APPENDIX D: Geothermal Development Decision Matrix (GDDM) summary and resource areas

	Development Factor (Name of region/area) MW reported from KWL & Geothemex 2015	Suggested favourability for Direct-use	Transmission Line	Finance & Regulations	Environmental	Community	Resource	Roading access & Constructability	Weighted Total		
			F	D+E+G+L	C	H	A+B+M	I+J+K+N			
			1	2	3	5	5	3	19	Ranking	Comments
A	Canoe Creek - Valemount (15 MW)	high	0.5	3.0	2.3	3.1	4.0	3.3	59.0	3.10	Receptive community; financial and technical support needed
B	Clarke Lake (34 MW)	high	1.5	2.4	3.8	3.8	4.1	3.3	66.8	3.52	Receptive community; financial and technical support needed
C	Clearwater (10 MW)	low	0.5	1.1	1.5	2.7	2.3	2.7	40.1	2.11	Temp. grad. work in the N. Thompson valley to confirm high heat flow; results might change ranking significantly.
D	Iskut (10 MW)	low	0.5	2.7	0.8	2.3	2.9	2.7	42.3	2.23	Remote location with limited population and development: new geochem Taweh (Sezill) (thanks to Polaris Infrastructure)
E	Jedney area (15 MW)	high	0.5	2.4	3.5	3.1	3.9	2.7	58.6	3.09	Remote location with limited population and development potential.
F	King Island (20 MW)	moderate	0.5	2.2	2.0	2.7	3.4	2.3	48.2	2.54	Remote site; established lodge for sale (as of March 2016)
G	Kootenay (20 MW)	moderate	2.5	2.4	2.0	2.8	3.8	3.5	56.8	2.99	Ainsworth may be open to Direct-use applications; new geochem Wildhorse (thanks to Polaris Infrastructure)
H	Lakelse Lake (20 MW)	high	1.0	2.0	2.5	2.6	4.1	4.5	59.5	3.13	Electrical generation project underway; potential for Direct-use
I	Lower Arrow Lake (20 MW)	moderate	1.8	2.2	3.3	2.4	3.5	3.1	54.9	2.89	Remote location with limited population and development
J	Mount Meager (100 - 200 MW)	high	3.0	2.8	2.0	2.7	4.3	3.0	58.4	3.08	Remote site; new hydro project and transmission; upgraded access to Pebble Creek HS
K	Mt. Cayley (50 MW)	moderate	0.5	2.4	3.0	2.8	3.8	2.7	55.1	2.90	Remote site; good access; new chemistry for Turbid Creek HS (thanks to Polaris infrastructure).
L	Mt. Garibaldi (50 MW)	moderate	1.5	2.9	3.0	2.8	2.7	3.6	54.5	2.87	Slightly lower score than Cayley is due to lack of a defined resource.
M	Mt. Silverthrone (50 MW)	low	0.0	2.9	2.0	2.6	3.0	2.0	45.4	2.39	Remote location with no population
N	Nazko Cone (10 MW)	moderate	0.0	2.2	2.5	2.7	3.8	3.2	53.8	2.83	Remote location with limited population and development
O	Okanagan (20 MW)	high	0.5	2.4	2.8	2.9	3.6	3.8	57.3	3.01	Potentially receptive community, recreational area.
P	Sloquet Creek (10 MW)	high	3.8	2.4	3.0	2.9	3.6	3.1	59.5	3.13	Potentially receptive community, recreational area.
Q	Sphaler Creek (10 MW)	low	0.0	2.2	2.8	2.3	2.9	2.0	44.9	2.36	Remote location with limited population and development
R	Upper Arrow (20 MW)	moderate	0.5	2.2	2.0	3.0	3.7	3.2	53.7	2.83	new chemistry St. Leon & Taylor (thanks to Polaris Infrastructure)

*Weighting factors are based on an analysis of the developability of an area using available data. The weighting factors used were biased towards a likely resource with temperatures between 40 - 80 C (or higher) and a receptive community. Favourability (low, moderate, high) were assigned based on the weighted ranking. High, 3.00 and above, moderate between 3.00 and 2.50 and those below 2.50 were assigned a low.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Canoe Creek - Valemount	
Nearest community name:	Valemount	
Nearest large community:	Kamloops	
Topographic map sheets (name and code) :	Canoe Mountain, 083D11	
Geological map sheets (name and code)	83D.065	

Canoe Creek - Valemount

A.	**Resource potential**		3.14
A.1	General geological setting		5
A.2	Size/potential/type	Lake Reservoir covers part of the area to assess	3
A.3	Temperature gradient/ Heat flow data		3
A.4	Water & Gas chemistry	Cl 320 mg/L, mixing waters. Medium concentrations of bicarbonate and sulphate.	3
A.5	Mineral indicators and/or surface alteration	none reported	0
A.6	Surface thermal features (type, temperature)	50-80C reported. Lake Reservoir covers thermal features most of the year. Mud pools have been submerged since dam construction.	5
A.7	Surface spring flow rates and Resource recharge	Need a better estimate of flow rates (reported 3L/s)	3
A.8	3D permeability (heat exchange potential)	Fracture permeability	3
A.9	Recent magmatism	No	0
A.10	Structural setting / seismic / tectonics	Lots of evidence of fracturing/faulting	3
A.11	Geophysics (type and interpretation if available)	2008 Quantech MT survey suggests alteration zone at 1000 m	5
A.12	Potential Resource host rocks	Fracture permeability	5
A.13	Potential drilling issues	Fractured rock	1
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	This is an area of high heat flow and major structures. This may make it more favourable that just the surface expression of springs might indicate.	5
B.	**Exploration Uncertainty (Risk)**		4.00
B.1	Degree of identification of resources/reserves	Surface manifestations, but resource not defined; need to define depth of waters less than 80 C; Borealis recently signed a direct heat agreement that entails using the cooled waste water (~70 degrees Celsius) coming from the power plant after power generation for purposes such as sustaining a community greenhouse for food growth and possible public hot springs facilities	4
B.2	Likelihood of covering Resource with concession	lake coverage; Borealis holds permit	4
B.3	Expected authorization date	2016/2017	5
B.4	Specific timing of exploration (BC yr. by yr. to max 7 years)	Borealis acquired geothermal permit in 2011, ~4 years	4
B.5	Degree of previous exploration (can be good or bad)	In progress, no slim hole drilling yet	4
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	Reservoir covers part of the area; steep mountain valley	3
B.7	Exploration to exploitation (Difficult to easy)	In progress, favourable environment	4
C.	**Environmental Issues**		2.25
C.1	Protected areas (type and classification)	Cranberry Marsh/Starratt wildlife habitat 5 km from potential transmission connection location	3
C.2	Endangered species	Southern Mountain Cariboo habitat area ~2 km from proposed transmission route	2
C.3	Geothermal surface features	yes used for bathing	2
C.4	Other	fish bearing stream crossed by potential transmission/piping route, various wildlife habitat areas (Grizzly bear, spotted owl), 5-20 km away	2

APPENDIX D: Geothermal Development Decision Matrix (GDDM) summary and resource areas

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Canoe Creek - Valemount	
	Nearest community name:	Valemount	
	Nearest large community:	Kamloops	
	Topographic map sheets (name and code) :	Canoe Mountain, 083D11	
	Geological map sheets (name and code)	83D.065	
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.67
D.1	Bidding Area	some permits dropped; Borealis state 2016/2017 to move forward on remaining permits. Permission to use Crown land is obtained by application under the Land Act (LA); target for Direct-use would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	KWL report	3
D.3	Other claim rights(Mining and/or Oil)	none known	5
E.	**Market**		5.00
E.1	Potential commodities for direct use applications	Village of Valemount is actively assessing Direct-use applications. Mushroom drying, forest products, greenhouses, direct heating/cooling etc.	5
E.2	Political stability and community relationship to development	Community engaged in economic evaluation	5
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	Current geothermal lease has been renewed and active exploration is underway (Borealis web site)	5
E.4	Renewable energy "green value" for potential development	Valemount has active interest in green value developments.	5
F.	**Transmission Line Infrastructure**		0.50
F.1	State of the Infrastructure	No transmission to the site of the springs (>20km away); pumps and other electrical equipment would have to run off of generators/solar/wind	1
F.2	Transmission route (distance, terrain and costs)	20 km piping distance; moderate slopes	1
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	Geothermal lease has been renewed once; could be done under crown land tenure for lower temperature resource (<80°C)	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years	5
H.	**Community Issues**		3.11
H.1	Indigenous Law and Indigenous Development Areas	different stages; two groups	1
H.2	Land claims	asserted territory of Lheidli (stage 5); Borealis does not have a MOU with Lheidli	1
H.3	Community action	Valemount actively looking at options	5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Canoe Creek - Valemount	
	Nearest community name:	Valemount	
	Nearest large community:	Kamloops	
	Topographic map sheets (name and code) :	Canoe Mountain, 083D11	
	Geological map sheets (name and code)	83D.065	
H.4	Surface Rights	treaty and crown land	3
H.5	Visual considerations	lots of logging and forest service road access	5
H.6	Tourism	springs used, many other recreational activities nearby.	4
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	Lheidli, Simpcw, Shuswap, Neskonlith first nations group (Borealis has an MOU with Simpcw and Shuswap)	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	Lheidli, Simpcw, Shuswap, Neskonlith first nations group (Borealis has an MOU with Simpcw and Shuswap)	3
H.9	Traditional use area: archeology sites and other areas of significance	Lheidli, Simpcw, Shuswap, Neskonlith first nations group (Borealis has an MOU with Simpcw and Shuswap)	3
I.	**Water rights**		5.00
I.1	availability for proposed development	2 active licenses on east side of Lake	5
I.2	availability for drilling	yes, with a licence	5
J.	**Engineering**		2.40
J.1	Development proposal and design	no reported progress	0
J.2	Construction issues	none reported	3
J.3	Transportation issues	none reported	3
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none reported	3
J.5	Special construction issues (heat exchanger & full injection)	none reported	3
K.	**Non electrical infrastructure (roads and habitation)**		3.80
K.1	Nearest large community > 50,000	Kamloops is a major center for trades and material	4
K.2	nearest community and size	Valemount (1000 people)	2
K.3	Nearest road and condition	unpaved road	3
K.4	Current access conditions (restrictions)	unpaved roads; close enough to Valemount for staff	5
K.5	Terrain and distance factor for road building	no requirements for new roads	5
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Canoe Creek - Valemount	
	Nearest community name:	Valemount	
	Nearest large community:	Kamloops	
	Topographic map sheets (name and code) :	Canoe Mountain, 083D11	
	Geological map sheets (name and code)	83D.065	
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		2.00
N.1	Spatial concentration of potential customers	Valemount is a small community	2
N.2	Distance to market for prospective commodities	Kamloops and Edmonton closest markets	3
N.3	Costs to potential customers to receive Direct-use benefits	no subsidies	1

OVERALL COMMENTS/ASSESSMENT:	Valemount is actively interested in pursuing Direct-use applications. They have had workshops to investigate the options. They have looked at mushroom growing; greenhouses, and heating.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Clarke Lake	
Nearest community name:	Fort Nelson	
Nearest large community:	Prince George	
Topographic map sheets (name and code) :	Jackfish Creek, 094J10	
Geological map sheets (name and code)	94J.078	

Clarke Lake

A.	**Resource potential**		4.21
A.1	General geological setting	well known	5
A.2	Size/potential/type	large (6.2 km3), reservoir temp estimated at 115C based on drill stem test (DST) records from natural gas wells (range 81 - 123C).	5
A.3	Temperature gradient/ Heat flow data	relatively high temp gradient (average measured 54C/km)	5
A.4	Water & Gas chemistry	Salinities approx. 35,000 ppm total dissolved solids. Natural gas from target formations contain 9.1% CO2 and 0.23% H2S.	3
A.5	Mineral indicators and/or surface alteration	N/A. Temp estimate based on direct measurements in DSTs.	5
A.6	Surface thermal features (type, temperature)		5
A.7	Surface spring flow rates and Resource recharge	No surface manifestations. Reported maximum from deepened natural gas well was 1,800 m3/day. Productivity of well drilled with larger diameter for geothermal production estimated 8,400 m3/day. Reservoir is reported to have strong reservoir recharge.	5
A.8	3D permeability (heat exchange potential)	high formation permeability	5
A.9	Recent magmatism		0
A.10	Structural setting / seismic / tectonics	Lots of evidence of fracturing/faulting	5
A.11	Geophysics (type and interpretation if available)	Seismic surveys available in area. Regional aeromagnetic surveys conducted for gas field identified main basements and fault trends.	5
A.12	Potential Resource host rocks	carbonate reef rocks	5
A.13	Potential drilling issues	Deep reservoir (average depth ~2,000 m). No known indication at shallower (i.e.. Lower temperature) depths.	1
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	high formation permeability	5
B.	**Exploration Uncertainty (Risk)**		3.14
B.1	Degree of identification of resources/reserves	Extensive gas drilling. Less than 80C water aquifer location unknown.	3
B.2	Likelihood of covering Resource with concession	Reservoir has large area, well defined by natural gas drilling. No current geothermal permits.	5
B.3	Expected authorization date	No geothermal tracts nearby.	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	as soon as permits are in place, 5 years for a 5MW pilot plant (KWL report)	3
B.5	Degree of previous exploration (can be good or bad)	High degree of natural gas exploration, no specific work done for geothermal applications.	4
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	Sufficient level ground exists for development. Gas field operations provide some infrastructure.	5
B.7	Exploration to exploitation (Difficult to easy)	Existing wells not likely useful, may be usable for injections (case by case basis).	2
C.	**Environmental Issues**		3.75
C.1	Protected areas (type and classification)	Not nearby.	5
C.2	Endangered species	Canada Warbler, Southern Mountain Caribou, Cape May Warbler habitats <5 km away.	2
C.3	Geothermal surface features	nearest hot springs >150 km away. Resource is not dependent on nearby surface features.	5
C.4	Other	Wildlife Habitat Area allotted for Boreal Caribou is nearby (3.5km south of proposed transmission/piping route). No fish bearing streams crossed.	3

APPENDIX D: Geothermal Development Decision Matrix (GDDM) summary and resource areas

