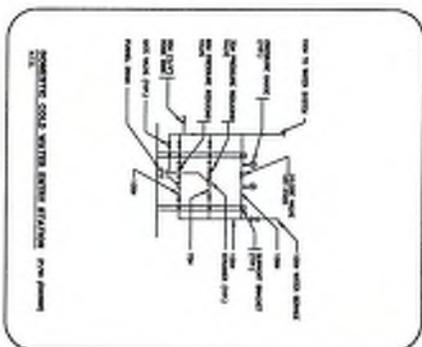
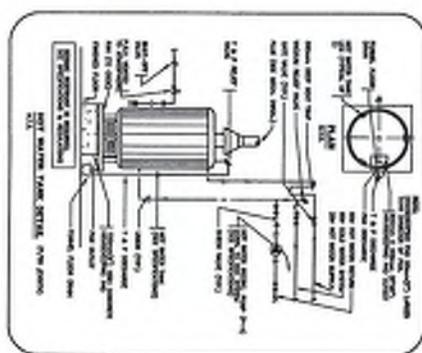
RICHARDSON ELEMENTARY SCHOOL
 1997 FIRE REPLACEMENT

DATE: 06/20/99
 BY: [illegible]

REVISIONS

KILICK METZ BOWEN





- KEYNOTES
1. 1/2" DIA. 1/2" WALL
 2. 1/2" DIA. 1/2" WALL
 3. 1/2" DIA. 1/2" WALL
 4. 1/2" DIA. 1/2" WALL

PART PLAN & DETAILS

PROJECT NO. 97580
SHEET NO. P-6

RICHARDSON ELEMENTARY SCHOOL
1997 FIRE REPLACEMENT

DATE: 08/11/97
DRAWN BY: J. BOWEN
CHECKED BY: J. BOWEN
SCALE: AS SHOWN

KILLICK METZ BOWEN
INCORPORATED



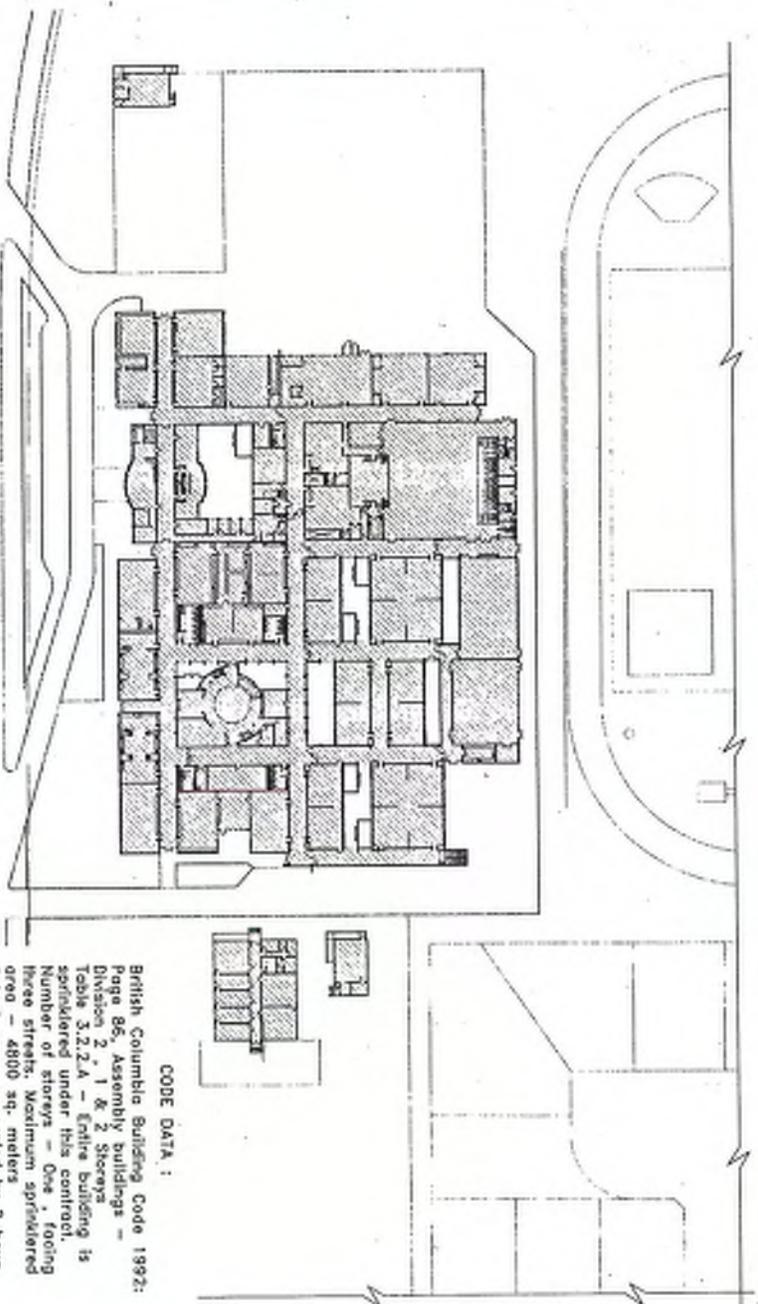


Appendix E

ALTERATIONS TO DELVIEW JUNIOR SECONDARY SCHOOL

9111 116th STREET, DELTA, B.C.

1 PARTIAL SITE PLAN
Scale - 1 : 500



CODE DATA :

British Columbia Building Code 1992:
Page 86, Assembly buildings -
Division 2, 1 & 2 Storeys
Table 3.2.2.A - Entire building is
sprinklered under this contract.
Number of storeys - One, footing
three streets, Maximum sprinklered
area - 4800 sq. meters
Actual areas separated by 2 hour
firewall : 4690 sq/m | 4024sq/m

Combustible or Noncombustible construction,
Floor assemblies - Noncombustible slab
on grade, if combustible over crawl spaces
or basements, Heavy Timber 45 min. Fire
Resistance Rating (FRR).
Mezzanines - 45 min. FRR
Roofs - 45 min. FRR, Heavy Timber (45min.)
or Noncombustible Steel, Roofing waived because
of sprinklers.
Load bearing walls, columns, and arches - 45
min. FRR.

LIST OF DRAWINGS :

ARCHITECTURAL

- 1 - PARTIAL SITE PLAN, LIST OF DRAWINGS
- 2 - GROUND FLOOR PLAN
- 3 - FAN ROOM FLOOR PLANS
- 4 - FINISH SCHEDULE
- 5 - DOOR SCHEDULE, FINISH HARDWARE SCHEDULE, DOOR JAMB SCHEDULE, PLANS & DETAILS
- 6 - FIREWALL SECTIONS & DETAILS
- 7 - EXTERIOR ELEVATIONS, SECTIONS & DETAILS

STRUCTURAL

- S1 - FIREWALL PLANS & GENERAL NOTES
- S2 - FAN ROOM PLANS & TYPICAL DETAILS
- S3 - TYPICAL FIREWALL DETAILS

MECHANICAL

- M1 - FLOOR PLAN, SOUTH-EAST
 - M2 - FLOOR PLAN, SOUTH-WEST
 - M3 - FLOOR PLAN, NORTH-EAST
 - M4 - FLOOR PLAN, NORTH-WEST
 - M5 - DETAILS OF NEW FAN ROOMS
 - M6 - EQUIPMENT SCHEDULES & DETAILS
 - M7 - HEATING WATER PIPING SCHEMATIC
- LEGEND OF SYMBOLS
- F1 - SITE PLAN
 - F2 - FLOOR PLAN, SOUTH-EAST
 - F3 - FLOOR PLAN, SOUTH-WEST
 - F4 - FLOOR PLAN, NORTH-EAST
 - F5 - FLOOR PLAN, NORTH-WEST
 - F6 - PART PLANS

ELECTRICAL

- E1 - SITE PLAN
- E2 - SINGLE LINE DIAGRAM
- E3 - FLOOR PLAN, SOUTH-EAST - LIGHTING
- E4 - FLOOR PLAN, SOUTH-EAST - POWER
- E5 - FLOOR PLAN, SOUTHWEST - LIGHTING & LOW TENSION
- E6 - FLOOR PLAN, SOUTHWEST - POWER & LOW TENSION
- E7 - FLOOR PLAN, NORTHEAST - LIGHTING & LOW TENSION
- E8 - FLOOR PLAN, NORTHEAST - POWER & LOW TENSION
- E9 - FLOOR PLAN, NORTHWEST - LIGHTING & LOW TENSION
- E10 - FLOOR PLAN, NORTHWEST - POWER & LOW TENSION

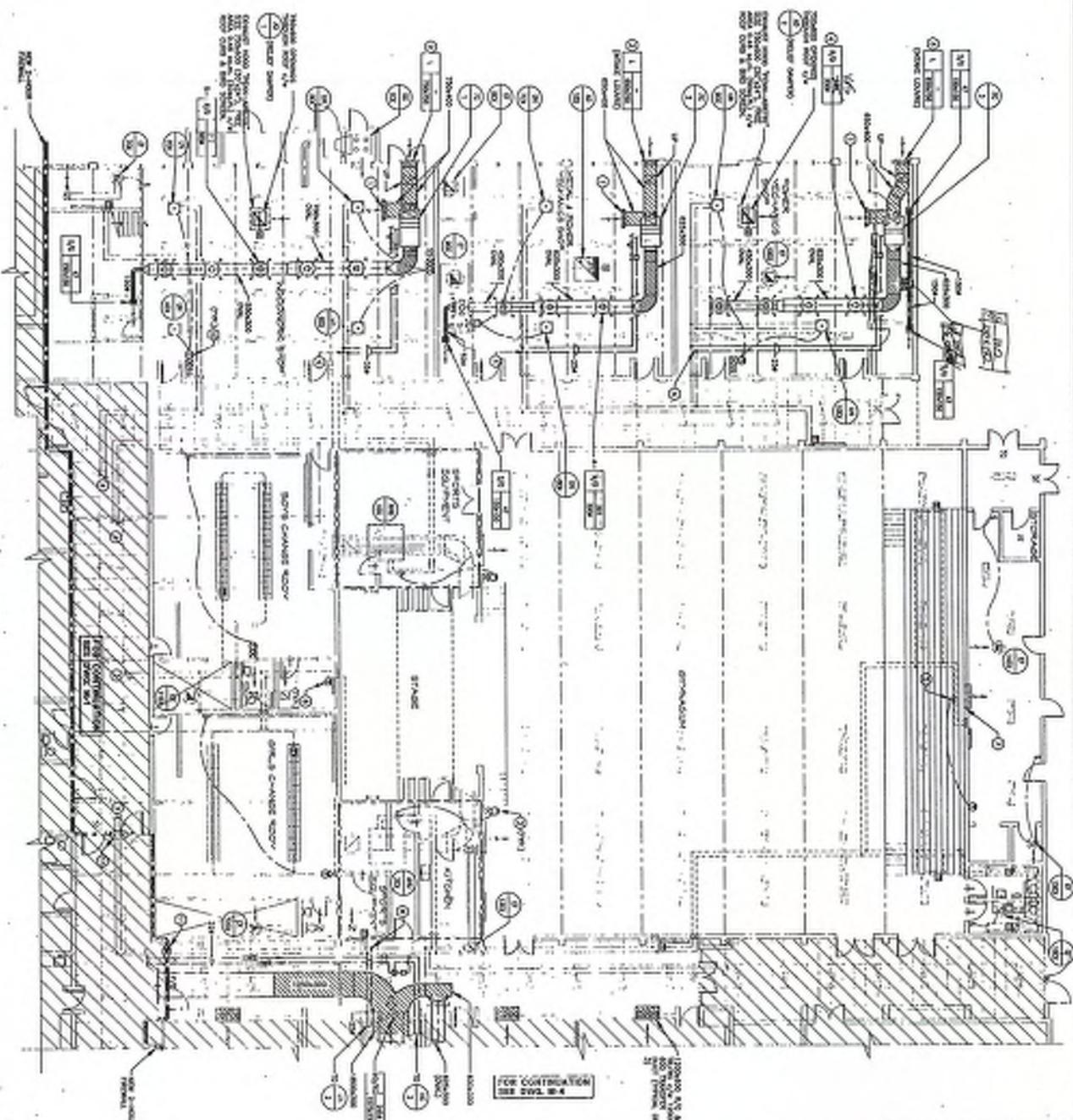


DAVID H. BROCKINGTON ARCHITECT

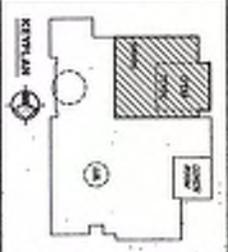
Calgary, Alberta
10000 Macleod Trail, S.E.
Suite 100
Calgary, Alberta T2C 1A8
Phone: (403) 271-1111
Fax: (403) 271-1112

NO. 101
DATE: 1992
DRAWING NO. 9502
SHEET 1 OF 1

FOR: DELVIEW JUNIOR SECONDARY SCHOOL
PROJECT: ALTERATIONS TO DELVIEW JUNIOR SECONDARY SCHOOL
DRAWING NO.: 9502
SHEET: 1 OF 1



FLOOR PLAN - SOUTHWEST
SCALE - 1/8" = 1'-0"



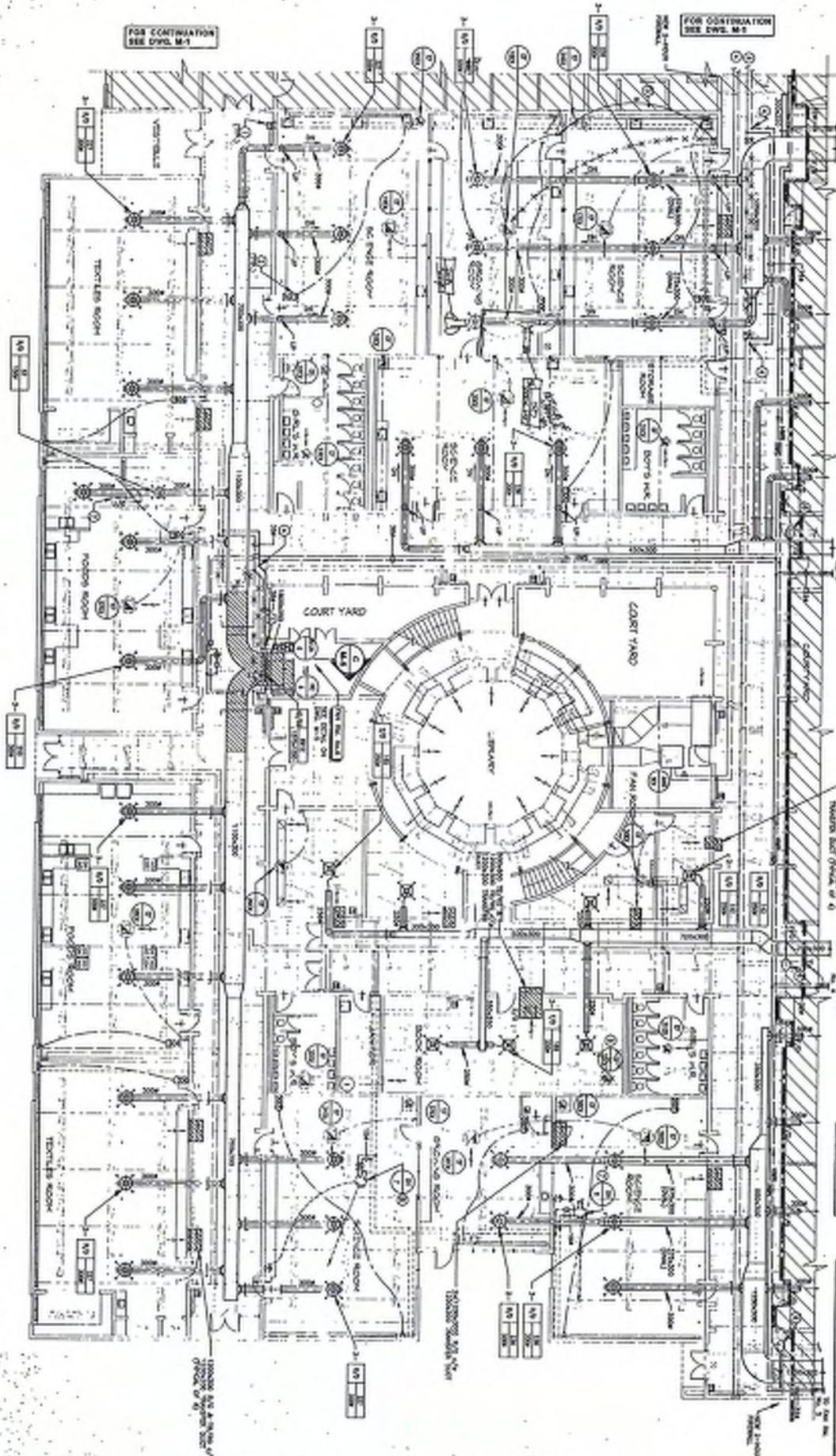
DAVID R. BROCKINGTON
ARCHITECT



- KEYNOTES**
1. BRICK 1 1/2" x 3 1/2" x 8" PER 1000
 2. CONCRETE 4" THICK
 3. GYPSUM BOARD 5/8" THICK
 4. GYPSUM BOARD 1/2" THICK
 5. GYPSUM BOARD 1/4" THICK
 6. GYPSUM BOARD 1/8" THICK
 7. GYPSUM BOARD 1/16" THICK
 8. GYPSUM BOARD 1/32" THICK
 9. GYPSUM BOARD 1/64" THICK
 10. GYPSUM BOARD 1/128" THICK
 11. GYPSUM BOARD 1/256" THICK
 12. GYPSUM BOARD 1/512" THICK
 13. GYPSUM BOARD 1/1024" THICK
 14. GYPSUM BOARD 1/2048" THICK
 15. GYPSUM BOARD 1/4096" THICK

FOR CONTRASTION
SEE DWG. 30-A

PROJECT NO.	9502
DATE	M-2
NO. OF SHEETS	2
SHEET NO.	1
PROJECT NAME	JUNIOR SECONDARY SCHOOL
ADDRESS	2111 - 21st St SW VANCOUVER, B.C.
OWNER	SCHOOL DISTRICT NO. 27 VANCOUVER, B.C.
DESIGNED BY	DAVID R. BROCKINGTON
DRAWN BY	DAVID R. BROCKINGTON
CHECKED BY	DAVID R. BROCKINGTON
DATE	1968

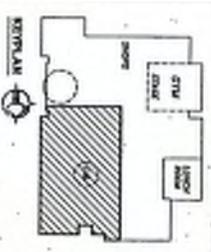


FOR CONTINUATION
SEE DWG. M-1

- NOTES
1. REVISIONS TO BE MADE TO THIS DRAWING SHALL BE MADE BY THE ARCHITECT.
 2. ALL WORK SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND CONDITIONS OF CONTRACT.
 3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS.
 4. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES AT ALL TIMES.
 5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES AND STRUCTURES.
 6. THE CONTRACTOR SHALL MAINTAIN THE SITE IN A SAFE AND SOUND CONDITION AT ALL TIMES.

1. REVISIONS TO BE MADE TO THIS DRAWING SHALL BE MADE BY THE ARCHITECT.
2. ALL WORK SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND CONDITIONS OF CONTRACT.
3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND APPROVALS.
4. THE CONTRACTOR SHALL MAINTAIN ACCESS TO ALL ADJACENT PROPERTIES AT ALL TIMES.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING UTILITIES AND STRUCTURES.
6. THE CONTRACTOR SHALL MAINTAIN THE SITE IN A SAFE AND SOUND CONDITION AT ALL TIMES.

FLOOR PLAN - NORTH-EAST
SHEET - 1300



DAVID H. BROCKINGTON
ARCHITECT

9502
M-3
OF 3

DELVIEW
JUNIOR
SECONDARY
SCHOOL
411 - 11th Street
Del., N.C.

