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April 22, 2008

Via Email
Original via Courier

Ms. Erica M. Hamilton
Commission Secretary
BC Utilities Commission
Sixth Floor, 900 Howe Street, Box 250
Vancouver, BC V6Z 2N3

Dear Ms. Hamilton:

Re: An Application for a CPCN for the Okanagan Transmission Reinforcement (OTR) Project No. 3698488 -Outstanding Information Requests

Please find enclosed 20 copies of FortisBC Inc.'s responses to BCUC IR2 Q80.2 and Q80.3, Harlingten Q5.1, Karow Q9 and Q12, and SOFAR/Wiltse Q10.7 and Q10.8.

Sincerely,

David Bennett
Vice President, Regulatory Affairs
and General Counsel

cc: Registered Intervenors

BCUC IR2

Q80.2 Please provide descriptions of corona emissions and noise as Non-Financial Factors, consistent with the description of other factors in Section 4.3.3 of Exhibit B-1-1.

A80.2 The corona emissions of transmission lines manifest as radio interference and audible noise and have weather dependency – worst during foggy and rainy weather conditions. With good design, installation and maintenance, the emissions from the new lines will be higher but should not be significantly more noticeable than the existing 76 Line. Audible noise will not be intrusive beyond the right-of-way edge in dry weather. In wet weather the noise may be more noticeable at the right-of-way edge but not in neighbouring houses.

All line designs will comply with regulations as noted in response to BCUC IR2 Q80.1.

Description:

1. Corona Emissions (radio frequency) – considers Project compliance with Industry Canada Standards. All alternatives will be within Industry Canada Standards. FortisBC has ranked the alternatives based on the number of conductors, proximity and frequency of passage expected on or immediately adjacent to the right-of-way.

2. Corona Emissions (audible noise) – FortisBC has ranked the alternatives based on the number of conductors, proximity and frequency of passage expected on or immediately adjacent to the right-of-way.

Q80.3 Please provide a comparison of the project alternatives with respect to corona emissions and noise that is similar to Table 4-3-3D, and include Weighting Factors that correspond to those for the other Non-Financial Factors and a discussion explaining the reasons for the numbers that FortisBC assigned to corona emissions and noise.

A80.3 A comparison similar to Table 4-3-3D is shown below as BCUC Table A80.3.

As the impacts are both related to corona emissions, a combined weighting of 5 is used, with audible noise ranked slightly higher for impacts. As the effects of corona emission are linked, as expected there are no differences between the radio frequency and audible noise ratings of a particular alternative.

As the impacts are related to human activity and proximity, the Alternatives that locate the lines Upland (Alternative 2A and 2B) are ranked higher than ones that use the existing right-of-way. For Alternatives that are within the existing right-of-way, the ones with one transmission line or three conductors (Alternative 1C and 3) rank higher than ones with six conductors (Alternative 1A and 1B) for corona emissions.

BCUC Table A80.3: Non Financial Comparison of Route Alternatives –Corona Emissions – Radio Interference and Audible Noise

(1 = lowest ranking: 5 = highest ranking)

	Criterion	Weighting Factors	Alternative 1A Existing Corridor – Single Pole Double Circuit		Alternative 1B Existing Corridor – H-Frame Double Circuit		Alternative 1C Existing Corridor – H-Frame Single High Capacity Circuit		Alternative 2A Upland - Single Pole Double Circuit		Alternative 2B Upland-Two Single Circuits		Alternative 3 Two Single Circuits – One Existing, One Upland	
			Rank	Weighted Rank	Rank	Weighted Rank	Rank	Weighted Rank	Rank	Weighted Rank	Rank	Weighted Rank	Rank	Weighted Rank
1	**Corona Emissions (radio frequency)**	2	2	4	2	4	3	6	5	10	5	10	3	6
2	**Corona Emissions (audible noise)**	3	2	6	2	6	3	9	5	15	5	15	3	9
3	**Total**	5		**10**		**10**		**15**		**25**		**25**		**15**

Harlingten IR1

5. Corona Ion Emissions

Reference:

Q5.1 For all of the options 1A through 3 please indicate the level of Corona Ion emissions on average and at a maximum

A5.1 The calculated corona ion (ozone) emissions are minimal. The worst case conditions occur near to the conductors and results are listed below. For conditions at the right-of-way edge the results were below detectable levels.

Harlingten Table A5.1

Alternative	Ozone Concentration Maximum (parts per billion)
Existing 76Line (161kV)	0.25
Alternative 1A (2A)	3.0
Alternative 1B	2.7
Alternative 1C	1.8
Alternative 2B	2.4
Alternative 3	2.3

Alternatives 1A and 2A are the same line designs; therefore the results are the same.

KAROW IR1

Q9 Please provide the actual calculated magnetic field value numbers at distances of every 5 meters from the centre of the line as far as down to 0.3 milliGauss on a table for all four magnetic field profiles shown on for the present and upgraded lines.

