COPY

September 7, 2005

FortisBC Inc.
5th Floor, 1628 Dickson Avenue
Kelowna, British Columbia
V1Y 9X1

Attention: Mr. Bob Gibney

Osoyoos Indian Band
McKinney Road & 71 Avenue
Oliver, British Columbia

Attention: Chief and Council
Mr. Chris Scott

Re: Proposed Substations and Transmission Line

FortisBC Inc. ("Fortis") and Osoyoos Indian Band, as represented by Chief and Council (the "Band") have entered into discussions with respect to Fortis constructing two electric power substations, transmission and distribution lines and other related works on certain lands within Osoyoos Indian Reserve #1 (the "Project").

The purpose of this letter (the "MOU") is to set out the understanding of Fortis and the Band concerning the terms of the leases and the permits required by Fortis for the Project. Provided that the Band obtains Band membership approval in a referendum vote held pursuant to the *Indian Act* on the terms of the leases and permits set out in this MOU, Fortis and the Band will work cooperatively and expeditiously to seek the grant by Her Majesty the Queen in Right of Canada (the "Crown") of the following instruments to Fortis:

(a) a lease (the "Nk'Mip Substation Lease") of a portion of Osoyoos Indian Reserve #1 (the "Reserve") for the purpose of the construction, operation and maintenance of an electric power substation and ancillary facilities (the "Nk'Mip Substation");

(b) a lease (the "Bentley Terminal Station Lease"), of a portion of the Reserve for the purpose of the construction, operation and maintenance of an electric power substation and ancillary facilities (the "Bentley Terminal Station");

(c) a permit for a linear corridor for transmission and distribution line purposes between the Nk'Mip Substation and the Bentley Terminal Station (the "Transmission Permit"); and

(d) other permits as may be required by Fortis for the Project for access and distribution line purposes as set out in this MOU,

all in accordance with the terms and intent of this MOU, and such other terms and conditions as may be agreed to by the parties, acting reasonably.

The Band agrees, and Fortis acknowledges, that the lands subject to the referendum vote are the Bentley Lands (as defined herein) and the Nk'Mip Lands (as defined herein) and the Band agrees to seek a designation term of 99 years for those lands.

Attached to this MOU are reference plans showing the locations of the Nk'Mip Lands and the Bentley Lands, and the proposed locations of the Transmission Permit Area and the Nk'Mip Access Route (all as defined herein).

The intent of this MOU is to set out with sufficient particularity the details of the transaction contemplated by the parties so that preliminary work may commence. This MOU is not intended to constitute a binding offer or agreement.

The general terms and conditions are as follows:

1. Landlord

The landlord under the proposed Nk'Mip Substation Lease and the Bentley Terminal Station Lease (together, the "Leases") will be the Crown.

2. Tenant

The tenant under the Leases will be Fortis, a corporation established by a Special Act of the Legislature of the Province of British Columbia, having its head office in the City of Kelowna, in the Province of British Columbia.

3. Holder of Permits

The holder of the Transmission Permit and all permits required for the Project (collectively the "Permits") will be Fortis and the grantor of the Permits will be the Crown.

4. Premises

The lands to be demised under the Leases are as follows:

(a) Nk'Mip Substation Lease – a lot containing approximately 1.62 hectares legally described as:

> Similkameen Division of Yale District, in Osoyoos Indian Reserve No. 1, all that part of Lot 196, now known as Lot 196-13 as shown on Plan R.S.B.C. 3998 R recorded in the Canada Lands Survey Records in Ottawa. The registration plan for Lot 196-13 is attached hereto as Schedule "A" (the "Nk'Mip Lands"); and

(b) Bentley Terminal Station Lease – a lot containing approximately 3.51 hectares legally described as:

> Similkameen Division of Yale District, in Osoyoos Indian Reserve No. 1, all of Lot 229 as shown on Plan R.S.B.C. 3995 recorded in the Canada Lands Survey Records in Ottawa. The registration plan for Lot 229 is attached hereto as Schedule "B" (the "Bentley Lands").

The lands (the "Transmission Permit Lands") to be licenced for use under the Transmission Permit will be a linear corridor, approximately 30 meters in width, on the Reserve between the Bentley Lands and the Nk'Mip Lands, the approximate location of which is shown in pink on the plan attached hereto as Schedule "C".

The lands to be licensed for use under all other Permits required for the Project will be as determined by the parties, subject to the terms of this MOU.

The Nk'Mip Lands, the Bentley Lands, the Transmission Permit Lands and all other lands on the Reserve required for the Project are hereinafter collectively referred to as the "Lands".

In consultation with the Band, Fortis will commission, at its sole costs and expense, registrable surveys of the Lands in accordance with the requirements of the Department of Indian Affairs (the "Department") and Natural Resources Canada.

5. Use of Lands

(a) The Nk'Mip Lands and the Bentley Lands are to be used for the construction, operation and maintenance of electrical substations, including all temporary substations, transmission structures, feeder lines, roads, works, fibre optic and telecommunication systems, used and owned by Fortis, and all uses ancillary thereto or necessary therefor, as may be required by Fortis, to operate electrical substations, PROVIDED THAT no transmission towers, such as the one depicted in the photograph attached hereto as Schedule "D" or like tower structures shall be permitted on the Nk'Mip Lands and the Bentley Lands.