ARCHITECT
DAVID H. BROCKINGTON
ARCHITECT

ENGINEER
JAMES W. BROWN
ENGINEER

CONTRACTOR
JAMES W. BROWN
CONTRACTOR

DATE
1950

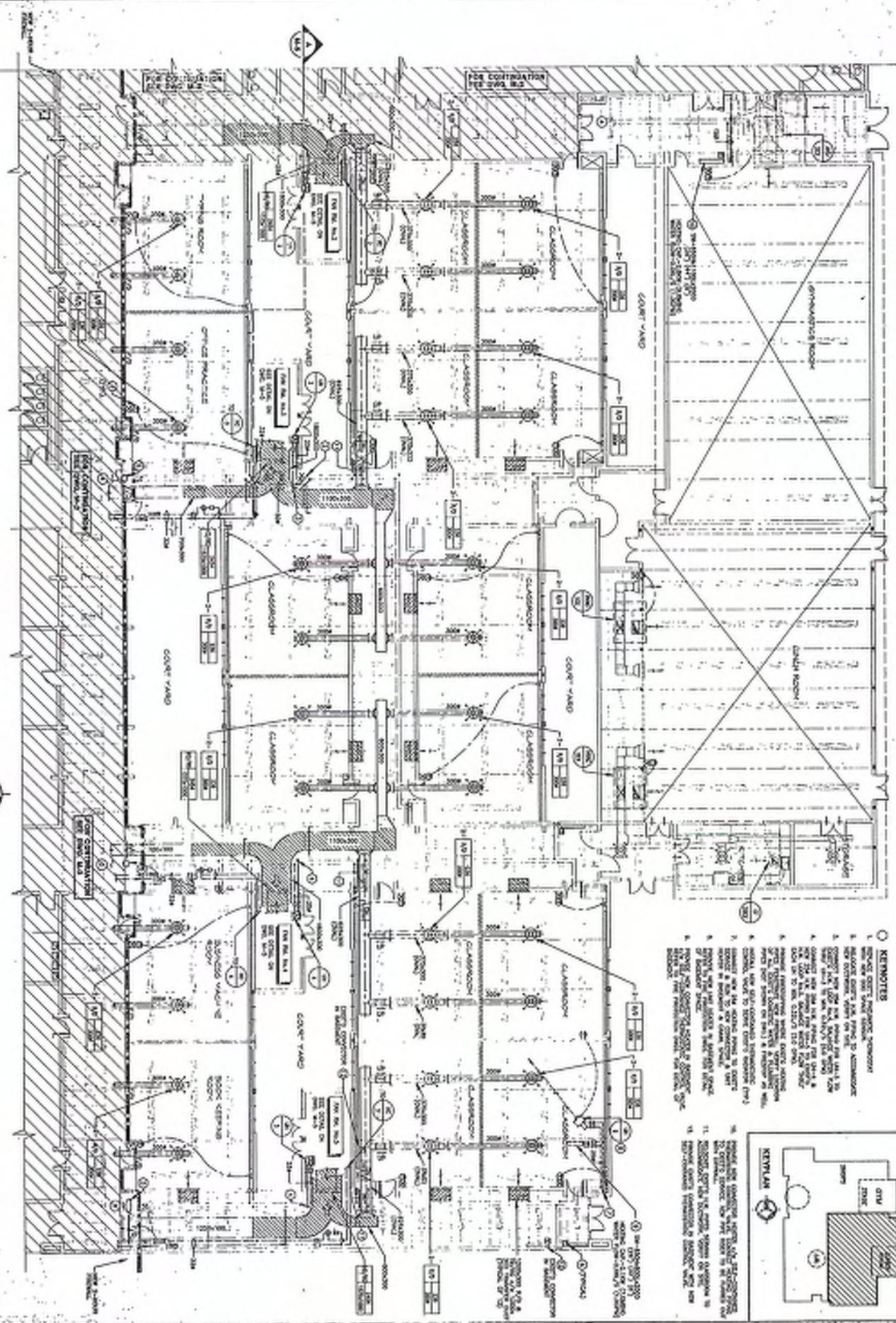
PROJECT
DELVIEW JUNIOR SECONDARY SCHOOL

NO. 1300

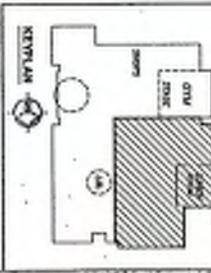
9502

M-3

FLOOR PLAN - NORTH-WEST
SHEET - 1100



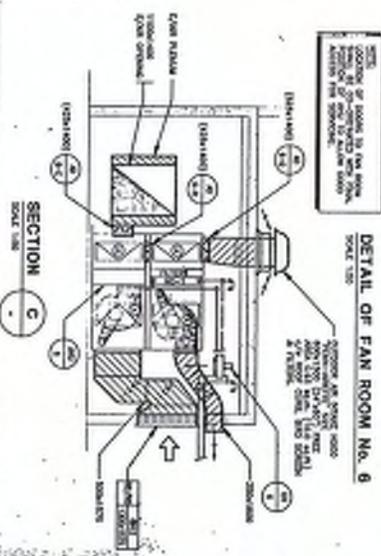
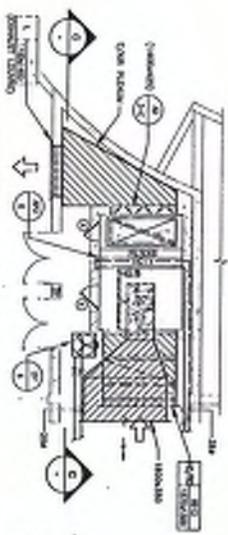
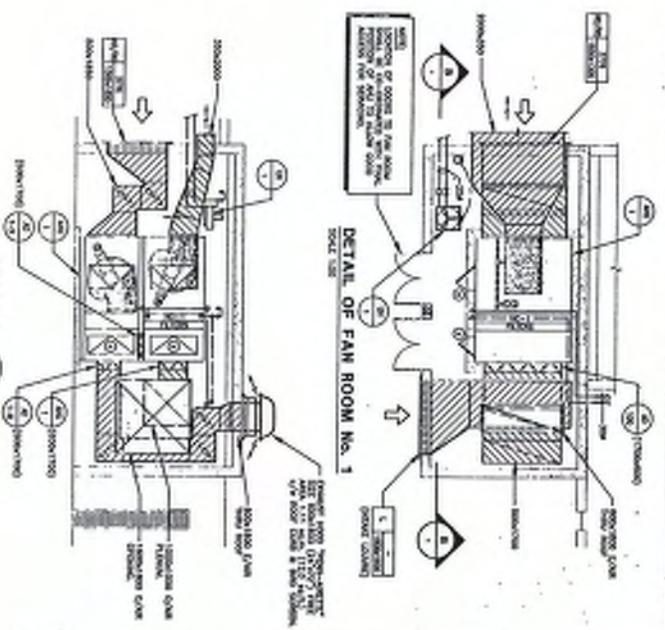
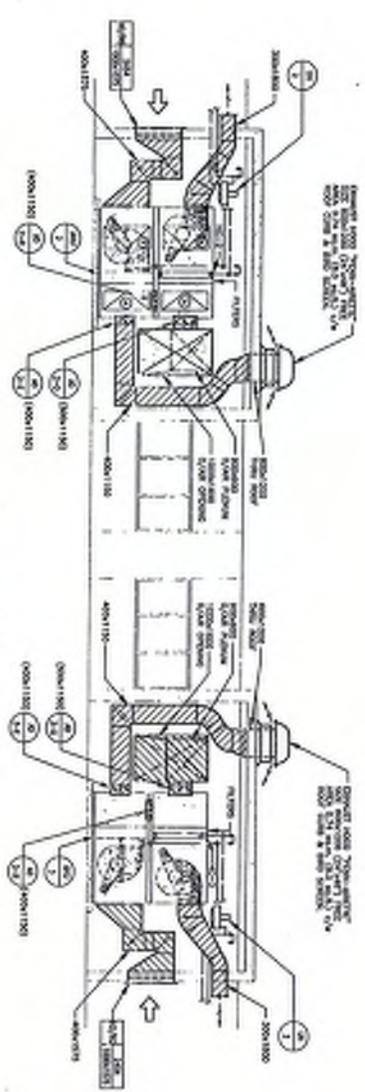
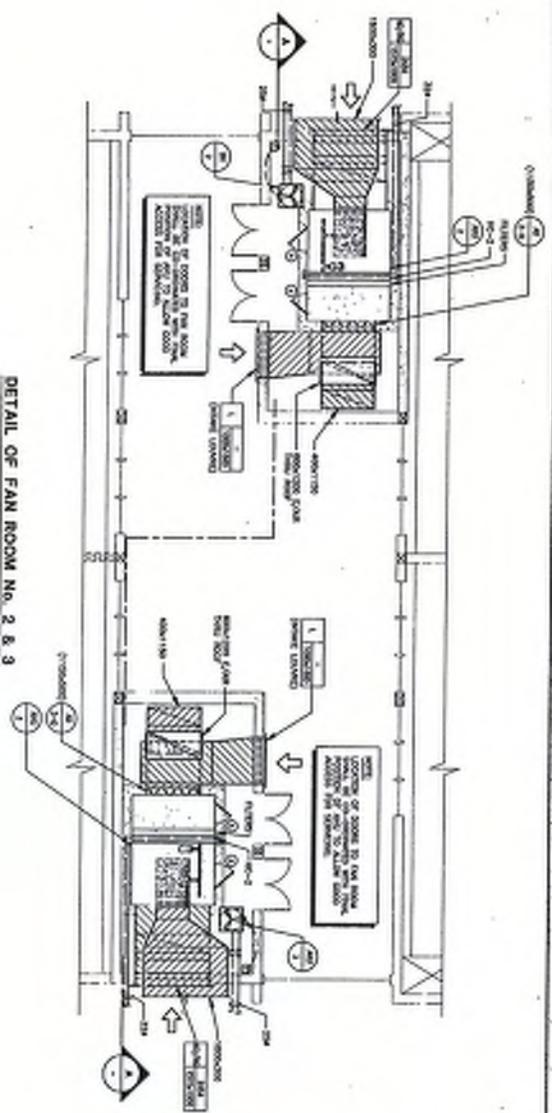
- KEYNOTES**
1. PLACE CAST IRONING TUBS
 2. SEE SHEET 1101 FOR CONTINUATION
 3. SEE SHEET 1101 FOR CONTINUATION
 4. SEE SHEET 1101 FOR CONTINUATION
 5. SEE SHEET 1101 FOR CONTINUATION
 6. SEE SHEET 1101 FOR CONTINUATION
 7. SEE SHEET 1101 FOR CONTINUATION
 8. SEE SHEET 1101 FOR CONTINUATION
 9. SEE SHEET 1101 FOR CONTINUATION
 10. SEE SHEET 1101 FOR CONTINUATION
 11. SEE SHEET 1101 FOR CONTINUATION
 12. SEE SHEET 1101 FOR CONTINUATION
 13. SEE SHEET 1101 FOR CONTINUATION
 14. SEE SHEET 1101 FOR CONTINUATION
 15. SEE SHEET 1101 FOR CONTINUATION



DAVID H. BHOCCINGTOI
ARCHITECT



PROJECT NO.	95-002
SHEET NO.	M-4
DATE	11/18/54
SCALE	AS SHOWN
DESIGNED BY	DAVID H. BHOCCINGTOI
DRAWN BY	DAVID H. BHOCCINGTOI
CHECKED BY	DAVID H. BHOCCINGTOI
APPROVED BY	DAVID H. BHOCCINGTOI
CLIENT	DELVIEW JUNIOR SECONDARY SCHOOL
ADDRESS	1111 - 1186 5th Ave. N.W.
CITY	OTTAWA, ONT.
PROJ. NO.	95-002
DATE	11/18/54
SCALE	AS SHOWN
DESIGNED BY	DAVID H. BHOCCINGTOI
DRAWN BY	DAVID H. BHOCCINGTOI
CHECKED BY	DAVID H. BHOCCINGTOI
APPROVED BY	DAVID H. BHOCCINGTOI
CLIENT	DELVIEW JUNIOR SECONDARY SCHOOL
ADDRESS	1111 - 1186 5th Ave. N.W.
CITY	OTTAWA, ONT.



DAVID H. HINGCHINGTON
ARCHITECT

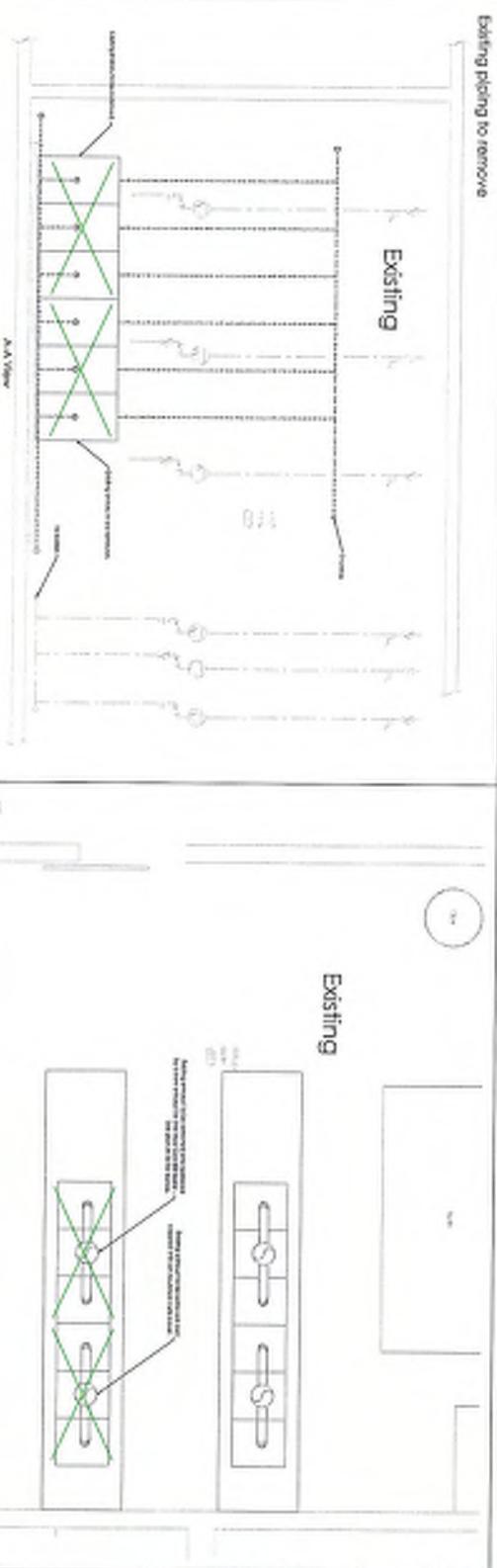


GENERAL CONTRACTOR: THE BROWN COMPANY, INC.
MECHANICAL CONTRACTOR: THE BROWN COMPANY, INC.
ELECTRICAL CONTRACTOR: THE BROWN COMPANY, INC.
PLUMBING CONTRACTOR: THE BROWN COMPANY, INC.
PAINT CONTRACTOR: THE BROWN COMPANY, INC.

DELVEY JUNIOR SECONDARY SCHOOL
811 - 11th Street
OAK, ILL.
FOR SCHOOL DISTRICT
OAK, ILL.

DATE: 10/15/50
DRAWING NO.: 9502
SHEET NO.: M-5

DETAILS OF NEW FAN ROOM

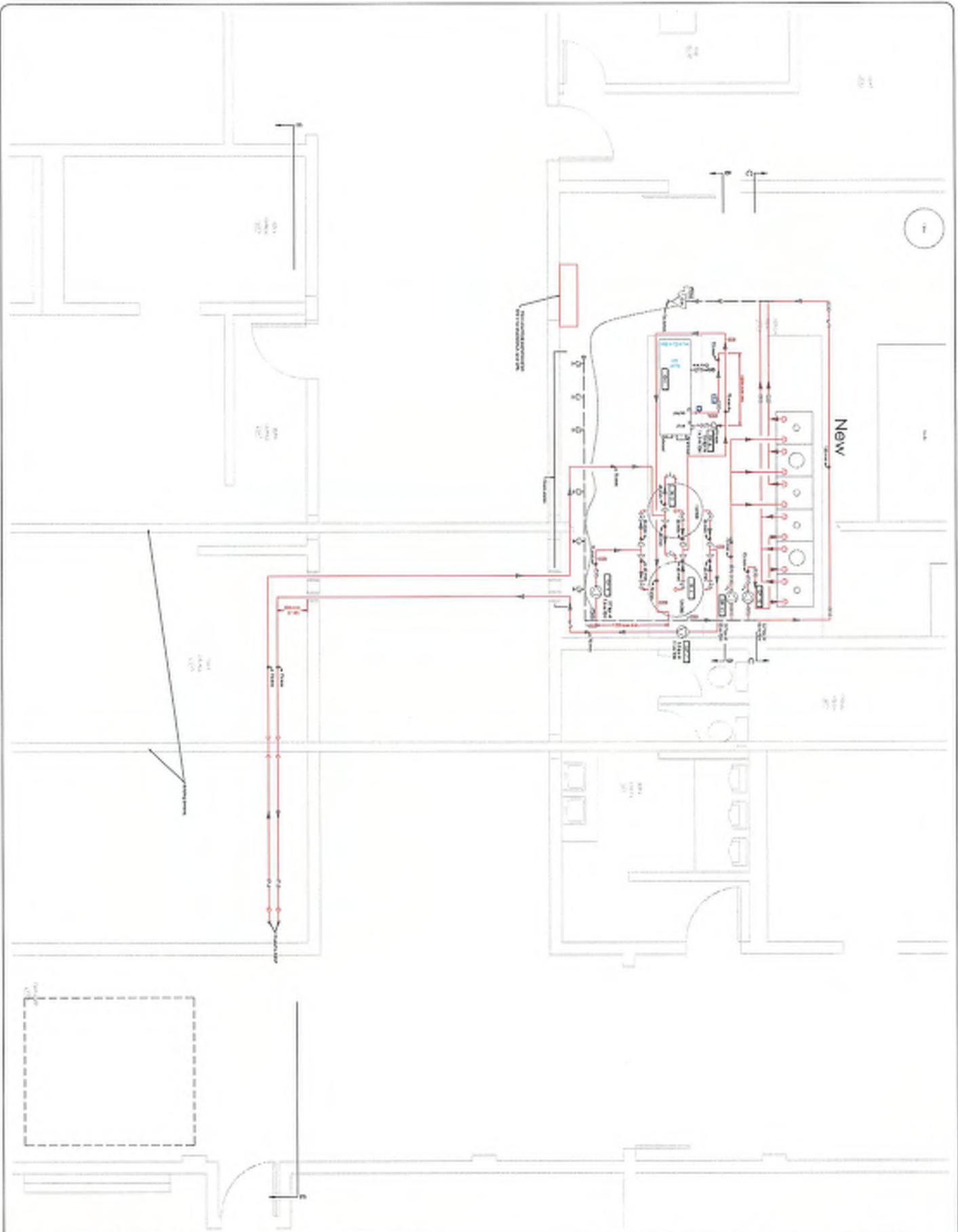


JOHNSON CONTROLS
3000 East 2nd Avenue
Arlington, VA 22204

DATE: 11/11/2014

NO.	DESCRIPTION	DATE
1	ISSUED FOR PERMIT	11/11/2014
2	ISSUED FOR CONSTRUCTION	11/11/2014
3	ISSUED FOR AS-BUILT	11/11/2014

Existing mechanical room demolition



Geo Energy
 3000 East 202 Avenue
 Yorkover SC 29394 USA
 Phone: +1 803 781 1111
 Fax: +1 803 781 1112
 Email: info@geoenergy.com



Master Control
 3600 East 202 Avenue
 Yorkover SC 29394 USA

Project Location
 5111 11th Street
 Ocala, NC

NO.	DESCRIPTION	DATE	BY	CHKD.
1	ISSUED FOR PERMIT	08/14/2014	J. SMITH	
2	ISSUED FOR CONSTRUCTION	08/14/2014	J. SMITH	
3	ISSUED FOR AS-BUILT	08/14/2014	J. SMITH	
4	ISSUED FOR RECORD	08/14/2014	J. SMITH	

Boiler room 111 new piping
 Date: 08/14/2014
 Time: 10:00 AM
 Scale: 1/8" = 1'-0"
 Project No: 14-001



GEORGIA POWER
 2000 Peachtree Street, N.E.
 Atlanta, Georgia 30309
 404.531.1000
 www.georgiapower.com

NO.	DATE	DESCRIPTION



Jaymon Controls
 3400 West 24th Avenue
 Vancouver BC V5M 0A4

Devon Secondary
 3111 Devon Road
 Delta BC

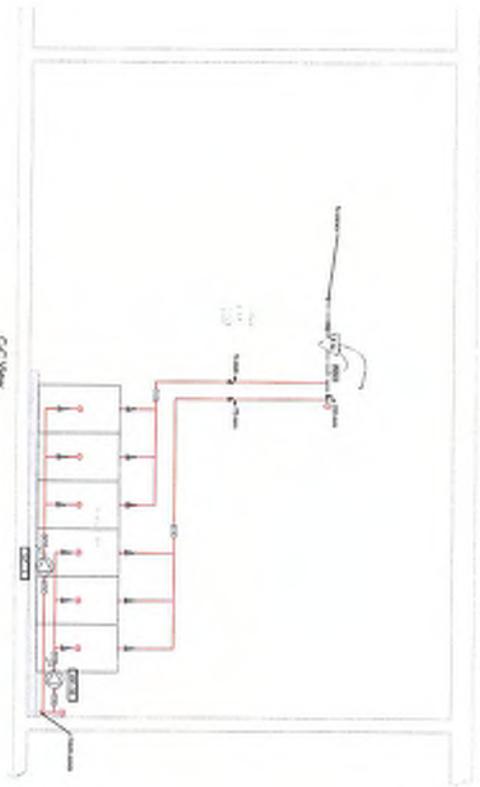
NO.	DESCRIPTION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

Project: Devon Secondary
 3111 Devon Road
 Delta BC
 Client: Jaymon Controls
 3400 West 24th Avenue
 Vancouver BC V5M 0A4
 Date: 08/11/2011
 Scale: 1/8" = 1'-0"



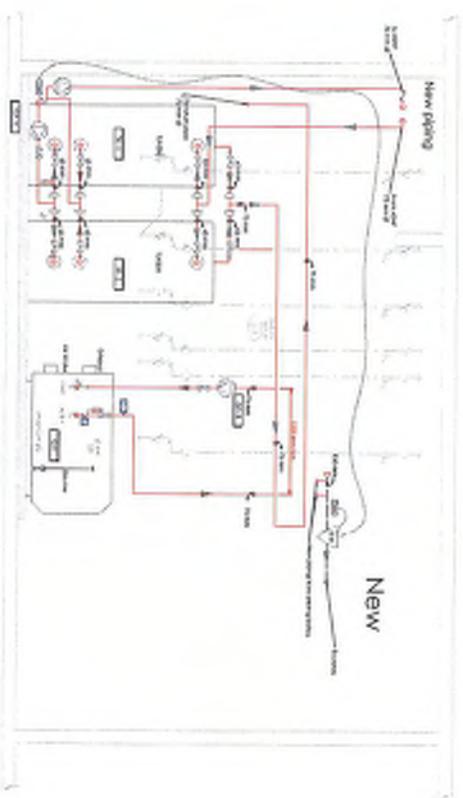
8484 1111 New Piping

DATE	BY	CHK



C-C View

B-B View

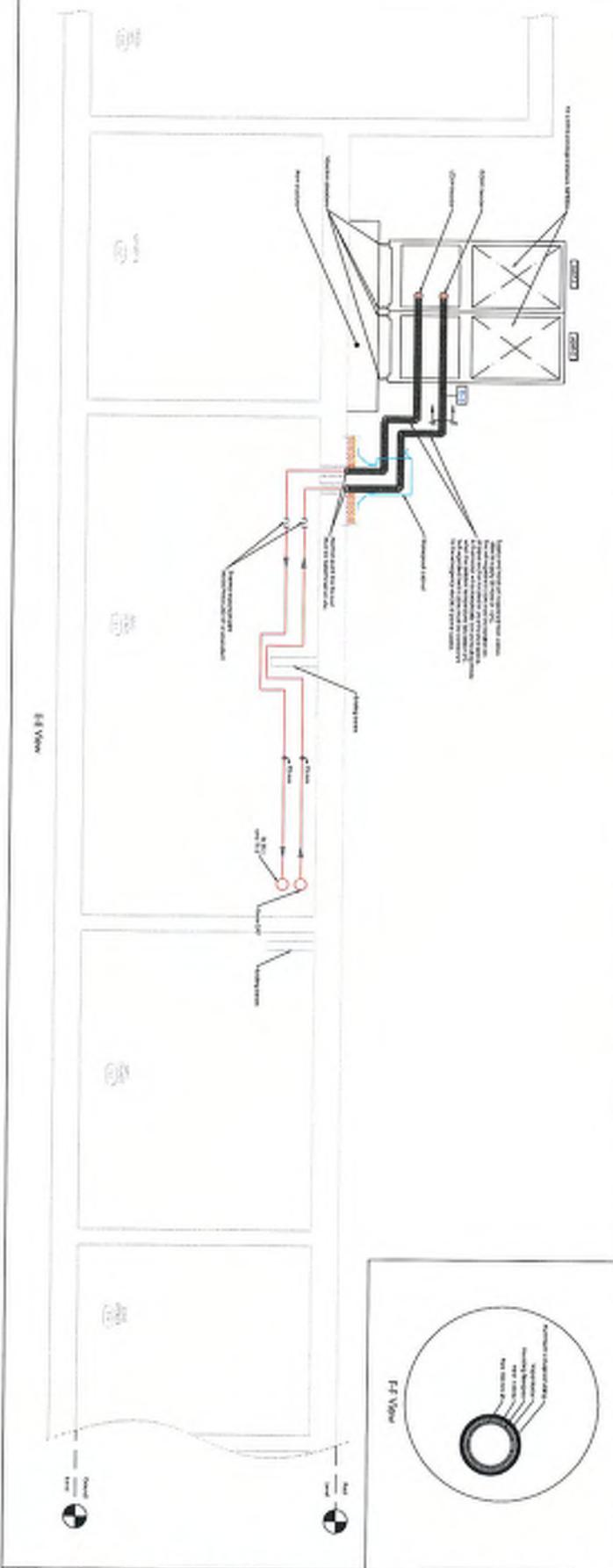
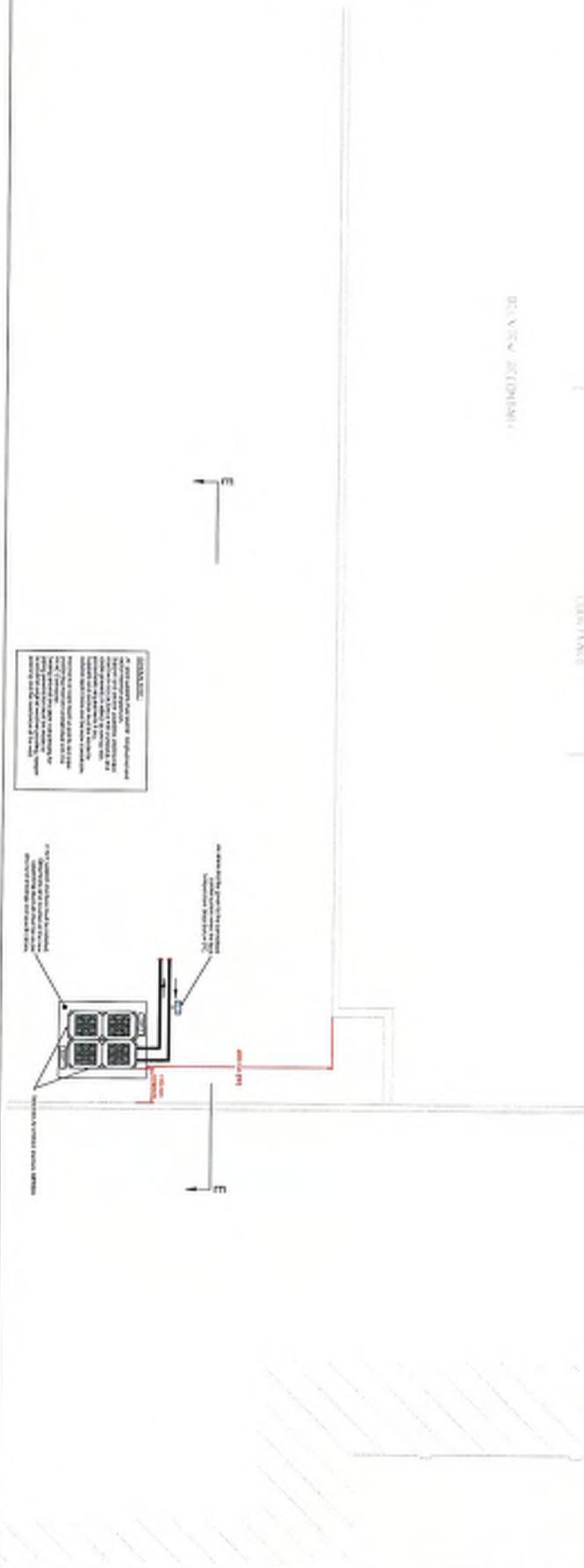