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Clarke Lake	
	Nearest community name:	Fort Nelson	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Jackfish Creek, 094J10	
	Geological map sheets (name and code)	94J.078	
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.00
D.1	Bidding Area	No geothermal tracts nearby. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	See KWL report. Also, collaboration possible with natural gas development (co-produced fluids).	3
D.3	Other claim rights(Mining and/or Oil)	Within oil and gas management area and overlapping petroleum and natural gas tenures exist. No existing mineral, coal titles.	3
E.	**Market**		3.50
E.1	Potential commodities for direct use applications	Fort Nelson reserve area is <5km away (pop 3,900). Greenhouses, forest products, etc. Closest large community is Prince George.	3
E.2	Political stability and community relationship to development	Fort Nelson is developing a Water Management Plan. May be positive/negative.	3
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	None known	3
E.4	Renewable energy "green value" for potential development	GHGE targets (i.e.. Fort Nelson: https://nr.civicweb.net/Documents/DocumentDisplay.aspx?ID=51471)	5
F.	**Transmission Line Infrastructure**		1.50
F.1	State of the Infrastructure	10 km of new 138 kV transmission necessary	3
F.2	Transmission route (distance, terrain and costs)	~ 10 km piping distance, flat; potential wetland conditions and crossing Fort Nelson River necessary.	3
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax.	4
G.5	Lease time and ability to renew or extend exploration licence	lease has been renewed once; could be done under crown land tenure	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years	5
H.	**Community Issues**		3.78
H.1	Indigenous Law and Indigenous Development Areas	Treaty 8 land area, most certainty about land claims and indigenous development processes.	5
H.2	Land claims	Treaty 8 land area	5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Clarke Lake	
	Nearest community name:	Fort Nelson	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Jackfish Creek, 094J10	
	Geological map sheets (name and code)	94J.078	
H.3	Community action	Fort Nelson court challenge against Site C development. Fort Nelson developing Water Management Plan with community plan goals to protect environment from pollution of land, water and air. First Nations have various agreements with Oil & Gas, Forestry industries, and other land management agreements.	3
H.4	Surface Rights	treaty and crown land	3
H.5	Visual considerations	lots of logging, oil and gas, hydro, seismic development infrastructure	5
H.6	Tourism	Alaska highway tourism, seasonal due to harsh winters. Nearest hot springs offer limited soaking, not easily accessed.	4
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	Treaty 8 First Nations: Acho Dene Koe (NWT), Dene Tha' (AB), Doig River, Fort Nelson, Prophet River, West Moberly.	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	Treaty 8 First Nations: Acho Dene Koe (NWT), Dene Tha' (AB), Doig River, Fort Nelson, Prophet River, West Moberly.	3
H.9	Traditional use area: archeology sites and other areas of significance	Treaty 8 First Nations: Acho Dene Koe (NWT), Dene Tha' (AB), Doig River, Fort Nelson, Prophet River, West Moberly.	3
I.	**Water rights**		5.00
I.1	availability for proposed development	Closest water license ~12 km away, 7 additional existing licenses nearby.	5
I.2	availability for drilling	yes, with a licence	5
J.	**Engineering**		2.40
J.1	Development proposal and design	no reported progress	0
J.2	Construction issues	None known	3
J.3	Transportation issues	None known	3
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		3.80
K.1	Nearest large community > 50,000	Prince George is a major center for trades and material	4
K.2	nearest community and size	Fort Nelson (3900 people)	2
K.3	Nearest road and condition	unpaved road	3
K.4	Current access conditions (restrictions)	unpaved roads; close enough to Fort Nelson for staff	5
K.5	Terrain and distance factor for road building	no requirements for new roads	5
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Clarke Lake	
	Nearest community name:	Fort Nelson	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Jackfish Creek, 094J10	
	Geological map sheets (name and code)	94J.078	
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		2.00
N.1	Spatial concentration of potential customers	Fort Nelson is closest community, small. Long distances.	2
N.2	Distance to market for prospective commodities	Prince George is a major center for trades and material, long distances.	3
N.3	Costs to potential customers to receive Direct-use benefits	no subsidies	1

OVERALL COMMENTS/ASSESSMENT	Clarke Lake has a significant resource and a fair population center that could utilize Direct-use for district heating or other applications. Given the extensive area of high heat flow in NE BC it is likely that waters <80 C could be found within an economic distance of the town site. Community has a planning document that includes a Green House Action Plan (June 2010) that states that geothermal energy is considered for the community. https://nr.civicweb.net/filepro/documents/90854?preview=38879

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Clearwater-Wells Gray	
Nearest community name:	Clearwater	
Nearest large community:	Kamloops	
Topographic map sheets (name and code) :	Mahood Lake, 092P16	
Geological map sheets (name and code)	92P.100	

Clearwater-Wells Gray

A.	**Resource potential**		1.50
A.1	General geological setting	well known	5
A.2	Size/potential/type	unknown	0
A.3	Temperature gradient/ Heat flow data	unknown	0
A.4	Water & Gas chemistry	unknown	0
A.5	Mineral indicators and/or surface alteration	Ray mineral and Clearwater springs are known to be geothermal	0
A.6	Surface thermal features (type, temperature)	Springs are cold springs related to faulting and subsurface flow under lava flows.	0
A.7	Surface spring flow rates and Resource recharge	unknown	0
A.8	3D permeability (heat exchange potential)	unknown	0
A.9	Recent magmatism		5
A.10	Structural setting / seismic / tectonics	Lots of evidence of fracturing/faulting	5
A.11	Geophysics (type and interpretation if available)	magnetic data available	0
A.12	Potential Resource host rocks	fractures related to young volcanism	3
A.13	Potential drilling issues	unknown	0
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	unknown	3
B.	**Exploration Uncertainty (Risk)**		0.43
B.1	Degree of identification of resources/reserves	none identified	1
B.2	Likelihood of covering Resource with concession	Young volcanic features are within a provincial park.	0
B.3	Expected authorization date	No geothermal tracts nearby.	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	unlikely to be a resource in close proximity to the town; deep faulting in the N. Thompson is a potential target.	1
B.5	Degree of previous exploration (can be good or bad)	regional and thesis work around the area	1
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	Provincial Park	0
B.7	Exploration to exploitation (Difficult to easy)	Permitting process and First Nation consultations will be lengthy. Drilling will be 20km from surface manifestations.	0
C.	**Environmental Issues**		1.50
C.1	Protected areas (type and classification)	Wells Gray-Clearwater provincial park <2 km away (to the North) from townsite	0
C.2	Endangered species	Coast Mountain Draba, Oregon Willowherb, Southern Mountain Caribou habitats within to 10 km away from potential resource area.	2
C.3	Geothermal surface features	Clearwater hot springs ~11 km (inside provincial park) north of potential resource area.	2
C.4	Other	Fish bearing streams located along proposed transmission/piping route.	2
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		1.00
D.1	Bidding Area	No geothermal tracts nearby; provincial park. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	1
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	unlikely ; see KWL report.	1
D.3	Other claim rights(Mining and/or Oil)	none known but within Provincial Park	1

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Clearwater-Wells Gray	
	Nearest community name:	Clearwater	
	Nearest large community:	Kamloops	
	Topographic map sheets (name and code) :	Mahood Lake, 092P16	
	Geological map sheets (name and code)	92P.100	
E.	**Market**		0.25
E.1	Potential commodities for direct use applications	mushroom drying;	1
E.2	Political stability and community relationship to development	unknown	0
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	unknown, too much uncertainty	0
E.4	Renewable energy "green value" for potential development	unknown	0
F.	**Transmission Line Infrastructure**		0.50
F.1	State of the Infrastructure	major transmission route in the N. Thompson >30 km away	1
F.2	Transmission route (distance, terrain and costs)	30 km via existing paved road to Clearwater station. Moderate terrain.	1
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		2.29
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	no current lease; no lease target outside of park	0
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	0
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years; Provincial Park	3
H.	**Community Issues**		2.67
H.1	Indigenous Law and Indigenous Development Areas	BCTC stage 4 negotiation (Canim Lake);	1
H.2	Land claims	Simpcw and Neskonlith not in negotiation but claim the territory.	1
H.3	Community action	Neskonlith have a 5 year community plan; rustic resort and greenhouse (outside of Clearwater area).	5
H.4	Surface Rights	treaty and crown land, Provincial Park	3
H.5	Visual considerations	Logging; provincial park	1
H.6	Tourism	provincial park draws many visitors to experience wilderness values of the park.	4
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	Canim Lake, Simpcw, Neskonlith	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	Canim Lake, Simpcw, Neskonlith	3
H.9	Traditional use area: archeology sites and other areas of significance	Canim Lake, Simpcw, Neskonlith	3
I.	**Water rights**		3.00
I.1	availability for proposed development	yes, if development is outside of park	3
I.2	availability for drilling	yes, if development is outside of park	3

APPENDIX D: Geothermal Development Decision Matrix (GDDM) summary and resource areas

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Clearwater-Wells Gray	
	Nearest community name:	Clearwater	
	Nearest large community:	Kamloops	
	Topographic map sheets (name and code) :	Mahood Lake, 092P16	
	Geological map sheets (name and code)	92P.100	
J.	**Engineering**		2.00
J.1	Development proposal and design	none identified	0
J.2	Construction issues	none known	3
J.3	Transportation issues	paved and gravel roads	3
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	provincial park so any structures would need to fit or blend into the surroundings.	1
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		3.80
K.1	Nearest large community > 50,000	Kamloops	4
K.2	nearest community and size	Clearwater (2331)	2
K.3	Nearest road and condition	paved and unpaved road	3
K.4	Current access conditions (restrictions)	no restrictions	5
K.5	Terrain and distance factor for road building	no requirements for new roads	5
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		2.00
N.1	Spatial concentration of potential customers	Clearwater is a small community, major industry is tourism.	2
N.2	Distance to market for prospective commodities	Good highway access to Kamloops and larger centres	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Clearwater-Wells Gray	
	Nearest community name:	Clearwater	
	Nearest large community:	Kamloops	
	Topographic map sheets (name and code) :	Mahood Lake, 092P16	
	Geological map sheets (name and code)	92P.100	
N.3	Costs to potential customers to receive Direct-use benefits	no subsidies	1

OVERALL COMMENTS/ASSESSMENT	Currently no action from the town/municipal council on Direct-use; local business installs ground based geothermal. Area of high heat flow with few TG wells.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Iskut	
Nearest community name:	Iskut	
Nearest large community:	Prince George	
Topographic map sheets (name and code) :	Iskut River, 104G01	
Geological map sheets (name and code)	104G.009	

Iskut

A.	**Resource potential**		2.36
A.1	General geological setting	Area is remote mountainous region; young and long lived volcanism in Mt. Edziza area.	3
A.2	Size/potential/type	no specific reservoir - isolated hot springs	0
A.3	Temperature gradient/ Heat flow data	none known; area of high heat flow	3
A.4	Water & Gas chemistry	new data for Mess and Iskut from Polaris infrastructure (see geochemistry Appendix D).	3
A.5	Mineral indicators and/or surface alteration	none reported	0
A.6	Surface thermal features (type, temperature)	very hot ~74° C	5
A.7	Surface spring flow rates and Resource recharge	low; unknown	1
A.8	3D permeability (heat exchange potential)	nothing known; likely structurally controlled	1
A.9	Recent magmatism	Stikine volcanic belt (Northern Cordilleran Volcanic Province)	5
A.10	Structural setting / seismic / tectonics	young faulting and volcanism	5
A.11	Geophysics (type and interpretation if available)	none available	0
A.12	Potential Resource host rocks	fractured basement rocks	3
A.13	Potential drilling issues	remote difficult access	1
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	Close proximity to Mt. Edziza; Bowser Basin to the east.	3
B.	**Exploration Uncertainty (Risk)**		1.29
B.1	Degree of identification of resources/reserves	reservoir not identified; likely fractured bedrock	1
B.2	Likelihood of covering Resource with concession	Spring within provincial park, if resource accessible outside of park area.	2
B.3	Expected authorization date	Unknown	0
B.4	Specific timing of exploration (7 years BC)	once permits are in place	3
B.5	Degree of previous exploration (can be good or bad)	Surface sampling, geological mapping	1
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	difficult terrain, no nearby infrastructure	1
B.7	Exploration to exploitation (Difficult to easy)	Difficult; little resource information	1
C.	**Environmental Issues**		0.75
C.1	Protected areas (type and classification)	Spring lies within a provincial park	0
C.2	Endangered species	Snow Pearlwort habitat area within 1 km of proposed transmission/piping route.	1
C.3	Geothermal surface features	Iskut spring (within Provincial Park); no pools, Mess Creek 50 km west	2
C.4	Other	remote area; fish-bearing streams; grizzly bear habitat; park established to protect species types and diversity.	0
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.33
D.1	Bidding Area	Local mine development may provide potential development. No geothermal tracts nearby. Provincial Park. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	See KWL report. Possible collaboration with mineral development.	2
D.3	Other claim rights(Mining and/or Oil)	mineral leases, but not nearby.	5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Iskut	
	Nearest community name:	Iskut	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Iskut River, 104G01	
	Geological map sheets (name and code)	104G.009	
E.	**Market**		1.50
E.1	Potential commodities for direct use applications	Locally gathered forest materials and logging	1
E.2	Political stability and community relationship to development	small communities; mining may promote more emphasis on green energy; community protests over some development.	2
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	no development in planning stage, limited population	2
E.4	Renewable energy "green value" for potential development	possible due to proximity of mining	1
F.	**Transmission Line Infrastructure**		0.50
F.1	State of the Infrastructure	power to Bob Quinn Lake, 25 km away	1
F.2	Transmission route (distance, terrain and costs)	69 kV line required 25 km via existing transmission line corridor and Galore Creek Mine road.	1
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		2.29
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80°C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	no geothermal leases; resource area is within protected Park	0
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	0
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years	3
H.	**Community Issues**		2.33
H.1	Indigenous Law and Indigenous Development Areas	Tahltan Central council; supports sustainable and responsible business development. Not currently in negotiation with BC Treaty Commission (high uncertainty)	1
H.2	Land claims	not currently negotiating, asserted claims by Tahltan and Iskut First Nations	1
H.3	Community action	Tahltan Nation Development Council. 2005 community action against Shell Canada.	3
H.4	Surface Rights	1910 Declaration of Tahltan tribe; Tahltan resource development policy	3
H.5	Visual considerations	remote wilderness area; logging; mining	3
H.6	Tourism	Tourism underexploited	1
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	the Tahltan people look to the land for sustenance, guidance and healing; http://www.tndc.ca/tahltan-people	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	as above	3
H.9	Traditional use area: archeology sites and other areas of significance	as above	3
I.	**Water rights**		3.00

APPENDIX D: Geothermal Development Decision Matrix (GDDM) summary and resource areas

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Iskut	
	Nearest community name:	Iskut	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Iskut River, 104G01	
	Geological map sheets (name and code)	104G.009	
I.1	availability for proposed development	Only active water license at Bob Quinn Lake. Possible if development is outside of Protected Park.	3
I.2	availability for drilling	yes, if development is outside Park.	3
J.	**Engineering**		2.40
J.1	Development proposal and design	no planning in progress	0
J.2	Construction issues	Unknown	3
J.3	Transportation issues	gravel roads and mining roads	3
J.4	Architectural Issues (blend/hide into environment?	none known; wilderness area	3
J.5	Special construction issues (heat exchanger & full injection)	none known; remote location	3
K.	**Non electrical infrastructure (roads and habitation)**		2.80
K.1	Nearest large community > 50,000	Prince George	4
K.2	nearest community and size	Iskut, Galore Creek, Bob Quinn Lake	2
K.3	Nearest road and condition	Galore Creek mining roads	2
K.4	Current access conditions (restrictions)	remote access via mining roads	3
K.5	Terrain and distance factor for road building	dependent on development and condition of existing Galore Creek Mine Road	3
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Iskut	
	Nearest community name:	Iskut	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Iskut River, 104G01	
	Geological map sheets (name and code)	104G.009	
N.	**Other issues and considerations**		1.00
N.1	Spatial concentration of potential customers	very remote locations	0
N.2	Distance to market for prospective commodities	if mining is viable, potential for cooperation	3
N.3	Costs to potential customers to receive Direct-use benefits	high, no subsidies	0

OVERALL COMMENTS/ASSESSMENT	Area is remote; underutilized for tourism, hike to hot spring is difficult, very limited. Power line recently completed to Bob Quinn lake so some economic development is possible.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Jedney	
Nearest community name:	Fort St. John	
Nearest large community:	Prince George	
Topographic map sheets (name and code) :	Medana Creek, 094G08	
Geological map sheets (name and code)	94G.029	