(b) The Transmission Permit Lands will be used for the construction, operation and maintenance of electric transmission and distribution lines, fibre optic and telecommunication systems, used and owned by Fortis, and all uses ancillary thereto or necessary therefor, as may be required by Fortis, PROVIDED THAT no transmission towers such as the one depicted in the photograph attached hereto as Schedule "D" or like tower structures shall be permitted on the Transmission Permit Lands. The current plan is that the transmission lines will be strung on approximately 175 poles similar to the pole depicted in the photograph attached hereto as Schedule "E". Fortis will choose a final design or designs for the poles in consultation with the Band. The transmission voltage will not exceed 138 kv without the Band's consent, which consent shall not be unreasonably withheld, and may be conditional upon Fortis paying additional compensation to the Band.

(c) Lands required for other Permits will be used for the purposes detailed below.

For greater certainty, Fortis shall not be permitted to authorize the use of the Lands by third parties, other than by its agents and contractors, without the prior written consent of the Band, which consent may be arbitrarily or unreasonably withheld.

6. Term

The term:

(a) of each of the proposed Leases will be the maximum term permitted under the 99 designation term, less six months, with both Leases commencing no later than March 15, 2007. Fortis would like to include provision in each of the Leases for renewal beyond the 99 year period. Fortis and the Band will enter into an agreement confirming the desire of both parties for Fortis to have an option to renew the Leases (on such terms and conditions to be agreed upon) and confirming that each party will take all reasonable steps to ensure that the Leases are so renewed, at the option of Fortis or its successor, subject to applicable law. If Fortis no longer requires one or both of the Leases, then Fortis will provide a surrender or surrenders as appropriate. The parties agree that Fortis will be deemed to require the Leases so long as Fortis is using the applicable Lands or intending to use the applicable Lands for the purposes set out on the applicable Lease or Leases.

(b) of each of the Permits will expire on the date on which Fortis ceases to require the lands subject to a Permit for the purposes for which the lands are authorized to be used under the applicable Permit. The parties agree that Fortis will be deemed to require the lands for the purposes stipulated in the applicable Permit so long as Fortis is using the lands or intending to use the lands for the stipulated purposes. The commencement date for the Transmission Line Permit will be no later than March 15, 2007.

7. Appraisal, Rent and Fees

Fortis has, at its sole cost and expense, commissioned an appraisal (the "Appraisal") of the Nk'Mip Lands, the Bentley Lands, the Transmission Permit Lands and the Nk'Mip Access Route by an appraiser approved by both parties. The Appraisal has been completed according to highest and best use of the lands being appraised.

The Appraisal has been used to determine the rents to be paid under the Leases (the "Lease Rents") and the fees to be paid under the Transmission Line Permit and the permit required for the Nk'Mip Access Route (the "Permit Fees"). Should the date of the Appraisal be more than 15 months prior to the commencement date of any of the Leases, Transmission Line Permit or the permit for the Nk'Mip Access Route , then the Lease Rent and/or and the Permit Fee, as the case may be, referred to below shall be increased to reflect the cumulative increases in the Consumer Price Index (All Items) for the Province of British Columbia during the period between the date of the Appraisal and the commencement date of the Lease or Permit in question, plus 1%.

Based upon the Appraisal,

(a) the rent payable under the Nk'Mip Substation Lease shall be $700,000;

(b) the rent payable under the Bentley Terminal Station Lease shall be $450,840;

(c) the fee payable for the Transmission Line Permit shall be $1,661,910 on the basis that Fortis will not have exclusive use of the Transmission Permit Lands; and

(d) the fee payable for the permit authorizing the use of the Nk'Mip Access Route will be $187,250.

The total of the above rents and fees is $3,000,000.

The fees payable for the other Permits shall be as set out in paragraphs 9 to 11 below.

The Lease Rents and all fees payable for the Permits shall be fully prepaid on the commencement date of each of the Leases and Permits. For greater certainty, there will be no rent or fee reviews provided for in the Leases or the Permits.

8. The Nk'Mip Access Route

In addition to the foregoing, the Band agrees to support the application by Fortis for an access route permit across portions of the Reserve and other necessary land for purposes of providing its employees, contractors and agents the right to non- exclusive access and egress on, under or over the Nk'Mip Lands (the "Nk'Mip Access Route").. The proposed location of the Nk'Mip Access Route is as shown on the plan attached as Schedule "F". Once the final location has been determined by Fortis and approved by the Band, Fortis will, at its sole cost and expense, commission a survey of the Nk'Mip Access Route in accordance with the requirements of the Department and Natural Resource Canada. Fortis will be responsible for repairing and maintaining, at its own cost, the access route.

As per paragraph 7 above, the fee payable for such access route permit shall be $187,250. In addition to this fee, Fortis agrees to reimburse the Band for any reasonable costs incurred by the Band in relocating six commercial billboards currently located along the Nk'Mip Access Route to the southern boundary of Lot 196, Osoyoos Indian Reserve No. 1, CLSR 84654 or such other proximate location. For greater certainty, Fortis will not pay to the Band any other compensation in connection with these billboards.