New

New Piping

DELIVER TO CONTRACTOR

CONTRACTOR



GeoEnergy
3000 East 21st Avenue
Tomball, TX 77375
Tel: 281-291-1000
Fax: 281-291-1001
www.geoenergy.com



Job: **Control**
3000 East 21st Avenue
Tomball, TX 77375
3/20/18

Client: **Secondary**
8111 118th Street
Coppell, TX

NO.	DESCRIPTION	QUANTITY	UNIT	PRICE	TOTAL
1	DIFFUSER	1	EA	100.00	100.00
2	GRILLE	1	EA	100.00	100.00
3	GASKET	1	EA	100.00	100.00
4	SEALANT	1	EA	100.00	100.00
5	TOTAL				400.00



At Source near Farnon 08/18

PUMP SCHEDULE											
NO.	DAY	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME
1	MONDAY	06:00	18:00	100%	100%	06:00	18:00	100%	100%	06:00	18:00

PUMP SCHEDULE											
NO.	DAY	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME
1	MONDAY	06:00	18:00	100%	100%	06:00	18:00	100%	100%	06:00	18:00

PUMP SCHEDULE											
NO.	DAY	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME
1	MONDAY	06:00	18:00	100%	100%	06:00	18:00	100%	100%	06:00	18:00

1. Pump is running 100% of the time.
2. Pump is running 100% of the time.
3. Pump is running 100% of the time.

PUMP SCHEDULE											
NO.	DAY	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME
1	MONDAY	06:00	18:00	100%	100%	06:00	18:00	100%	100%	06:00	18:00



GeoEnergy
11111 11th Street
Durham, NC 27704
919.286.1111



Johns County
3000 East 2nd Avenue
Waynesville, NC 27586, USA

Snider Technology
11111 11th Street
Durham, NC

NO.	DAY	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME
1	MONDAY	06:00	18:00	100%	100%	06:00	18:00	100%	100%	06:00	18:00



Snider Technology

NO.	DAY	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME	START	STOP	START TIME	STOP TIME
1	MONDAY	06:00	18:00	100%	100%	06:00	18:00	100%	100%	06:00	18:00



Appendix F



FEI DELTA SCHOOL DISTRICT 37
THERMAL ENERGY SERVICE CONTRACTS EXHIBIT B-1

Diane Roy
Director, Regulatory Affairs - Gas
FortisBC Energy Inc.

16705 Fraser Highway
Surrey, B.C. V4N 0E8
Tel: (604) 576-7349
Cell: (604) 908-2790
Fax: (604) 576-7074
Email: diane.roy@fortisbc.com
www.fortisbc.com

Regulatory Affairs Correspondence
Email: gas.regulatoryaffairs@fortisbc.com

November 28, 2011

British Columbia Utilities Commission
6th Floor, 900 Howe Street
Vancouver, BC
V6Z 2N3

Attention: Ms. Alanna Gillis, Acting Commission Secretary

Dear Ms. Gillis:

Re: FortisBC Energy Inc.
Application for a Certificate of Public Convenience and Necessity ("CPCN") for
Approval of Contracts and Rate for Public Utility Service to Provide Thermal
Energy Service to Delta School District Number 37 (the "Application")

FortisBC Energy Inc. ("FEI") has entered into contracts with Delta School District Number 37 (the "SD") to provide thermal energy service to the SD at 19 of its schools, and is requesting a CPCN and approval of rates from the British Columbia Utilities Commission ("BCUC" or the "Commission"), in accordance with BCUC Order No. G-141-09 and the *Utilities Commission Act*, as described in the attached Application.

On October 17, 2011, FEI filed an application with the Commission seeking, among other things, an interim approval for rates established in the contracts between FEI and the SD. FEI sought interim approval for the rates at that time on the basis that it required this approval in order to secure the price established in the design build contract with FEI's contractor, Johnson Controls L.P. ("JCLP"), for the installation of the facilities that will provide thermal energy to the SD.

On October 25, 2011, the Commission denied the request for interim rates by Commission Order G-179-11. As a result, on October 27, 2011, FEI withdrew the October 17 application so that it could have further discussions with both the SD and JCLP regarding the impact of Order G-179-11. At the time, FEI indicated that following these further discussions, FEI anticipated that it would re-submit an application, with the necessary and appropriate amendments, for Commission approval. FEI has concluded these further discussions with the SD and JCLP, and the attached Application reflects the outcome of those discussions.

The key changes to the October 17 application as a result of the further discussions and negotiations with JCLP and the SD are as follows:

- (a) the project costs have increased by \$150,000;

- (b) the capital costs of the project now exceed \$5,000,000, and therefore FEI is seeking a certificate of public convenience and necessity for the project and no longer seeks section 44.2 approval; and
- (c) the construction schedule has been adjusted to reflect an anticipated approval of the Application by March 1, 2012.

FEI believes that a regulatory review period of three months and a written process is appropriate for a project of this size, and seeks approval of the project on or before March 1, 2012, so that construction can begin as scheduled. FEI submits that a written process is appropriate for this application due to the size of the project, the fact that the customer has a well established and understood energy demand, and the fact that the SD is a willing customer who wants to go forward with the project, as indicated by the fact that it has executed 19 contracts with FEI.

Issues Raised in Order G-179-11

In Order G-179-11, the Commission raised certain issues regarding the Project that FEI has responded to in this Application. The first issue raised was described as follows:

The examination of whether high efficiency boilers should be added to the list of alternative energy extensions cannot be resolved on an interim basis and requires further review.

FEI has provided further information regarding this issue in section 6.2 of the Application.

The Commission also stated that:

... the Commission will examine whether the CPCN threshold should be applied based on the full project costs or net of the Contributions in Aid of Construction.

This is no longer an issue as the increase of \$150,000 to the project costs means that FEI's project costs are in excess of the \$5 million threshold whether considered net of the contribution or not. FEI was mindful of the CPCN issue identified by the Commission in preparing the October 17 version of the application, and for that reason the application was prepared in accordance with the applicable CPCN Guidelines. Consequently, the fact that FEI is now seeking a CPCN has not meant that the Application needed to be significantly revised to address the need to comply with the CPCN Guidelines.

While the CPCN threshold is now exceeded in respect of the Project, FEI does not believe that all of the CPCN Guidelines are applicable to a project of this size and nature. The approach to this Application reflects the overriding principle stated in the CPCN Guidelines that they are intended to reflect the specific circumstances of the applicant, the size and nature of the project, and the issues that it raises. In particular:

- (a) Because the project takes place entirely on Delta School District land there has been no need for consultation, and therefore FEI has not addressed section 3 of the Guidelines.

- (b) The project is being built to serve a customer whose thermal energy demands are well known¹, unlike other TES CPCNs for new developments that have recently come before the Commission, such as Corix's UniverCity CPCN and the River District Energy CPCN.
- (c) While FEI did go through an alternatives analysis, which is described in section 2.4 of the Application, FEI has not provided the kind of detailed alternatives analysis that is contemplated in section 2(ii) of the Guidelines. For this Application, FEI has a willing customer (the SD) who has entered into 19 contracts with FEI and desires the specific project applied for. The Project will be built and will operate entirely on the SD's land. This is in contrast to the usual CPCN situation in which a public utility brings forward, for example, a new transmission project to service a large number of ratepayers. In the traditional CPCN situation, there is no individual customer who has signed up for the project, and the Commission's consideration of other alternatives is meaningful and appropriate in considering the public interest. In this case, however, there is little to be gained from considering whether the SD has selected the appropriate project, since it is the SD's choice and desire to have the particular project applied for.
- (d) Section 7 (New Service Areas) is not applicable.

FEI further submits that the regulatory review period (~3 months) for this project is suitable in light of a comparison to other recent CPCNs for TES projects (such as UniverCity and River District Energy) that the Commission has recently reviewed because of three underlying factors:

- (a) the capital cost of the project is only slightly above the CPCN threshold;
- (b) the project is serving an established energy load and customer; and
- (c) the energy solution being provided to the SD is not phased or changes energy forms as the project matures.

Confidentiality

FEI is filing the Application publicly but requests that the Commission keep the following appendices confidential in accordance with the Commission's Practice Directive related to Confidential Filings, until they are approved by the Commission:

- (a) Appendix A – Energy System Service Agreements between FEI and the SD; and

¹ The new energy solution is serving established schools and their energy consumption is known. This is in contrast to Corix's UniverCity CPCN and the River District Energy CPCN where these systems are being built to serve new load, the energy demand may be phased in and the energy solution may change over time

- (b) Appendix B – Energy System Rate Development Agreement between FEI and the SD.

The general terms of these agreements are described in section 5 of the attached Application.

FEI is requesting that the Commission keep the following appendices confidential on a permanent basis in accordance with the Commission's Practice Directive related to Confidential Filings:

- (a) Appendix C – Design Build Agreement with JCLP; and
- (b) the "live" version of Appendix D financial model (but not hardcopies of the outputs).

The general terms of the design build agreement are described in section 4 of the attached Application.

FEI does not object to customer group interveners such as the British Columbia Public Interest Advocacy Centre on behalf of the British Columbia Old Age Pensioners Organization et al ("BCOAPO") and the Commercial Energy Consumers Association of British Columbia ("CEC") and environmental interveners such as the BC Sustainable Energy Association ("BCSEA"), who are not competitors of FEI or currently negotiating with FEI for TES projects, being provided with these appendices upon executing standard form undertakings of confidentiality. However, for the reasons set out below, FEI does not believe that any of these documents should be provided to its competitors, such as Corix Utilities Inc. A sample Undertaking of Confidentiality has been included in Appendix F.

FEI submits that it is important for the Commission to treat all participants in the thermal energy systems market equally. FEI notes that in the Corix Multi-Utility Service Inc. ("Corix") UniverCity CPCN application proceeding, the Commission received the Infrastructure Agreement with SFU Community Trust and the working spreadsheet of the financial model in confidence, on the basis of a request from Corix for confidentiality. FEI notes that similar treatment was provided to the developer in the River District Energy CPCN application that is currently before the Commission. The rationale provided by the developer was the statement that the financial models should be kept confidential "to protect the parties' business interests". FEI submits that fairness dictates similar treatment of its confidential and commercially sensitive information in this proceeding.

FEI further submits that the proper approach to considering confidentiality requests of this nature is to balance between the commercial interest being compromised, on the one hand, and the interests of those seeking disclosure of the document on the other hand. As set out above, FEI does not have any issue with intervener groups who represent customers and/or environmental groups (or other public interest organizations) being provided with the documents upon giving the standard undertakings. This ensures that those parties who represent the interests of ratepayers, and broader public interests, have access to the full record of the proceeding, and diminishes concerns regarding transparency in the regulatory process.

In terms of the specific appendices, FEI submits as follows.

The SD Contracts (Appendices A and B)

The contracts with the SD contain the details of a business model that FEI has employed for this application that is unique in the industry at this time and as such is commercially sensitive. FEI's concern is with competitors obtaining the documents prior to Commission approval. The contracts with the SD are all subject to Commission approval, and either party may terminate the agreements if Commission approval is not obtained within a defined time. Should this application not be approved, FEI will be in a position where it needs to renegotiate with the SD. If this situation were to occur, the SD may wish to consider other providers (competitors of FEI) instead of continuing negotiations with FEI. In this situation, FEI would be unfairly prejudiced by a competitor having had access to the detailed contracts that had been entered into between FEI and the SD, as it could use this information to compromise FEI's negotiating position in future negotiations with the SD. Such disclosure would give a competitor an unfair competitive advantage in any such future negotiations, and represents a real and substantial risk of harm to FEI's interests. This unfairness, coupled with the fact that non-competitor interveners will have access to the documents, favours granting confidentiality in respect of these documents. Once the contracts are approved, this concern no longer arises, and the contracts can be made public. FEI notes that it is also currently negotiating other TES projects at this time and that this also favours granting confidentiality of these agreements until they are approved.

This situation distinguishes from, for example, the River District CPCN, where the developer was applying for a CPCN, prior to having 1 customers who would be paying for the energy singed up for the service. However, even in that situation, as mentioned above, the developer was still granted confidentiality over certain commercially sensitive documents.

The JCLP Contract (Appendix C)

FEI submits that the design-build contract with JCLP should be kept confidential on the basis that it contains commercial and financial information, and there is a reasonable expectation of harm to both JCLP and FEI if this information is made public. The release of this document to the public would negatively impact both FEI's and JCLP's competitive position in the market by providing potential future contracting parties with information that could be used against either of FEI or JCLP to compromise future negotiating positions. FEI anticipates entering into other such agreements in the future, and believes that it is in the interests of its future customers that FEI's negotiating position with other design build contractors in such transactions is not compromised by those parties having access to previously executed design build contracts.

FEI's Financial Model (Appendix D)

The financial model in Appendix D is the result of significant development effort on behalf of FEI and therefore the formulas and configuration of the model are commercially sensitive. This is particularly important because to the best of FEI's knowledge, the business model FEI has employed for this application is unique in the industry and as such is commercially sensitive. FEI submits that concerns with transparent regulatory review are addressed by the provision of the outputs of this model.

FEI therefore requests the Commission hold the information in these Appendices confidential in accordance with the Commission's Practice Directive related to Confidential Filings. FEI believes that there is more than adequate non-confidential information in the Application to permit a transparent review process for all concerned interveners. Furthermore, those parties with non-competitive, public interest concerns with the Application can have access to the full record upon executing standard undertakings of confidentiality, and as a result FEI's requests for confidentiality should be granted.

If you require further information or have any questions regarding this submission, please contact Grant Biermeier at (250) 380-5794.

Yours very truly,

FORTISBC ENERGY INC.

Original signed by: Shawn Hill

For: Diane Roy

Attachments



FortisBC Energy Inc.

**Application for a
Certificate of Public Convenience and Necessity
for the**

**Approval for the Delta School District 37 (the
"SD 37") Thermal Energy Project**

and

**Approval of Service Agreements and Rate
Development Agreement for Thermal Energy
Project with Delta School District**

November 28, 2011

Table of Contents

1	Approvals Sought and Executive Summary	1
1.1	Approval Sought.....	1
1.2	Executive Summary.....	1
1.2.1	<i>The project</i>	1
1.2.2	<i>The Contracts</i>	2
1.2.3	<i>The Rate</i>	2
1.2.4	<i>The Benefits</i>	3
1.2.5	<i>Regulatory Context</i>	4
1.2.6	<i>Need for Approval of Rates Effective March 1, 2012 and Proposed Regulatory Process</i>	5
1.3	Organization of the Application	6
1.4	The Applicant.....	6
1.4.1	<i>Name, Address and Nature of Business</i>	6
1.4.2	<i>Financial Capability</i>	7
1.4.3	<i>Technical Capability</i>	7
1.4.4	<i>Project Team</i>	8
1.4.5	<i>Name, Title and Address of Company Contact</i>	8
1.4.6	<i>Name, Title and Address of Legal Counsel</i>	8
2	Project Benefits and Justification.....	9
2.1	Introduction.....	9
2.2	Project Need – The SD’s Mandate to Reduce GHG Emissions	9
2.3	Project Benefits in Addition to Meeting SD’s Objectives at Reasonable Cost.....	10
2.3.1	<i>Benefits to Natural Gas Customers</i>	10
2.3.2	<i>Supports British Columbia’s Energy Objectives</i>	10
2.4	Screening Analysis of Alternative Technologies Considered.....	14
2.4.1	<i>The Available Technologies</i>	14
2.4.2	<i>Calculation of thermal energy demand</i>	17

2.5	Relation to Most Recent Long Term Resource Plan	22
3	Project Description.....	23
3.1	The Current Facilities at the Schools	23
3.2	Summary of the Project	23
3.3	Scope of Work	24
3.4	The Project will Provide Safe, Reliable Service.....	25
3.5	Project Schedule	26
3.6	Human Resource Requirements.....	27
3.7	Risks Associated with Successful Completion of the Project	28
3.7.1	Capital Cost Risk	28
3.7.2	Demand & Stranded Asset Risk.....	28
3.8	Project Impacts.....	29
3.9	Other Approvals as Required.....	29
4	Project Cost Estimate and Expenditure Schedule.....	30
4.1	Design Build Agreement.....	30
4.2	Breakdown of Project Costs.....	31
4.2.1	Fixed Cost Components	31
4.2.2	Variable Cost Components.....	31
4.2.3	Contributions in Aid of Construction ("CIAC").....	32
5	Contracts with School District	33
5.1	Energy System Service Agreements.....	33
5.2	Energy System Rate Development Agreement.....	34
6	Rate Proposal for thermal Energy Service to Delta School district	36
6.1	Introduction.....	36
6.2	The Requirements of GT&C 12A	36
6.3	Elements of the SD Rate Design	38
6.3.1	SD37 "Postage Stamp" Rate	38
6.3.2	Annual Rate Based on Forecast Cost of Service and Energy Demand	39

6.3.3	<i>Projected Energy Consumption/Number of Customers</i>	42
6.3.4	<i>Deferral Mechanism To Permit "True Up" to Actual Cost</i>	43
6.3.5	<i>The Transitional "Market Rate"</i>	44
6.3.6	<i>SD37 Rate Rider</i>	45
6.3.7	<i>Terminal Value and Buy-out</i>	46
6.3.8	<i>Example Monthly Bill</i>	46
6.3.9	<i>Economic Test Results</i>	47
6.3.10	<i>Expansion of the Service Will Improve Economics for Customer</i>	48
6.3.11	<i>Sensitivity (Monte Carlo) Analysis</i>	49
6.3.12	<i>Rate Base</i>	50
7	Conclusion	52

List of Appendices

- A – Energy System Service Agreements - Confidential

- B – Energy System Rate Development Agreement and Amending Agreement - Confidential

- C – Johnson Controls L.P. Design Build Agreement and Amending Agreement - Confidential

- D – Financial Model Output - Live Spreadsheet Confidential

- E – General Terms and Conditions Section 12A

- F – Draft Order and Undertaking of Confidentiality

1 APPROVALS SOUGHT AND EXECUTIVE SUMMARY

1.1 Approval Sought

FortisBC Energy Inc. ("FEI" or the "Company") has entered into 19 "Energy System Service Agreements" (the "Service Agreements")¹ with Delta School District Number 37 (the "School District" or "SD") to provide thermal energy to 19 individual schools throughout the school district (collectively "Thermal Energy Services"). FEI has also entered into an "Energy System Rate Development Agreement" ("RDA")² under which FEI will provide the Thermal Energy Services to the school sites under a single pooled rate.

In this application (the "Application"), FEI seeks the following approvals:

- a Certificate of Public Convenience and Necessity ("CPCN") for the construction and operation of the project described in this Application under sections 45 and 46 of the *Utilities Commission Act* (the "Act");
- approval of the rates and rate design established by the 19 Energy System Service Agreements and the Energy System Rate Development Agreement filed with this Application, and described in Section 6 herein, as just and reasonable rates under sections 59-61 of the *Act*;

The approvals sought in this Application put in place the thermal energy project and the necessary rate structures for the Company to provide the Thermal Energy Services to the 19 schools within the SD. As further explained below in Section 1.2.5, this approach is consistent with what is contemplated in the Negotiated Settlement Agreement (the "NSA") in the 2010-2011 Revenue Requirements Application ("RRA"), which was approved by the British Columbia Utilities Commission ("BCUC" or the "Commission") in Order No. G-141-09.

1.2 Executive Summary

1.2.1 THE PROJECT

The Delta School District Thermal Energy Project (the "Project") will provide 19 of the SD's buildings with thermal energy upgrades over the next two years. Once complete, FEI will own, operate and maintain the new thermal plants, and charge the SD a single rate for thermal energy consumed. In general terms, the Project involves the replacement of conventional

¹ Appendix A – Energy System Service Agreements

² Appendix B – Energy System Rate Development Agreement

boilers with high efficiency, condensing boilers at eight sites, the conversion of existing thermal plants to state-of-the-art geo-exchange systems at 11 sites, and retrofit/replacement of existing mechanical infrastructure at all 19 sites to accept the new technologies. The Project will take place over two years, and the total estimated cost of the project is \$6.5 million. Of this amount, the SD will be making a \$1.357 million Contribution in Aid of Construction ("CIAC").

1.2.2 THE CONTRACTS

The Project involves 20 separate contracts with the SD. FEI and the SD have entered into a separate Energy Service Agreement for each of the 19 schools involved in the Project. The development of the individual contracts involved analysis of the demand characteristics, available technologies, emissions and costs for each of the school buildings, and then included a determination of the appropriate technology to achieve the SD's desired environmental benefits within the SD's existing operating budget. The Service Agreements provide that FEI will design and build the energy system at each school, operate and maintain the systems, and charge the SD a rate for the thermal energy. The Energy System Rate Development Agreement between FEI and the SD establishes a single pooled monthly rate that the SD pays FEI for the thermal energy consumed at all 19 schools.

FEI has entered into a design build contract with Johnson Controls L.P. ("JCLP")³, pursuant to which JCLP will install the various energy systems at each of the 19 schools. The design build contract was developed subsequent to a feasibility analysis that FEI purchased from JCLP and responses to a Request for Expressions of Interest for Large Scale Thermal Energy Delivery Projects that FEI issued in March of 2011.

In the Application, FEI has discussed the general terms of the contracts below in Section 5. For the reasons set out in the cover letter to this Application, all of these contracts and the electronic spreadsheet financial model have been filed confidentially to preserve commercially sensitive information.

Upon approval of the contracts with SD, the Energy System Service Agreements and the Energy System Rate Development Agreement will be made available to the public, consistent with the Commission's direction in the NGV Decision (Order No. G-128-11, p. 25).