Jedney

A.	**Resource potential**		3.50
A.1	General geological setting	actual reservoir has not been defined	5
A.2	Size/potential/type	good likelihood of 40 - 60 45°C waters within 1-2 km of surface; unknown permeability or formation target.	5
A.3	Temperature gradient/ Heat flow data	45°C/km	5
A.4	Water & Gas chemistry	yes; part of the field is sour with H_2S	3
A.5	Mineral indicators and/or surface alteration	good information from well cuttings	5
A.6	Surface thermal features (type, temperature)	no surface features	0
A.7	Surface spring flow rates and Resource recharge	none known	0
A.8	3D permeability (heat exchange potential)	likely good permeability	5
A.9	Recent magmatism	sedimentary basin	0
A.10	Structural setting / seismic / tectonics	good knowledge of area due to drilling	5
A.11	Geophysics (type and interpretation if available)	a number of regional geophysical studies	3
A.12	Potential Resource host rocks	sedimentary sequence	5
A.13	Potential drilling issues	unlikely based on knowledge of the area	5
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	reservoir is likely in gas bearing dolomite formation; heat flow is 45°C/km; but no reported aquifers shallower in the sequence.	3
B.	**Exploration Uncertainty (Risk)**		3.14
B.1	Degree of identification of resources/reserves	cooler < 80° C water is not reported above the 130-140° C waters in the gas bearing aquifer	3
B.2	Likelihood of covering Resource with concession	Given shallower target should not be conflict with oil and gas.	5
B.3	Expected authorization date	unknown	0
B.4	Specific timing of exploration (7 years BC)	exploration would be done Land Act permitting, 5 years for potential 5MW pilot plant (KWL report)	3
B.5	Degree of previous exploration (can be good or bad)	considerable knowledge from oil and gas exploration	4
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	good terrain; also road access	5
B.7	Exploration to exploitation (Difficult to easy)	high cost	2
C.	**Environmental Issues**		3.50
C.1	Protected areas (type and classification)	closest park is 40 km away	5
C.2	Endangered species	Boreal Mount Caribou; some birds and plants, 1 to 45 km from proposed resource area.	2
C.3	Geothermal surface features	none known. Nearest springs ~125 km away.	5
C.4	Other	transmission/piping route would cross many fish bearing streams.	2
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.00
D.1	Bidding Area	No geothermal tracts. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	yes, see KWL and Geothermex (2015)	3
D.3	Other claim rights(Mining and/or Oil)	oil and gas exploration in the area	3
E.	**Market**		1.00

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Jedney	
	Nearest community name:	Fort St. John	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Medana Creek, 094G08	
	Geological map sheets (name and code)	94G.029	
E.1	Potential commodities for direct use applications	remote location along the Alaska Highway; locally collected wild foods (mushrooms); forest products.	1
E.2	Political stability and community relationship to development	no known issues; but limited population	1
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	no known issues; but limited population	2
E.4	Renewable energy "green value" for potential development	not part of a town planning process	0
F.	**Transmission Line Infrastructure**		0.50
F.1	State of the Infrastructure	If power is required for operation only available to Fox Creek substation	1
F.2	Transmission route (distance, terrain and costs)	remote area, >100 km of transmission required.	1
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	lease has been renewed once; could be done under crown land tenure	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years	5
H.	**Community Issues**		3.11
H.1	Indigenous Law and Indigenous Development Areas	Treaty 8 land area, most certainty about land claims and indigenous development processes.	5
H.2	Land claims	Treaty 8 land area	5
H.3	Community action	court challenge, demonstrations against Site C	3
H.4	Surface Rights	crown land grant	3
H.5	Visual considerations	logging and gas field development in the area	3
H.6	Tourism	no specific tourism site	0
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	see individual First nations: Blueberry River, Dene Tha', Doig River, Halfway River, Prophet River, west Moberly	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	as above	3
H.9	Traditional use area: archeology sites and other areas of significance	as above	3
I.	**Water rights**		5.00
I.1	availability for proposed development	No nearby water licenses, >15 km is closest.	5
I.2	availability for drilling	yes, with a licence	5
J.	**Engineering**		2.00
J.1	Development proposal and design	no planning underway	0
J.2	Construction issues	none known; remote location; near highway	3
J.3	Transportation issues	long distances	1

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Jedney	
	Nearest community name:	Fort St. John	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Medana Creek, 094G08	
	Geological map sheets (name and code)	94G.029	
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		3.60
K.1	Nearest large community > 50,000	Prince George	3
K.2	nearest community and size	Fort St. John	2
K.3	Nearest road and condition	Alaska Highway, significant network of existing unpaved access roads.	5
K.4	Current access conditions (restrictions)	none known	5
K.5	Terrain and distance factor for road building	No requirement for new road anticipated.	3
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		0.00
N.1	Spatial concentration of potential customers	very limited population	0
N.2	Distance to market for prospective commodities	long distances	0
N.3	Costs to potential customers to receive Direct-use benefits	high on a per capita basis	0

OVERALL COMMENTS/ASSESSMENT	Very remote area with limited population base to build a development.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	King Island	
Nearest community name:	Bella Coola	
Nearest large community:	Williams Lake	
Topographic map sheets (name and code) :	Labouchere Channel, 093D06	
Geological map sheets (name and code)	93D.044	

King Island

A.	**Resource potential**		2.79
A.1	General geological setting	no clearly defined resource; scattered hot springs along large regional faults.	5
A.2	Size/potential/type	resource probably limited by fracture density	3
A.3	Temperature gradient/ Heat flow data	limited to spring T.	3
A.4	Water & Gas chemistry	neutral chemistry; sea water detected in some	3
A.5	Mineral indicators and/or surface alteration	limited	0
A.6	Surface thermal features (type, temperature)	temperatures up to ~45° C	5
A.7	Surface spring flow rates and Resource recharge	limited knowledge	2
A.8	3D permeability (heat exchange potential)	limited knowledge	2
A.9	Recent magmatism	mafic dykes of unknown, but geologically young ages.	3
A.10	Structural setting / seismic / tectonics	large scale, crustal features create fiords	5
A.11	Geophysics (type and interpretation if available)	regional geophysics available	1
A.12	Potential Resource host rocks	fracture permeability in rocks of mainly the coast plutonic complex.	3
A.13	Potential drilling issues	fracture and crystalline rocks	1
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	a number of small springs along the inlets proximal to Bella Coola.	3
B.	**Exploration Uncertainty (Risk)**		2.43
B.1	Degree of identification of resources/reserves	along major fault structures, but no clearly defined resource	1
B.2	Likelihood of covering Resource with concession	no geothermal lease required; T below 80C	5
B.3	Expected authorization date	Current lodge for sale	3
B.4	Specific timing of exploration (7 years)	no geothermal lease required; T below 80C, once permits in place 5-6 years.	3
B.5	Degree of previous exploration (can be good or bad)	Lodge development that has changed hands	2
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	dependent on location	2
B.7	Exploration to exploitation (Difficult to easy)	challenging due to terrain and access	1
C.	**Environmental Issues**		2.00
C.1	Protected areas (type and classification)	local community plan to protect views; great Bear Rain forest and local conservancy areas	1
C.2	Endangered species	plant occurrences within proposed transmission/piping route.	3
C.3	Geothermal surface features	yes; used for First Nations and public	2
C.4	Other	developed spa currently for sale. Fish bearing streams along proposed transmission/piping route.	2
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		2.33
D.1	Bidding Area	Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource. Not known what existing lodge has for permits.	3
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	possible but challenging	1
D.3	Other claim rights(Mining and/or Oil)	none known	3
E.	**Market**		2.75

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	King Island	
	Nearest community name:	Bella Coola	
	Nearest large community:	Williams Lake	
	Topographic map sheets (name and code) :	Labouchere Channel, 093D06	
	Geological map sheets (name and code)	93D.044	
E.1	Potential commodities for direct use applications	spa/resort potential	3
E.2	Political stability and community relationship to development	favourable to development that doesn't impact natural setting.	5
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	Current lodge for sale	3
E.4	Renewable energy "green value" for potential development	n/a	0
F.	**Transmission Line Infrastructure**		0.50
F.1	State of the Infrastructure	Bella Coola is off the grid (25 kV distribution system)	1
F.2	Transmission route (distance, terrain and costs)	Remote, >50 km of transmission line to Bella Coola.	1
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law; existing commercial structure	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	existing lodge at Nascall Hot Springs	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	Geothermal lease not necessary	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years; not known what existing lodge has for permits.	5
H.	**Community Issues**		2.67
H.1	Indigenous Law and Indigenous Development Areas	Heiltsuk BCTC stage 4; Heiltsuk have an economic development corp.	1
H.2	Land claims	Naxalk not in negotiation but asserts territory	1
H.3	Community action	stand against Enbridge; agreement reached to protect great bear rainforest; protested against fish farming; Bella Coola as a food action plan; Bella Coola has a community Plan (1998) key is protection of the natural setting	3
H.4	Surface Rights	treaty rights and crown land	3
H.5	Visual considerations	logging	3
H.6	Tourism	recreation destination	4
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	hot springs used for healing purposes	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	Heiltsuk and Naxalk First Nations	3
H.9	Traditional use area: archeology sites and other areas of significance	Heiltsuk and Naxalk First Nations	3
I.	**Water rights**		5.00
I.1	availability for proposed development	3 active applications for water licenses nearby.	5
I.2	availability for drilling	yes, with a licence	5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	King Island	
	Nearest community name:	Bella Coola	
	Nearest large community:	Williams Lake	
	Topographic map sheets (name and code) :	Labouchere Channel, 093D06	
	Geological map sheets (name and code)	93D.044	
J.	**Engineering**		2.60
J.1	Development proposal and design	existing lodge at Nascall Hot Springs	3
J.2	Construction issues	Springs are along waterways; spa/swimming facilities would be by boat/barge; existing lodge	5
J.3	Transportation issues	long distances; water access or float plan (Cruise ships)	1
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	needs to blend with natural environment	2
J.5	Special construction issues (heat exchanger & full injection)	materials would be required to be brought in by barge	2
K.	**Non electrical infrastructure (roads and habitation)**		0.40
K.1	Nearest large community > 50,000	Prince George	1
K.2	nearest community and size	Bella Coola (1910 in 2011)	1
K.3	Nearest road and condition	access is by boat or float plane	0
K.4	Current access conditions (restrictions)	limited access; remote region	0
K.5	Terrain and distance factor for road building	very difficult - barge access for building	0
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		1.33
N.1	Spatial concentration of potential customers	very low density of people; tourist appeal; needs marketing and plan to get people to the site.	4

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	King Island	
	Nearest community name:	Bella Coola	
	Nearest large community:	Williams Lake	
	Topographic map sheets (name and code) :	Labouchere Channel, 093D06	
	Geological map sheets (name and code)	93D.044	
N.2	Distance to market for prospective commodities	difficult access due to water/rugged mountains	0
N.3	Costs to potential customers to receive Direct-use benefits	very high	0

OVERALL COMMENTS/ASSESSMENT	Local use would be challenging due to lack of population and water only access. One functioning resort, Nascall is now closed. Potential for increased tourist trade and development. The property is still for sale http://www.oceanfront4sale.net/oceanfront-4-sale/canada-nascall-hotsprings-property-in-central-coast-british-columbia

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Kootenay	
Nearest community name:	Ainsworth Hot Springs	
Nearest large community:	Kelowna	
Topographic map sheets (name and code) :	Crawford Bay, 082F10	
Geological map sheets (name and code)	82F.076	

Kootenay

A.	**Resource potential**		3.93
A.1	General geological setting	well known	5
A.2	Size/potential/type	not defined, estimated 2 - 10 km3 using assumptions, depth to resource >500 m	5
A.3	Temperature gradient/ Heat flow data	34C/km along Purcell Trench	5
A.4	Water & Gas chemistry	Geothermometry indicate source temps up to 160C. Ainsworth alkalinity 1050 mg/L, Cl 45 mg/L; Riondel supersaturated with CO2, Dewar HCO3 149 mg/L, Mg 0.3 mg/L, Cl 54 mg/L.	4
A.5	Mineral indicators and/or surface alteration	limited	1
A.6	Surface thermal features (type, temperature)	Ainsworth springs nearby (48C). Also in the area: Riondel (48C), Dewar Creek (83C), Crawford Creek (30-32C) hot springs.	5
A.7	Surface spring flow rates and Resource recharge	Ainsworth 7L/s, Riondel potential up to 150 L/s, Dewar Creek, Crawford Creek, unknown.	4
A.8	3D permeability (heat exchange potential)		5
A.9	Recent magmatism		0
A.10	Structural setting / seismic / tectonics	Lots of evidence of fracturing/faulting	5
A.11	Geophysics (type and interpretation if available)	no information?	3
A.12	Potential Resource host rocks	Likely from fractured/faulted granitic/metamorphic rocks.	5
A.13	Potential drilling issues	Riondel: Scale buildup and high CO2 content	3
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	deep circulation of fluids rising to the surface through fault systems	5
B.	**Exploration Uncertainty (Risk)**		2.57
B.1	Degree of identification of resources/reserves	Largely based on info from Riondel mine. Ainsworth hot springs confirm resource potential	3
B.2	Likelihood of covering Resource with concession	Ainsworth is commercial spa. Mineral tracts along west Kootenay Lake. Dewar Creek within Purcell Wilderness Conservancy Provincial Park. Riondel possible. Crawford Creek mineral title tracts surround on 3 sides.	3
B.3	Expected authorization date	No geothermal tracts nearby. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	as soon as permits can be put in place, 5-7 yr.	3
B.5	Degree of previous exploration (can be good or bad)	Geoscientific information exists. Geothermometry studies exist. Some temperature gradient knowledge but further definition required.	3
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	enough area needed appears sufficient.	5
B.7	Exploration to exploitation (Difficult to easy)	potential for water-use issues with mine leases/conservancy areas/hot spring resort nearby.	1
C.	**Environmental Issues**		2.00
C.1	Protected areas (type and classification)	Kokanee Lake Provincial Park <500 m from potential proposed transmission line. Cody Caves Provincial park <5 km away.	1
C.2	Endangered species	Blunt-sepaled starwort occurrence 5 km away; White Sturgeon <5 km, Westslope Cutthroat Trout.	2