A9 Please see Karow Attachment A9 for the calculated magnetic field value numbers at distances of every five meters from the center of the line down to 0.3 milliGauss for four magnetic field profiles shown for the existing 76 Line and for Alternatives 1A, 1B and 1C. For the double circuit Alternatives 1A and 1B, the calculations are based on opposing phasing configuration to mitigate magnetic fields.

		Magnetic Field vs Distance							
		Existing 76 Line at 161kV		Alternative 1A - Double Circuit Single Pole		Alternative 1B - Double Circuit H-frame		Alternative 1C - Single Circuit High Capacity H-frame	
	Distance from Centre of Right of Way (m)	Average Case (mG)	Maximum Case (mG)	Average Case (mG)	Maximum Case (mG)	Average Case (mG)	Maximum Case (mG)	Average Case (mG)	Maximum Case (mG)
	-300								**0.3**
	-295								0.31
	-290								0.32
	-285								0.33
	-280								0.34
	-275								0.35
	-270								0.37
	-265								0.38
	-260								0.39
	-255								0.41
	-250								0.43
	-245								0.44
	-240								0.46
	-235								0.48
	-230								0.5
	-225								0.53
	-220								0.55
	-215								0.58
	-210								0.6
	-205								0.63
	-200								0.67
	-195		**0.31**						0.7
	-190		0.32						0.74
	-185		0.34						0.78
	-180		0.36				**0.3**		0.82
	-175		0.38				0.32		0.87
	-170		0.4				0.34		0.92
	-165		0.42				0.36		0.98
	-160		0.45				0.38		1.04
	-155		0.48				0.41		1.11
	-150		0.51				0.43		1.18
	-145		0.54				0.46		1.26
	-140		0.58				0.5		1.36
	-135		0.62				0.53	**0.29**	1.46
	-130		0.66				0.58	0.31	1.57
	-125		0.72				0.62	0.34	1.7
	-120		0.77				0.68	0.37	1.84
	-115		0.84				0.74	0.4	2
	-110	**0.31**	0.91				0.81	0.44	2.19
	-105	0.34	0.99				0.89	0.48	2.4
	-100	0.37	1.08				0.98	0.53	2.65
	-95	0.41	1.19				1.09	0.59	2.93
	-90	0.45	1.31				1.21	0.65	3.26
	-85	0.5	1.46			**0.27**	1.36	0.73	3.65
	-80	0.56	1.63			0.31	1.54	0.82	4.12
	-75	0.63	1.83		**0.27**	0.35	1.75	0.93	4.67
	-70	0.71	2.07		0.33	0.4	2.02	1.07	5.35
	-65	0.81	2.36		0.41	0.47	2.35	1.24	6.19
	-60	0.93	2.71		0.51	0.55	2.76	1.45	7.24
	-55	1.09	3.16		0.65	0.66	3.3	1.72	8.58
	-50	1.28	3.72		0.84	0.8	4	2.07	10.33
	-45	1.53	4.44		1.11	0.99	4.97	2.53	12.65
	-40	1.85	5.39	**0.3**	1.51	1.26	6.31	3.17	15.83
	-35	2.29	6.67	0.42	2.11	1.66	8.27	4.07	20.35
	-30	2.91	8.48	0.61	3.07	2.25	11.23	5.4	27
	-25	3.82	11.1	0.93	4.62	3.19	15.93	7.45	37.27
Edge of R/W	-20	5.19	15.1	1.46	7.28	4.71	23.51	10.77	53.83
	-15	7.42	21.58	2.4	11.97	7	34.95	16.23	81.17
	-10	11.25	32.71	4.01	20.04	9.46	47.21	24.56	122.82
	-5	18.03	52.43	6.25	31.23	10.6	52.92	33.26	166.29
Centre of R/W	0	28.44	82.7	7.54	37.63	10.68	53.34	36.64	183.2
	5	36.75	106.87	6.25	31.23	10.6	52.92	33.26	166.29
	10	37.45	108.92	4.01	20.04	9.46	47.21	24.56	122.82
	15	30.59	88.97	2.4	11.97	7	34.95	16.23	81.17
Edge of R/W	20	19.87	57.77	1.46	7.28	4.71	23.51	10.77	53.83
	25	12.31	35.82	0.93	4.62	3.19	15.93	7.45	37.27
	30	8.02	23.34	0.61	3.07	2.25	11.23	5.4	27
	35	5.55	16.15	0.42	2.11	1.66	8.27	4.07	20.35
	40	4.05	11.76	**0.3**	1.51	1.26	6.31	3.17	15.83
	45	3.07	8.92		1.11	0.99	4.97	2.53	12.65
	50	2.4	6.99		0.84	0.8	4	2.07	10.33
	55	1.93	5.61		0.65	0.66	3.3	1.72	8.58
	60	1.58	4.61		0.51	0.55	2.76	1.45	7.24
	65	1.32	3.85		0.41	0.47	2.35	1.24	6.19
	70	1.12	3.26		0.33	0.4	2.02	1.07	5.35
	75	0.96	2.8		**0.27**	0.35	1.75	0.93	4.67
	80	0.83	2.42			0.31	1.54	0.82	4.12
	85	0.73	2.12			**0.27**	1.36	0.73	3.65
	90	0.64	1.87				1.21	0.65	3.26
	95	0.57	1.67				1.09	0.59	2.93
	100	0.51	1.49				0.98	0.53	2.65
	105	0.46	1.34				0.89	0.48	2.4
	110	0.42	1.21				0.81	0.44	2.19
	115	0.38	1.1				0.74	0.4	2
	120	0.35	1.01				0.68	0.37	1.84
	125	0.32	0.92				0.62	0.34	1.7
	130	**0.29**	0.85				0.58	**0.31**	1.57
	135		0.78				0.53		1.46
	140		0.73				0.5		1.36
	145		0.67				0.46		1.26
	150		0.63				0.43		1.18
	155		0.59				0.41		1.11
	160		0.55				0.38		1.04
	165		0.51				0.36		0.98
	170		0.48				0.34		0.92
	175		0.45				0.32		0.87
	180		0.43				**0.3**		0.82
	185		0.4						0.78
	190		0.38						0.74
	195		0.36						0.7
	200		0.34						0.67
	205		0.33						0.63
	210		0.31						0.6
	215		**0.3**						0.58
	220								0.55
	225								0.53
	230								0.5
	235								0.48
	240								0.46
	245								0.44
	250								0.43
	255								0.41
	260								0.39
	265								0.38
	270								0.37
	275								0.35
	280								0.34
	285								0.33
	290								0.32
	295								0.31
	300								**0.3**