1.2.3 THE RATE

The rate that FEI will charge the SD is a rate that has been developed pursuant to Order No. G-141-09, and more specifically FEI's General Terms and Conditions ("GT&C"), Section 12A. FEI will charge the SD a single, pooled rate for thermal energy provided to all 19 schools that is based on FEI's cost of service. Both parties agree that a cost of service rate that the BCUC

³ Appendix C – Johnson Controls L.P. Design Build Agreement

approves from time to time based on forecast costs and demand is the appropriate rate overall. The RDA contemplates using a deferral account (the "SD37 Deferral Account") to capture variances between the forecast cost of service and the revenues, with the balance being recovered in rates in subsequent years as part of the cost of service. This "true up" helps, in light of this being a new type of project, to ensure both that any efficiencies in the costs are to the benefit of the SD and that there is a reasonable expectation of a return on the investment for FEI. The SD37 Deferral Account will be a sub-set of the overall Thermal Energy Services Deferral Account ("TESDA") that was established in Order No. G-141-09. The establishment of the SD37 Deferral Account will allow FEI to track project specific costs and revenues within the TESDA.

The thermal energy rate must meet the transitional challenge of moving from the current costs of energy to the cost of service rate without causing an increase beyond what the SD might experience using their current natural gas equipment. The operating budgets at the SD are very tight and any increases in energy costs come out of the total budget. Therefore, the SD must operate within this budget and desires to minimize the potential volatility of these rates as well. To resolve this transitional challenge, initially the SD will pay a rate the parties have referred to as the "market rate" that is calculated each month based upon the negotiated initial rate of \$0.089/kWh of thermal energy, adjusted by the monthly index for natural gas in British Columbia that Statistics Canada publishes (see Section 6.3.6). The SD will pay this market rate for thermal energy until they elect to switch to the cost of service rate, with variances captured in the SD37 Deferral Account. To assist in this decision, FEI will provide the cost of service rate as a reference each month while the SD is paying the market rate. FEI will also have the ability to apply to the BCUC to move the SD to the cost of service rate. The expectation, for reasons described in this Application, is that the SD will want to switch over to the cost of service rate after an initial transition period.

The SD and FEI have also negotiated a special rate rider for the SD to reduce their thermal energy rates throughout the term of these Contracts. This negotiated amount recognizes the CIAC that the SD will be providing to this Project. It also helps to create an appropriate incentive structure to expand the service to incorporate other schools, ensuring that the SD continues to get the credit for the contribution even in the event that other customers are added to the asset pool (see Section 6.3.11).

In addition, the SD and FEI have also negotiated a buy-out provision for the SD in the event of termination or expiry. The buy-out price is set at the rate base value at the time, but explicitly contemplates the BCUC to set the value at which the assets should transfer. For context, it is reasonable to expect that the SD will continue to require thermal energy for their buildings beyond the term of the agreement. Accordingly, there are automatic renewal periods of ten years each, beyond the initial term of twenty years.

1.2.4 THE BENEFITS

The Project provides the following benefits:

- it helps the SD achieve its goal of reducing its carbon footprint and complying with its associated obligations;
- the Project is consistent with and advances several of British Columbia's energy objectives – in particular, the Project will reduce the energy consumption of the SD at the 19 schools (in total) by 40%, and the Greenhouse Gas ("GHG") emissions by over 70% each year and in total over the term of the Contracts;
- the cost of the facilities will be recovered from the SD over the term of the Energy System Rate Development Agreement, including recovering a portion of the balance in the TES Deferral Account for thermal energy services-related overheads and a unique equity risk premium;
- FEI's investment benefits existing and future natural gas customers by providing a thermal energy solution that utilizes natural gas assets that are already in place.

These benefits are discussed in greater detail in Section 2.

1.2.5 REGULATORY CONTEXT

FEI is bringing this Application forward in the manner contemplated by Order No. G-141-09, approving the NSA in the 2010-2011 RRA. The NSA provides as follows with respect to the General Terms and Conditions ("GT&C") for alternative energy extensions, and the manner in which they are to be reviewed by the Commission:

In evaluating AES projects, TGI will apply the economic test outlined in the Application. The Parties agree that the proposed GT&C (Section 12A – Alternative Energy Extensions) are acceptable. Pursuant to the Utilities Commission Act, within the Alternative Energy class of service, project-specific contracts with AES customers will be filed with the Commission for acceptance as a rate, at which time the Commission may review and adjust the economic test and GT&C Section 12A – Alternative Energy Extensions.

The CPCN threshold of \$5 million applies to AES projects brought forward in 2010 and 2011.

The Parties agree that it is premature to address issues relating to the gas load and gas consumption profiles of AES projects that incorporate a natural gas component. Such issues are appropriately addressed in a future rate design application, once TGI has sufficient AES customers that take gas so as to provide reliable information on gas load and gas consumption profiles.

The Company has designed the rate structure based on the economic test established in GT&C Section 12A – Alternative Energy Extensions. FEI has relied on cost inputs specific to the School District. It has conducted an economic assessment using well established cost of

service methodology, and has developed a rate design that recovers the Project's cost of service over time from the School District.

FEI is mindful that this Project falls within the broader thermal energy service class of service that is the subject matter of the ongoing Alternative Energy Solutions ("AES") Inquiry established by Order No. G-118-11. However, the Commission has made clear that the AES Inquiry is not intended to interfere with other applications brought before the Commission during the Inquiry process:

The Panel agrees that it is not appropriate for this Inquiry to be used as a vehicle to re-open past Decisions of the Commission. With respect to ongoing processes that may have some degree of overlap with the issues being considered by this proceeding, the Panel believes that such processes will be decided on the basis of the evidence put before them. While it may be beneficial to have the outcome of this proceeding known before similar issues are dealt with in other ongoing proceedings, it would be inefficient and potentially unfair for such proceedings to be delayed. The Panel sees the outcome of this proceeding as being applied in a forward looking manner and not impinging on past or current ongoing proceedings.

The approval of the Project and rates sought in this Application should have no impact on the ongoing AES Inquiry. This Application is being made pursuant to an approved rate schedule (GT&C Section 12A). The Commission has already determined that the AES Inquiry is prospective and should not impede or delay other processes. Further, the Project does not depend in any way on Energy Efficiency and Conservation ("EEC") funds becoming available. Any EEC funds that the SD may or may not receive as a result of this Project will belong solely to the SD. FEI respectfully submits that it is in the interest of the customer and FEI to ensure that this process proceeds expeditiously, efficiently and cost-effectively. It should be confined to matters specifically relating to the Project, and avoid redundancy with the broader issues that are being addressed in the other forum.

1.2.6 NEED FOR APPROVAL OF RATES EFFECTIVE MARCH 1, 2012 AND PROPOSED REGULATORY PROCESS

FEI is seeking approval of the Energy System Service Agreements and the Energy System Rate Development Agreement effective March 1, 2012. FEI seeks this approval on the basis that the price established in the design build contract with JCLP is contingent upon the BCUC approving the Project by March 1, 2012, when construction is scheduled to begin. This date was the product of commercial negotiations. JCLP has agreed to hold its price only until March 1, as that is the basis upon which JCLP will be allocating its resources for the coming months. Should FEI not be granted approval, it would be subject to a price adjustment from JCLP, which in turn would impact the rates ultimately charged to the SD.

FEI respectfully submits the following in support of this approval request:

- This Application is being made pursuant to a previously approved rate schedule (GT&C 12A; see Order No. G-141-09), and the proposed rates meet the economic test set out in GT&C 12A and recover from SD the full cost of service.
- The rates that are designed and provided for in the contracts are rates that have been negotiated between sophisticated parties. The SD's acceptance of the rates that it will be charged by FEI is implicit in the fact that it has entered into 20 agreements with FEI that establish these rates.
- There is no risk to natural gas customers, as this Project is related to the Thermal Energy Services class of service.
- The rate to the customer will change on a yearly basis, with the risks borne by the customer or FEI based on negotiated and agreed upon terms in the contracts.

To meet the effective date of March 1, 2012, FEI proposes that this application can be reviewed in a written process. FEI will work with Commission staff to develop a regulatory timetable once the application is filed.

1.3 Organization of the Application

This Application is organized as follows:

- Section 2 describes the justification for and benefits of the Project.
- Section 3 provides the Project description.
- Section 4 provides FEI's cost estimate for the Project.
- Section 5 describes the Energy Service and Energy System Rate Development agreements that FEI has entered into with the SD.
- Section 6 describes the rate proposal for thermal energy service to the SD.

1.4 The Applicant

1.4.1 NAME, ADDRESS AND NATURE OF BUSINESS

FEI is a company incorporated under the laws of the Province of British Columbia and is a wholly-owned subsidiary of FortisBC Holdings Inc., which in turn is a wholly-owned subsidiary of Fortis Inc. FEI maintains an office and place of business at 16705 Fraser Highway, Surrey, British Columbia, V4N 0E8.

FEI is the largest natural gas distribution utility in British Columbia, providing sales and transportation services to residential, commercial, and industrial customers in more than 100

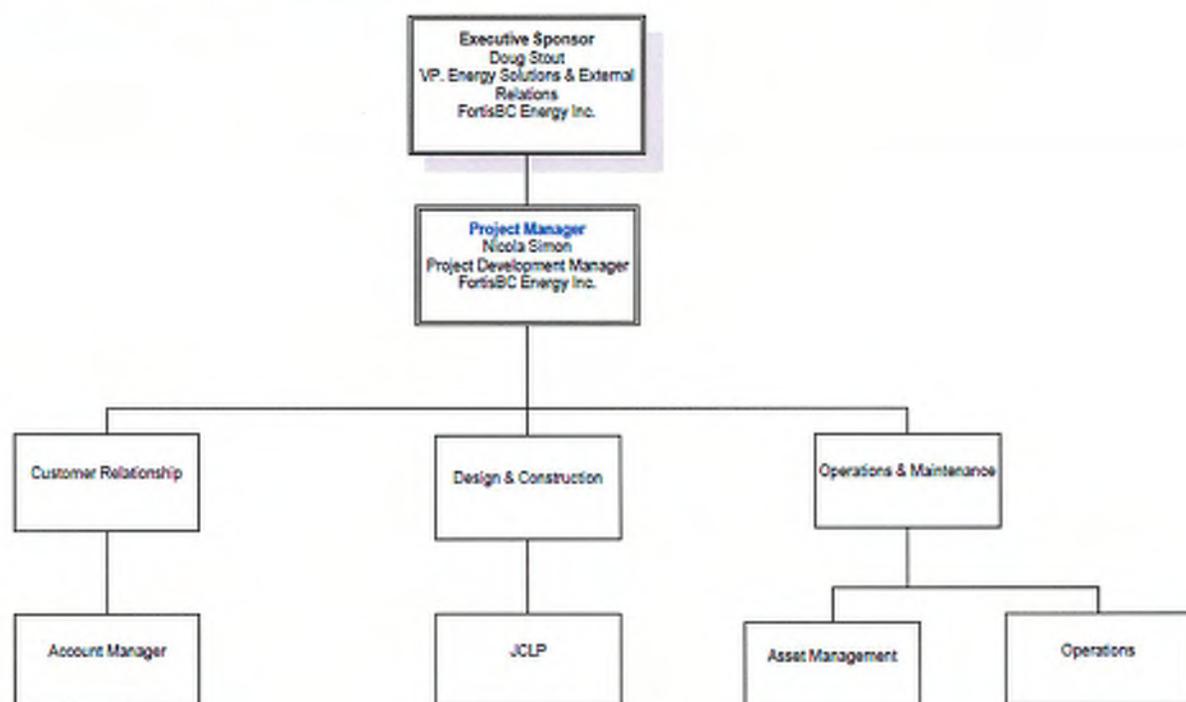
communities throughout British Columbia, with approximately 930,000 customers served throughout British Columbia. FEI's distribution network delivers gas to more than eighty percent of the natural gas customers in British Columbia.

1.4.2 FINANCIAL CAPABILITY

FEI is regulated by the BCUC. FEI is capable of financing the Project either directly or through its parent, Fortis Inc. FEI has credit ratings for senior unsecured debentures from Dominion Bond Rating Service and Moody's Investors Service of A and A3 respectively.

1.4.3 TECHNICAL CAPABILITY

FEI is partnering with JCLP to provide the thermal energy solutions to the SD. JCLP is a global leader in delivering sustainable energy and water solutions and technology integration services. They are the largest energy services company in North America with revenues in excess of \$34 billion in 2010. To date JCLP has delivered more than 5,000 central plant improvements, energy efficiency and renewable energy projects worldwide. These projects have delivered over \$19 billion in savings and more than 15 million metric tonnes of CO₂ emission reductions for customers in both the public and private sector. JCLP energy efficiency projects consist of a combination of both supply and demand side solutions. JCLP is also a recognised leader in sustainability and corporate responsibility. JCLP will be providing the supply side solutions to FEI in this project for producing thermal energy.

1.4.4 PROJECT TEAM

1.4.5 NAME, TITLE AND ADDRESS OF COMPANY CONTACT

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 Director
 Regulatory Affairs
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1.4.6 NAME, TITLE AND ADDRESS OF LEGAL COUNSEL

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2 PROJECT BENEFITS AND JUSTIFICATION

2.1 Introduction

In this Section, FEI describes the primary driver for the Project, which is the SD's desire to implement energy systems that reduce GHG emissions and make use of renewable energy sources that are cost effective over the long term. FEI also describes the related benefits of the Project to existing and future natural gas customers, and British Columbians in general. FEI also describes the process through which various energy solutions were screened to determine the optimal solution for each of the 19 schools, and provides a brief discussion of how the Project supports FEI's most recent Long-Term Resource Plan.

2.2 Project Need – The SD's Mandate to Reduce GHG Emissions

The SD serves the communities of North Delta, Ladner, Tsawwassen and Westham Island and covers an area of 183.7 square kilometres. The SD provides a comprehensive education program to 16,000+ students from kindergarten to Grade 12 at 24 elementary schools and 7 secondary schools. The SD also operates 68 modular classrooms, a District Administration Building, the Delta Manor Education Centre, 2 Adult Learning Centres, a District Maintenance Centre and various satellite sites, leased facilities and undeveloped sites. In total, the SD has 42 sites consisting of 202,400 square metres of permanent and modular buildings situated on 141 hectares and 2,289 staff.

Under the *Greenhouse Gas Reduction Targets Act*, the SD was required to become carbon neutral starting in 2010. The SD is also a signatory to the Climate Action Charter ("CAC"). By signing the CAC, the SD committed itself to work towards increasing its energy efficiency by developing projects to offset GHG emissions.

The SD has been proactive in reducing their thermal energy consumption and carbon footprint by implementing air-source heat pumps at 15 of the 34 buildings in the SD. That initiative has reduced natural gas consumption across the SD by approximately 13,000 GJ, while electricity consumption increased from 211 MWh to 900 MWh and reduced carbon emissions by about 470 tCO₂e. However, the SD no longer has access to capital to allow them to perform further energy system upgrades, and each year the remaining 19 of the SD's 34 buildings consume approximately 58,650 GJ of natural gas and 1,300 MWh of electricity for thermal energy on an annual basis. The annual GHG emissions related to this amount of energy consumption are almost 3,000 tCO₂e in a normal weather year. Of the 19 sites that are involved in the Project, 10 have aging heating systems that require immediate replacement. Eight schools have central boilers that are more than 20 years old. Two schools have rooftop air-handling units that are more than 20 years old. Five schools have heating systems that will reach the end of their life cycle within the next 5 to 10 years.

The Project achieves the SD's goal of reducing GHG emissions and making use of renewable energy, while managing tight budget constraints, through FEI ownership and operation of the thermal energy systems and the sale of thermal energy to the SD at a price that is affordable to the SD within their operating budget. The Project will enable the SD to obtain reliable thermal energy that it requires on an ongoing basis at reasonable prices and reduce their carbon footprint at the same time. As further explained below, the Project will reduce the SD's GHG emissions by over 70%.

The SD will connect their remaining 19 buildings to FEI energy systems and purchase thermal energy from FEI at a rate that is based upon the costs of providing thermal energy service to the SD in aggregate. In this Project, FEI will manage both the initial and ongoing costs of delivering thermal energy to these SD buildings while achieving significant reductions in GHG emissions in exchange for a single rate for thermal energy at all 19 sites. This approach to providing thermal energy enables FEI to pool the costs and benefits of all buildings in a manner that optimizes the overall environmental benefits of employing innovative technologies that utilize clean, renewable resources, while managing the rates for thermal energy within the budgetary constraints of the SD.

2.3 Project Benefits in Addition to Meeting SD's Objectives at Reasonable Cost

As described above, the primary driver of this Project is the SD's need to implement energy solutions that reduce GHG emissions, make efficient use of energy and make use of renewable energy sources, within the SD's budget constraints. In turn, the primary benefit of this Project is that it helps the SD achieve its energy goals. Aside from the direct benefit to the SD, for the reasons described in the following sections, the Project also benefits FEI's existing and future natural gas customers, and British Columbians generally by advancing British Columbia's energy objectives.

2.3.1 BENEFITS TO NATURAL GAS CUSTOMERS

This Project includes the use of natural gas as the primary energy source at 8 of the sites and retains natural gas for complementing the energy from heat pumps at the remaining 11 sites. This ensures that as the SD moves towards reduction of GHG emissions the transition occurs in a manner that utilizes assets that are already in place to service natural gas loads at these sites. Currently, the market for thermal energy in British Columbia is dynamic, and natural gas is experiencing declining loads. Inclusion of natural gas in this project helps to mitigate the risk that the SD would move towards a solution (e.g. electricity) that caused an immediate loss of revenue to the natural gas class of service.

2.3.2 SUPPORTS BRITISH COLUMBIA'S ENERGY OBJECTIVES

Section 46 of the *Act* requires the Commission to consider the applicable of British Columbia's energy objectives. In this section, FEI sets out the energy objectives that are relevant to the

Project and explains why the Project is consistent with or promotes "British Columbia's energy objectives". This Project will reduce the total energy necessary to produce the thermal energy that the SD requires at these 19 buildings by utilizing higher efficiency natural gas boilers and heat pumps that access renewable energy sources.

The existing natural gas equipment at these buildings utilizes older, inefficient equipment that wastes a significant amount of the energy inputs necessary to supply the thermal energy demands of the SD. A pure electric solution for thermal energy eliminates the waste heat and also does not produce any GHG emissions at the SD. However, such a solution significantly increases the demands for both peak and annual electricity. In contrast, the Project incorporates a significant amount of renewable energy, as well as increases in efficiency of the remaining natural gas equipment to produce a solution that reduces GHG emissions, reduces waste, and reduces the reliance on electricity as the method of reducing GHGs emissions while still incorporating natural gas in the solution. The following table summarizes the sources of energy necessary to meet the thermal energy requirements of the SD comparing the existing equipment, the Project and a pure electricity alternative on an annual and peak day basis:

Table 1: Comparison of Demand Characteristics

	GJ/Annum		
	Existing Natural Gas	Contracts	Electricity Alternative
Electricity	4,684	11,142	38,177
Natural Gas	58,607	13,255	-
Renewable Energy	-	15,164	-
Energy Waste	(25,114)	(1,384)	-
Total Thermal Energy	38,177	38,177	38,177
GHG tCO ₂ e	2,913	659	-

	GJ/Peak Day		
	Existing Natural Gas	Contracts	Electricity Alternative
Electricity	-	64	360
Natural Gas	553	301	-
Renewable Energy	-	82	-
Total	553	447	360

In the following sections, FEI discusses the following specific energy objectives that are relevant to the Project:

- to use and foster the development in British Columbia of innovative technologies that support energy conservation and efficiency and the use of clean or renewable resources;
- to reduce BC GHG emissions;
- to encourage the switching from one kind of energy source or use to another that decreases GHG emissions in British Columbia; and
- to encourage economic development and the creation and retention of jobs.

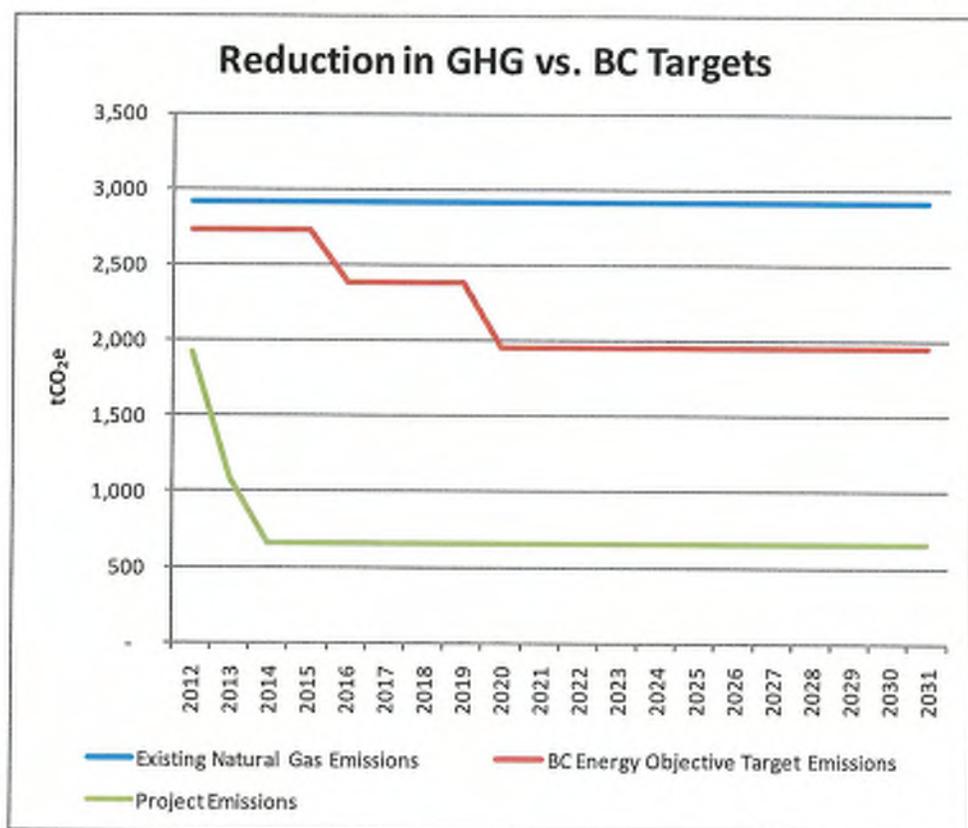
To use and foster the development in British Columbia of innovative technologies that support energy conservation and efficiency and the use of clean or renewable resources

Utilization of innovative technologies such as high efficiency natural gas boilers and heat pumps reduces the energy waste of the SD by almost 95% each year, from 25,000 GJ to 1,400 GJ. The Project also accesses renewable resources from the immediately surrounding area to supply 15,000 GJ, or almost 40% of the energy necessary to produce the thermal energy for these 19 sites, which is 38,000 GJ. For further details, see the 'Energy System Summary' worksheet in the financial model in Appendix D.

To reduce BC greenhouse gas emissions

The Project will reduce GHG emissions by over 70% from these sites. The sites currently generate 2,900 tCO₂e per year, and this amount will be reduced to 700 tCO₂e per year. Over the 20 year term of the Contracts with the SD, the targets for BC GHG emissions are almost 25% of the existing natural gas emissions today and in 2007. Therefore, this Project will reduce the emissions by threefold when comparing to the target reductions as shown in the graph below.

Figure 1: GHG Emissions Beats Target Emissions in BC energy objectives



To encourage the switching from one kind of energy source or use to another that decreases GHG emissions in British Columbia

By switching 11 of these sites from conventional natural gas boilers to ground source heat pumps and a few air source heat pumps, the Project will replace 45,000 GJ of natural gas with 26,000 GJ of electricity and renewable resources. Natural gas produces 0.0497 tCO₂e for every GJ. Renewable energy sources like the ambient air and the ground produce no GHG emissions.