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Kootenay	
	Nearest community name:	Ainsworth Hot Springs	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	Crawford Bay, 082F10	
	Geological map sheets (name and code)	82F.076	
C.3	Geothermal surface features	Ainsworth hot springs resort nearby, Riondel hot springs ~7 km away.	3
C.4	Other	fish bearing stream nearby	2
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.00
D.1	Bidding Area	No geothermal tracts nearby. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	Ainsworth could be collaborative/competitive. See KWL report for electrical generation potential.	3
D.3	Other claim rights(Mining and/or Oil)	existing mineral, coal titles at resource area and within 30 km radius.	3
E.	**Market**		3.25
E.1	Potential commodities for direct use applications	Limited nearby populations: closest communities Balfour, Kaslo BC (<1000 pop). Greenhouses, mushroom drying forest products.	2
E.2	Political stability and community relationship to development	Ainsworth resort area already exists, so open to direct-use applications but may be competitive rather than collaborative.	3
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	none known	3
E.4	Renewable energy "green value" for potential development	Nearby communities favorable to green development.	5
F.	**Transmission Line Infrastructure**		2.50
F.1	State of the Infrastructure	closest substation 63 kV, 7 km away, existing roads.	5
F.2	Transmission route (distance, terrain and costs)	approx. 7 km transmission/piping required to closest substation along established powerline corridor.	5
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	could be done under geothermal/Land Act tenure.	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years	5
H.	**Community Issues**		2.78
H.1	Indigenous Law and Indigenous Development Areas	BC Treaty stage 4 and non-treaty First Nations	1
H.2	Land claims	Ktunaxa Nation Council, Okanagan Nation Alliance, Secwepemc Nation	1
H.3	Community action	Lower Kootenay Band purchasing Ainsworth hot spring near Kaslo, BC.	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Kootenay	
	Nearest community name:	Ainsworth Hot Springs	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	Crawford Bay, 082F10	
	Geological map sheets (name and code)	82F.076	
H.4	Surface Rights	treaty and crown land	3
H.5	Visual considerations	hydro-electric, logging areas nearby.	4
H.6	Tourism	Existing extensive outdoor recreation tourism industry including camping, hiking, skiing, hot springs.	4
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	Ktunaxa Nation Council, Okanagan Nation Alliance, Secwepemc Nation	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	Ktunaxa Nation Council, Okanagan Nation Alliance, Secwepemc Nation	3
H.9	Traditional use area: archeology sites and other areas of significance	Ktunaxa Nation Council, Okanagan Nation Alliance, Secwepemc Nation	3
I.	**Water rights**		4.00
I.1	availability for proposed development	70 water licences within 5 km of potential resource area (domestic and mineral trading).	3
I.2	availability for drilling	yes, with a licence	5
J.	**Engineering**		2.80
J.1	Development proposal and design	no planning underway	0
J.2	Construction issues	moderately sloped terrain	3
J.3	Transportation issues	Existing paved road <1 km from potential resource area.	5
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		4.40
K.1	Nearest large community > 50,000	Kelowna	4
K.2	nearest community and size	Ainsworth, Balfour, Kaslo (all <1000 pop)	3
K.3	Nearest road and condition	paved road	5
K.4	Current access conditions (restrictions)	paved roads, small towns nearby for staff	5
K.5	Terrain and distance factor for road building	no requirements for new roads	5
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Kootenay	
	Nearest community name:	Ainsworth Hot Springs	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	Crawford Bay, 082F10	
	Geological map sheets (name and code)	82F.076	
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		2.67
N.1	Spatial concentration of potential customers	Ainsworth, Balfour, Kaslo (all <1000 pop). Resort townsite nearby may indicate openness for more development or collaboration opportunities for direct use.	4
N.2	Distance to market for prospective commodities	Kelowna	3
N.3	Costs to potential customers to receive Direct-use benefits	moderate; limited local population	1

OVERALL COMMENTS/ASSESSMENT	Ainsworth townsite may be open to collaboration of another development, or additional direct-use applications.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Lakelse Lake	
Nearest community name:	Terrace	
Nearest large community:	Prince George	
Topographic map sheets (name and code) :	Lakelse Lake, 103I07	
Geological map sheets (name and code)	103I.038	

Lakelse Lake

A.	**Resource potential**		4.29
A.1	General geological setting	likely a graben structure in the coast plutonic complex	5
A.2	Size/potential/type	large capacity; 457 liters/minute (MEM 2015)	5
A.3	Temperature gradient/ Heat flow data	Nine springs with a average T of 85 C; wells for pool facilities	5
A.4	Water & Gas chemistry	yes; geochemistry suggests 85°C	5
A.5	Mineral indicators and/or surface alteration	Surface manifestations, but little alteration	3
A.6	Surface thermal features (type, temperature)	Nine springs with a average T of 85 C; wells for pool facilities	5
A.7	Surface spring flow rates and Resource recharge	Flow rates up to 457 liters/minute	5
A.8	3D permeability (heat exchange potential)	little is known; likely fracture permeability	3
A.9	Recent magmatism	shallow pluton; young volcanism to the North.	3
A.10	Structural setting / seismic / tectonics	graben structure; faulting	5
A.11	Geophysics (type and interpretation if available)	regional gravity; EM conducted in 1984	5
A.12	Potential Resource host rocks	Coast plutonic complex	3
A.13	Potential drilling issues	private land	3
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	major, crustal structure/lineament	5
B.	**Exploration Uncertainty (Risk)**		3.14
B.1	Degree of identification of resources/reserves	work underway by Borealis; assume they will define a reservoir and drilling targets.	4
B.2	Likelihood of covering Resource with concession	main springs are on private land; provincial parks and protected areas nearby.	2
B.3	Expected authorization date	Lease acquired 2014 - have 7 years to carry out work (yearly fee payment required or work); web site give 2017 as year of construction of power plant; no 2015 update	3
B.4	Specific timing of exploration (7 years)	Work underway by Borealis; no 2015 update. http://borealisgeopower.com/projects/lakelse-geothermal-kitselas-borealis-geopower/	3
B.5	Degree of previous exploration (can be good or bad)	private land has a resort complex currently closed	3
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	Enough area, may need to purchase private land.	4
B.7	Exploration to exploitation (Difficult to easy)	heavily treed area with private land	3
C.	Environmental Issues		2.50
C.1	Protected areas (type and classification)	Lakelse Provincial Park and private land	2
C.2	Endangered species	Bog Rush and White Adder's-mouth orchid	3
C.3	Geothermal surface features	springs used by locals; main springs are part of a closed resort.	3
C.4	Other	Resort is in a very run down state, significant modifications and upgrades would be needed to have it function. 12 Fish bearing streams on route of proposed transmission/piping line.	2
D.	Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)		2.67

APPENDIX D: Geothermal Development Decision Matrix (GDDM) summary and resource areas

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Lakelse Lake	
	Nearest community name:	Terrace	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Lakelse Lake, 103I07	
	Geological map sheets (name and code)	103I.038	
D.1	Bidding Area	current geothermal lease; no mention of direct use on webpage, but local First Nations have identified the potential. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	yes; lease held by Borealis Geothermal; likely will be payout	3
D.3	Other claim rights(Mining and/or Oil)	none known; private land	2
E.	**Market**		3.75
E.1	Potential commodities for direct use applications	fish, fish products, forestry, greenhouses; existing hot spring resort now closed.	4
E.2	Political stability and community relationship to development	good working relationship between most tribes and developers; agreements have been reached.	3
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	none known	3
E.4	Renewable energy "green value" for potential development	Terrace is open to green developments and has GHGE targets	5
F.	**Transmission Line Infrastructure**		1.00
F.1	State of the Infrastructure	existing 287 kV line but connection is 20 km away via existing transmission corridor; good paved road to area	2
F.2	Transmission route (distance, terrain and costs)	probably sufficient for small industrial applications from existing infrastructure.	2
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law; existing commercial structure	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	existing lease held by Borealis (January 21, 2014)	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	Geothermal lease not necessary; would need to negotiate with lease holder	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years; not known what existing lodge has for permits.	5
H.	**Community Issues**		2.56
H.1	Indigenous Law and Indigenous Development Areas	Kitselas; Kisumkalum; Lax Kw'alaams; Tsimshian are in negotiation stages 2 to 4.	1
H.2	Land claims	various stages of negotiations	1

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Lakelse Lake	
	Nearest community name:	Terrace	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Lakelse Lake, 103I07	
	Geological map sheets (name and code)	103I.038	
H.3	Community action	Kitselas signed agreement with Borealis; Sustainable development is a stated objective; The City of Terrace has set the following GHG reduction targets: 5% below 2007 levels by 2015 11% below 2007 levels by 2020 80% below 2007 levels by 2050	5
H.4	Surface Rights	land claims; private land; crown land	1
H.5	Visual considerations	valley, logging, other industrial activity	3
H.6	Tourism	yes	3
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	Kitselas; Kisumkalum; Lax Kw'alaams; Metlakatla; Terrace; check out websites	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	as above	3
H.9	Traditional use area: archeology sites and other areas of significance	as above	3
I.	**Water rights**		5.00
I.1	availability for proposed development	No nearby water licenses. More than 50 water licenses on east side of Lakelse Lake for domestic purpose.	5
I.2	availability for drilling	yes, with a licence	5
J.	**Engineering**		3.00
J.1	Development proposal and design	Borealis is working on electrical generation project, no mention of direct use applications http://borealisgeopower.com/projects/lakelse-geothermal-kitselas-borealis-geopower/	3
J.2	Construction issues	none reported	3
J.3	Transportation issues	none reported	3
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none reported	3
J.5	Special construction issues (heat exchanger & full injection)	none reported	3
K.	**Non electrical infrastructure (roads and habitation)**		5.00
K.1	Nearest large community > 50,000	Prince George	5
K.2	nearest community and size	Terrace (11,230 in 2015)	5
K.3	Nearest road and condition	paved highway to Kitimat and transportation hub between Prince Rupert and Prince George.	5
K.4	Current access conditions (restrictions)	springs are on private land	5
K.5	Terrain and distance factor for road building	relatively easy terrain.	5
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Lakelse Lake	
	Nearest community name:	Terrace	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Lakelse Lake, 103I07	
	Geological map sheets (name and code)	103I.038	
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		5.00
N.1	Spatial concentration of potential customers	Terrace has a significant eco-tourist trade	5
N.2	Distance to market for prospective commodities	close by rail; Kitimat and Prince Rupert major deep water ports	5
N.3	Costs to potential customers to receive Direct-use benefits	population of greater Terrace is around 19,000	5

OVERALL COMMENTS/ASSESSMENT	Electrical generation project underway; could enter into discussions as to other uses for the warm water. Borealis has discussed direct-use application with Valemount in their project there.

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Lower Arrow Lake	
	Nearest community name:	Fauquier	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	Burrell Creek, 082E09	
	Geological map sheets (name and code)	82E.080	

Lower Arrow Lake

A.	**Resource potential**		3.00
A.1	General geological setting	well known	5
A.2	Size/potential/type	not defined but estimated at 5 km3, low temperature	1
A.3	Temperature gradient/ Heat flow data	regional heat flow calculated at 4.8 µW/m3	5
A.4	Water & Gas chemistry	Octopus Creek Cl 44 mg/L, geothermometry temp 87C	5
A.5	Mineral indicators and/or surface alteration		3
A.6	Surface thermal features (type, temperature)	Octopus Creek 49C, other cold springs	5
A.7	Surface spring flow rates and Resource recharge	low flow rates	3
A.8	3D permeability (heat exchange potential)	fractured rocks but may require reservoir stimulation.	2
A.9	Recent magmatism	no	0
A.10	Structural setting / seismic / tectonics	Lots of evidence of fracturing/faulting and intense folding	5
A.11	Geophysics (type and interpretation if available)	regional	1
A.12	Potential Resource host rocks	unknown, area by Octopus Creek is regionally granitic and other intrusive suites.	2
A.13	Potential drilling issues	possible hot dry rock project	0
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	Intrusions are source of radiogenic heat.	5
B.	**Exploration Uncertainty (Risk)**		2.43
B.1	Degree of identification of resources/reserves	no reservoir yet identified	1
B.2	Likelihood of covering Resource with concession	Likely possible.	4
B.3	Expected authorization date	No geothermal tracts nearby. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	as soon as permits can be put in place, 5-7 year timeframe.	3
B.5	Degree of previous exploration (can be good or bad)	Geoscientific information exists. Geothermometry studies exist. Some temperature gradient knowledge but further definition required.	3
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	Likely.	5
B.7	Exploration to exploitation (Difficult to easy)	remote	1
C.	**Environmental Issues**		3.25
C.1	Protected areas (type and classification)	Arrow Lakes Provincial Park approx. 8 km away.	3
C.2	Endangered species	Three-leaved Lewisia (40 km away)	4
C.3	Geothermal surface features	Octopus Creek hot springs located ~1-2 km (but not really used) from potential resource area.	3
C.4	Other	No known fish-bearing streams in immediate vicinity; transmission would cross streams	3
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.67
D.1	Bidding Area	No geothermal tracts nearby. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	KWL report	3
D.3	Other claim rights(Mining and/or Oil)	no known coal/mineral/crown lease tenures nearby	5

APPENDIX D: Geothermal Development Decision Matrix (GDDM) summary and resource areas

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Lower Arrow Lake	
	Nearest community name:	Fauquier	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	Burrell Creek, 082E09	
	Geological map sheets (name and code)	82E.080	
E.	**Market**		1.75
E.1	Potential commodities for direct use applications	forest based products, mushrooms drying, greenhouse; logging; although limited nearby community Fauquier (pop 200)	2
E.2	Political stability and community relationship to development	stable, but development favourability unknown	2
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	none known	3
E.4	Renewable energy "green value" for potential development	n/a	0
F.	**Transmission Line Infrastructure**		1.75
F.1	State of the Infrastructure	closest substation 500 kV and 138 kV, ~ 4 km away	5
F.2	Transmission route (distance, terrain and costs)	6 km of transmission/piping via existing unpaved roads. New substation will be required.	2
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	could be done under geothermal/Land Act tenure.	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years	5
H.	**Community Issues**		2.44
H.1	Indigenous Law and Indigenous Development Areas	Ktunaxa Nation BCTC Stage 4	1
H.2	Land claims	Ktunaxa Nation Council, Sinixt Nation. Secwepemc and Westbank nearby (25-35 km away)	1
H.3	Community action	no significant population nearby (Fauquier pop 200)	2
H.4	Surface Rights	treaty and crown land	3
H.5	Visual considerations	logging areas and roads nearby	3
H.6	Tourism	Lower Arrow Lakes-Needle Ferry, outdoor recreation area. Most activities are centralized near Fauquier, BC.	3
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	Ktunaxa Nation Council, Okanagan Nation Alliance, Secwepemc Nation	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	Ktunaxa Nation Council, Okanagan Nation Alliance, Secwepemc Nation	3
H.9	Traditional use area: archeology sites and other areas of significance	Ktunaxa Nation Council, Okanagan Nation Alliance, Secwepemc Nation	3
I.	**Water rights**		5.00
I.1	availability for proposed development	4 current water licenses within 5 km of potential resource area.	5
I.2	availability for drilling	yes, with a licence	5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Lower Arrow Lake	
	Nearest community name:	Fauquier	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	Burrell Creek, 082E09	
	Geological map sheets (name and code)	82E.080	
J.	**Engineering**		2.00
J.1	Development proposal and design	no planning underway	0
J.2	Construction issues	Remote, steep mountainous terrain, unpaved roads	1
J.3	Transportation issues	none known	3
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		3.80
K.1	Nearest large community > 50,000	Kelowna	4
K.2	nearest community and size	Fauquier (pop 200)	2
K.3	Nearest road and condition	unpaved existing logging road	3
K.4	Current access conditions (restrictions)	unpaved road access to potential resource area.	5
K.5	Terrain and distance factor for road building	no requirements for new roads	5
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		1.67
N.1	Spatial concentration of potential customers	Fauquier (pop 200), limited small local community.	1
N.2	Distance to market for prospective commodities	Kelowna	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Lower Arrow Lake	
	Nearest community name:	Fauquier	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	Burrell Creek, 082E09	
	Geological map sheets (name and code)	82E.080	
N.3	Costs to potential customers to receive Direct-use benefits	moderate to high; limited local population	1

OVERALL COMMENTS/ASSESSMENT	Potential for development but area is remote with minimal previous exploration of any type. Other nearby springs (Nakusp, Ainsworth, etc.) with high level of development would be competing.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Meager-Pebble	
Nearest community name:	Pemberton	
Nearest large community:	North Vancouver	
Topographic map sheets (name and code) :	Chischa River/Akue Creek, 092J12/092J11	
Geological map sheets (name and code)	92J.053, 92J.063	