9. Right of Way to West Osoyoos Substation

In addition to the foregoing, the Band agrees to support the application by Fortis for a right of way permit for transmission power lines for the new 60 kv tie between the proposed Nk'Mip Substation and the existing West Osoyoos substation. The proposed location of this transmission right of way will be provided by Fortis to the Band for approval, such approval not to be unreasonably witheld. Once approved, Fortis will, at its sole cost and expense, commission a survey of the portion of the Reserve required for the permit in accordance with the requirements of the Department and Natural Resources Canada.

The fee payable for the permit described in this paragraph shall be calculated based on the same per acreage value rate of the Nk'Mip Lands, as discounted by 11.1%, and adjusted based on CPI in accordance with paragraph 7 above, if the commencement date of this permit shall be more than 15 months after the date of the Appraisal.

10. Distribution Rights of Way to Osoyoos and the Reserve

In addition to the foregoing, the Band agrees to support the application by Fortis for a right of way permit for distribution power lines feeders ("Feeders") providing power from the Nk'Mip Substation and the Bentley Terminal Station to load points within the Reserve and off the Reserve, subject to the parties' agreement on the fees, if any, payable for such permit for the Feeders on Reserve. The proposed location of these Feeders on Reserve will be provided by Fortis to the Band for approval, such approval not to be unreasonably withheld on the understanding that the Band will require some of the Feeders to be buried underground. Once approved, Fortis will, at its sole cost and expense, commission a survey of the portion of the Reserve required for the permit in accordance with the requirements of the Department and Natural Resources Canada. For this purpose, Fortis and the Band will utilize the Blanket Agreement provided that it is acceptable to both parties; if not, then the parties will work cooperatively to seek the grant of an appropriate permit by the Crown to Fortis.

11. Widening of Existing Rights of Way

Fortis has existing right of way permits pursuant to Section 28(2) of the *Indian Act* (Canada) in respect of a portion of the Reserve in respect of the Bentley Terminal Station. If Fortis determines, acting reasonably, that the existing right of way permit corridors need to be widened, subject to the Band's approval of the location, such approval not to be unreasonably withheld and the additional width required and the parties' agreement on the fees payable for the extra lands required by Fortis, Fortis and the Band shall work cooperatively and expeditiously together to request the Crown to grant an amendment to the existing right of way permits to widen the right of way corridors. The fee for the additional width required shall be based upon an appraisal of the additional width, which appraisal shall be commissioned by Fortis at its sole cost and expense, based on terms of reference agreed to by the Band and Fortis, and approved by the Department.

12. Environmental/Archaeological

Fortis will, at its sole cost and expense, conduct all required environmental and archaeological impact assessments of the Project on the Lands, as may be required by law, including the *Canadian Environmental Assessment Act* and provide copies of all such reports to the Band and the Department for approval. If Fortis proceeds with the Project, it acknowledges that it will be required to comply with all mitigation measures flowing from such reports as may be required by the Crown or the Band.

13. Fire Protection, Water and other Utilities

The Band agrees to negotiate with the Town of Osoyoos to have the Nk'Mip Lands included in the Fire Protection Area currently provided under contract between the Town of Osoyoos and the Band. The Band agrees to negotiate with the Town of Oliver to have the Bentley Lands included in the Fire Protection Area currently provided under contract between the Town of Oliver and the Band.

The Band further agrees to work cooperatively with Fortis to have water and other utilities brought to the boundary of the Nk'Mip Lands and the Bentley Lands as required by Fortis, at Fortis's sole cost and expense.

14. Taxation

(a) The Band agrees that the annual taxation rate to be applied to the Nk'Mip Lands and improvements will be the same annual taxation rate charged for similar property and improvements within the Town of Osoyoos for the corresponding taxation year.

(b) The Band agrees that the annual taxation rate to be applied to the Bentley Lands and improvements will be the same annual taxation rate charged for similar property and improvements within the Town of Oliver for the corresponding taxation year.

(c) The Band agrees that two annual taxation rates will apply to the Transmission Permit Area and improvements. The demarcation of these two taxation distrctions is the bold line (the "Demarcation") shown on the plan attached hereto as Schedule "G". That portion of the Transmission Permit Area and improvements south of the Demarcation will be subject to the annual taxation rate charged for similarly classified property and improvements within the Town of Osoyoos for the corresponding taxation year and the portion of the Transmission Permit Area and improvements north of the Demarcation will be subject to the annual taxation rate charged for similar classified property and improvements within the Town of Oliver for the corresponding taxation year. The foregoing is subject to the Band confirming that an amendment of its taxation by-law is possible to allow for a division of the Reserve into two taxation districts with different taxation rates.

(d) All other lands and improvements subject to the other Permits north of the Demarcation will be subject to the same annual taxation rates as those charged by the Town of Oliver for similarly classified lands and improvements for the corresponding taxation year, and the remaining lands and improvements subject to the other Permits south of the Demarcation will be subject to the same annual taxation rates as those charged by the Town of Osoyoos for similarly classified lands and improvements for the corresponding taxation year. The foregoing is subject to the Band confirming that an amendment of its taxation by-law is possible to allow for a division of the Reserve into two taxation districts within different taxation rates.