To encourage economic development and the creation and retention of jobs

The construction of this Project will create investment opportunities in British Columbia for both FEI investors and the investors of the design build contractor, JCLP. Further, it will generate new jobs in British Columbia during the construction phase and it will be creating jobs in British Columbia that are necessary for the ongoing maintenance and operation of this infrastructure. There will be a greater share of the costs of energy to supply the thermal energy needs of the SD going towards capital investments, construction jobs, operations jobs and income taxes here in British Columbia than currently.

2.4 Screening Analysis of Alternative Technologies Considered

In this Section, FEI describes the technologies that it considered in developing the Project, and explains the basis for the determination of the specific technologies employed at each school site. FEI, in consultation with the SD, has aimed at a mix of technologies most suited to its needs and budgetary constraints.

2.4.1 THE AVAILABLE TECHNOLOGIES

There are a variety of technologies currently available to utilize for delivery of thermal energy. Each energy system technology has specific attributes that determine the feasibility of installation at a particular location. Irrespective of how a system generates thermal energy, thermal energy demands for any building are primarily dependent upon the outside temperature, and the ability of buildings to retain thermal energy. While thermal energy retention plays a significant role in the equation for thermal energy demand, FEI's interest and expertise is in the systems that produce thermal energy and emissions, and not the building systems that generate the demand for thermal energy.

There are two basic ways to reduce the GHG emissions and conserve energy necessary to produce thermal energy. The first is to utilize free renewable energy from the surrounding natural environment. The second is to eliminate or reduce any waste in the conversion and delivery processes. As described below, the Project utilizes both methods.

It is noteworthy that very little of the annual thermal energy demand occurs during the peak day. Since GHG emissions are a direct result of energy production, it follows that very little of the annual GHG emissions occur during the peak day. The importance of this is that by combining energy system technologies, significant reductions in emissions may be possible even if the system meets peak demands using higher emission fuels. These "hybrid" systems use alternative energy supply and natural gas, and therefore can optimize the balance between costs and emissions, depending on the energy demand characteristics of the buildings.

FEI determined that the following technologies were appropriate for consideration for the Project:

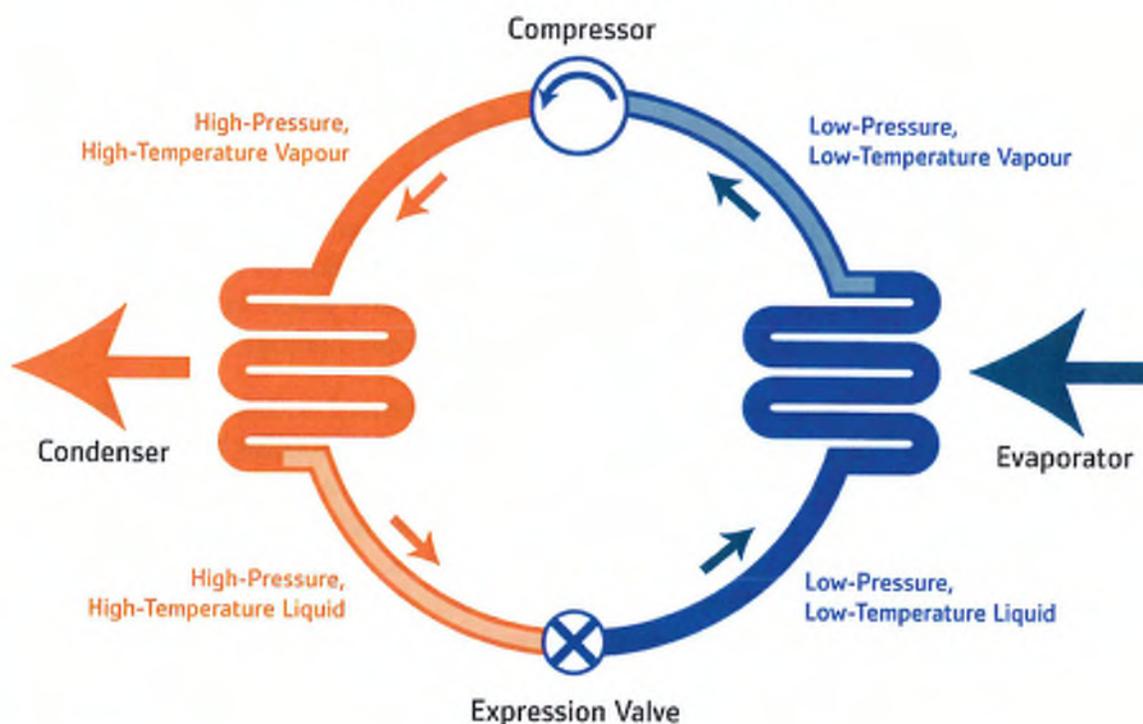
- Heat pump energy systems
 - Air source heat pumps
 - Ground source heat pumps
 - Open loop
 - Closed loop
- High efficiency condensing boilers

FEI describes each of these technologies in the following sections.

Heat Pump Energy Systems

Heat pump energy systems use a pump to transfer heat from an accessible, renewable energy source, such as ground, water or air to users in buildings. Heat pump systems rely on the law of physics stating that when pressure increases, so does temperature and vice versa. A refrigerator is an example of a heat pump that transfers heat from inside the unit to the ambient air surrounding it by applying this law. Heat pump systems can operate to pump heat into or out of buildings, providing heating and cooling in a single system.

Figure 2: Heat Pump Flow Diagram



Heat pump energy systems utilize electricity to run the pumps that transfer thermal energy. However, they can transfer energy from or to renewable sources such as the ambient air, ground water, lakes, oceans, rivers or simply the earth itself. Since those energy sources are renewable, one only needs to count the amount of electricity that drives the pumps, which is much less than the thermal energy the pumps deliver into or out of the buildings. This explains why heat pumps have efficiency ratings that can exceed 300%.

Air Source Heat Pumps

Air source heat pumps transfer heat to or from ambient air. Since air source heat pumps are reliant on the ambient temperature, which is also the primary driver for thermal demand, during extreme climate conditions the efficiency of air source heat pumps is lowest. This means that an air source heat pump requires a redundant back-up thermal energy production system at additional capital cost to provide thermal energy capacity during peak-day demand conditions. In practice, these systems have a balance point at which the operation of the system is either primarily the heat pump, or primarily the backup system. Therefore, while these systems can significantly reduce GHG emissions, they also require significant peak day support from the backup system. As a result, FEI prefers to limit the use of air-source heat pumps. It is noteworthy that the 15 buildings that the SD originally switched to air source heat pumps still have significant peak demand requirements from their redundant backup systems, although they have reduced emissions at a relatively low capital cost.

Ground Source Heat Pumps

Ground source heat pumps use a renewable source of energy that is much more stable. At the depth of 100 meters, the ground in the Vancouver area is approximately 10°C regardless of the ambient temperature. This enables ground source heat pumps to operate at higher efficiency levels even during peak demand periods. Similarly, ground water from aquifers typically has a temperature of approximately 10°C year-round. The relative stability of the temperatures at these depths means that vertical borehole, closed or open loop fields and central ground source heat pump(s) can provide high efficiency space heating and cooling under all weather conditions. While it is possible to design these systems to meet all of the peak day demands, use of a supplementary natural gas boiler helps to minimize the overall capital costs, without adding significantly to the emissions footprint of the systems. Due to the stability of the renewable energy in ground source energy systems relative to air source energy systems, these systems can operate effectively in all conditions without a redundant backup system, whereas air source systems must have complete redundancy.

High Efficiency Condensing Boilers

Older natural gas boilers may recover less than 60% of the energy in the natural gas that they consume. This is because of the design of the older boilers, the age and condition of the boilers and the operation of the boilers. Direct losses occur primarily in the form of flue gases, radiation and convection heat losses. Mineral scale build-up that reduces the efficient transfer of heat from within the boiler can become significant over time. Finally, the accuracy of the control system that calls for thermal energy may play a role in the efficient matching of thermal demand to supply.

High-efficiency condensing boilers can dramatically reduce the losses of energy in flue gases. By reducing the flue gas temperatures below the condensing point, condensing boilers recover both the sensible and latent heat within the flue gases. This can increase boiler efficiency in

dramatic ways and alone can increase efficiency by as much as 20% by recovering this form of waste heat.

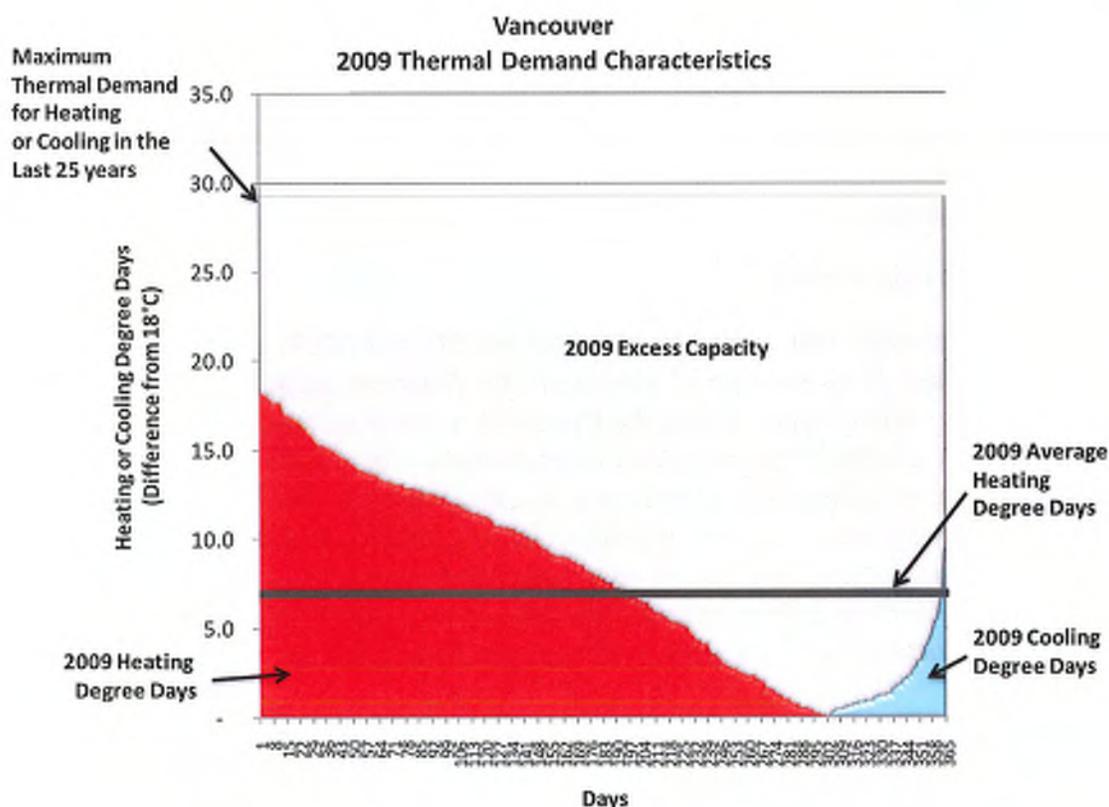
Over years, mineral scale can coat the internal surfaces of the boilers as well. This mineral deposit inside the boiler tubes acts as an insulating layer that reduces heat transfer and therefore efficiency. Tests show that 1 mm of mineral deposit can reduce boiler efficiency by as much as 10%.

Installation of more efficient controls at the burner tip enable better efficiency through better matching the oxygen requirements for proper combustion. While the benefits of this are not as large as the benefits achievable through condensing flue gases and achieving proper heat transfer within the unit, over time, more efficient matching of fuel and oxygen produces significant gains in efficiency. Together, practical efficiencies in excess of 90% are achievable with new condensing boilers and control systems.

2.4.2 CALCULATION OF THERMAL ENERGY DEMAND

In order to choose the right technology for each school site, taking into consideration the budget constraints of the SD, FEI had to calculate the thermal energy demand for each site.

Energy systems must have the capacity to deliver the maximum demand in total that each of the SD buildings may require at any time. In practice, this maximum demand will occur when the outside temperature is either coldest or hottest for our climate. In Delta, the coldest temperature experienced was -11.2°C in 1989. This "Peak Day" or "Design Day" is much colder than the coldest day in most years. For instance, the lowest daily average temperature in Vancouver in 2009 was 0°C , while the average temperature for that year was 11.0°C . This means that thermal energy systems throughout the region had excess capacity throughout the year. It also means that regardless of the thermal energy system, capacity utilization will depend on weather conditions and the thermal energy retention of the buildings. The following graph shows the characteristic excess capacity that is inherent with energy systems that are designed to meet the thermal energy load. This characteristic plays an important role in determining the most cost effective means of meeting the thermal demands while minimizing energy consumption and GHG emissions.

Figure 3: Thermal Demand Characteristics


Each site has unique building characteristics relating to the size, layout, age and physical location of the building. As a result, an analysis of thermal energy demand for each site was required so that the optimum balance of GHG emissions and energy conservation could be achieved with an affordable rate for the SD, recognizing that they have no access to capital and must operate within their operating budgets overall. The challenge for FEI and the SD was that, while it is technically possible to install geexchange heat pumps at all sites, which would produce a complete elimination of GHG emissions, such a project would be prohibitively expensive. As a result, FEI had to use a global approach that pools costs and benefits for all 19 schools, and produces optimum results by utilizing the most appropriate and cost effective technologies on a site by site basis.

FEI utilized historical billing information for both natural gas and electricity and then performed a regression analysis against heating degree-days in Vancouver to establish the thermal energy demand. FEI obtained the natural gas and electricity billing information by site directly from the SD, since their energy manager had the data readily available. In addition, JCLP performed an evaluation at each site to estimate the boiler efficiencies and any non- heating gas utilization at the site. The data and regression analysis are included in the 'Normalized Energy' worksheet in the financial model found in Appendix D.

For each of the 19 school sites, FEI developed capital cost, operating cost and energy estimates for:

1. Geo-exchange systems
 - a. Open loop, and
 - b. Closed loop
2. Boiler Upgrades
3. Air Source Heat Pumps

Utilizing these estimates, FEI, in cooperation with the SD and JCLP, developed a solution that produced significant GHG emissions reductions by reducing waste heat and incorporating renewable energy. Rather than limiting the Project to a single technological solution and trying to make it work at all sites, FEI's approach incorporates multiple technologies across the sites. For example, use of condensing boilers only would produce a lower cost, but not as much conservation of energy and reduction of GHG emissions; use of ground source heat pumps only would produce greater GHG emissions reductions and energy conservation, but at a higher capital cost; the use of air source heat pumps only would produce GHG emissions reductions, but much higher residual peak demand on the backup energy source, whether it be natural gas or electricity.

Selection of Systems by Site

Absent budgetary constraints, to maximize GHG emissions reductions FEI would install a geo-exchange system with vertical bore-holes for each school. However, geo-exchange is only cost effective where it is feasible to convert the existing mechanical systems to utilize low temperature heat (50°C). Mechanical systems that include air based handling systems, such as air handling units, force-flow heaters and unit ventilators are relatively simple to connect to a geo-exchange system, while mechanical systems (hybrid electric baseboard heating and air handling systems) and hot water baseboard systems are more costly to connect to geo-exchange systems. FEI analysed each building to assess the complexity of connection of the building mechanical systems to geo-exchange systems to establish which sites are good candidates. FEI determined that the following sites were suitable for the installation of geo-exchange systems:

- Delview Secondary School
- North Delta Secondary School
- South Delta Secondary School
- Delta Manor Centre
- Delta Secondary School

- English Bluff Elementary School
- Neilson Grove Elementary School
- Pinewood Elementary School
- Richardson Elementary
- School Board Office
- South Park Elementary School

Sites Using Open Loop Geo-exchange Systems

The abundance of ground water that FEI identified in some parts of Delta through a study FEI commissioned from Hemerra, made the following schools good candidates for open-loop geo-exchange systems:

- Delview Secondary School
- Delta Secondary School
- North Delta Secondary School
- Richardson Elementary School
- Pinewood Elementary School
- English Bluff Elementary School
- South Park Elementary School
- South Delta Secondary School

Open loop geo-exchange systems extract heat from extraction wells and return the colder water through injection wells. Heat pumps operate at higher efficiencies as ground water remains constant at about 10°C, while closed loop geo-exchange systems can face an increasing colder ground temperature as winter progresses. While an open loop is preferable from an efficiency perspective, other factors will affect the selection such as installation cost, quality of water, quantity of water, the presence of undesirable elements in the water and operating and maintenance costs. These extra variables can introduce risks that need to be offset with lower costs.

FEI acquired a preliminary geological and hydrological assessment on the eight school sites to determine the overall feasibility of open loop geo-exchange systems from these sites. This assessment indicated that all sites but Delta Secondary site were good candidates for further investigation. JCLP subsequently provided cost estimates for both open and closed loop geo-

exchange systems for these sites, which indicated that, for all six elementary schools, the capital costs of the open-loop systems were 10% greater than comparable closed-loop systems. With this cost differential and the reduced operating and maintenance cost/risk, FEI selected closed loop systems for these sites. For Delview and North Delta Secondary, the open-loop system capital costs were less than closed loop and, hence, open loop systems are still feasible. As a result, the parties agreed to utilize closed loop technologies at the sites following:

- South Delta Secondary School
- Delta Manor Centre
- Delta Secondary School
- English Bluff Elementary School
- Neilson Grove Elementary School
- Pinewood Elementary School
- Richardson Elementary
- School Board Office
- South Park Elementary School

Sites using Boiler Upgrades

At the remaining eight school sites with heating systems that are not good candidates for geo-exchange systems, the best solution is an upgrade of the natural gas boiler to a high-efficiency natural gas boiler. The proposal is to convert the current boilers from conventional boilers with operating efficiencies between 50% and 65%, to condensing/near-condensing boilers with operating efficiencies between 90% and 95% at the following schools:

- Annieville Elementary School
- Beach Grove Elementary School
- Chalmers Elementary School
- Cliff Drive Elementary School
- Heath Elementary School
- Holly Elementary School
- Ladner Elementary School

- Tilbury Maintenance Facility

The calculation of natural gas conservation associated with the installation of condensing boilers utilizes normalized fuel consumption calculated using regression analysis and a comparison of the existing boiler seasonal efficiency compared to the new boiler seasonal efficiency. The calculation of existing boiler efficiency considers measured combustion efficiency less estimated losses for radiated heat at the boiler casing, convective losses up the boiler stack and losses associated with cycling the burners. The new boiler efficiency is assumed to be 93% which assumes that the boiler will be operating in condensing mode a majority of the time but has some allowance to operate at higher temperatures if required on peak winter days.

2.5 Relation to Most Recent Long Term Resource Plan

This Application is consistent with the 2010 Long Term Resource Plan ("LTRP") of FEI as an application for a specific project that supports the BC energy objectives as described above. The levels of GHG emissions reductions that this project delivers provide a clear insight into the level and scale of changes that will need to occur to achieve the targets for British Columbia. As one can readily see, those targets are achievable and affordable with existing technology and the application of the appropriate business model. This Project is also consistent with the stated intention to initially apply for approval on a project basis as well.

From the perspective purely of FEI, this Project responds to the changing business environment that FEI is facing with respect to the natural gas services it has been providing. The character of that environment is one of declining demand for natural gas service in spite of the prevailing low commodity costs for natural gas. This Project is one of the necessary initial steps FEI is undertaking to transform "into a complete, integrated energy provider of alternative energy solutions incorporating the reliability of conventional energy services" (LTRP Exhibit B-1, p. E-1, p. 3, pp. 9-10).

3 PROJECT DESCRIPTION

3.1 The Current Facilities at the Schools

The SD currently owns and operates the energy systems located at each of the 19 school sites. The existing energy systems consist of conventional natural gas equipment, which produce the majority of the GHG emissions of the SD and therefore represent the largest opportunity for the SD to reduce its carbon footprint.

3.2 Summary of the Project

The Project, the construction of which will take about two years, will provide thermal energy to 19 of the SD's buildings with new thermal energy systems (as described in Section 2.4). In general terms, the Project involves the replacement of conventional boilers with high efficiency, condensing boilers at eight sites, the conversion of existing thermal plants to state-of-the-art geo-exchange systems at 11 sites, and retrofit/replacement of existing mechanical infrastructure at all 19 sites to accept the new technologies. Scope of work involved at each school site depends on the energy system chosen for that site and will be further described below. Once complete, FEI will own, operate and maintain the new thermal plants, and charge the SD a single rate for thermal energy consumed.

FEI will install thermal energy meters at each site to measure the thermal energy deliveries to the SD. The thermal energy systems will be upstream of these thermal meters. Since natural gas meters and electricity meters are upstream of the energy systems, the thermal energy rate will be inclusive of any input energy costs at the prevailing rates for those commodities that the BCUC sets from time to time.

The total project cost after application of CIAC is approximately \$5.15 million. The SD will be contributing \$1.357 million as CIAC towards this Project in order to minimize the rates that FEI will charge for the thermal energy over time. The SD received this amount from the Province via the Public Sector Energy Conservation Agreement ("PSECA") as a result of this Project and has chosen to contribute those funds to FEI in exchange for lower rates for thermal energy. In the absence of this contribution from the SD, the capital investment of FEI would be higher and rates would subsequently be higher as well.

FEI will purchase the energy systems from JCLP and intends to begin implementation of the Project on March 15, 2012. It is the goal of FEI, the SD and JCLP to complete the project as soon as is reasonably possible and no later than May 2013.

The following table summarizes the energy solutions that will be used at each of the 19 school sites, and were described above in Section 2.4:

Table 2: Energy Systems by Site

Building	Address	m ²	Solution
Delta Secondary School	4629 - 51st Street	18,754	Ground Source Heat Pump - Closed Loop
Delview Secondary School	9111 - 116th Street	10,490	Ground Source Heat Pump - Open Loop
Annieville Elementary School	9240 - 112nd Street	4,011	Meter Installation (recent natural gas boiler upgrade)
Cliff Drive Elementary School	5025 - 12th Avenue	4,192	High Efficiency Natural Gas Boiler
Delta Manor Centre	4750 - 57th Street	4,333	Ground Source Heat Pump - Closed Loop
School Board Office	4585 - Harvest Drive	1,930	Ground Source Heat Pump - Closed Loop
English Bluff Elementary School	402 - 48th Street	3,408	Ground Source Heat Pump - Closed Loop
Neilson Grove Elementary School	5500 - Admiral Boulevard	2,191	Ground Source Heat Pump - Closed Loop
Pinewood Elementary School	11777 Pinewood Drive	3,635	Ground Source Heat Pump - Closed Loop
Richardson Elementary	11339 - 83rd Street	3,759	Ground Source Heat Pump - Closed Loop
South Park Elementary School	735 - Gilcrest Drive	4,039	Ground Source Heat Pump - Closed Loop
South Delta Secondary School	750 - 53rd Street	16,475	Ground Source Heat Pump - Closed Loop & Air Source Heat Pump RTU
Beach Grove Elementary School	5955 - 17A Avenue	3,008	High Efficiency Natural Gas Boiler
Chalmers Elementary School	11315 - 75th Avenue	4,459	High Efficiency Natural Gas Boiler
Ladner Elementary School	5016 - 44th Avenue	4,313	High Efficiency Natural Gas Boiler
North Delta Secondary School	11447 - 82nd Avenue	15,494	Ground Source Heat Pump - Open Loop
Tilbury Maintenance Facility	7186 - Brown Street	2,376	High Efficiency Natural Gas Boiler
Holly Elementary School	4630 - 61st Street	3,975	High Efficiency Natural Gas Boiler
Heath Elementary School	11364 - 72nd Avenue	4,035	High Efficiency Natural Gas Boiler

3.3 Scope of Work

Once the Project is approved and as provided in the design build agreement, JCLP will commence construction of the Project at the sites, pursuant to the schedule described below in section 3.4. As the schedule indicates, after approval of the Project various initial steps will be taken such as a kick off meeting and demolition of the existing systems. The work at the various sites will begin at different times as set out in the schedule. In some cases, the work done at a site will only take a few weeks, and on sites involving more substantial installations the work will be carried out over a number of months.