Meager-Pebble

A.	**Resource potential**		4.43
A.1	General geological setting	near a large strato volcano with recent eruptive history.	5
A.2	Size/potential/type	15 km3 (KWL & GT 2015) 100 -200 MW	5
A.3	Temperature gradient/ Heat flow data	high heat flows; T up to 270 at 1,200 m	5
A.4	Water & Gas chemistry	measured and calculated T up to 270	5
A.5	Mineral indicators and/or surface alteration	extensive surface alteration; lead to failure in Capricorn Creek, 2010	5
A.6	Surface thermal features (type, temperature)	multiple seeps and springs used for bathing	5
A.7	Surface spring flow rates and Resource recharge	Low flows from springs; meteoric recharge ~30 years	5
A.8	3D permeability (heat exchange potential)	low formation permeability; but potentially good fracture permeability	3
A.9	Recent magmatism	2350 yrBP explosive to passive dacite eruption	5
A.10	Structural setting / seismic / tectonics	young volcanism and faulting forming graben structure	5
A.11	Geophysics (type and interpretation if available)	MT shows strong anomaly	5
A.12	Potential Resource host rocks	Mesozoic aged quartz Diorite	3
A.13	Potential drilling issues	Hard and abrasive formation	3
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	drilling and other work demonstrated heat but not permeability; fracture permeability needs to be carefully targeted.	3
B.	**Exploration Uncertainty (Risk)**		3.43
B.1	Degree of identification of resources/reserves	Still high risk until permeability it located and can be targeted.	3
B.2	Likelihood of covering Resource with concession	good	4
B.3	Expected authorization date	Permit in place. Lease to expire 2017	4
B.4	Specific timing of exploration (BC 7 years)	unknown; could be 3-5 years but company is no longer active in area. Can be done under Land Act.	4
B.5	Degree of previous exploration (can be good or bad)	significant exploration and drilling	4
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	steep terrain subject to landslides and snow avalanches.	2
B.7	Exploration to exploitation (Difficult to easy)	easy to moderate	3
C.	**Environmental Issues**		2.00
C.1	Protected areas (type and classification)	Upper Lillooet Prov. Park 2 km away;	1
C.2	Endangered species	Vivid Dancer dragon fly; spotted owl; plants	2
C.3	Geothermal surface features	prior to landslide were heavily used	3
C.4	Other	Grizzly and sheep habitat areas overlap active title tracts	2
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.67
D.1	Bidding Area	Polaris infrastructure leases to expire in 2017. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	high, see KWL & GeothermEx 2015 report	5
D.3	Other claim rights (Mining and/or Oil)	mineral/coal title north of Mt. Meager, minimal overlap with active geothermal tract; pumice was mined locally.	3
E.	**Market**		4.25
E.1	Potential commodities for direct use applications	mushroom drying; forest products	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Meager-Pebble	
	Nearest community name:	Pemberton	
	Nearest large community:	North Vancouver	
	Topographic map sheets (name and code) :	Chischa River/Akue Creek, 092J12/092J11	
	Geological map sheets (name and code)	92J.053, 92J.063	
E.2	Political stability and community relationship to development	positive relationship between local community and development; area currently under development for run of river hydro.	5
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	current geothermal lease expires in 2017, exploration has stalled but has potential due to hydro-electric project nearby	4
E.4	Renewable energy "green value" for potential development	Pemberton is favourable to green development	5
F.	**Transmission Line Infrastructure**		3.00
F.1	State of the Infrastructure	Transmission line with Energex project	4
F.2	Transmission route (distance, terrain and costs)	if capacity on Energex line 2-10 km to connection, need to go thru slide debris area for Meager	3
F.3	Wheeling power	n/a	0
F.4	Transmission providers	Innergex/BC Hydro	5
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	current geothermal lease expires in 2017	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years; Provincial Park	5
H.	**Community Issues**		2.67
H.1	Indigenous Law and Indigenous Development Areas	none currently in negotiation with BC Treaty Commission	1
H.2	Land claims	Lillooet, Mount Currie and St'at'imc not currently in negotiation; St'at'imc Land and Resources Authority - SLRA (www.statimc.net), within asserted area	1
H.3	Community action	objections to planned ski area development; St'at'imc signed BC Hydro agreement; large hydro project with Innergex close to geothermal, company statement as to close association with first nations.	3
H.4	Surface Rights	not currently in treaty negotiations	3
H.5	Visual considerations	Large hydro project nearby	4
H.6	Tourism	Before road wash out there was significant number of visitors to the hot springs.	3
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	St'at'imc traditional use area	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	St'at'imc traditional use area	3
H.9	Traditional use area: archeology sites and other areas of significance	St'at'imc traditional use area	3
I.	**Water rights**		4.00

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Meager-Pebble	
	Nearest community name:	Pemberton	
	Nearest large community:	North Vancouver	
	Topographic map sheets (name and code) :	Chischa River/Akue Creek, 092J12/092J11	
	Geological map sheets (name and code)	92J.053, 92J.063	
I.1	availability for proposed development	No active water licenses within 5 km, but 6 km away for Boulder Creek hydro project. Need to consult Innergex developer.	3
I.2	availability for drilling	yes, with a licence	5
J.	**Engineering**		2.60
J.1	Development proposal and design	none identified	0
J.2	Construction issues	Innergex development nearby.	4
J.3	Transportation issues	gravel roads on east side recently upgraded; west side road still not completed.	3
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		3.40
K.1	Nearest large community > 50,000	North Vancouver	4
K.2	nearest community and size	Pemberton pop 2,436 (2014)	2
K.3	Nearest road and condition	paved and unpaved road	3
K.4	Current access conditions (restrictions)	no restrictions	5
K.5	Terrain and distance factor for road building	rebuild road through Capricorn or on south side of Meager Creek.	3
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Meager-Pebble	
	Nearest community name:	Pemberton	
	Nearest large community:	North Vancouver	
	Topographic map sheets (name and code) :	Chischa River/Akue Creek, 092J12/092J11	
	Geological map sheets (name and code)	92J.053, 92J.063	
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		2.00
N.1	Spatial concentration of potential customers	Pemberton is a small community, major industry is tourism.	2
N.2	Distance to market for prospective commodities	Good highway access to Vancouver and other centres.	3
N.3	Costs to potential customers to receive Direct-use benefits	no subsidies	1

OVERALL COMMENTS/ASSESSMENT	Distance from Pemberton remains an issue. With new hydro project much more favourable for electrical generation. New road/access makes bathing/spa more likely, but travel distance is still significant. Upwards of 30,000 visitors/year were recorded prior to the destruction of the road by landslide.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Mt. Cayley	
Nearest community name:	Squamish	
Nearest large community:	North Vancouver	
Topographic map sheets (name and code) :	Tenaka Creek, 092J03	
Geological map sheets (name and code)	92J.014	

Mt. Cayley

A.	**Resource potential**		4.21
A.1	General geological setting	young volcanism nearby and large structures	5
A.2	Size/potential/type	small to medium from electrical potential	5
A.3	Temperature gradient/ Heat flow data	some heat flow data show 33-59 C/km; hot springs give T up to 28C	5
A.4	Water & Gas chemistry	extensive alteration near volcanic center	5
A.5	Mineral indicators and/or surface alteration	yes	5
A.6	Surface thermal features (type, temperature)	two groups of small springs with low flow	5
A.7	Surface spring flow rates and Resource recharge	very low flow rate reported	3
A.8	3D permeability (heat exchange potential)	unknown reservoir	3
A.9	Recent magmatism	yes; youngest is just post glacial (<10k)	5
A.10	Structural setting / seismic / tectonics	young volcanism nearby and large structures	5
A.11	Geophysics (type and interpretation if available)	regional as well as DC and EM circa mid 1980's; deep seismic done in mid '90s identified a "bright spot".	5
A.12	Potential Resource host rocks	crystalline basement rocks	3
A.13	Potential drilling issues	access; landslide hazards	0
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	springs are associated with young volcanism at Mt. Cayley; significant alteration has led to slope stability issues similar to Mt. Meager	5
B.	**Exploration Uncertainty (Risk)**		2.14
B.1	Degree of identification of resources/reserves	no reservoir has been identified	1
B.2	Likelihood of covering Resource with concession	geothermal concession, but no work for many years.	3
B.3	Expected authorization date	unknown reservoir	0
B.4	Specific timing of exploration	under Land Act tenure, 5-7 years.	3
B.5	Degree of previous exploration (can be good or bad)	some exploration	3
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	difficult in areas of springs but closer to river it is possible.	2
B.7	Exploration to exploitation (Difficult to easy)	good possibility of finding resource of <80C, but remote access	3
C.	**Environmental Issues**		3.00
C.1	Protected areas (type and classification)	many provincial parks in vicinity, but none very near potential resource site (6-25 km away). conservancy area close by	3
C.2	Endangered species	plants and amphibians possible, but not reported in vicinity.	3
C.3	Geothermal surface features	yes, but not used and extremely difficult to access.	4
C.4	Other	many river crossing with salmon	2
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.00
D.1	Bidding Area	cancelled geothermal lease. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	yes, geothermal exploration has been undertaken, no development underway. See KWL report	3
D.3	Other claim rights(Mining and/or Oil)	Mineral/coal titles southwest of potential resource area.	3
E.	**Market**		2.50
E.1	Potential commodities for direct use applications	local forest products (mushrooms, plants, fish and logging); no close population; remote and limited access.	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Mt. Cayley	
	Nearest community name:	Squamish	
	Nearest large community:	North Vancouver	
	Topographic map sheets (name and code) :	Tenaka Creek, 092J03	
	Geological map sheets (name and code)	92J.014	
E.2	Political stability and community relationship to development	First nations interest; Squamish is a long way away.	3
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	nothing planned	3
E.4	Renewable energy "green value" for potential development	Squamish is favourable to green development but high cost due to limited population in nearby vicinity.	1
F.	**Transmission Line Infrastructure**		0.50
F.1	State of the Infrastructure	closest transmission is 20 km east but very mountainous terrain	1
F.2	Transmission route (distance, terrain and costs)	new line within 20 km, but rugged mountainous terrain.	1
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	geothermal lease expired	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years; Provincial Park	5
H.	**Community Issues**		2.78
H.1	Indigenous Law and Indigenous Development Areas	Squamish Nation BC treaty negotiation Stage 3	1
H.2	Land claims	Stage 3 treaty negotiations	1
H.3	Community action	Squamish as a community plan with GHGE reduction target; road is the main access to the Elaho Valley wilderness area.	5
H.4	Surface Rights	crown land; conservancy area	3
H.5	Visual considerations	logging in valley	3
H.6	Tourism	very limited; remote area	3
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	2001 Squamish Nation developed stewardship plan http://www.squamish.net/about-us/our-land/xay-temixw-sacred-land-land-use-plan/	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	as above	3
H.9	Traditional use area: archeology sites and other areas of significance	as above	3
I.	**Water rights**		5.00
I.1	availability for proposed development	only 1 existing water license within 10 km.	5
I.2	availability for drilling	yes, with a licence	5
J.	**Engineering**		1.60
J.1	Development proposal and design	no development proposed	0

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Mt. Cayley	
	Nearest community name:	Squamish	
	Nearest large community:	North Vancouver	
	Topographic map sheets (name and code) :	Tenaka Creek, 092J03	
	Geological map sheets (name and code)	92J.014	
J.2	Construction issues	steep terrain; gravel access road subject to washouts.	1
J.3	Transportation issues	gravel road not maintained in winter	1
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		2.80
K.1	Nearest large community > 50,000	North Vancouver	5
K.2	nearest community and size	Squamish (Whistler is closer but over the mountains)	2
K.3	Nearest road and condition	gravel road not maintained in winter	1
K.4	Current access conditions (restrictions)	gravel road not maintained in winter	1
K.5	Terrain and distance factor for road building	no new roads required	5
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		1.33
N.1	Spatial concentration of potential customers	Squamish is a major tourist centre	2
N.2	Distance to market for prospective commodities	gravel road not maintained in winter	1
N.3	Costs to potential customers to receive Direct-use benefits	high due to distance from population	1

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Mt. Cayley	
Nearest community name:	Squamish	
Nearest large community:	North Vancouver	
Topographic map sheets (name and code) :	Tenaka Creek, 092J03	
Geological map sheets (name and code)	92J.014	
OVERALL COMMENTS/ASSESSMENT	Cayley is more than 40 km from Squamish on gravel road; there is limited winter access. For a spa or bathing facility significant marketing and transportation alternatives would need to developed. It is on a direct path to the Elaho valley and its giant Douglas fir trees. In 2015 a 600+ hectare fire threatened the Elaho giant, but it was saved. The road however, has become impassable due to washouts after the fire.	

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Mt. Garibaldi	
Nearest community name:	Squamish	
Nearest large community:	North Vancouver	
Topographic map sheets (name and code) :	Cheakamus River, 092G14	
Geological map sheets (name and code)	92G.085	