Fortis agrees that if it decommissions all of its works within a permit area with the intention that new works will be constructed within the permit area at a later date, Fortis will pay to the Band an annual amount equal to the annual real property taxes that would otherwise have been payable by Fortis to the Band had the works not be decommissioned, for as long as the construction of the new works is not complete.

15. Conceptual Drawings

Prior to commencing any construction, Fortis agrees to provide a conceptual rendering of the proposed Nk'Mip Substation, the Bentley Terminal Station, the Transmission Permit Area, showing access routes, transmission lines, structures to be built on the Lands, proposed lighting, proposed building materials, proposed heights of structures, colour schemes and landscaping in a form allowing the Band Council to visually acknowledge the scope of the Project and to confirm that the Project will proceed in the manner and on the terms and conditions agreed to between Fortis and the Band.

16. Condition in favour of Fortis

As set out in the fourth paragraph hereof, this MOU is not intended to constitute a binding offer or agreement. Without in any way derogating from this intent, if the parties do, in the future, enter into a binding agreement, the obligation of Fortis to proceed in the future with any of the transactions contemplated by this MOU will be subject to Fortis receiving all necessary licences, easements, rights of way, permits and approvals necessary to complete the Project contemplated herein including, without limitation, approval of the British Columbia Utilities Commission.

17. Further Assurances

Each of Fortis and the Band will do all such further documents as may be necessary or desirable in order to give full effect to the intent of this MOU.

Agreed to by Fortis and the Band:

FortisBC Inc.
by its authorized signatory

Per: ______________________
Authorized Signatory

Date: September 7, 2005

Osoyoos Indian Band
by its authorized signatory

Per: ______________________
Authorized Signatory

Date: Sept 7/05

SCHEDULE "A"