The sites that are receiving geo-exchange systems will require the installation of heat pumps, pump condensers, connecting equipment, piping to connect the heat pump to the field loop, a geo-exchange field loop, control systems, and BTU meters. Each site receiving a geo-exchange system will typically require the installation of one or more ground source heat pumps. The heat pump and related equipment will be installed in the boiler room at the old boiler's location on a concrete pad. Each heat pump will have one pump condenser, and various piping, control valves and other necessary equipment and accessories. A geo-exchange field loop will be installed at the site, and piping will be installed to connect the field loop to the heat pump. Once the field loop has been installed, JCLP will supply and inject the needed fluids into the system (propylene/glycol), and install the needed control systems and BTU meters for the equipment.

The sites that are receiving high efficiency boilers will require the installation of one or more boilers, pumps, piping, control valves and other equipment and accessories connected to the boiler, BTU meters, and control systems.

The specific equipment and components that will be installed at each of the 19 schools are listed in Schedule "A" of each of the 19 Service Agreements.⁴

The Service Agreements and the design build agreement with JCLP include detailed site rules for contractors that address safety, security and access, and conduct of the workers. These rules reflect the fact that the construction sites at issue are schools. These rules can be found at Schedule "B" of the Service Agreements.

As described above in Section 2.4, each of the specific solutions produces the optimum balance between conservation of energy, reduction of GHG emissions and capital costs, while managing the affordability of the rate to the SD in the long term.

FEI estimates annual energy conservation and GHG emission reductions are 39,000 GJ of natural gas and electricity combined and 2,250 tonnes of CO₂. Details of the calculations are found in the worksheet 'Energy System Summary' in the financial model in Appendix D.

3.4 The Project will Provide Safe, Reliable Service

FEI will install equipment that adheres to the governing codes and regulations as applicable, using qualified personnel. The Project components will be subject to inspection by the appropriate authorities.

The natural gas boilers that the SD currently utilizes have provided safe and reliable service to the SD for many years. The newer high-efficiency boilers will continue to provide high quality service to the SD, but are more efficient and reduce the amount of waste heat.

The geo-exchange systems utilize relatively simple technology and equipment. While the specific equipment that comprises a geo-exchange energy system is conventional, using the same common technology as air conditioning or refrigeration, the design configuration of the equipment and the quality of the installation can have an effect on system performance and reliability. For systems with backup boilers for peaking, poor design, implementation and commissioning can result in overuse of the boilers during times when the geo-exchange pumps are capable of delivering the entire thermal energy loads of the system. Furthermore, poor design of the systems and integration of sizing loop fields, heat pumps and control systems can result in significant inefficiencies and lack of performance. FEI is using a highly qualified design

⁴ Please note that Schedule "A" for each of the Service Agreements was inadvertently named "Sample Schedule "A" in the final versions of these agreements. FEI confirms that these Schedules are not "samples", but are the final equipment schedules for each of the 19 sites.

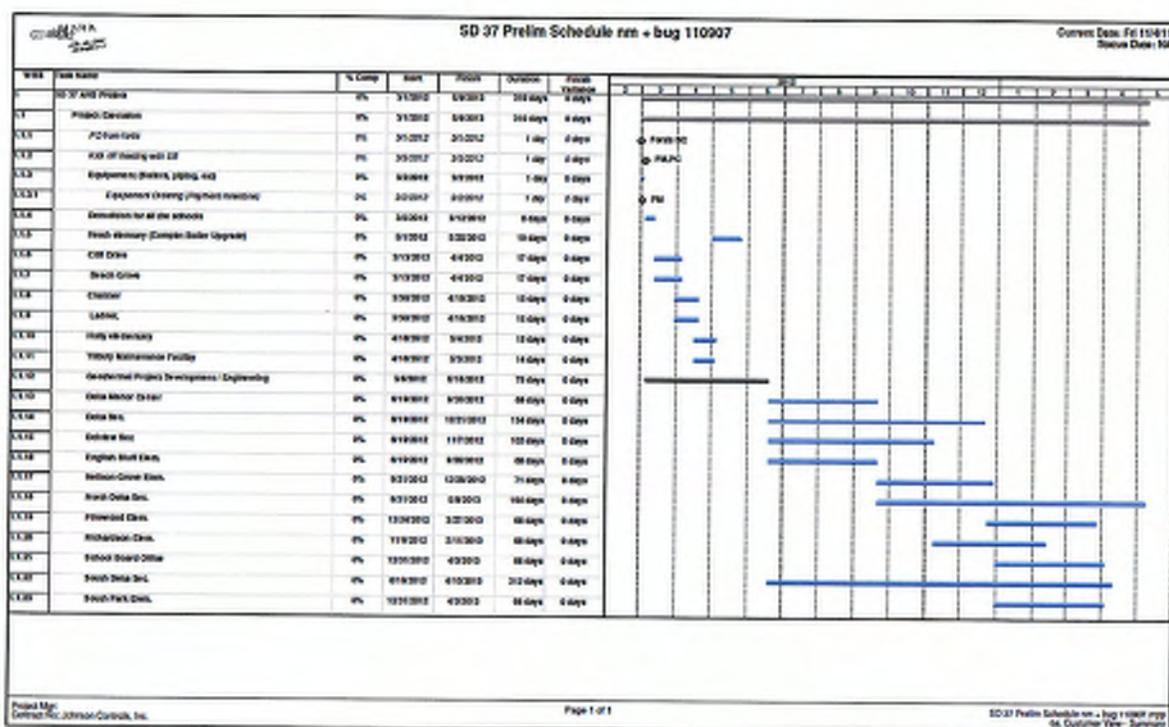
build contractor, JCLP, to design and build the systems. JCLP's credentials are described below in Section 4.1. The design includes conductivity testing of the soil to ensure proper thermal energy transfer and loop field sizing. In addition, JCLP's experience with building systems will help to ensure that control systems and mechanical equipment are both designed properly and operating reliably on an ongoing basis.

On an ongoing basis, FEI will be subcontracting for the preventative maintenance, replacement and repair of the equipment by using only qualified personnel such as JCLP at competitive prices. FEI has provided an estimate of these costs in Schedule D. Beyond the benefits of ensuring that only qualified personnel work on the equipment, this also ensures that tracking of the costs is readily identifiable. At this time, FEI intends to utilize the existing FEI 24 hour response capability to initiate a response to a service call from the SD. Any costs that arise from a service call will be readily identifiable and the response itself will also be traceable for inclusion into the cost of service and rates because of the use of external qualified personnel.

3.5 Project Schedule

Construction is scheduled to commence in mid-March 2012. The following is the construction schedule for the Project:

Figure 4: Construction Schedule



The construction schedule for these energy systems carefully balances the special needs of the SD, which operates in a challenging environment where the safety and care of the children must always be their top priority. In addition, the SD must carefully consider the working conditions of their most important asset, which are the staff of teachers. Understandably, there are special restrictions relating to criminal record checks for anyone performing work on the SD sites. Considering all of these constraints, the schedule that JCLP has put together to construct and commission these energy systems is a key driver of the costs they will charge to FEI and ultimately the SD. As described below in Section 3.6.1, changes to the schedule may adversely affect the costs of the project and the subsequent economics of the service to the SD. Therefore, it is important to be able to maintain the construction schedule that has been established with JCLP and the SD.

3.6 Human Resource Requirements

FEI will not incur additional human resources to deliver this service to the SD. Instead, JCLP will be providing design and build services as per the agreement in Appendix C. For ongoing preventative maintenance, repair and replacement, FEI will utilize qualified contractors in the area to perform the services at rates that are competitive. Should FEI require the services of

internal FEI resources to perform this service, such as 24 service response, costs will be tracked to the service for inclusion in the cost of service for the SD.

3.7 Risks Associated with Successful Completion of the Project

This section addresses the risks associated with successful completion of the project. FEI has identified and appropriately managed the risks identified below.

3.7.1 CAPITAL COST RISK

Since JCLP is providing the solutions at each site as a package, and the contract price is a function of the Project schedule that has been set in consideration of the specific needs of the SD by site, any delays in the schedule may affect the price of the project. This can be because of the timing between when JCLP must purchase the equipment to the time when the commissioning occurs, or it can be related to the lead-time that JCLP requires to obtain the necessary paperwork to clear personnel to gain site access to the SD. JCLP has already accommodated one schedule change and this may make it difficult to seek any further accommodation from JCLP.

It is the desire of the SD to begin installation of the energy systems in this heating season and commission as many of the energy systems possible prior to the following heating season beginning in late 2012. Accordingly, JCLP, the SD and FEI have put together a schedule that takes into consideration the special scheduling constraints that arise due to the unique attributes of the SD.

Since the Project capital costs are part of the agreement including schedule, it is not possible to know what the consequences of a delay in the schedule will be in terms of costs to the project at this time. It is possible that further negotiations and the associated delays that would result could adversely affect the economics of the entire Project.

3.7.2 DEMAND & STRANDED ASSET RISK

The Project provides excellent matching between the thermal energy demand and the capital cost of the system. The buildings that are to be served already exist and require thermal energy, so there is an immediate match between the size of these energy systems and the demand for thermal energy. The Project matches the capital investment to the demand for thermal energy via the set of agreements.

The proposed rate design set out in the contracts with the SD provides for a cost of service recovery approach that includes flexibility to adapt to changing conditions such as the closure of a school or expansion of the asset pool. In this manner, provided that the SD remains in existence throughout the term of the Contract and continues to require thermal energy at their sites, the assets will remain in use producing sufficient revenues to recover the cost of service in aggregate.

3.8 Project Impacts

There are no physical interconnections between the 19 sites requiring a right of way in the municipality or requiring FEI to cross the private lands of any other parties than the SD itself. The SD, as the customer requesting the service, is the only party affected directly by the physical implementation of these energy systems. In addition, each of these sites currently has an energy system in place. Accordingly, there are no impacts to stakeholders or First Nations that arise due to implementation of these energy systems on SD lands.

3.9 Other Approvals as Required

There are no other approvals beyond BCUC approval necessary for FEI to obtain to begin this Project. While installation of the equipment at each site will require permits for items such as electrical service, the installation of these energy systems does not require any special permits or approvals to proceed.

4 PROJECT COST ESTIMATE AND EXPENDITURE SCHEDULE

In this Section, FEI describes the cost estimate for the Project.

As set out above, the total Project costs of \$6.5 million are offset by a CIAC from the SD by \$1.357M. The \$6.5 million includes \$100,000 provided by FEI to JCLP for a feasibility analysis and the project development costs of \$50,000. FEI has reduced the risk of cost overruns by negotiating fixed costs for the boiler upgrades and the total margin that JCLP will receive for the Project. In addition, FEI has included in the design build contract an incentive mechanism for JCLP to reduce costs by sharing equally beneficial cost variances with FEI. The entire FEI share of cost variances will pass through directly to the SD via a lower cost of service rate should it occur.

The total project costs are summarized as follows:

Amended design build contract price	\$6,350,000
JCLP feasibility analysis	\$100,000
FEI Project development costs (approx..)	\$50,000
Total Project Costs (approx.)	\$6,500,000
SD CIAC	\$1,357,000
FEI Project Costs (approx.)	\$5,143,000

4.1 Design Build Agreement

In December 2010, FEI entered into an agreement with JCLP to perform feasibility analysis on this Project. Subsequently, in March 2011, FEI also issued a Request for Expressions of Interest in Large Scale Thermal Energy Delivery Projects to JCLP, Honeywell and Ameresco. Based on the satisfactory responses from JCLP and Honeywell, and the lack of response from Ameresco, FEI decided to continue to enter into a design build agreement for the project with JCLP. FEI has decided to work with JCLP on at least two other projects that are similar in nature.

As discussed in the cover letter and requested above, FEI has filed the JCLP agreement confidentiality in order to preserve the commercially sensitive information contained in the agreement. The following is a high level description of the key obligations of JCLP under the design build agreement:

1. design, build, install and commission metered thermal energy delivery systems for the 19 schools;

2. provide all detailed engineering and development scope for the entire project;
3. provide all project management for the entire project;
4. supply all Project documentation for each site by each Installation Date; and
5. provide a complete commissioning report and system performance verification.

The design build contract includes a fixed cost component for all boiler upgrades, all design costs, all project management costs and the margin for geo-exchange upgrades. Variable cost components relate to the direct geo-exchange system costs. The variable component allows for accommodation of cost variations on a site-by-site basis. FEI expects that the detailed design work carried out by JCLP, the use of contractor cost estimates to define geo-exchange costs, and the diligent project management techniques employed by JCLP will minimize variations from the package price.

Costs developed by JCLP in the course of completing their design have an accuracy range that is consistent with an AACE degree of accuracy of Class 3.

4.2 Breakdown of Project Costs

The total Project cost is \$6.5 million. As illustrated above, this amount is made up of the design build contract price of \$6.35 million, the \$100,000 paid to JCLP for preliminary work to analyse this Project, and the \$50,000 for project development. The contract price of \$6.35 million consists of a fixed component and variable component.

4.2.1 FIXED COST COMPONENTS

The fixed cost components of the JCLP contract total \$1,900,000. This includes turnkey boilers at the boiler upgrade sites and fixed project management and margin amounts for the geo-exchange sites. It is common practice for margin costs to be a percentage of total capital costs. By fixing the margin, JCLP will not earn any additional profit in the event that the geo-exchange systems do cost more than the Class III estimate that JCLP has provided.

4.2.2 VARIABLE COST COMPONENTS

The variable cost components of the Project cost are the capital costs of the geo-exchange systems and subcontractor costs to deliver those systems since the actual conductivity of the soil will not be confirmed until the construction begins. This is a low risk, but may affect the equipment sizing and costs compared to the current cost estimate. As mentioned above, JCLP will not earn additional margin on these costs if they are higher than the estimate. The estimate of \$4,450,000 for installation of these systems is a class III estimate of costs. This cost also includes remediation of contaminants that the SD is aware of at some of the sites. Should it become apparent that costs will be higher, FEI has the ability to alter the scope of the services

in order to maintain the budget if necessary by adjusting the technology solutions with agreement of the SD. If the costs for the geo-exchange systems come in lower, JCLP and FEI will share equally in the benefits. This ensures that JCLP has an incentive to reduce costs, and because the business model is the cost of service utility model, the SD receives the other half via lower cost of service rates.

4.2.3 CONTRIBUTIONS IN AID OF CONSTRUCTION ("CIAC")

The SD will provide CIAC to FEI equal to a total of \$1.357 million. This will reduce the capital investment of FEI directly and the payment of the contribution will occur according to the Energy System Service Agreements by site and successful commissioning of the related energy systems. Considering the schedule, FEI expects that \$850,000 will be paid to FEI by December 2012 and the remaining \$507,000 will be paid to FEI over the course of 2013.

5 CONTRACTS WITH SCHOOL DISTRICT

As set out above, FEI and the SD have entered into 19 Energy Service Agreements that address the installation, ownership, operation and maintenance of the thermal energy systems at the 19 schools, and an Energy System Rate Development Agreement, which is an umbrella agreement that allows FEI to charge the SD a single thermal energy rate for the services provided at each of the 19 schools. FEI has filed the agreements themselves confidentially in order to preserve the commercially sensitive information contained in the agreements, and will file them publicly upon approval of the rates.

In this section, FEI describes the contracts in terms of the high-level, general terms of the agreements to provide a general understanding of what each of them addresses. These agreements were the product of negotiation, and as a result should be considered as packages. Further details about the rate design are set out in Section 6.

5.1 Energy System Service Agreements

The development of the 19 individual Energy Service Agreements involved analysis of the demand characteristics, available technologies, emissions and costs for each of the school buildings, and then determining the appropriate technology to achieve the SD's desired environmental benefits within the SD's financial constraint.

Some of the key terms of the Energy Service Agreements are as follows:

- they provide that FEI design and construct the energy system at each school;
- the agreements have a term of 20 years and an automatic renewal provision unless the SD provides notice that it does not wish to renew more than six months in advance;
- they provide that the SD will pay FEI a CIAC for the Project;
- they address work schedule issues that ensure that each building's existing energy system remains operational during normal school hours;
- they provide that FEI will own the energy systems installed at each school, and will provide thermal energy services to the SD during the term of the agreements, including maintenance services; and
- they provide that the SD will pay FEI monthly for thermal energy at the rates established under the Energy System Rate Development Agreement described in Section 5.2 below.

The service agreements are separate in order to enable FEI and the SD to add or remove sites as needs change over time. This provides the ability to expand or contract the number of sites and have the rate automatically adjust for those changes, without the need to substantively alter

the Rate Development Agreement, or RDA. These contractual arrangements produce an incentive for both the SD and FEI to continue to explore economically viable expansion opportunities for the pool, since expansion necessarily will provide additional risk management benefits to all parties.

5.2 Energy System Rate Development Agreement

The Energy System Rate Development Agreement between FEI and the SD establishes a single monthly rate that the SD pays FEI for the thermal energy consumed at all 19 schools.

Some of the key terms of the RDA are as follows:

- the agreement has a term of 20 years, with an automatic renewal provision that applies unless either party provides written notice in advance of the end of the term that it does not wish to renew;
- the agreement acknowledges that FEI may apply to the BCUC for approval of a general tariff for all TES projects served by FEI, and provides the SD with a right to elect to pay an approved general TES postage stamp tariff rate if and when such a rate is approved by the BCUC;
- the agreement establishes that FEI will initially pay a single pooled market rate for all of the thermal energy provided by FEI at all of the 19 schools;
- the agreement also establishes a "cost of service rate" that the SD may elect to switch to at any time during the contract;
- the agreement provides that changes to the FEI cost structure that occur from time to time will automatically adjust the rate;
- the agreement provides that additional buildings may be brought into the contract and included in the single thermal energy rate charged to the SD under the RDA.

In negotiations, the SD expressed to FEI a preference to purchase thermal energy according to postage stamp rates that the BCUC approves from time to time. While it is the intention of FEI to develop and apply for postage stamp rates at some time in the future, there are no such rates currently approved. Accordingly, the construction of the rate in this agreement emulates the behaviour of postage stamp rates within the SD. Should FEI successfully develop and receive BCUC approval of a broader postage stamp rate for comparable thermal energy service in the future, the SD has the right under the contractual framework to elect to sign up for that service.

The flexibility of the rate methodology applied for, which charges SD a single rate for thermal energy at all of the 19 schools, enables the rate to adjust for the addition or removal of Service Agreements. This is important for both FEI and the SD as it introduces the flexibility to manage risks by adapting to changing conditions or needs over time that neither party can reasonably

anticipate today. Technologies and building requirements may change, and opportunities or challenges may arise. The contractual framework enables the parties to adjust the number of Service Agreements that the RDA includes in the pool for rate calculations. In addition, each Service Agreement specifies the energy system for that particular site and the payment provisions for that site. In this manner, the Contracts interact in a dynamic fashion, enabling the service to adjust to the changing needs of the parties.

6 RATE PROPOSAL FOR THERMAL ENERGY SERVICE TO DELTA SCHOOL DISTRICT

6.1 Introduction

In this Section, FEI will describe in further detail the proposed rate design for the SD Project. The rate is the product of negotiation between FEI and the SD, and the terms are mutually acceptable. The rate design tracks the requirements of the approved GT&C, Section 12A, and ultimately results in the cost of providing service being recovered from the customer over the initial contract term. It also provides a transition mechanism to ensure that, in the short term, the rate charged reflects what the customer would otherwise be paying for energy in the absence of the Project proceeding. FEI believes that the rates are in all respects just and reasonable and should be approved as filed.

This Section is organized as follows:

- Section 6.2 describes the requirements of GT&C, Section 12A; and
- Section 6.3 describes the rate design and how it meets the requirements of GT&C, Section 12A.

6.2 The Requirements of GT&C 12A

The Commission, in Order No. G-141-09, approved an NSA in the FEI's 2010-2011 RRA proceeding, which includes GT&C, Section 12A: Alternative Energy Extensions, for the provision of Thermal Energy Services to customers. A copy of GT&C, Section 12A is included as Appendix E to this Application. The key elements of GT&C, Section 12A are as follows:

- GT&C, Section 12A.1 describes, in general terms, the nature of the thermal energy systems that are contemplated under GT&C 12A
- GT&C, Section 12A.2 requires that FEI own all thermal energy extensions
- GT&C, Section 12A.3 requires that the cost of service model will determine the rate that a customer will pay for the service associated with the alternative energy extension, and that service will be provided under the terms and conditions of the Service Agreement between FortisBC Energy and the Customer
- GT&C, Section 12A.4 sets out requirements for determining consumption and number of customer estimates to be used in the cost of service model
- GT&C, Section 12A.5 sets out the required cost elements for the cost of service model

As further explained below, FEI has developed the Project within the parameters established under GT&C, Section 12A. In particular, as described above in Section 2.4, the Project makes use of geo-exchange systems and high efficiency boilers to deliver thermal energy to 19 buildings from their central plants that meet the definitions set out in 12A.1. As described above in Section 3.2, FEI will own the energy systems upstream of the thermal energy meters as required under GT&C, Section 12A.2. FEI has evaluated the Project using the economic test methodology set out in GT&C Section 12A.4 and 12A.5, and established rates on a cost of service basis.

In Order No. G-179-11, the Commission indicated that in this proceeding, it would examine whether high efficiency boilers "should be added to the list of alternative energy extensions" in GT&C, Section 12A. FEI does not believe that high efficiency boilers need to "added to the list of alternative energy extensions" as Order No. G-141-09 clearly contemplated that the "extensions" described in GT&C, Section 12A includes systems that would, more often than not, include natural gas as part of the customer's energy solution. Section 13 of Appendix A to Order No. G-141-09 provides that:

Alternative Energy Solutions ("AES") means Geo-exchange, Solar-thermal and District Energy Systems as those terms are described in the Application.

...

In evaluating AES projects, TGI will apply the economic test outlined in the Application. The Parties agreed that the proposed GT&C (Section 12A – Alternative Energy Extensions) are acceptable... [Emphasis added.]

The "Application" referred to in this section of the Order (i.e. the 2010-2011 RRA) made clear that AES systems will likely require natural gas boilers:

We view each of these alternative energy technologies as complementary to, or extensions of, the Terasen Gas energy system as these systems more often than not require natural gas as part of the energy solution.⁵

...

Typically geo-exchange systems are designed to provide 50-80% of the heat with the remaining heat provided for by a gas boiler.⁶

...

These systems are often used in combination with high efficiency natural gas or electric boilers to provide baseload or back-up heating...⁷

⁵ FEI 2010-2011 Revenue Requirements Application, page 261

⁶ FEI 2010-2011 Revenue Requirements Application, page 262

⁷ FEI 2010-2011 Revenue Requirements Application, page 263

Furthermore, the list of system extensions described in GT&C, Section 12A is inclusive, and not meant to be exhaustive.

By combining technologies that reduce waste heat and utilize renewable energy sources throughout the SD, the project balances the costs and benefits to find the most efficient solution for producing and delivering thermal energy considering the needs and constraints of the SD in particular.

6.3 Elements of the SD Rate Design

The rate design is set out in detail in the Contracts for which approval is being sought. The key elements of the contractual rate design, discussed below, are as follows:

- the SD pays a single per unit rate for thermal energy delivered to the 19 schools;
- the rate paid is reviewed and may need to be reset annually on a forecast basis, reflecting the expected costs and demand during the upcoming year;
- the cost of service inputs are the cost of natural gas and electricity, FEI's forecast operating costs, property taxes, depreciation and amortization expense, incomes taxes, and a return on equity;
- variances from forecast are trued-up annually;
- as a transitional measure, and to assist the School District in meeting tight budgeting requirements, SD will start off paying a rate – termed a “market rate” – that approximates the SD's current energy costs;
- the SD will obtain credit for its CIAC by way of negative rate rider over the course of the initial term; and
- the SD can purchase the assets upon expiry or termination by either party.