Mt. Garibaldi

A.	**Resource potential**		2.36
A.1	General geological setting	young volcanism nearby and large structures	5
A.2	Size/potential/type	no identified reservoir; rumours of warm springs and warm ground east of the volcano have never been verified; possibility of warm ground near Table Meadows (south of Mt Price) a post glacial strato volcano.	0
A.3	Temperature gradient/ Heat flow data	some heat flow data to the east near Mt. Cayley show 33-59 C/km; hot springs give T up to 28C	3
A.4	Water & Gas chemistry	none	0
A.5	Mineral indicators and/or surface alteration	none known; mercury and arsenic anomalies near Brohm Lake	3
A.6	Surface thermal features (type, temperature)	none known	0
A.7	Surface spring flow rates and Resource recharge	no surface springs	0
A.8	3D permeability (heat exchange potential)	unknown reservoir	3
A.9	Recent magmatism	yes; youngest is post glacial (<10k)	5
A.10	Structural setting / seismic / tectonics	young volcanism nearby and large structures	5
A.11	Geophysics (type and interpretation if available)	Seismic done in mid '90s identified a "bright spot" to the north.	5
A.12	Potential Resource host rocks	crystalline basement rocks	3
A.13	Potential drilling issues	access; landslide hazards (Cheekye Fan)	0
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	young volcanic center with post glacial volcanism; significant alteration at head of Cheekye fan leads to major instability.	1
B.	**Exploration Uncertainty (Risk)**		0.86
B.1	Degree of identification of resources/reserves	no reservoir has been identified	1
B.2	Likelihood of covering Resource with concession	western slopes can be covered but Garibaldi Provincial park occupies most prospective ground.	0
B.3	Expected authorization date	unknown	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	depends if development possible outside of Park, 7yr	1
B.5	Degree of previous exploration (can be good or bad)	minimal, requires drilling for confirmation of resource	1
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	Potentially, but would require planning. western slopes are steep; Cheekye fan instability	2
B.7	Exploration to exploitation (Difficult to easy)	small probability of finding resource of <80C	1
C.	**Environmental Issues**		3.00
C.1	Protected areas (type and classification)	many provincial parks in vicinity, largest is Garibaldi Prov. Park (8 km), closest is Brackendale Eagles Prov. Park 2 km from potential transmission/piping route.	2
C.2	Endangered species	some plants (4-10 km away)	3
C.3	Geothermal surface features	none known. Nearest hot springs 48 km away.	5
C.4	Other	river crossings with salmon. Wildlife habitat area for Marbled Murrelet ~2 km from proposed resource area.	2
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.00
D.1	Bidding Area	no existing geothermal tracts. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Mt. Garibaldi	
	Nearest community name:	Squamish	
	Nearest large community:	North Vancouver	
	Topographic map sheets (name and code) :	Cheakamus River, 092G14	
	Geological map sheets (name and code)	92G.085	
D.2	Electrical generation potential? Competition or collaboration possible from Companies present	yes, geothermal exploration has been undertaken, no development underway, but not favourable economics (see KWL report).	1
D.3	Other claim rights(Mining and/or Oil)	none known	5
E.	**Market**		4.00
E.1	Potential commodities for direct use applications	local forest products (mushrooms, plants, fish and logging); close population; good access.	5
E.2	Political stability and community relationship to development	First nations interest; highway is a major tourist corridor; Squamish is committed to preservation of outdoor recreation "Hard wired for Adventure"	3
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	nothing planned	3
E.4	Renewable energy "green value" for potential development	high; local community has been moving from resource based economy to tourism; "green value" in development.	5
F.	**Transmission Line Infrastructure**		1.50
F.1	State of the Infrastructure	500 and 300 kV with nearby substation, 5 km away but moderate to steep terrain	3
F.2	Transmission route (distance, terrain and costs)	depends on location and type of development; relatively short transmission	3
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	geothermal lease expired, could be done under land act tenure	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years; Provincial Park	5
H.	**Community Issues**		2.78
H.1	Indigenous Law and Indigenous Development Areas	Squamish nation in Stage 3 BC treaty negotiation	1
H.2	Land claims	Stage 3 treaty negotiations	1
H.3	Community action	Squamish as a community plan with GHGE reduction target; no mention of geothermal, but do have an energy action committee; BC Government funding in 2013 to assess renewal energy options https://news.gov.bc.ca/stories/clean-energy-opportunities-for-11-first-nations-communities. Squamish Nation; Lil'wat First Nations; have been looking into renewal energy options.	5
H.4	Surface Rights	crown land; provincial parks	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Mt. Garibaldi	
	Nearest community name:	Squamish	
	Nearest large community:	North Vancouver	
	Topographic map sheets (name and code) :	Cheakamus River, 092G14	
	Geological map sheets (name and code)	92G.085	
H.5	Visual considerations	logging in valley	3
H.6	Tourism	significant hiking, skiing, biking as well as along corridor to Whistler	3
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	2001 Squamish Nation developed stewardship plan http://www.squamish.net/about-us/our-land/xay-temixw-sacred-land-land-use-plan/	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	as above	3
H.9	Traditional use area: archeology sites and other areas of significance	as above	3
I.	**Water rights**		5.00
I.1	availability for proposed development	2 current water licenses, 8 applications within 5 km.	5
I.2	availability for drilling	yes, with a licence	5
J.	**Engineering**		1.60
J.1	Development proposal and design	no development proposed	0
J.2	Construction issues	steep terrain; gravel access road subject to washouts.	1
J.3	Transportation issues	main highway; fully maintained year round; subsidiary roads are not maintained.	1
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known; but visual considerations would be important	3
J.5	Special construction issues (heat exchanger & full injection)	none known; but would need to fit into natural setting of area and tourist values.	3
K.	**Non electrical infrastructure (roads and habitation)**		4.00
K.1	Nearest large community > 50,000	North Vancouver	5
K.2	nearest community and size	Squamish population 17,158 (2011)	2
K.3	Nearest road and condition	main highway; fully maintained year round	5
K.4	Current access conditions (restrictions)	some logging roads access the west flank. Surrounded by Parks.	3
K.5	Terrain and distance factor for road building	No new road requirement.	5
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Mt. Garibaldi	
	Nearest community name:	Squamish	
	Nearest large community:	North Vancouver	
	Topographic map sheets (name and code) :	Cheakamus River, 092G14	
	Geological map sheets (name and code)	92G.085	
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		3.67
N.1	Spatial concentration of potential customers	Squamish is a major tourist centre;	5
N.2	Distance to market for prospective commodities	gravel roads along west flank not maintained in winter	1
N.3	Costs to potential customers to receive Direct-use benefits	close population and high tourist visitation	5

OVERALL COMMENTS/ASSESSMENT	proximity to Squamish and major route to Whistler makes this area worth some additional investigation along the west flanks of Garibaldi.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Mt. Silverthrone	
Nearest community name:	Campbell River	
Nearest large community:	Vancouver	
Topographic map sheets (name and code) :	Klinaklini Glacier, 092N05	
Geological map sheets (name and code)	92N.022	

Mt. Silverthrone

A.	**Resource potential**		2.86
A.1	General geological setting	young volcanism around Franklin Glacier as well as major caldera complex at Silverthrone and large structures	5
A.2	Size/potential/type	small to medium from electrical potential	3
A.3	Temperature gradient/ Heat flow data	limited data; may be northern limit of Garibaldi volcanic belt; young volcanism along coastal areas (for example Milbanke sound)	3
A.4	Water & Gas chemistry	extensive alteration near volcanic center	3
A.5	Mineral indicators and/or surface alteration	yes; around Silverthrone volcano and Hoodoo Creek	3
A.6	Surface thermal features (type, temperature)	Hoodoo creek has most significant features	3
A.7	Surface spring flow rates and Resource recharge	no flow rates reported	2
A.8	3D permeability (heat exchange potential)	unknown reservoir	2
A.9	Recent magmatism	yes; youngest is just post glacial (<10k)	5
A.10	Structural setting / seismic / tectonics	young volcanism nearby and large structures	5
A.11	Geophysics (type and interpretation if available)	no information	0
A.12	Potential Resource host rocks	crystalline basement rocks	3
A.13	Potential drilling issues	access; rugged terrain	0
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	springs are associated with young volcanism at Silverthrone (or Franklin Glacier); Silverthrone is an evolved center of dacite and rhyolite.	3
B.	**Exploration Uncertainty (Risk)**		1.14
B.1	Degree of identification of resources/reserves	no reservoir has been identified	1
B.2	Likelihood of covering Resource with concession	geothermal concession but has been cancelled.	3
B.3	Expected authorization date	unknown	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	7 yr., dependent on permitting, access.	1
B.5	Degree of previous exploration (can be good or bad)	Geological mapping	1
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	difficult in areas of springs but closer to Klinaklina River may be possible. Little infrastructure.	1
B.7	Exploration to exploitation (Difficult to easy)	good possibility of finding resource of <80C, very remote area.	1
C.	**Environmental Issues**		2.00
C.1	Protected areas (type and classification)	conservancy area around head of Knight inlet , proposed transmission/piping line in section of Elk falls Provincial Park, Rock Bay marine Provincial park <1km from proposed transmission/piping line.	1
C.2	Endangered species	plants at risk within 5 km, amphibians possible	2
C.3	Geothermal surface features	yes, but Hoodoo has very difficult access (no soaking pools due to topography); Klinaklina also difficult access.	3
C.4	Other	many river crossing with salmon, proposed wildlife habitat area for Marbled Murrelet <3km away from proposed transmission/piping.	2
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.00
D.1	Bidding Area	cancelled geothermal lease. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Mt. Silverthrone	
	Nearest community name:	Campbell River	
	Nearest large community:	Vancouver	
	Topographic map sheets (name and code) :	Klinaklini Glacier, 092N05	
	Geological map sheets (name and code)	92N.022	
D.2	Electrical generation potential? competition or collaboration possible from Companies present	yes, geothermal exploration has been undertaken, no development underway, but not favourable economics (see KWL report)	1
D.3	Other claim rights (Mining and/or Oil)	none known	5
E.	**Market**		1.75
E.1	Potential commodities for direct use applications	local forest products (mushrooms, plants, fish and logging); no close population; remote and limited access.	3
E.2	Political stability and community relationship to development	First nations interest; no population close by.	1
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	nothing planned	3
E.4	Renewable energy "green value" for potential development	n/a	0
F.	**Transmission Line Infrastructure**		0.00
F.1	State of the Infrastructure	no close transmission >150 km away	0
F.2	Transmission route (distance, terrain and costs)	would need a submarine cable to bring to site	0
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	geothermal lease expired, could be done under Land Act tenure	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years; Provincial Park	5
H.	**Community Issues**		2.56
H.1	Indigenous Law and Indigenous Development Areas	Da'naxda'xw/Awaetlala First Nation Stage 4 in BC treaty negotiation	3
H.2	Land claims	Nanwakolas and Tl'etinqox-T'in Government Office (Anahim Band) assert territorial rights but not in treaty negotiation.	1
H.3	Community action	Campbell River has a community plan with GHGE reduction target	5
H.4	Surface Rights	crown land; conservancy area	3
H.5	Visual considerations	logging in valley, remote area	2
H.6	Tourism	very limited; remote area	0
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	asserted right in area	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	as above	3
H.9	Traditional use area: archeology sites and other areas of significance	as above	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Mt. Silverthrone	
	Nearest community name:	Campbell River	
	Nearest large community:	Vancouver	
	Topographic map sheets (name and code) :	Klinaklini Glacier, 092N05	
	Geological map sheets (name and code)	92N.022	
I.	**Water rights**		5.00
I.1	availability for proposed development	No existing water licenses	5
I.2	availability for drilling	yes, with a licence	5
J.	**Engineering**		1.20
J.1	Development proposal and design	no development proposed	0
J.2	Construction issues	steep terrain; old logging roads; remote	0
J.3	Transportation issues	access by water/old logging roads	0
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		1.40
K.1	Nearest large community > 50,000	Vancouver (by boat and highway)	3
K.2	nearest community and size	Campbell River population in 2011 was 31,188; access is by boat	1
K.3	Nearest road and condition	marine access to Vancouver Island highway; unpaved logging roads within site distance.	1
K.4	Current access conditions (restrictions)	165 km on existing unpaved roads of unknown condition.	1
K.5	Terrain and distance factor for road building	marine access to Vancouver Island highway; condition of existing roads unknown	1
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Mt. Silverthrone	
	Nearest community name:	Campbell River	
	Nearest large community:	Vancouver	
	Topographic map sheets (name and code) :	Klinaklini Glacier, 092N05	
	Geological map sheets (name and code)	92N.022	
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		0.33
N.1	Spatial concentration of potential customers	very remote location; marine access	0
N.2	Distance to market for prospective commodities	marine access to Vancouver Island highway	1
N.3	Costs to potential customers to receive Direct-use benefits	high due to distance from population	0

OVERALL COMMENTS/ASSESSMENT	Very remote location with no local population; limited tourist activity, very rugged (along the west side of Mount Waddington).

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Nazko Cone	
Nearest community name:	Quesnel	
Nearest large community:	Prince George	
Topographic map sheets (name and code) :	Marmot Lake, 093B13	
Geological map sheets (name and code)	93B.092	

Nazko Cone

A.	**Resource potential**		4.00
A.1	General geological setting	young volcanism nearby and large structures; actual cinder cone is 20 km from Nazko community; in Quesnel, large faults and pozalite locality.	5
A.2	Size/potential/type	small from electrical potential; no defined reservoir	3
A.3	Temperature gradient/ Heat flow data	area of moderate heat flow	5
A.4	Water & Gas chemistry	nearby gas seeps with magmatic signature but likely related to underlying limestone deposits with small magmatic influence	3
A.5	Mineral indicators and/or surface alteration	yes; tufa deposits related to CO2 seeps	3
A.6	Surface thermal features (type, temperature)	cold springs with CO2 seeps	3
A.7	Surface spring flow rates and Resource recharge	very low flow rate reported; but bogs cover a substantial area.	3
A.8	3D permeability (heat exchange potential)	unknown reservoir	3
A.9	Recent magmatism	youngest is Nazko dated at 7,200 yrBP; large volume post glacial flow to the NW of Nazko Cone	5
A.10	Structural setting / seismic / tectonics	young volcanism nearby and large structures mapped	5
A.11	Geophysics (type and interpretation if available)	regional magnetics, gravity and MT as well as seismic exist; geophysics suggest a deep-seated (400 km) low-velocity zone that may be the source of volcanism (substantiates hot spot hypothesis).	5
A.12	Potential Resource host rocks	sedimentary basement rocks	5
A.13	Potential drilling issues	access is by gravel logging roads.	3
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	Young volcanism and CO2 seeps and moderate heat flow in the area suggest that temperatures high enough for Direct-use may be accessible at depths less than 3 km.	5
B.	**Exploration Uncertainty (Risk)**		2.43
B.1	Degree of identification of resources/reserves	no reservoir has been identified	1
B.2	Likelihood of covering Resource with concession	possible; resource review has been carried out but no obvious targets without additional geoscience; private and First Nations land holdings	3
B.3	Expected authorization date	unknown reservoir	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	5-7 years, once permits in place	3
B.5	Degree of previous exploration (can be good or bad)	some exploration (geophysics, geological); no targets generated	2
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	no hot springs, but cold springs and CO2 seeps with magmatic signature.	3
B.7	Exploration to exploitation (Difficult to easy)	good possibility of finding resource of <80C	5
C.	**Environmental Issues**		2.50
C.1	Protected areas (type and classification)	limited within the area of interest, Puntchesakut Lake and Pinnacles Provincial Parks within 2 km of proposed transmission/piping route.	3
C.2	Endangered species	White Sturgeon in Fraser River (proposed transmission/piping route), plants at risk	2
C.3	Geothermal surface features	travertine and CO2 seep used by wildlife	3
C.4	Other	river crossings with fish to access the area	2
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		2.33

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Nazko Cone	
	Nearest community name:	Quesnel	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Marmot Lake, 093B13	
	Geological map sheets (name and code)	93B.092	
D.1	Bidding Area	no geothermal leases; private and First Nations land. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? competition or collaboration possible from Companies present	yes, geothermal exploration has been contemplated, no development underway, but not favourable economics (see KWL report)	1
D.3	Other claim rights(Mining and/or Oil)	proposed resource area is within existing mineral/coal titles.	3
E.	**Market**		3.50
E.1	Potential commodities for direct use applications	local forest products (mushrooms, plants, fish and logging); limited close population; Quesnel driving time ~1.5 hrs.	3
E.2	Political stability and community relationship to development	First nations interest; already invested in a resource review.	5
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	nothing planned; have had resource reviews and expert input	3
E.4	Renewable energy "green value" for potential development	moderate; remote site	3
F.	**Transmission Line Infrastructure**		0.00
F.1	State of the Infrastructure	closest transmission/substation ~100 km away	0
F.2	Transmission route (distance, terrain and costs)	need to upgrade transmission if need for power was high	0
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	geothermal lease expired, could be done under Land Act tenure	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years; Provincial Park	5
H.	**Community Issues**		2.67
H.1	Indigenous Law and Indigenous Development Areas	Nazko First Nation BCTC stage 4	1
H.2	Land claims	asserted territory by Lhtako Dene Nation; Tsilhqot'in National government (not currently in negotiation)	1
H.3	Community action	Nazko Nation involved in 2 resource review studies; Kunkle PhD focused on renewable energy and Aboriginal communities; Quesnel also did review of renewable energy possibilities; local interest in Pozalite deposit and potential for warm waters along major structures.	5
H.4	Surface Rights	private and First Nations	3
H.5	Visual considerations	logging in area	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Nazko Cone	
	Nearest community name:	Quesnel	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Marmot Lake, 093B13	
	Geological map sheets (name and code)	93B.092	
H.6	Tourism	limited tourism; hunting, fishing, cross country skiing.	2
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	First Nations assert ownership	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	as above	3
H.9	Traditional use area: archeology sites and other areas of significance	as above	3
I.	**Water rights**		5.00
I.1	availability for proposed development	1 current water license in the area	5
I.2	availability for drilling	yes, with a licence	5
J.	**Engineering**		1.60
J.1	Development proposal and design	no development proposed	0
J.2	Construction issues	steep terrain; gravel access road subject to washouts.	1
J.3	Transportation issues	gravel road not maintained in winter	1
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		3.80
K.1	Nearest large community > 50,000	Prince George	5
K.2	nearest community and size	Quesnel (local population 10,000; regional adds another 13,000)	2
K.3	Nearest road and condition	paved all weather road maintained in winter; logging roads to more remote sites	5
K.4	Current access conditions (restrictions)	none known, 100 km from Quesnel	2
K.5	Terrain and distance factor for road building	no new roads required	5
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Nazko Cone	
	Nearest community name:	Quesnel	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Marmot Lake, 093B13	
	Geological map sheets (name and code)	93B.092	
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		2.33
N.1	Spatial concentration of potential customers	limited number in local communities;	2
N.2	Distance to market for prospective commodities	paved road maintained in winter	4
N.3	Costs to potential customers to receive Direct-use benefits	limited local population	1