Plan of Nk'Mip Lands

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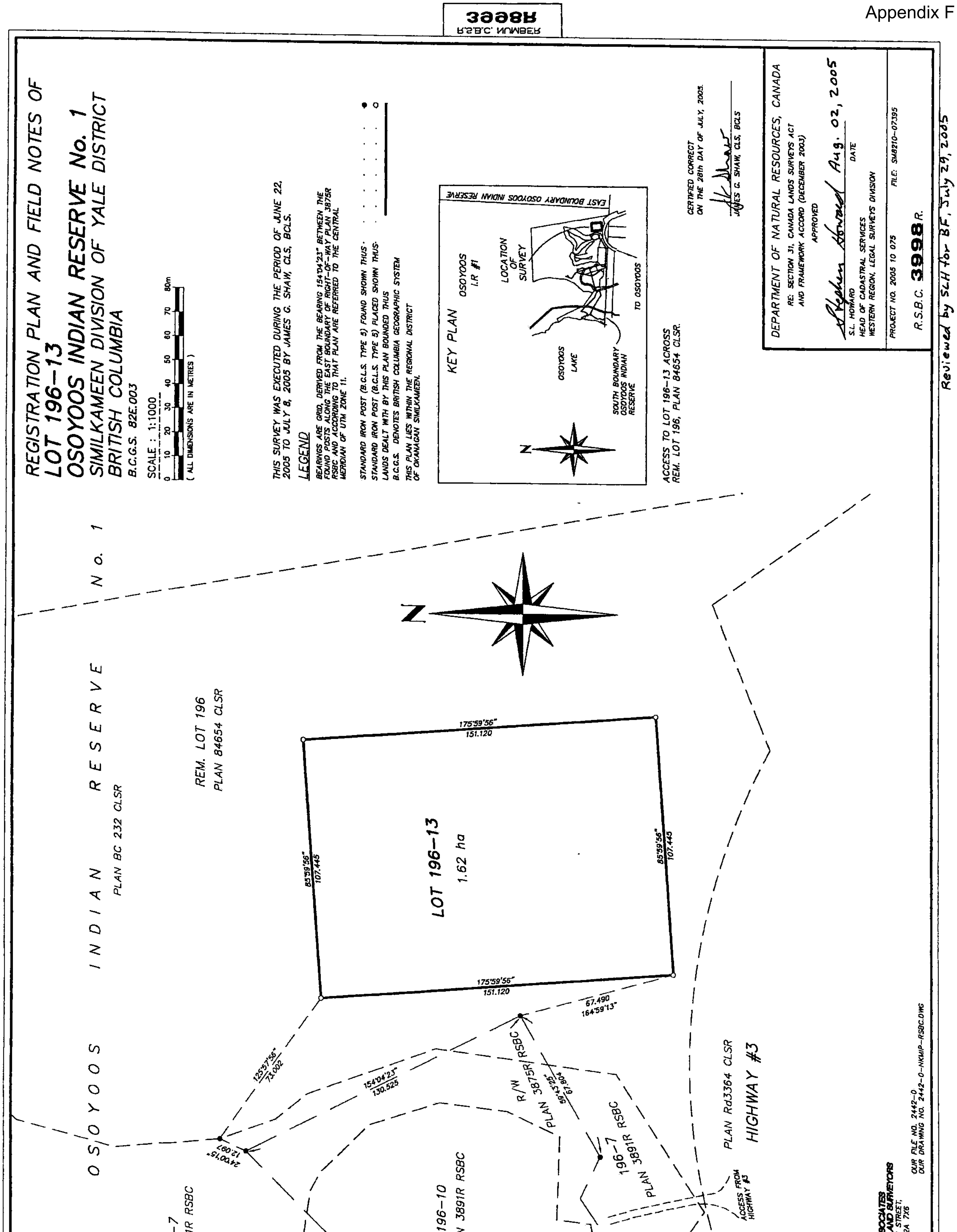
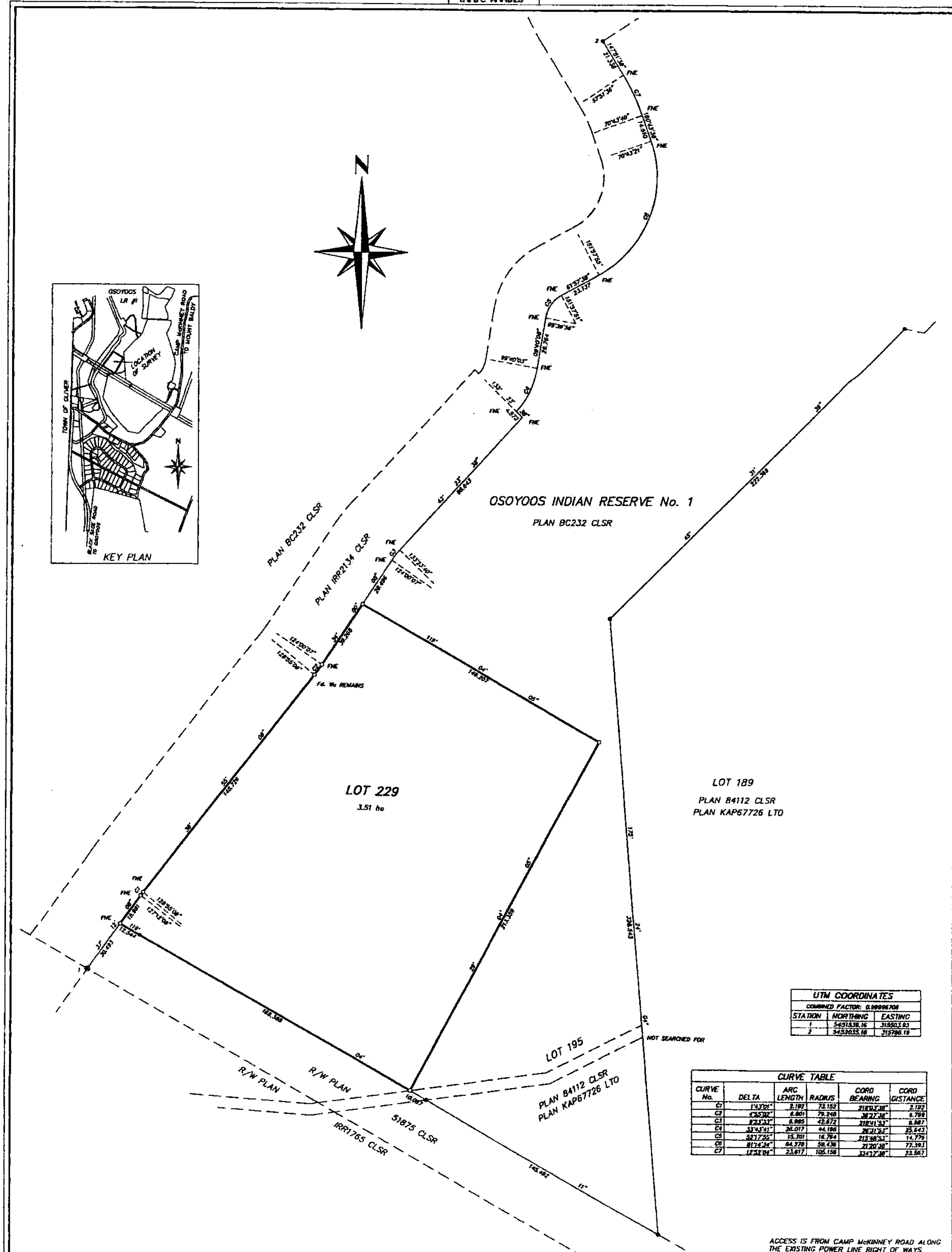