6.3.1 SD37 “POSTAGE STAMP” RATE

As described in Sections 4 and 5 above, FEI will charge the SD a single thermal energy rate at all 19 sites that recovers the cost of service of FEI to provide service to all of the 19 sites. This emulates a “postage stamp” rate for service and manages the risks to the SD of a building shutting down and causing a rate increase against the benefits of expanding the pool of buildings that make up the cost of service rate.

Expansion of the number of buildings in the pool generates a number of benefits that are consistent with standard postage stamp rate making that utilities employ. Generally, expansion must be economic as a first principle; therefore, expansion will at the very least recover the costs of expansion, ensuring that the SD is no worse off than with expansion from a cost of service perspective. However, the expansion does introduce greater risk sharing properties that

help to stabilize the cost of service and the demand, resulting in greater rate stability over time. Specifically, the SD37 rate rider which is discussed in greater detail in Section 6.3.7 below directly benefits the SD in the event that other customers enter the pool, since the SD is the only party that will receive the SD37 rate rider. In this manner, the rate rider serves a dual purpose of creating savings initially for the SD and also creating an incentive to expand the pool of buildings to lower their own rates.

6.3.2 ANNUAL RATE BASED ON FORECAST COST OF SERVICE AND ENERGY DEMAND

The SD has agreed to take service for a fixed term of 20 years, renewable in 10 year increments, during which time FEI will charge a rate that is sufficient to permit FEI to recover the cost of service over the term, whether it is renewed or not. In the event of renewal, the assets remain in service collecting rates each year that recover the cost of service.

The ongoing management of the rates requires FEI to forecast the cost of service and demand for these Contracts each March for the upcoming annual contract year, which spans July through June to match with the budget cycle of the SD. The forecast cost of service is then divided by the forecast demand for the period to arrive at a thermal energy rate per kWh.

In addition, FEI will adjust the cost of service rate immediately for any changes that the BCUC makes to the natural gas or electricity rates that affect the cost of energy in these Contracts.

It will be necessary for the Commission to review and approve the each year, which will ensure that the annual rates remain just and reasonable. FEI envision that the rate setting review process for this project may evolve over time but sees the current gas costs rate setting process as the framework to which rates may be adjusted. FEI will submit a report each March that provides the latest forecast of costs and thermal energy demand to establish the cost of service rate for the upcoming year. This report will utilize a standard cost of service model such as the one provided in Appendix D, but with the most recent values for the deferral account, forecast costs and thermal energy. This will minimize the review requirements of the BCUC each year, but will provide a formal mechanism for the benefit of the BCUC and the SD to manage the ongoing regulation of this service.

Cost of Service Inputs

FEI utilized a standard cost of service model to provide an illustrative forecast of the cost of service for each year in the initial term of the Contracts. The Cost of Service will establish the basis for a rate that will be set each year as per the RDA. The complete financial model with working formulae in electronic excel format is included in Appendix D for ease of reference and review.

Forecast Revenue Requirement

The Table below sets out an illustration of the cost of service over the initial term of 20 years. Each March, FEI will be providing a forecast of the revenue requirement to the BCUC for review

and approval. The figures were determined using the standard cost of service calculations and forecasts of the variables as described in greater detail in this section. These forecasts were also utilized in the economic test shown in Section 6.3.10 that is required by BCUC Order No. G-141-09.

Table 3: Illustrative Revenue Requirement Forecast
Thermal Energy Solutions: Illustrative Revenue Requirement
(\$000's), unless otherwise stated

Particulars	2012	2013	2014	2015	2016	2021	2031
Revenue Requirement							
Cost of Natural Gas	42	104	117	124	132	158	192
Cost of Electricity	25	165	227	234	240	276	363
Operation and Maintenance	168	233	238	243	248	277	340
Property Taxes	6	1	4	8	11	13	15
Depreciation Expense	74	156	214	216	218	227	263
Amortization Expense	(10)	(26)	(44)	(44)	(44)	(43)	(40)
Income Taxes	(112)	(375)	(361)	(140)	(28)	55	43
Earned Return	87	290	399	393	386	352	335
Annual Revenue Requirement	280	549	793	1,034	1,162	1,315	1,511

Cost of Natural Gas and Electricity

Since the Contracts will provide thermal energy, in developing the cost of service an amount for the natural gas purchase costs and the electricity purchase costs is necessary. FEI will pay the prevailing rates for those services that the BCUC sets from time to time and pass those through into the cost of service directly by making adjustments to the cost of service rate at the time that the BCUC approves the rate changes for those commodities (the RDA utilizes an energy rate in the cost of service to streamline the administration of ongoing adjustments). For the forecast years in the analysis, FEI is utilizing the latest GLJ Petroleum Consultants Ltd. forecast for natural gas as the base case for natural gas prices. This forecast can be found in the financial model worksheet 'GLJ Forecast' in Appendix D. In addition FEI is utilizing the latest information relating to electricity price increases and a regression of the electricity price index in Canada to establish an annual real increase in the future

OM&A

FEI estimated the costs of preventative maintenance and replacement of equipment by site and in aggregate for the Project. For each type of equipment in the project, FEI estimated the frequency of preventative maintenance measures, the labour necessary to provide the service and the labour costs. In addition, FEI estimated the frequency of replacement of parts and the replacement costs for each type of equipment over the term of the Contracts.

Project Development Costs and Allocation of Overheads

In addition to the standard cost of service items, FEI is including in the cost of service an appropriate amount for the project development costs of \$150,000, plus an annual amount of \$50,000 for shared services and overheads. This represents almost 5% of the total cost of service over the term of these Contracts. These amounts will recover a total of \$1,336,000, assuming an inflation rate of 2%, of the TESDA over the term of the Contracts. This allocation directly contributes to the development costs of the Project that will go to the TESDA. In addition, it will also contribute a sizeable amount towards the \$500k total TES allocation approved in 2010 and 2011 for TES overheads beyond direct development costs and direct OM&A costs.

Depreciation and Amortization

The depreciation rates are set according to the general accounting standards to recover the cost over the useful life of these assets by asset class. Of note though is that FEI is assuming that loop fields will have a useful life of 50 years, which may be conservative.

Taxes

While there is not currently a property tax charge that FEI must pay for this service, FEI is including a provision for property taxes in anticipation that there will be property taxes imposed on FEI during the term of these Contracts.

This Project produces a significant Capital Cost Allowance ("CCA") for the geo-exchange systems in particular, by qualifying for class 43.2. The CCA rate for class 43.2 is 50%, which produces a significant tax benefit in the early years of the Project and each time a geo-exchange system is added to the pool.

Financing Costs and ROE

FEI is including an additional risk premium in the cost of service above the benchmark return on equity (i.e. FEI's natural gas class of service). This reflects the segregation of the risks of providing service to customers in the thermal energy class of service by isolating all costs, including an overhead allocation, into the TESDA for recovery from future customers in the thermal energy class of service.

The thermal energy service is in the early stages of development, which is inherently riskier than FEI's mature natural gas class of service at FEI. Given that the intention of the segregation of costs is to isolate the risks of providing thermal energy service to the current and future customers of the thermal energy service, it is appropriate to adjust the risk premium for serving thermal energy customers to reflect this increase in risk. FEI submits that 50 basis points is a reasonable adjustment considering the segregation of costs and risks from the natural gas class of service and the BCUC's recent decision in the Corix Multi-Utility Service Inc. UniverCity

Burnaby CPCN proceeding. In the UniverCity CPCN decision, the Commission approved a premium of 50 basis points over the benchmark ROE. The School District is aware of the risk premium and has agreed to it forming part of the rate.

6.3.3 PROJECTED ENERGY CONSUMPTION/NUMBER OF CUSTOMERS

Section 12A.4 of GT&C sets out the basis upon which projected energy consumption of a thermal energy services project and the number of customers to be used in the cost of service model are determined in establishing the rate for the service. Section 12A.4 reads as follows:

12A.4 Projected Energy Consumption/Number of Customers - *The projected energy consumption and number of customers to be used in the cost of service model will be determined by FortisBC Energy by*

- (a) estimating the number of Customers to be served by the alternative energy extension;*
- (b) if applicable, establishing consumption estimates for each Customer; and*
- (c) projecting when the Customer will be connected to the alternative energy extension.*

If applicable, the projection will take into consideration the estimated number and type of thermal appliances used and the effect variations in weather conditions throughout the applicable Service Area have on consumption. All Customers expected to connect to the alternative energy extension will be considered in the cost of service model.

The table below provides the normal annual and peak demands for thermal energy at each of the 19 sites in this Project. This will form the basis for the thermal energy demand that FEI expects to meter at each site. As noted above, each year in March, FEI will submit the demand forecast along with the cost of service in order to establish the cost of service rate for the upcoming year. This amount may change each year depending on a variety of factors including but not limited to changes in the buildings needs that result from changes to the building envelope.

Table 4: Annual and Peak Demand Estimates by Site

Building	Address	m ²	Thermal	Peak Day
			Energy	Thermal
			MWh	MWh
Annieville Elementary School	9240 - 112nd Street	4,011	402.3	3.8
Beach Grove Elementary School	5955 - 17A Avenue	3,008	221.5	2.1
Chalmers Elementary School	11315 - 75th Avenue	4,459	396.5	3.7
Cliff Drive Elementary School	5025 - 12th Avenue	4,192	351.0	3.3
Delta Manor Centre	4750 - 57th Street	4,333	372.5	3.5
Delta Secondary School	4629 - 51st Street	18,754	1,718.0	16.2
Delview Secondary School	9111 - 116th Street	10,490	905.3	8.5
English Bluff Elementary School	402 - 48th Street	3,408	439.7	4.1
Heath Elementary School	11364 - 72nd Avenue	4,035	281.8	2.7
Holly Elementary School	4630 - 61st Street	3,975	293.1	2.8
Ladner Elementary School	5016 - 44th Avenue	4,313	283.5	2.7
Neilson Grove Elementary School	5500 - Admiral Boulevard	2,191	222.0	2.1
North Delta Secondary School	11447 - 82nd Avenue	15,494	1,078.6	10.2
Pinewood Elementary School	11777 Pinewood Drive	3,635	426.9	4.0
Richardson Elementary	11339 - 83rd Street	3,759	362.9	3.4
School Board Office	4585 - Harvest Drive	1,930	255.4	2.4
South Delta Secondary School	750 - 53rd Street	16,475	1,815.8	17.1
South Park Elementary School	735 - Gilcrest Drive	4,039	426.0	4.0
Tilbury Maintenance Facility	7186 - Brown Street	2,376	351.9	3.3
19		114,877	10,605	100

6.3.4 DEFERRAL MECHANISM TO PERMIT "TRUE UP" TO ACTUAL COST

FEI will record any differences between the revenues and the cost of service in a deferral account (termed the "SD37 Deferral Account") in the first year of the contract term and in each subsequent year throughout the term of the Contracts. The cost of service in subsequent years will include an amount to recover any balance in the SD37 Deferral Account over the remaining years in the term of the contract or ten years, whichever is longer. This deferral account helps to ensure that forecast variances are recovered from, or credited to, this customer. In order to help minimize the potential balances in the deferral account that may arise due to variances between forecasts of costs and actual costs, FEI will be adjusting the cost of service rate for changes in natural gas rates and electricity rates at the time that the BCUC approves changes to those rates.

6.3.5 THE TRANSITIONAL "MARKET RATE"

The rate design incorporates a transitional rate structure, termed the "market rate", that approximates what the SD would be paying for energy in the absence of the Project.

The SD operates within challenging financial constraints for operating costs and capital spending. Purchasing thermal energy from FEI solves many of the immediate and ongoing challenges with respect to capital constraints of the SD. However, the SD still must operate within strict annual operating budget constraints as well. This means that in practice the SD cannot justify spending more on operating expenses in one year, even if there is a reasonable expectation that there will be a savings over time in present value of the new cost stream versus the cost stream in a business-as-usual environment.

The RDA meets this challenge by establishing the "market rate" as a transitional rate. The initial "market rate" has been set at \$0.089 per kWh. This initial "market rate" was the result of analysis and negotiations with the SD, and the rate reflects an agreement on the forecast of the costs of thermal energy that the SD expected to pay, in the absence of the Project, in the upcoming fiscal year for the SD which runs from July through June. The cost estimate utilized the normalized billing data for natural gas, electricity and carbon costs including a provision for the maintenance costs that the Project will eliminate for the SD. The SD and FEI agree that this initial market rate is a fair representation of the costs that the SD would expect to face in the absence of this Project. The initial "market rate" is affordable to the SD considering their existing operating budget constraints.

Since the SD's existing equipment utilizes natural gas, the "market rate" will change each month in accordance with the Statistics Canada index for natural gas prices in British Columbia. This ensures that the SD has an initial rate that enables them to transition to cost of service in a manner that matches their needs.

The RDA allows the SD to switch from the market rate to the cost of service rate at any time. To assist in this decision, FEI will provide the cost of service rate as a reference each month while the SD is paying the market rate. FEI will also have the ability to apply to the BCUC to move the SD to the cost of service rate. FEI will discontinue calculating the adjusted "market rate" once the customer has switched to the cost of service rate. The ability for the SD to elect to move from the "market rate" meets the transitional challenge by moving the SD to the cost of service within their operating budget constraint in a seamless fashion.

Although there is no set time by which the SD must switch from the transitional "market rate" to the cost of service rate, the variance between the "market rate" and the true cost of service will be captured in the SD37 Deferral Account, and either recovered from, or returned to, the customer. It is not likely to be in the customer's interest to remain on the "market rate" if it means accumulating significant balances that must be recovered down the road. Further, there may be a strong economic incentive for the customer to switch to the cost of service rate in the near future. The cost of service initially will be very low, which is the product of favourable treatment for tax purposes of the geexchange solutions in particular, which are the more

capital intensive of the energy systems in this solution. Canadian tax law enables capital cost allowance rates of 50% for these systems, which means that should the SD remain on market rates for some period of time, the deferral account impact may in fact produce a credit initially, that reduces rates in the future, rather than a debit that increases rates in the future.

As the "market rate" was intended to be transitional in nature, and was not intended as a mechanism for the customer to delay paying the cost of service over the longer term, the RDA confers upon FEI the right to apply to the BCUC for approval to switch the thermal energy rate from the market rate to the cost of service rate at any time. This provision recognizes that the BCUC remains the authority that will hear a dispute, however unlikely, between the SD and FEI respecting when to switch to cost of service rates. Nonetheless, it is important to note that both FEI and the SD, as demonstrated by the financial analysis, including sensitivity analysis, expect that the cost of service rate will be competitive with the market rate and provide benefits to the SD in the form of low and/or less volatile rates.

6.3.6 SD37 RATE RIDER

The SD is providing FEI with a CIAC totalling \$1.357 million. This CIAC is not contingent on receipt of any other funding in the form of government subsidies or grants or funds from FEI programs such as EEC programs. Nonetheless, the SD, with support from FEI, did receive \$1.357 million from the third call of the PSECA as a result of an application they made relating to this Project as it was understood at that time.

In recognition of the capital contribution that the SD is providing to FEI, a rate rider specific to the SD will apply to their thermal energy rate. This rate rider is a discount of \$0.018 cents per kWh to the thermal energy rate. The SD will receive this rider at all times over the term of the agreement. Each year, the cost of service calculation will incorporate the value of the prior year discount that arises due to the rate rider. In the event that the market rate is still in effect, then the discount will flow through to the deferral account for amortization as part of the total deferral account balance.

Effectively, this means that the rate rider will be useful to the SD in the event that they are on the "market rate", but will also create an incentive for the SD to accept other parties into the pool of buildings that the cost of service rates are based upon since only the SD will receive the benefit of the rider, but the costs will form a part of the total cost. In this way, the SD retains the benefits of providing the contribution to FEI. The only time that the rate rider is not adding direct value to the SD is if the cost of service rate is in effect, but the pool of assets remains limited to only the 19 initial sites in these Contracts. This mechanism aligns the interests of FEI and the SD to always maintain a cost effective service and to economically grow the asset pool for the benefit of all.

6.3.7 TERMINAL VALUE AND BUY-OUT

In order to reduce the risk of stranding assets, and to ensure that the SD has access to continuous service, at expiry or upon termination, the SD may purchase the energy systems at the rate base value or other value that the BCUC determines to be appropriate. Since FEI will only earn a return on the rate base, the rate base value is an appropriate starting point from which to establish the value of the service at any time. In this manner, the Contracts contemplate recovery of the full cost of providing service, but explicitly respect that the BCUC must approve the sale of the assets and the rates for the service, and therefore, may determine the appropriate price that the SD must pay for the energy systems at the time of termination, or expiry, should that occur.

Preferably, the SD will elect to renew the Contracts for another ten years at the end of the first term.

6.3.8 EXAMPLE MONTHLY BILL

In order to assist in understanding the rate constructs, FEI has provided an example of how a monthly bill will be calculated and appear to the customer.

The following example assumes that the "market rate" remains below the cost of service rate and that the customer has elected to remain on the "market rate". FEI will present both rates on the monthly bill until the switch to Cost of Service Rates occurs, at which point FEI will no longer calculate the adjusted "market rate". The calculation of the cost of service rate utilizes the annual cost of service approved each year and backs out the Energy Costs included in that rate, then makes any adjustments for changes in costs of natural gas or electricity that may have occurred since approval of the Annual Cost of Service.

Finally, the energy reimbursement amount is either added or subtracted from the bill as the situation necessitates. This amount will address situations where gas usage aside from the FEI Energy System exists but is too small to justify installation of a sub-meter. In these cases, an estimate agreed upon by the SD and FEI will serve as the basis for the reimbursement.

Table 5: Example Monthly Invoice

Delta Secondary School April 2014				Sample Bill
Forecast Annual Cost of Service	FACS	\$		988
Energy Purchase Costs	EPC	\$		344
Forecast Thermal Energy Consumption	FTEC	MWh		10,605
forecast Energy Purchase Costs	FEPC	\$		344
Energy Rate		\$/kWh	\$	0.032
Cost of Service Rate		\$/kWh	\$	0.093
Initial Market Rate		\$/kWh	\$	0.089
April 2014 Natural Gas Index for BC (CANSIM vector number V41692506)				114.2
Market Rate		\$/kWh	\$	0.091
Thermal Energy Rate		\$/kWh	\$	0.091
SD37 Rate Rider		\$/kWh	\$	(0.018)
April 2014 Thermal Energy Consumption		MWh		152.06
Thermal Energy Charges			\$	13,775.13
SD37 Rate Rider			\$	(2,696.88)
Energy Reimbursement			\$	217.67
Total Charges			\$	11,295.92

6.3.9 ECONOMIC TEST RESULTS

Using the economic test that conforms to the requirements of Order No. G-141-09 and the GT&C, Section 12A, and the inputs as described above in Section 6.3.3, the present value of cash flows is positive, indicating that the Project will recover the cost of service in rates over the term of these Contracts. Since the rates are set using the market rate initially, the actual revenues will vary in comparison to the cost of service or revenue requirement in a given year. For cash flow analysis purposes, FEI is calculating the cash taxes that will be payable based on the revenue forecast in each year.

Table 6: Economic Test Results

<u>Particulars</u>	<u>Initial</u> <u>Capital</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2021</u>	<u>2031</u>
After-Tax WACC		7.10%	7.10%	7.10%	7.10%	7.10%	7.10%	7.10%
Discount Factor	1.00	1.07	1.15	1.23	1.32	1.41	1.99	3.94
Inflow								
Other Revenue (env. credits/electricity sales)		-	-	-	-	-	-	-
Rate Revenue		149	449	789	1,081	1,216	1,372	1,574
Rate \$/kWh		\$ 0.071	\$ 0.052	\$ 0.074	\$ 0.102	\$ 0.115	\$ 0.129	\$ 0.148
Annual Net Cash Inflow		149	449	789	1,081	1,216	1,372	1,574
Discounted Cash Inflow		139	391	643	822	863	691	399
Outflow								
Capital Investment	-	2,216	2,958	19	174	-	-	-
Cost of Energy Sold		67	269	344	358	372	434	555
O & M		168	249	254	259	264	295	364
Property Taxes		6	1	4	8	11	14	16
Income Tax Expense ¹		(23)	(18)	47	114	142	157	160
CCA Tax Shield		(111)	(349)	(362)	(196)	(112)	(48)	(65)
Terminal Value								(4,117)
Annual Net Cash Outflow	0	2,323	3,111	306	716	678	852	(3,088)
Discounted Cash Outflow	0	2,169	2,712	249	545	481	429	(783)
Cash Flow	0	(2,174)	(2,662)	484	365	539	520	4,662
Discounted Cash Flow	0	(2,030)	(2,321)	394	277	382	262	1,183
PV of cash Flow	210							

Considering all of the costs and revenues of the Contracts, the NPV indicates that there is a reasonable expectation that Rates will be sufficient to recover costs

6.3.10 EXPANSION OF THE SERVICE WILL IMPROVE ECONOMICS FOR CUSTOMER

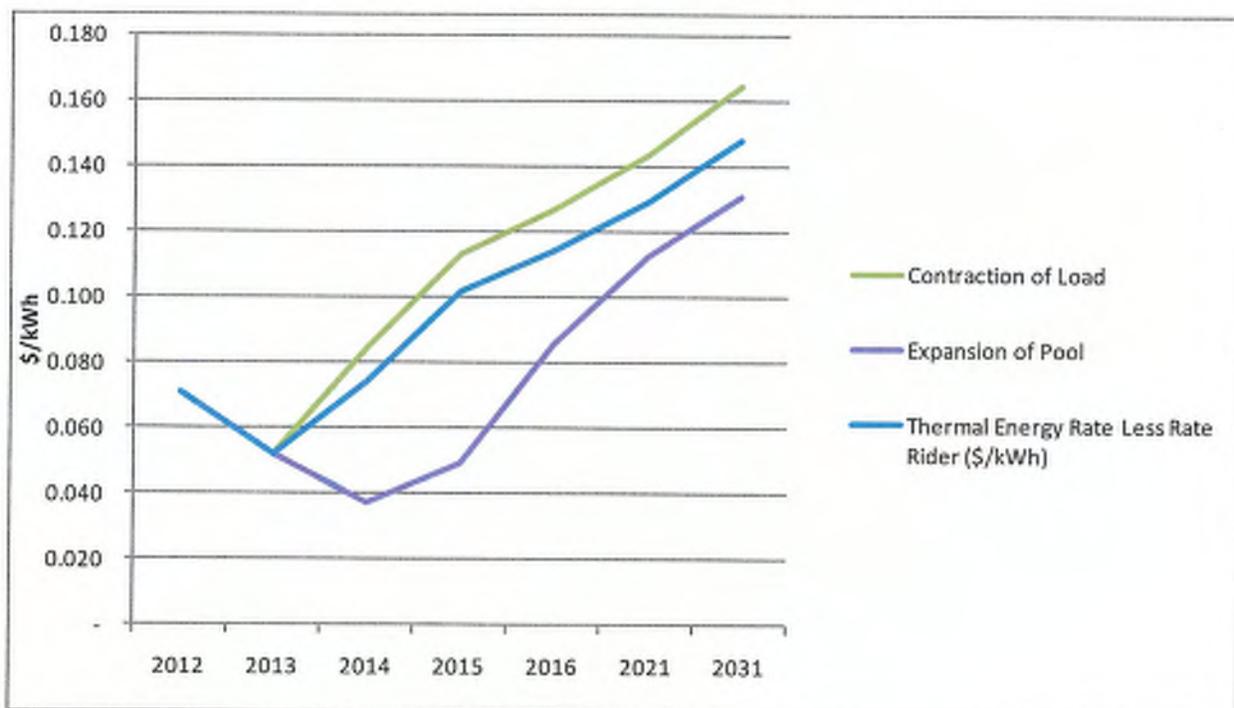
Expansion may also produce early benefits by increasing the capital cost allowances, which in turn lower the cost of service rates relative to what they would be without expansion. This creates an incentive to the SD to:

- first move to the cost of service rates, as the customer cannot benefit from expansion while paying a rate reflecting commodity prices; and
- to expand the number of buildings that the cost of service rate is based upon beyond the initial 19 sites to either keep rates down or lower them further.