OVERALL COMMENTS/ASSESSMENT	Nazko has undertaken two geothermal reviews; both suggest the possibility of resources sufficient for Direct-use, but limited ability of the community to undertake exploration and development. Funding needed to move ahead with TG drilling to assess regional temperature gradient.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Okanagan	
Nearest community name:	Peachland	
Nearest large community:	Kelowna	
Topographic map sheets (name and code) :	Summerland, 082E12	
Geological map sheets (name and code)	82E.061	

Okanagan

A.	**Resource potential**		3.86
A.1	General geological setting	well known	5
A.2	Size/potential/type	Springbook formation estimated 60m thick over 100 km2 area	5
A.3	Temperature gradient/ Heat flow data	Temperature gradient estimated 50C/km, heat flow estimates 70-85 mW/m2.	5
A.4	Water & Gas chemistry	Angel spring (aka KLO) 23C, Geothermometry calculation up to 137C. HCO3 815 mg/L, Mg 27 mg/L, Cl 4 mg/L.	5
A.5	Mineral indicators and/or surface alteration	Extensive tufa deposits at Angel Spring.	5
A.6	Surface thermal features (type, temperature)	Angel Spring 23C located 50 km NE of Summerland borehole EPB/GSC 495	5
A.7	Surface spring flow rates and Resource recharge	Artesian conditions. 3-10 L/s estimate.	3
A.8	3D permeability (heat exchange potential)	conduction or deep fluid circulation within sedimentary and volcanic formations. Thin permeable interbedded layers, tops of basic lavas, basal conglomerate and along faults.	3
A.9	Recent magmatism	50M ago	0
A.10	Structural setting / seismic / tectonics	Lots of evidence of fracturing/faulting and graben-like structures, overall basin-and-range style setting.	5
A.11	Geophysics (type and interpretation if available)	Regional	3
A.12	Potential Resource host rocks	Likely basal conglomerate, also perhaps breccia lenses in fault zones. Silicate host?	3
A.13	Potential drilling issues	naturally radioactive (heavy metal) minerals present in area previously detected in groundwater	2
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	Extensional environment. Okanagan Valley Fault associated with location of Angel Spring. Last known volcanic (50M ago) deposits preserved in grabens, half-grabens and cauldron-subsidence complexes.	5
B.	**Exploration Uncertainty (Risk)**		2.00
B.1	Degree of identification of resources/reserves	Potential resource, but no viable aquifers identified yet.	1
B.2	Likelihood of covering Resource with concession	Extent of geothermal area requires definition. Angel Spring is within Myra-Bellevue Provincial Park.	1
B.3	Expected authorization date	No geothermal tracts nearby.	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	as soon as permits can be put in place, 5-7 yr.	3
B.5	Degree of previous exploration (can be good or bad)	Geoscientific information exists. Geothermometry studies exist. TG and heat flow data known for general area. A few gradient/exploration wells drilled but dispersed throughout basin areas.	2
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	Likely	5
B.7	Exploration to exploitation (Difficult to easy)	More resource definition required.	2
C.	**Environmental Issues**		2.75
C.1	Protected areas (type and classification)	Wildlife Habitat Area approx. 3 km from potential resource location. Darke Lake Provincial Park ~10 km away.	2
C.2	Endangered species	American Badger, Western Screech-Owl, Prairie Gentian occurrences are along proposed transmission/piping route.	2
C.3	Geothermal surface features	Nearest hot springs approx. 70 km from potential resource area.	5
C.4	Other	Potential transmission/piping line crosses fish bearing streams.	2

APPENDIX D: Geothermal Development Decision Matrix (GDDM) summary and resource areas

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Okanagan	
	Nearest community name:	Peachland	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	Summerland, 082E12	
	Geological map sheets (name and code)	82E.061	
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.00
D.1	Bidding Area	No geothermal tracts nearby. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? competition or collaboration possible from Companies present	KWL report	3
D.3	Other claim rights(Mining and/or Oil)	several mineral/coal titles in the area.	3
E.	**Market**		3.50
E.1	Potential commodities for direct use applications	closest community Summerland. Greenhouses, mushroom drying, forest products etc.	3
E.2	Political stability and community relationship to development	stable, openness to development but favourability to specific direct-use applications unestablished.	3
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	None known.	3
E.4	Renewable energy "green value" for potential development	Communities nearby favourable to green development.	5
F.	**Transmission Line Infrastructure**		0.50
F.1	State of the Infrastructure	closest substation is 23 km away	1
F.2	Transmission route (distance, terrain and costs)	23 km of new 63 kV transmission line along existing paved road.	1
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	could be done under geothermal/Land Act tenure.	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years	5
H.	**Community Issues**		2.89
H.1	Indigenous Law and Indigenous Development Areas	within Westbank Stage 4 BCTC treaty area	1
H.2	Land claims	within Okanagan Nation Alliance (Syilx) asserted territory	1
H.3	Community action	Westbank First Nation provides Land Use Plan for communities in Summerland. Summerland signed onto BC Climate Action Charter.	4
H.4	Surface Rights	treaty and crown land, nearby Provincial Park	3
H.5	Visual considerations	logging areas and roads nearby. Wine country nearby.	5
H.6	Tourism	Summerland has a significant ecotourism industry; four Provincial Park protected areas are within 6 km of the location of the proposed resource area and transmission route. (http://www.summerland.ca/)	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Okanagan	
	Nearest community name:	Peachland	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	Summerland, 082E12	
	Geological map sheets (name and code)	82E.061	
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	Westbank First Nation, Okanagan Nation Alliance	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	Westbank First Nation, Okanagan Nation Alliance	3
H.9	Traditional use area: archeology sites and other areas of significance	Westbank First Nation, Okanagan Nation Alliance	3
I.	**Water rights**		5.00
I.1	availability for proposed development	closest water licenses ~10 km from proposed resource area.	5
I.2	availability for drilling	closest water licenses ~10 km from proposed resource area.	5
J.	**Engineering**		2.60
J.1	Development proposal and design	no planning underway	0
J.2	Construction issues	Short <1km road may be required.	3
J.3	Transportation issues	Access via existing paved roads and unpaved access roads.	4
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		3.40
K.1	Nearest large community > 50,000	Kelowna	5
K.2	nearest community and size	Peachland (pop 5000)	2
K.3	Nearest road and condition	unpaved existing logging road	3
K.4	Current access conditions (restrictions)	unpaved road access to potential resource area	3
K.5	Terrain and distance factor for road building	may require short (<1km) new road, forested, gentle to moderate slope	4
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Okanagan	
	Nearest community name:	Peachland	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	Summerland, 082E12	
	Geological map sheets (name and code)	82E.061	
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		4.00
N.1	Spatial concentration of potential customers	Peachland (pop 5000), Kelowna is major center and close by	4
N.2	Distance to market for prospective commodities	Kelowna (close by)	5
N.3	Costs to potential customers to receive Direct-use benefits	no subsidies, short distances decrease cost.	3

OVERALL COMMENTS/ASSESSMENT	Potential for development with nearby large market (Kelowna). Remote, requires long transmission/piping potentially. Resource requires definition.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Sloquet Creek	
Nearest community name:	Harrison Hot Springs	
Nearest large community:	Maple Ridge	
Topographic map sheets (name and code) :	Stave River, 092G09	
Geological map sheets (name and code)	92G.079	

Sloquet Creek

A.	**Resource potential**		3.07
A.1	General geological setting	well known	5
A.2	Size/potential/type	Unknown, based on assumptions, perhaps 2 km3.	3
A.3	Temperature gradient/ Heat flow data	no current TG data available. Geothermometry suggests 100-110C source waters.	3
A.4	Water & Gas chemistry	water chemistry: 440 ppm SO4, 375 mg/L SO4, Cl=60mg/l	3
A.5	Mineral indicators and/or surface alteration	Opal, gypsum and sinter.	4
A.6	Surface thermal features (type, temperature)	49C-71C for August Jakob's and Sloquet	5
A.7	Surface spring flow rates and Resource recharge	100L/min, better estimate required.	3
A.8	3D permeability (heat exchange potential)	Unknown	3
A.9	Recent magmatism	18-8M yr. ago	0
A.10	Structural setting / seismic / tectonics	Lots of evidence of faulting in the area.	3
A.11	Geophysics (type and interpretation if available)	Regional available. Local resistivity study but did not yield target.	2
A.12	Potential Resource host rocks	not defined, potentially volcanic	3
A.13	Potential drilling issues	popular recreational area	1
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	Location of springs possibly controlled by faulting along creek, water flows from vertical fractures and accompanied by sulfurous odor and sinter deposits.	5
B.	**Exploration Uncertainty (Risk)**		2.86
B.1	Degree of identification of resources/reserves	Surface manifestation but resource not defined. Need to define depths of water <80C.	2
B.2	Likelihood of covering Resource with concession	Mineral titles north and east by gold exploration company. Not located within protected park area. First Nation consultation will be required.	4
B.3	Expected authorization date	unknown	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	5-6 years if not permitting issues.	3
B.5	Degree of previous exploration (can be good or bad)	Gold exploration north of springs, no focus on geothermal reservoir definition.	3
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	River valley is heavily forested but logging activity may provide clearings and access roads.	4
B.7	Exploration to exploitation (Difficult to easy)	Access, community acceptance, active mineral exploration, but reservoir still requires definition	4
C.	**Environmental Issues**		3.00
C.1	Protected areas (type and classification)	Garibaldi and Golden Ears Provincial Parks ~5 km away.	2
C.2	Endangered species	Pygmy Longfin Smelt area 8 km away.	4
C.3	Geothermal surface features	yes, very popular recreational area.	3
C.4	Other	nearest Wildlife Habitat Area (Spotted Owl) ~15 km away, Sloquet creek contains spawning locations for various species of Salmon. Mountain goat habitat ~2 km away. Multiple Mule Deer habitats 2-10 km away.	3
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		3.00
D.1	Bidding Area	No geothermal tracts in the area. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? competition or collaboration possible from Companies present	Hydro-electric development nearby. KWL report.	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Sloquet Creek	
	Nearest community name:	Harrison Hot Springs	
	Nearest large community:	Maple Ridge	
	Topographic map sheets (name and code) :	Stave River, 092G09	
	Geological map sheets (name and code)	92G.079	
D.3	Other claim rights(Mining and/or Oil)	Within mineral/coal title claims.	3
E.	**Market**		3.50
E.1	Potential commodities for direct use applications	Closest community Harrison Lake is small (pop 1500)	3
E.2	Political stability and community relationship to development	First Nations interest, but consultations will be required.	3
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	None known	3
E.4	Renewable energy "green value" for potential development	First Nations interest, but consultations will be required.	5
F.	**Transmission Line Infrastructure**		3.75
F.1	State of the Infrastructure	forestry and hydro-electric access nearby	5
F.2	Transmission route (distance, terrain and costs)	<1 km to Innergex 138 kV transmission line	5
F.3	Wheeling power	n/a	0
F.4	Transmission providers	BC Hydro	5
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	lease has been renewed once; could be done under crown land tenure	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years	5
H.	**Community Issues**		2.89
H.1	Indigenous Law and Indigenous Development Areas	different stages; two groups (In-SHUCK-ch, Stó:lō)	1
H.2	Land claims	within asserted territory areas of In-SHUCK-ch, Stó:lō Nations, St'at'imc Chiefs Council, Sts'ailes band.	1
H.3	Community action	Sloquet hot springs run as joint venture between BC govt and First Nations. Tsek' (Skookumchuck) hot springs nearby run by In-SHUCK-ch Nation.	4
H.4	Surface Rights	treaty and crown land	3
H.5	Visual considerations	lots of forestry and hydro-electric access	5
H.6	Tourism	springs used for bathing.	3
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	In-SHUCK-ch, Stó:lō Nations bands, Lillooet Tribal Council, St'at'imc Chiefs Council and Sts'ailes.	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	In-SHUCK-ch, Stó:lō Nations bands, Lillooet Tribal Council, St'at'imc Chiefs Council and Sts'ailes.	3
H.9	Traditional use area: archeology sites and other areas of significance	In-SHUCK-ch, Stó:lō Nations bands, Lillooet Tribal Council, St'at'imc Chiefs Council and Sts'ailes.	3
I.	**Water rights**		5.00
I.1	availability for proposed development	No water licenses in the area	5
I.2	availability for drilling	Yes, with a water license.	5
J.	**Engineering**		2.80

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Sloquet Creek	
	Nearest community name:	Harrison Hot Springs	
	Nearest large community:	Maple Ridge	
	Topographic map sheets (name and code) :	Stave River, 092G09	
	Geological map sheets (name and code)	92G.079	
J.1	Development proposal and design	no planning underway	0
J.2	Construction issues	nearby access	4
J.3	Transportation issues	nearby access	4
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		3.00
K.1	Nearest large community > 50,000	Maple Ridge, BC	4
K.2	nearest community and size	Harrison Lake, BC (has hot spring resort area)	2
K.0	Nearest road and condition	nearest logging unpaged road within 1 km of resource area. Road to Harrison Hot Springs not maintained in winter.	3
K.4	Current access conditions (restrictions)	Via existing unpaved logging roads. Road to Harrison Hot Springs not maintained in winter.	3
K.5	Terrain and distance factor for road building	No new road construction required, but road to Harrison will need upgrading as it is prone to washouts.	3
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		1.67
N.1	Spatial concentration of potential customers	Harrison Lake, BC (pop 1500), rough road	2

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Sloquet Creek	
	Nearest community name:	Harrison Hot Springs	
	Nearest large community:	Maple Ridge	
	Topographic map sheets (name and code) :	Stave River, 092G09	
	Geological map sheets (name and code)	92G.079	
N.2	Distance to market for prospective commodities	Maple Ridge, BC and lower mainland, but road south is not maintained in winter.	2
N.3	Costs to potential customers to receive Direct-use benefits	no subsidies	1

OVERALL COMMENTS/ASSESSMENT	Undefined resource. Good potential. Recreational area. First Nations nearby are involved and may be interested in further development.