3998R
R.S.B.C. NUMBER
REGISTRATION PLAN AND FIELD NOTES OF
LOT 196-13
OSOYOOS INDIAN RESERVE No. 1
SIMILKAMEEN DIVISION OF YALE DISTRICT
BRITISH COLUMBIA
B.C.G.S. 82E.003
SCALE : 1:1000
0 10 20 30 40 50 60 70 80m
(ALL DIMENSIONS ARE IN METRES)
THIS SURVEY WAS EXECUTED DURING THE PERIOD OF JUNE 22, 2005 TO JULY 8, 2005 BY JAMES G. SHAW, CLS, BCLS.
LEGEND
BEARINGS ARE GRID, DERIVED FROM THE BEARING 154°04'23" BETWEEN THE FOUND POSTS ALONG THE EAST BOUNDARY OF RIGHT-OF-WAY PLAN 3875R RSBC AND ACCORDING TO THAT PLAN ARE REFERRED TO THE CENTRAL MERIDIAN OF UTM ZONE 11.
STANDARD IRON POST (B.C.L.S. TYPE 5) FOUND SHOWN THUS
STANDARD IRON POST (B.C.L.S. TYPE 5) PLACED SHOWN THUS
LANDS DEALT WITH BY THIS PLAN BOUNDED THUS
B.C.G.S. DENOTES BRITISH COLUMBIA GEOGRAPHIC SYSTEM
THIS PLAN LIES WITHIN THE REGIONAL DISTRICT OF OKANAGAN SIMILKAMEEN.
KEY PLAN
OSOYOOS I.R #1
LOCATION OF SURVEY
EAST BOUNDARY OSOYOOS INDIAN RESERVE
OSOYOOS LAKE
SOUTH BOUNDARY OSOYOOS INDIAN RESERVE
TO OSOYOOS
ACCESS TO LOT 196-13 ACROSS REM. LOT 196, PLAN 84654 CLSR.
CERTIFIED CORRECT ON THE 28th DAY OF JULY, 2005.
JAMES G. SHAW, CLS, BCLS
DEPARTMENT OF NATURAL RESOURCES, CANADA
RE: SECTION 31, CANADA LANDS SURVEYS ACT AND FRAMEWORK ACCORD (DECEMBER 2003)
APPROVED
Aug. 02, 2005
S.L. HOWARD
HEAD OF CADASTRAL SERVICES
WESTERN REGION, LEGAL SURVEYS DIVISION
DATE
PROJECT NO. 2005 10 075
FILE: SM8210-07395
R.S.B.C. 3998 R.
Reviewed by SLH for BF, July 29, 2005
OSOYOOS INDIAN RESERVE No. 1
PLAN BC 232 CLSR
REM. LOT 196
PLAN 84654 CLSR
175°59'56"
151.120
85°59'56"
107.445
LOT 196-13
1.62 ha
67.490
164°59'13"
125°57'56"
73.002
154°04'23"
130.525
59°43'25"
61.804
12.097
240°0'15"
R/W PLAN 3875R RSBC
196-7 PLAN 3891R RSBC
196-10 PLAN 3891R RSBC
PLAN Rd3364 CLSR
HIGHWAY #3
ACCESS FROM HIGHWAY #3
McELHANNEY ASSOCIATES
PROFESSIONAL LAND SURVEYORS
#102-123 MARTIN STREET,
PENTICTON, B.C. V2A 7X6
TEL: 492 - 7399
FAX: 492 - 5488
OUR FILE NO. 2442-0
OUR DRAWING NO. 2442-0-NKMIP-RSBC.DWG

SCHEDULE B

Plan of Bentley Lands

R.S.B.C. NUMBER 3999R



UTM COORDINATES		
COMBINED FACTOR: 0.99996706		
STATION	NORTHING	EASTING
1	5451538.16	315503.93
2	5452035.18	315786.19

CURVE TABLE					
CURVE No.	DELTA	ARC LENGTH	RADIUS	CORD BEARING	CORD DISTANCE
C1	1°43'01"	2.192	73.152	218°03'38"	2.192
C2	4°55'02"	6.801	79.248	38°27'38"	6.799
C3	9°23'33"	6.995	42.672	218°41'53"	6.987
C4	33°43'41"	26.017	44.196	26°31'53"	25.643
C5	52°17'55"	15.301	16.764	215°40'53"	14.776
C6	81°14'34"	84.278	59.436	21°20'38"	77.393
C7	12°52'04"	23.617	105.156	334°17'38"	23.567

ACCESS IS FROM CAMP McKINNEY ROAD ALONG THE EXISTING POWER LINE RIGHT OF WAYS.

REGISTRATION PLAN AND FIELD NOTES OF LOT 229 OSOYOOS INDIAN RESERVE No. 1

SIMILKAMEEN DIVISION OF YALE DISTRICT
BRITISH COLUMBIA

B.C.G.S. 82E.013

SCALE : 1:1000

0 10 20 30 40 50 60 70 80m

(ALL DIMENSIONS ARE IN METRES)

THIS SURVEY WAS EXECUTED DURING THE PERIOD JUNE 1, 2005 TO JULY 8, 2005 BY JAMES G. SHAW, C.L.S., B.C.L.S.

LEGEND

BEARINGS ARE GRID, DERIVED FROM GPS OBSERVATIONS TO CANADIAN ACTIVE CONTROL STATION DRAO, CCM# 887006 AND ARE REFERRED TO THE CENTRAL MERIDIAN THROUGH U.T.M. ZONE 11.

STANDARD IRON POST (B.C.L.S. TYPE 5) FOUND SHOWN THUS . . . . . . ●
STANDARD IRON POST (B.C.L.S. TYPE 5) PLACED SHOWN THUS . . . . . ○
NON-STANDARD IRON BAR FOUND SHOWN THUS . . . . . . ◉
LANDS DEALT WITH BY THIS PLAN BOUNDED THUS ———
B.C.G.S. DENOTES BRITISH COLUMBIA GEOGRAPHIC SYSTEM

THIS PLAN LIES WITHIN THE REGIONAL DISTRICT OF OKANAGAN SIMILKAMEEN.