Expansion is particularly attractive as the size of the pool grows. The figure below illustrates how expanding the size of the pool from 19 buildings to 114 buildings in the year 2014 would

affect the SD. It is also possible to infer from this that continued expansion of the pool would continue to introduce benefits to the SD. Considering that a contraction of thermal energy load within the pool will increase rates, all other things being equal, this also illustrates the benefits of expansion, as the larger the pool, the less the effect of a contraction of load will have.

Figure 5: Sensitivity of Rates to Growth or Contraction



The market rate exists to provide a seamless transition mechanism and price protection for the SD initially; however, FEI expects the cost of service rate will provide superior benefits to the SD in the long-run on both a quantitative and qualitative basis.

6.3.11 SENSITIVITY (MONTE CARLO) ANALYSIS

FEI utilized a Monte Carlo analysis to evaluate the probabilities that the Contracts will produce competitive rates. That analysis included 9,999 unique scenarios and tracked the results. As assumptions for the analysis, FEI seeded 8 separate variables for each year over the 20 years in the analysis using empirical data for each variable. The variables are:

1. CPI
2. Long Term Debt Rates
3. Return on Equity
4. Exchange Rate
5. Real Natural Gas Prices at Sumas

6. Station 2 Price Spread
7. Real Electricity Price Change
8. Corporate Tax Rates

With these assumptions, using a levelized rate for illustration purposes to help simplify the comparison, the analysis shows the following with respect to the levelized rate expectations over the term for the market rate relative to the thermal energy rate:

Table 7: Sensitivity (Monte Carlo) Analysis Results

Percentile	Thermal Energy Rate		Market Rate	
	\$/kWh			
10%	\$	0.116	\$	0.119
50%	\$	0.119	\$	0.130
90%	\$	0.122	\$	0.142

A few observations can be made about this including that the range of rates is smaller on the thermal energy rate than the "market rate" and that the lowest market rate is only slightly below the highest thermal energy rate. The complete report for the Monte Carlo analysis is in the electronic worksheet 'Monte Carlo Reports' found in the Financial Model in Appendix D, filed confidentially.

In addition, examining the sensitivity of the rates to the variables above at the high and low end of their ranges indicates that:

- the "market rate" is very sensitive to the price of natural gas, where the real price, exchange rate and the station 2 spread are the most influential variables; and
- the thermal energy rate is relatively insensitive to the variables, where the CPI rate and electricity prices are the most important variables.

The complete tornado analysis is in the worksheets 'Market Rate Tornado and Thermal Energy Rate Tornado' found in the Financial Model in Appendix D, filed confidentially.

6.3.12 RATE BASE

The maximum rate base of this Project will be \$4.9M in 2014 as per table 8 below. JCLP will provide the energy systems for \$6.35 million, FEI has already provided \$100,000 to JCLP for a feasibility analysis and has project development costs of \$50,000, and the SD will provide a CIAC of \$1.357 million. Including replacement of equipment that FEI is forecasting over the term, the table below illustrates the expectation for rate base amounts relative to this project.

Table 8: Forecast of Rate Base

<u>Particulars</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2021</u>	<u>2031</u>
TES Rate Base							
Gross Plant In Service- Beginning	-	3,066	6,531	6,550	6,724	7,189	8,992
Gross Plant In Service- Ending	3,066	6,531	6,550	6,724	6,724	7,189	8,992
Accumulated Depreciation- Beginning	-	(74)	(230)	(444)	(660)	(1,754)	(4,160)
Accumulated Depreciation- Ending	(74)	(230)	(444)	(660)	(878)	(1,981)	(4,423)
CIAC - Beginning	-	(850)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)
CIAC - Ending	(850)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)
Accumulated Amortization- Beginning	-	10	37	81	125	342	754
Accumulated Amortization- Ending	10	37	81	125	169	385	793
Net Plant in Service, Mid-Year	1,076	3,566	4,905	4,831	4,745	4,328	4,117
Adjustment to 13-month average	-	-	-	-	-	-	-
Unamortized Deferred Charges, Mid-Year	-	-	-	-	-	-	-
Cash Working Capital	-	-	-	-	-	-	-
Total TES Rate Base	1,076	3,566	4,905	4,831	4,745	4,328	4,117

Contributions in Aid of Construction

As indicated above, the SD is providing FEI with a CIAC totalling \$1.357 million. This reduces the rate base and subsequent cost of service rate accordingly. This CIAC is not contingent on receipt of any other funding in the form of government subsidies or grants or funds from FEI programs such as EEC programs. Nonetheless, the SD, with support from FEI, did receive \$1.357 million from the third call of the PSECA as a result of an application they made relating to this Project as it was understood at that time.

FEI is not receiving any EEC Funds

The SD may be eligible for EEC funds as a result of this project. However, it is the responsibility of the SD to apply for these funds and there is no obligation under these agreements to provide any EEC funds that the SD may receive to FEI as part of the CIAC total or for any other reason in these Contracts. Any EEC funds that the SD may receive as a result of their application are their property. EEC is not a component of these Contracts.

7 CONCLUSION

FortisBC Energy Inc. has reached agreement with the SD to provide thermal energy at 19 sites throughout the School District. Ultimately, the SD desires FEI to provide this service according to a tariff and GT&Cs similar to natural gas or electricity service. In the absence of a general tariff for Thermal Energy Service, FEI and the SD have signed agreements that enable FEI to provide Thermal Energy Service according to a postage stamp rate within the SD.

To provide this service, FEI will purchase energy systems that JCLP designs and builds and FEI will connect those energy systems to the 19 buildings in the SD. The total project costs are approximately \$6.5 million, with the SD providing a CIAC of \$1.357 million. The Project will provide 11 geo-exchange systems and 8 energy systems that use high efficiency natural gas boilers. Providing thermal energy to the SD using these systems will reduce the energy consumption of the SD at the 19 sites in total by 40% and the GHG emissions by over 70%.

The rates that FEI will charge for this service will provide competitive prices for the SD, while recovering their cost of service, including an appropriate amount for overhead allocation.

In addition, this service will provide an investment opportunity in BC, employment opportunities in BC for the construction and operation of the energy systems.

FEI respectfully requests that the Commission grant the orders sought in this Application and included in Appendix F – Draft Order.

Appendix A

ENERGY SYSTEM SERVICE AGREEMENTS

FILED CONFIDENTIALLY

Appendix B

ENERGY SYSTEM RATE DEVELOPMENT AGREEMENT

FILED CONFIDENTIALLY

Appendix C

JOHNSON CONTROLS L.P. DESIGN BUILD AGREEMENT

FILED CONFIDENTIALLY

Appendix D

FINANCIAL MODEL OUTPUT

LIVE SPREADSHEET MODEL FILED CONFIDENTIALLY

Provided in electronic format only

(accessible by opening the Attachments Tab in Adobe)

Fortis BC
 Thermal Energy Solutions
 School District No 37 - Delta
 (\$'000's), unless otherwise stated

Economic Test Summary	
PV of Inflows	12,109
PV of Outflows	11,899
PI	1.02
Total Required Contribution for PI=1	-

Particulars	Initial		2012	2013	2014	2015	2016	2021	2031	
	Capital	PI								
After-Tax WACC			7.10%	7.10%	7.10%	7.10%	7.10%	7.10%	7.10%	
Discount Factor	1.00		1.07	1.15	1.23	1.32	1.41	1.99	3.94	
Inflow										
Rate Revenue			146	449	790	1,082	1,217	1,372	1,574	
Rate \$/kWh			\$ 0.070	\$ 0.052	\$ 0.074	\$ 0.102	\$ 0.115	\$ 0.129	\$ 0.148	
Annual Net Cash Inflow			146	449	790	1,082	1,217	1,372	1,574	
Discounted Cash Inflow			136	391	643	822	864	691	400	
Outflow										
Capital Investment	-		2,216	2,958	19	174	-	-	-	
Cost of Energy Sold			67	269	344	358	372	434	555	
O & M			168	249	254	259	264	295	364	
Property Taxes			6	1	4	8	11	14	16	
Income Tax Expense ¹			(24)	(18)	47	114	142	157	160	
CCA Tax Shield			(111)	(349)	(362)	(196)	(112)	(48)	(65)	
Terminal Value									(4,117)	
Annual Net Cash Outflow	0		2,322	3,111	306	717	678	852	(3,087)	
Discounted Cash Outflow	0		2,168	2,712	249	545	481	429	(783)	
Cash Flow	0		(2,176)	(2,662)	484	365	539	520	4,662	
Discounted Cash Flow	0		(2,032)	(2,321)	394	277	383	262	1,183	
PV of cash Flow			210							

Fortis BC

Thermal Energy Solutions

School District No 37 - Delta

Thermal Energy Solutions: Indicative Rate Design
(\$'000's), unless otherwise stated

Particulars	PV	Year									
		2012	2013	2014	2015	2016	2017	2018	2019	2020	2021
Annual Volume for Billing (MWh)		2,099	8,617	10,605	10,605	10,605	10,605	10,605	10,605	10,605	10,605
Present Value	93,553	1,941	7,370	8,388	7,757	7,174	4,853	2,221			
Market Rate \$/kWh	0.131	0.087	0.096	0.103	0.110	0.117	0.140	0.170			
Market Rate Revenue		183	831	1,094	1,166	1,238	1,481	1,805			
Present Value	12,214	170	711	866	853	837	678	378			
Cost of Service		280	564	809	1,050	1,179	1,334	1,536			
Present Value	10,982	259	483	640	768	798	610	322			
Cost of Service Rate \$/kWh		0.133	0.065	0.076	0.099	0.111	0.126	0.145			
COS Switch		-	1	1	1	1	1	1			
Amortization Period		20	19	18	17	16	11	1			
Amortization of Deferral Account		-	37	169	220	226	227	227			
COS Including Amortization		280	601	978	1,270	1,405	1,561	1,763			
Thermal Energy Rate \$/kWh		0.133	0.070	0.092	0.120	0.132	0.147	0.166			
SD 37 Rate Rider	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)	(0.018)			
SD 37 Rate Discount	(37)	(153)	(188)	(188)	(188)	(188)	(188)	(188)			
Present Value	(1,659)	(34)	(131)	(149)	(138)	(127)	(86)	(39)			
Total Annual Revenue		146	449	790	1,082	1,217	1,372	1,574			
Present Value	11,016	135	384	625	791	823	628	330			
Thermal Energy Rate Less Rate Rider (\$/kWh)	0.118	0.070	0.052	0.074	0.102	0.115	0.129	0.148			

Fortis BC

Thermal Energy Solutions

School District No 37 - Delta

Thermal Energy Solutions: Indicative Rate Base
 (\$000's), unless otherwise stated

Particulars	2012	2013	2014	2015	2016	2021	2031
TES Rate Base							
Gross Plant In Service- Beginning	-	3,066	6,531	6,550	6,724	7,189	8,992
Gross Plant In Service- Ending	3,066	6,531	6,550	6,724	6,724	7,189	8,992
Accumulated Depreciation- Beginning	-	(74)	(230)	(444)	(660)	(1,754)	(4,160)
Accumulated Depreciation- Ending	(74)	(230)	(444)	(660)	(878)	(1,981)	(4,423)
CIAC - Beginning	-	(850)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)
CIAC - Ending	(850)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)	(1,357)
Accumulated Amortization- Beginning	-	10	37	81	125	125	342
Accumulated Amortization- Ending	10	37	81	125	169	385	793
Net Plant in Service, Mid-Year	1,076	3,566	4,905	4,831	4,745	4,328	4,117
Adjustment to 13-month average	-	-	-	-	-	-	-
Unamortized Deferred Charges, Mid-Year	-	-	-	-	-	-	-
Cash Working Capital	-	-	-	-	-	-	-
Total TES Rate Base	1,076	3,566	4,905	4,831	4,745	4,328	4,117
Return on TES Rate Base							
Equity Return	43	143	196	193	190	173	165
Debt Component	44	147	203	200	196	179	170
Total Earned Return	87	290	399	393	386	352	335
Return on Rate Base %	8.13%	8.13%	8.13%	8.13%	8.13%	8.13%	8.13%

Rate Base

Fortis BC

Thermal Energy Solutions

School District No 37 - Delta

Thermal Energy Solutions: Illustrative Revenue Requirement
 (\$000's), unless otherwise stated

<u>Particulars</u>	<u>2012</u>	<u>2013</u>	<u>2014</u>	<u>2015</u>	<u>2016</u>	<u>2021</u>	<u>2031</u>
<u>Revenue Requirement</u>							
Cost of Natural Gas	42	104	117	124	132	158	192
Cost of Electricity	25	165	227	234	240	276	363
Operation and Maintenance	168	249	254	259	264	295	364
Property Taxes	6	1	4	8	11	14	16
Depreciation Expense	74	156	214	216	218	227	263
Amortization Expense	(10)	(26)	(44)	(44)	(44)	(43)	(40)
Income Taxes	(112)	(375)	(361)	(140)	(28)	55	43
Earned Return	87	290	399	393	386	352	335
Annual Revenue Requirement	280	564	809	1,050	1,179	1,334	1,536

Fortis BC

Thermal Energy Solutions

School District No 37 - Delta

Thermal Energy Solutions: Indicative O&M, Other Revenue and Property Tax
 (\$000's), unless otherwise stated

Particulars	2012	2013	2014	2015	2016	2021	2031
Gross O&M							
Labour Costs	-	-	-	-	-	-	-
Vehicle Costs	-	-	-	-	-	-	-
Employee Expenses	-	-	-	-	-	-	-
Materials & Supplies	-	-	-	-	-	-	-
Computer Costs	-	-	-	-	-	-	-
Fees & Administrations Costs	-	-	-	-	-	-	-
Contractor Costs	134	199	203	207	211	236	291
Facilities	-	-	-	-	-	-	-
Overheads and Shared Services Allocation	34	50	51	52	53	59	73
Non-Labour Costs	168	249	254	259	264	295	364
Total Gross O&M Expenses	168	249	254	259	264	295	364
Other Revenue							
Environmental Credits	-	-	-	-	-	-	-
Electricity Sales Revenue	-	-	-	-	-	-	-
Total Other Revenue	-	-	-	-	-	-	-
Property Taxes							
General, School and Other	-	-	-	-	-	-	-
1% in Lieu of General Municipal Tax ¹	6	1	4	8	11	14	16
Total Property Taxes	6	1	4	8	11	14	16

Fortis BC

Thermal Energy Solutions

School District No 37 - Delta

Thermal Energy Solutions: Indicative Income Tax Expense
(\$000's), unless otherwise stated

Particulars	2012	2013	2014	2015	2016	2021	2031
Income Tax Expense							
Income Tax Rate	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%	25.00%
1 - Current Income Tax Rate	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%
Earned Return before tax	57.4	190.2	261.6	257.7	253.1	230.8	219.6
Add: Depreciation Expense	73.7	156.4	214.0	216.0	217.7	227.0	263.1
Add: Amortization Expense	(10.2)	(26.4)	(44.3)	(43.6)	(43.9)	(42.8)	(39.7)
Deduct: Capital Cost Allowance	(443.3)	(1,397.7)	(1,449.9)	(785.2)	(446.6)	(192.7)	(259.8)
Taxable Income	(322.4)	(1,077.6)	(1,018.6)	(355.2)	(19.8)	222.3	183.2
Total Income Tax Expense	(80.6)	(269.4)	(254.6)	(88.8)	(4.9)	55.6	45.8
Adjustments	(31.7)	(105.6)	(106.7)	(51.1)	(22.7)	(0.7)	(3.0)
Net Tax Expense	(112.3)	(375.0)	(361.3)	(139.9)	(27.7)	54.9	42.8
Loss Carry-forward	-	31.7	137.3	244.0	295.0	309.3	291.8
Opening Balance	-	-	-	-	-	-	-
Loss Carry-forward	31.7	105.6	106.7	51.1	22.7	0.7	3.0
Loss Utilization	-	-	-	-	-	-	-
Closing Balance	31.7	137.3	244.0	295.0	317.8	310.0	294.9

Income Tax

Appendix E

GENERAL TERMS AND CONDITIONS SECTION 12A

12A. Alternative Energy Extensions

12A.1 System Expansion - FortisBC Energy will make extensions to the FortisBC Energy System using technology that produces alternative energy, in accordance with the provisions of this section. The alternative energy extensions include geo-exchange, solar-thermal and district energy systems which are described below:

Geo-exchange systems, also referred to as geo-thermal systems, earth exchange systems or ground and water source heat pumps, utilize the latent heat energy contained in near surface layers of the earth, ground water and surface water. A subsurface piping system contains a liquid that absorbs heat from the surrounding material and delivers it to a central heat exchanger. High efficiency heat pumps convert this latent energy into hot water or steam contained in a separate piping system that can then deliver the heat energy to where it is required for space heating and hot water uses. Centralized equipment is usually contained within specifically designed mechanical room that serves the entire development. The heat exchanger is reversed to provide space cooling, removing heat from the building(s) and returning it to the subsurface substrate.

Solar-thermal water heating systems, also called solar hybrid water heating systems, are a system of solar collection tubes and piping capture heat energy from the sun's rays and deliver it to a central heat exchanger, where it is converted to domestic hot water and distributed in a manner similar to that described above for geo-exchange systems. The solar collection tubes are located outside the building or buildings, typically on the roof, while centralized equipment is again housed in a specifically designed mechanical room.

District energy systems employ a range of energy technologies and sources to deliver piped heating (steam or hot water) and/or cooling (cool water) to multiple buildings and customers within a neighbourhood from a central plant location or locations.

12A.2 Ownership - All alternative energy extensions will remain the property of FortisBC Energy.

12A.3 Cost of Service Model - All applications by Customers for service using an alternative energy extension will be subject to review using a cost of service model. The cost of service model will determine the rate that a customer will pay for the service associated with the alternative energy extension. Service will be provided under the terms and conditions of the Service Agreement between FortisBC Energy and the Customer.

12A.4 Projected Energy Consumption/Number of Customers - The projected energy consumption and number of customers to be used in the cost of service model will be determined by FortisBC Energy by

- (a) estimating the number of Customers to be served by the alternative energy extension;
- (b) if applicable, establishing consumption estimates for each Customer; and
- (c) projecting when the Customer will be connected to the alternative energy extension.

If applicable, the projection will take into consideration the estimated number and type of thermal appliances used and the effect variations in weather conditions throughout the applicable Service Area have on consumption. All Customers expected to connect to the alternative energy extension will be considered in the cost of service model.

12A.5 Costs - The total costs to be used in the cost of service model include, without limitation

- (a) the full labour, material, and other costs necessary to serve the new Customers less any contributions in aid of construction by the Customers or third parties, grants, tax credits, or non-financial factors offsetting the full costs that are deemed to be acceptable by the British Columbia Utilities Commission;
- (b) the appropriate allocation of FortisBC Energy's overheads associated with the construction of the alternative energy extension;
- (c) depreciation expense related to the capital equipment associated with the alternative energy extension; and
- (d) the incremental operating and maintenance expenses necessary to serve the Customers.

In addition to the costs identified, the cost of service model will include applicable taxes and the appropriate return on investment as approved by the British Columbia Utilities Commission.

Appendix F

DRAFT ORDER AND UNDERTAKING OF CONFIDENTIALITY

SIXTH FLOOR, 900 HOWE STREET, BOX 250
VANCOUVER, BC V6Z 2N3 CANADA
web site: <http://www.bcuc.com>



BRITISH COLUMBIA
UTILITIES COMMISSION

ORDER
NUMBER

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

DRAFT ORDER

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

and

An Application by FortisBC Energy Inc.
For a Certificate of Public Convenience and Necessity for the Approval of a Rate Schedule to Provide Thermal
Energy Services to Delta School District Number 37

BEFORE:

(Date)

WHEREAS:

- A. On November 28, 2011, FortisBC Energy Inc. (FEI) applied (the "Application") pursuant to sections 45 and 46 of the *Utilities Commission Act* (the "Act") for a Certificate of Public Convenience and Necessity for the Delta School District 37 (the "SD 37") Thermal Energy Project (the "SD 37 Thermal Energy Project");
- B. FEI also seeks approval, pursuant to sections 59-61 of the Act and Commission Order No. G-141-09, of thermal energy service contracts between FEI and SD 37 and a new rate for thermal energy services provided to SD 37 under those contracts; and
- C. The Commission has reviewed the Application and materials filed and has determined that the requested rates as outlined in the Application are just and reasonable, and the proposed project expenditures are in the public interest.

NOW THEREFORE the Commission orders as follows:

1. A Certificate of Public Convenience and Necessity is granted to FEI for the SD 37 Thermal Energy Project as described in the Application.

**BRITISH COLUMBIA
UTILITIES COMMISSION**

**ORDER
NUMBER**

2

2. Pursuant to sections 59-61 of the Act:
 - a. The rates and rate design established by the 19 Energy System Service Agreements and the Energy System Rate Development Agreement filed with the Application, and described in Section 5 of the Application, are approved; and
 - b. The creation of a deferral account, as described in Section 6.3.4 of the Application, for capturing the variances between the rate charged to SD 37 and its cost of service is approved, which will become a sub-set of the overall TES deferral account that was established by Order G-141-09.
3. FEI is to file, by March 1 of each year, commencing in 2012, a forecast of the SD 37 cost of service, and the thermal energy demand for the upcoming contract year, which runs from July to June.

DATED at the City of Vancouver, In the Province of British Columbia, this day of **<MONTH>**, 2011.

BY ORDER

FortisBC Energy Inc. ("FEI")

Application for a Certificate of Public Convenience and Necessity ("CPCN") for the Approval of the Delta School District 37 Thermal Energy Project and Approval of Service Agreements and Rate Development Agreement for Thermal Energy Project with Delta School District

CONFIDENTIAL Undertaking

I, _____, am a participant acting for _____ in the matter of the review of the FEI's Delta School District Thermal Energy Services Contracts CPCN Application.

In this capacity, I request access to the confidential information. I understand that the execution of this undertaking is a condition of an Order of the Commission, and the Commission may enforce this Undertaking pursuant to the provisions of the ATA.

I hereby undertake

- a) to use the information disclosed under the conditions of the Undertaking exclusively for duties performed in respect of this proceeding;
- b) not to divulge information disclosed under the conditions of this Undertaking except to a person granted access to such information or to staff of the Commission;
- c) not to reproduce, in any manner, information disclosed under the conditions of this Undertaking except for purposes of the proceeding;
- d) to keep confidential and to protect the information disclosed under the conditions of this Undertaking;
- e) to return to the FEI, under the direction of the Commission, all documents and materials containing information disclosed under the conditions of this Undertaking, including notes and memoranda based on such information, or to destroy such documents and materials and to file with the Commission a certification of destruction at the end of the proceeding or within a reasonable time after the end of my participation in the proceeding; and
- f) to report promptly to the Commission any violation of this Undertaking.

Dated at _____ this _____ day of _____, 2011.

Signature: _____

Name: _____
(please print)

Address: _____

Telephone: _____

Fax: _____

E-mail: _____



Appendix G

FORTIS BC APPLICATION FILED CONFIDENTIALLY