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Sphaler Creek	
Nearest community name:	Iskut	
Nearest large community:	Prince George	
Topographic map sheets (name and code) :	Sphaler Creek, 104G03	
Geological map sheets (name and code)	104G.005	

Sphaler Creek

A.	**Resource potential**		2.43
A.1	General geological setting	Area is remote mountainous region; young and long lived volcanism in Mt. Edziza area.	3
A.2	Size/potential/type	no specific reservoir - isolated hot springs	0
A.3	Temperature gradient/ Heat flow data	none known; area of high heat flow	3
A.4	Water & Gas chemistry	one sample (see geochemistry Appendix D).	3
A.5	Mineral indicators and/or surface alteration	none reported	0
A.6	Surface thermal features (type, temperature)	very hot ~74° C	5
A.7	Surface spring flow rates and Resource recharge	low; unknown	1
A.8	3D permeability (heat exchange potential)	nothing known; likely structurally controlled	1
A.9	Recent magmatism	Stikine volcanic belt (Northern Cordilleran Volcanic Province)	5
A.10	Structural setting / seismic / tectonics	young faulting and volcanism	5
A.11	Geophysics (type and interpretation if available)	regional	1
A.12	Potential Resource host rocks	fractured basement rocks	3
A.13	Potential drilling issues	remote difficult access	1
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	Close proximity to Mt. Edziza; Bowser Basin to the east.	3
B.	**Exploration Uncertainty (Risk)**		1.29
B.1	Degree of identification of resources/reserves	reservoir not identified; likely fractured bedrock	1
B.2	Likelihood of covering Resource with concession	moderate, may be conflict with mineral tracts.	2
B.3	Expected authorization date	no geothermal leases; could be done under crown land tenure	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	once permits in place, 5-7 yr.	3
B.5	Degree of previous exploration (can be good or bad)	Surface sampling, geological mapping	1
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	difficult terrain, need for more infrastructure	1
B.7	Exploration to exploitation (Difficult to easy)	Difficult; little resource information	1
C.	**Environmental Issues**		2.75
C.1	Protected areas (type and classification)	Ecological Reserves and Provincial Parks >12.5 km away.	3
C.2	Endangered species	Northern Mountain Caribou 65 km from proposed resource area.	4
C.3	Geothermal surface features	Sphaler Creek hot springs within 5 km of potential resource area, remote tourism.	3
C.4	Other	remote area; spotted owl, grizzly habitat areas nearby; Fish bearing creeks	1
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		2.33
D.1	Bidding Area	Local mine development may provide potential development. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? competition or collaboration possible from Companies present	possible collaboration with mineral development. Not favourable economics (KWL report)	1
D.3	Other claim rights(Mining and/or Oil)	mineral/coal leases	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Sphaler Creek	
	Nearest community name:	Iskut	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Sphaler Creek, 104G03	
	Geological map sheets (name and code)	104G.005	
E.	**Market**		2.00
E.1	Potential commodities for direct use applications	Locally gathered forest materials and logging	1
E.2	Political stability and community relationship to development	small communities; mining may promote more emphasis on green energy; community protests over some development.	3
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	no development in planning stage	3
E.4	Renewable energy "green value" for potential development	possible due to proximity of mining	1
F.	**Transmission Line Infrastructure**		0.00
F.1	State of the Infrastructure	power to Bob Quinn Lake, >50 km	0
F.2	Transmission route (distance, terrain and costs)	>50 km of new transmission required thru steep forested terrain.	0
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80°C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	no geothermal leases; could be done under crown land tenure	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years	5
H.	**Community Issues**		2.33
H.1	Indigenous Law and Indigenous Development Areas	Tahltan Central council; supports sustainable and responsible business development. Not currently in negotiation with BC Treaty Commission (high uncertainty)	1
H.2	Land claims	asserted claim but not currently in negotiation with BCTC	1
H.3	Community action	Tahltan Nation Development Council. 2005 community action against Shell Canada.	3
H.4	Surface Rights	1910 Declaration of Tahltan tribe; Tahltan resource development policy; treaty and crown land	3
H.5	Visual considerations	remote wilderness area; logging; mining	3
H.6	Tourism	Tourism underexploited	1
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	the Tahltan people look to the land for sustenance, guidance and healing; http://www.tndc.ca/tahltan-people	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	as above	3
H.9	Traditional use area: archeology sites and other areas of significance	as above	3
I.	**Water rights**		5.00
I.1	availability for proposed development	Closest water license ~15km away.	5
I.2	availability for drilling	yes, with a licence	5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Sphaler Creek	
	Nearest community name:	Iskut	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Sphaler Creek, 104G03	
	Geological map sheets (name and code)	104G.005	
J.	**Engineering**		1.60
J.1	Development proposal and design	no planning in progress	0
J.2	Construction issues	remote, steep terrain	1
J.3	Transportation issues	remote location	1
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known; wilderness area	3
J.5	Special construction issues (heat exchanger & full injection)	none known; remote location	3
K.	**Non electrical infrastructure (roads and habitation)**		1.20
K.1	Nearest large community > 50,000	Prince George	4
K.2	nearest community and size	Iskut, Galore Creek, Bob Quinn Lake	2
K.3	Nearest road and condition	Closest road is 30 km away.	0
K.4	Current access conditions (restrictions)	Remote	0
K.5	Terrain and distance factor for road building	30 km of new road thru steep forested terrain	0
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		0.33
N.1	Spatial concentration of potential customers	very remote locations	0

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Sphaler Creek	
	Nearest community name:	Iskut	
	Nearest large community:	Prince George	
	Topographic map sheets (name and code) :	Sphaler Creek, 104G03	
	Geological map sheets (name and code)	104G.005	
N.2	Distance to market for prospective commodities	if mining is viable, potential for cooperation, but new road required	1
N.3	Costs to potential customers to receive Direct-use benefits	high	0

OVERALL COMMENTS/ASSESSMENT	Remote location with limited population and development

GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
AREA OF INTEREST:	Upper Arrow Lake	
Nearest community name:	Revelstoke/Nakusp	
Nearest large community:	Kelowna	
Topographic map sheets (name and code) :	St. Leon Creek, 082K05	
Geological map sheets (name and code)	82K.041	

Upper Arrow Lake

A.	**Resource potential**		3.29
A.1	General geological setting	well known	5
A.2	Size/potential/type	not defined but estimated at 5 km3, low temperature	2
A.3	Temperature gradient/ Heat flow data	32C/km for Columbia River Fault, circulation depth ~4 km	5
A.4	Water & Gas chemistry	Halcyon SO4 400 mg/L, low Mg, Cl; Halfway River, SO4 500 mg/L, low Mg, Cl; Nakusp SO4 300 mg/L, low Mg; St. Leon SO4 560 mg/L, low Mg, Cl.	5
A.5	Mineral indicators and/or surface alteration	none reported	0
A.6	Surface thermal features (type, temperature)	Halcyon 48C, Halfway River 55C, Nakusp 54C, St. Leon 49C, Wilson Lake 30C	5
A.7	Surface spring flow rates and Resource recharge	1-5L/s	3
A.8	3D permeability (heat exchange potential)		3
A.9	Recent magmatism		0
A.10	Structural setting / seismic / tectonics	Lots of evidence of fracturing/faulting and intense folding	5
A.11	Geophysics (type and interpretation if available)	regional	1
A.12	Potential Resource host rocks	Silicate/crystalline schist	5
A.13	Potential drilling issues	potentially a deep resource	2
A.14	Brief description of geological setting of thermal features (i.e. springs emanate from fluvial gravels; beside a river; etc.)	Columbia River Fault along eastern margin of regional extension complex.	5
B.	**Exploration Uncertainty (Risk)**		2.71
B.1	Degree of identification of resources/reserves	low	3
B.2	Likelihood of covering Resource with concession	Likely possible. Halcyon near mining titles.	4
B.3	Expected authorization date	Unknown. No geothermal tracts nearby.	0
B.4	Specific timing of exploration (2 + 2 years, BC 8 years, etc.)	5-7yr, as soon as permits can be put in place	3
B.5	Degree of previous exploration (can be good or bad)	Geoscientific information exists. Geothermometry studies exist. TG and heat flow data known for general area.	2
B.6	Surface Operational capacity (enough stable area for drilling and facilities planned?)	Likely	5
B.7	Exploration to exploitation (Difficult to easy)	Many unknowns but no high risk uncertainty.	2
C.	**Environmental Issues**		2.00
C.1	Protected areas (type and classification)	potential proposed transmission/piping crosses Ungulate Winter Range no harvest zone.	2
C.2	Endangered species	potential proposed transmission runs thru Southern Mountain Caribou and Snow Ramble occurrences.	2
C.3	Geothermal surface features	Nearest hot springs ~10km from potential resource area. 3 other hot springs within ~15 km. Favourable for tourism.	2
C.4	Other	Potential transmission/piping line crosses fish bearing streams.	2
D.	**Geothermal Area - Bidding and/or type of land holding (private/gov/lease/etc.)**		2.33
D.1	Bidding Area	No geothermal tracts nearby. Permission to use Crown land is obtained by application under the Land Act (LA); target would be lower temperature < 80°C resource.	3
D.2	Electrical generation potential? competition or collaboration possible from Companies present	Not favourable economics, KWL report	1
D.3	Other claim rights(Mining and/or Oil)	several mineral/coal titles in the area.	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Upper Arrow Lake	
	Nearest community name:	Revelstoke/Nakusp	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	St. Leon Creek, 082K05	
	Geological map sheets (name and code)	82K.041	
E.	**Market**		3.50
E.1	Potential commodities for direct use applications	closest communities Revelstoke and Nakusp, and Halcyon resort.	3
E.2	Political stability and community relationship to development	stable, but development favourability unknown. Already 2 resorts (Halcyon and Nakusp) may be potential for collaboration or unwanted competition.	3
E.3	Time Limits? (Business agreements, Operating/generating-by deadlines?)	none known	3
E.4	Renewable energy "green value" for potential development	Nearby communities open to favourable green development	5
F.	**Transmission Line Infrastructure**		0.50
F.1	State of the Infrastructure	closest substation is 28 km away	1
F.2	Transmission route (distance, terrain and costs)	28 km of new 69 kV transmission/piping. Flat conditions along lake, but steep, treed terrain in St. Leon creek.	1
F.3	Wheeling power	n/a	0
F.4	Transmission providers	n/a	0
G.	**Laws governing direct-use renewable energy sources**		3.43
G.1	General Criteria of the Geothermal Law	important aspect is the temperature criteria; under 80 C Crown Land Tenure; above geothermal law.	3
G.2	General Criteria of the water resources law	need a water use licence	3
G.3	Direct sales possible	yes, with a licence	3
G.4	Carbon credits	BC Carbon Registry (new, in place 2016), Carbon Tax	4
G.5	Lease time and ability to renew or extend exploration licence	could be done under geothermal/Land Act tenure.	3
G.6	Issues (and timing) related to conversion from exploration to exploitation	If done under a geothermal lease specific work program is required.	3
G.7	Time frame for exploitation licence	Crown land tenure takes weeks to months, depending on the length of tenure requested; lease up to 30 years	5
H.	**Community Issues**		3.00
H.1	Indigenous Law and Indigenous Development Areas	within Ktunaxa territory (BCTC stage 4)	1
H.2	Land claims	within Okanagan Nation Alliance (Syilx), Secwepemc, Sinixt asserted territories	1
H.3	Community action	no FN communities very nearby. Nakusp community plan "The Hot Springs resource is enhanced, protected and economically sustainable"	5
H.4	Surface Rights	treaty and crown land	3
H.5	Visual considerations	logging areas and roads nearby. Halcyon resort area. Hydro-electric reservoir area.	5
H.6	Tourism	Halcyon, Nakusp hot springs are commercial tourist destination. 4 additional non-commercial hot springs are in the area. Large tourist industry due to proximity to Revelstoke and variety of outdoor recreational activities available.	3
H.7	Traditional use area: trapping, hunting, food and medicinal plants, fishing activities	Ktunaxa Nation Council, Okanagan Nation Alliance, Secwepemc Nation	3
H.8	Traditional use area: Community sacred site, gathering place or event sites	Ktunaxa Nation Council, Okanagan Nation Alliance, Secwepemc Nation	3

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Upper Arrow Lake	
	Nearest community name:	Revelstoke/Nakusp	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	St. Leon Creek, 082K05	
	Geological map sheets (name and code)	82K.041	
H.9	Traditional use area: archeology sites and other areas of significance	Ktunaxa Nation Council, Okanagan Nation Alliance, Secwepemc Nation	3
I.	**Water rights**		5.00
I.1	availability for proposed development	no existing water licence within ~10 km of potential resource area	5
I.2	availability for drilling	no existing water licence within ~10 km of potential resource area	5
J.	**Engineering**		1.60
J.1	Development proposal and design	none underway	0
J.2	Construction issues	Remote, steep mountainous terrain, limited existing access via logging roads.	1
J.3	Transportation issues	Limited access via existing unpaved roads in St. Leon Creek valley and paved road to Nakusp substation.	1
J.4	Architectural Issues (blend/hide into environment? Local styles? Etc.)	none known	3
J.5	Special construction issues (heat exchanger & full injection)	none known	3
K.	**Non electrical infrastructure (roads and habitation)**		3.40
K.1	Nearest large community > 50,000	Kelowna	4
K.2	nearest community and size	Revelstoke, Nakusp	2
K.3	Nearest road and condition	unpaved existing logging road	3
K.4	Current access conditions (restrictions)	unpaved road access to potential resource area. Provincial Park nearby.	3
K.5	Terrain and distance factor for road building	no requirements for new roads	5
L.	**Development Finance**		0.00
L.1	Development value (greenhouses; tourism; heating; etc.)		0
L.2	Market price for similar commodities not using direct-use heat		0
L.3	Green power premium for commodity?		0
L.4	Commodity price		0
L.5	Marketing implications		0
L.6	Estimated size of resource		0
L.7	Are there any green use incentives?		0
L.8	Grants		0
L.9	Tax holidays		0
L.10	Tax relief		0
L.11	Loan guarantees		0
L.12	Royalties/Fees		0
L.13	General idea of royalties		0
L.14	Private land owner or government land		0
L.15	Tax rate in the country		0
L.16	Transmission Tariffs		0
M.	**Maps**		5.00
M.1	Regional topographic map showing population centres, roads and other infrastructure including electrical grid and nearest substation and/or generating station. (1:500,000?)		5

	GEOTHERMAL DECISION MATRIX WORKSHEET	Comments	Numerical favourability index
	AREA OF INTEREST:	Upper Arrow Lake	
	Nearest community name:	Revelstoke/Nakusp	
	Nearest large community:	Kelowna	
	Topographic map sheets (name and code) :	St. Leon Creek, 082K05	
	Geological map sheets (name and code)	82K.041	
M.2	Regional map showing land tenure in area – geothermal concessions, mining concessions, private land holds, public or national lands (parks) (1:500,000?)		5
M.3	Regional geological map (1:250 or 500,000?)		5
M.4	Detailed geological map of the immediate area of the concessions (1:50,000 or 100,000)		5
N.	**Other issues and considerations**		2.67
N.1	Spatial concentration of potential customers	Revelstoke (pop 7000), Nakusp (pop 1500)	4
N.2	Distance to market for prospective commodities	Kelowna	3
N.3	Costs to potential customers to receive Direct-use benefits	no subsidies	1

OVERALL COMMENTS/ASSESSMENT	Potential for development but area is somewhat remote with minimal previous exploration of any type.