Q12 **<u>Comparison chart of magnetic field levels from different appliance sources</u>**

For clear information of affected parties and in order to avoid misunderstandings of EMF levels at various distances from sources mentioned below, please supply a table in good readable format containing

the lowest,
mean, and
highest

reading of the appliances at distances from the sources:
10cm, 30cm, 50cm,1m, 2m, 3m, 5m, 10m, 25m, 50m, 100m, 150m, 200m, 250m, 300m:

a) electric shaver
b) electric toothbrush
c) can opener
d) hair dryer
e) light dimmer switch
f) non-digitale radio alarm clock
g) digitale radio alarm clock, and
h) projected to be upgraded lines

A12 For item h) the following Karow Table A12, is provided for the proposed line upgrade Alternative 1A.

Karow Table A12

Alternative 1A – Distance from Centre of Right of Way (meters)	Average Case (mG)	Maximum Case (mG)
0	7.54	37.63
1	7.48	37.33
2	7.30	36.46
5	6.25	31.23
10	4.01	20.04
25	0.93	4.62
50	0.17	0.84
100	0.02	0.12
150	0.01	0.04
200	0	0.02
250	0	0.01
300	0	0

The NIEHS brochure EMF: Questions & Answers available at the following link http://www.niehs.nih.gov/health/topics/agents/emf/docs/emf2002.pdf at pages 33-34 provides some of the above requested readings pertaining to a) electric shaver, c) can opener, d) hair dryer, f and g) digital and analog clocks. This brochure also includes readings of magnetic fields measured near other sources for which readings were not requested.

SOFAR/Wiltse IR1

Q10.7 Please provide a similar rendering for each of the view lots in the Heritage Hills subdivision with the single pole, double circuit line in place.

A10.7 Please see below the photographs of the existing line and renderings for four representative view lots in the Heritage Hills subdivision with the single pole, double circuit line in place. The proposed structure renderings are based on height of structures determined by preliminary design, final design may identify some change in height relative to existing structures.

SOFAR/Wiltse Attachment A10.7a is from 300 One Quail Place, Attachment A10.7b is from 135 Big Horn Trail, Attachment A10.7c is from 161 Big Horn Trail and Attachment A10.7d is from 260 Heritage Boulevard.

SOFAR/Wiltse Attachment A10.7a

SOFAR/Wiltse Attachment A10.7b

SOFAR/Wiltse Attachment A10.7c

SOFAR/Wiltse Attachment A10.7d

Q10.8 Please provide a similar rendering at Heritage Boulevard in Heritage Hills showing the double circuit section of lines 75 and 76 constructed on H-frame wood poles, identify the height of those poles and explain why that particular height was chosen.

A10.8 Please find below rendering SOFAR/Wiltse Attachment A10.8 showing the double circuit section of 75 Line and 76 Line constructed on H-frame steel flat galvanized poles. The pole height, for physical strength, would require steel structures as opposed to wood. However the steel poles can be supplied with a "pre-weathered" finish which is a rust colour resembling wood.

The proposed structure renderings are based on structure height determined by preliminary design. Final design may identify some change in height relative to existing structures. The above ground height of the pole structure in the centre of the rendering is 37 meters (120 feet). The height of this structure is a function of the higher elevation ground points for the adjacent structures north and south. Per Appendix C page 11, (Exhibit B-1-2), this structure, L76 – 94, is one that possible removal would be assessed during detailed design. However, if determined technically possible, this would increase pole height at the adjacent structures, which may not be favoured by residents.