McELHANNEY ASSOCIATES
PROFESSIONAL LAND SURVEYORS
102-123 MARTIN STREET,
PENTICTON, B.C. V2A 7X6
TEL. 492 - 7399
FAX 492 - 5488

LTO CLIENT# 10613
OUR FILE NO. 2442-0
OUR DRAWING NO. 2442-0-BENTLEY-RSBC.DWG

CERTIFIED CORRECT
ON THE 28th DAY OF JULY, 2005.

JAMES G. SHAW, C.L.S., B.C.L.S.

DEPARTMENT OF NATURAL RESOURCES, CANADA
RE: SECTION 31, CANADA LANDS SURVEYS ACT AND FRAMEWORK ACCORD (DECEMBER 2003)
APPROVED

Stephen Howard Aug. 02, 2005
S.L. HOWARD — DATE
HEAD OF CADASTRAL SERVICES
WESTERN REGION, LEGAL SURVEYS DIVISION

PROJECT NO. 2005 10 076 — FILE: SM8210-07395

R.S.B.C. 3999R.

Reviewed by SLH for BF, July 29, 2005

OK /BF/ AUG 2 2005

R.S.B.C. NUMBER 3999R

SCHEDULE "C"

Plan of Transmission Permit Lands

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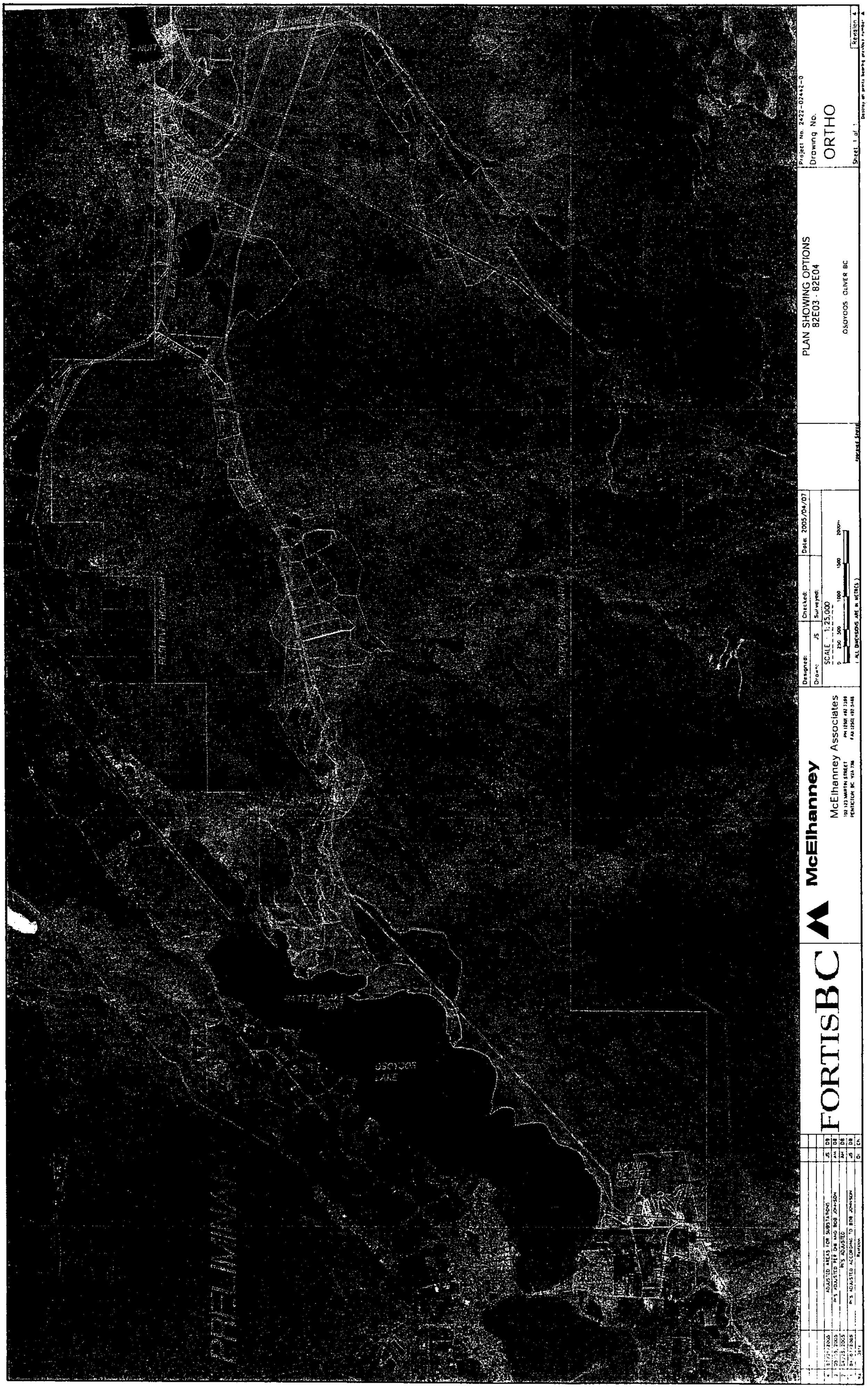
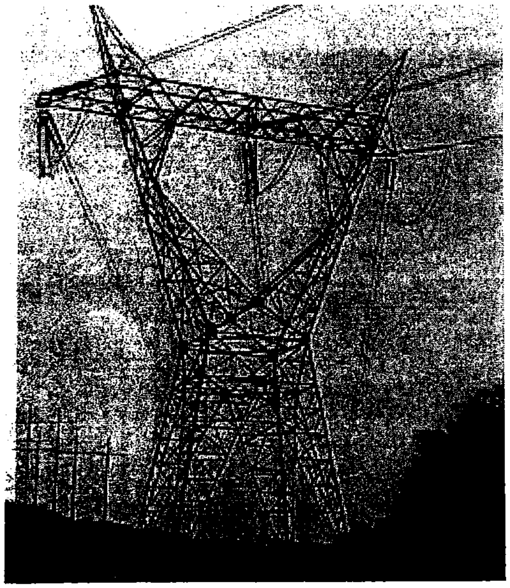
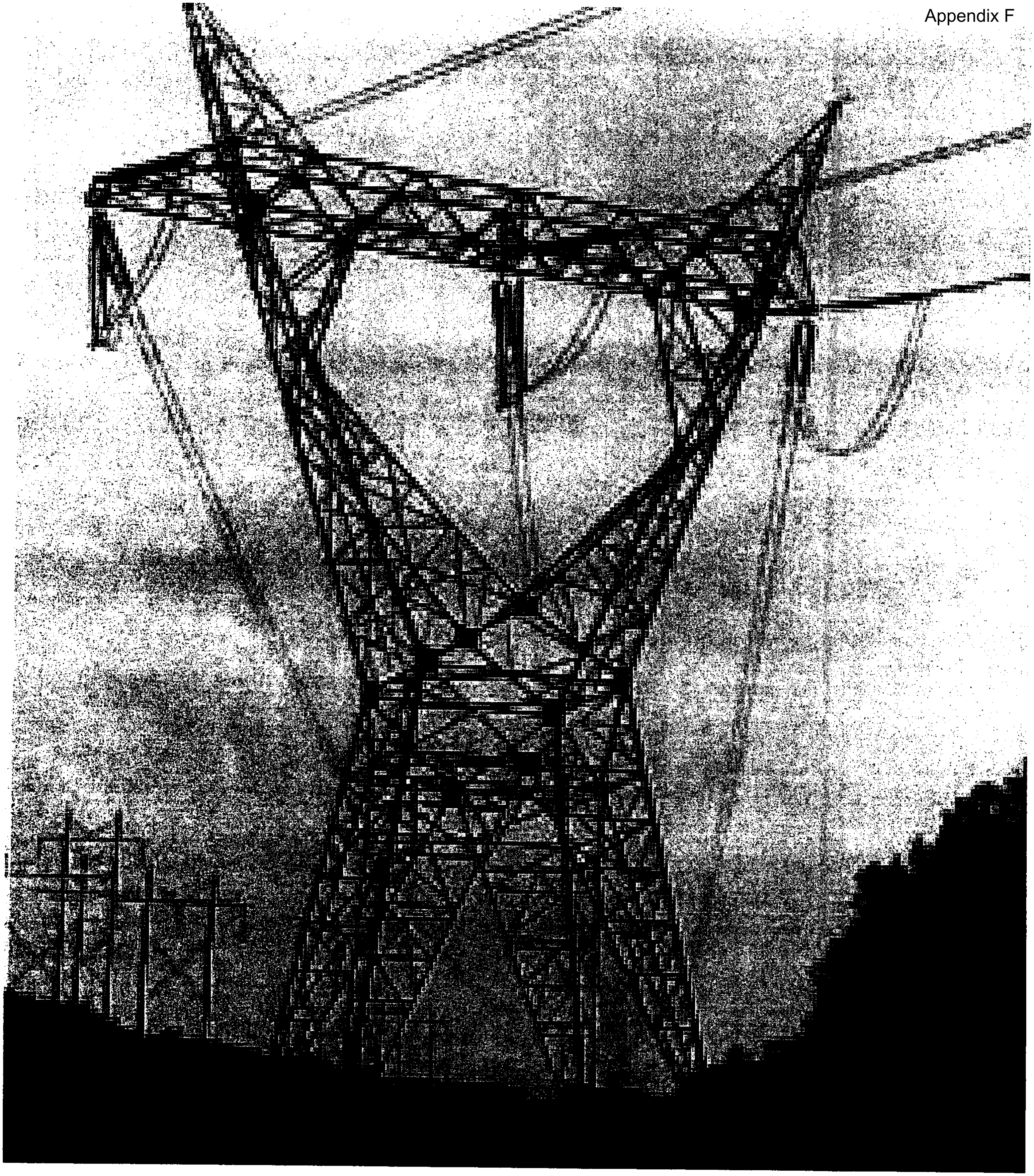

PLAN SHOWING OPTIONS
82E03 · 82E04
OSOYOOS OLIVER BC
Drawing No.
ORTHO
Date 2005/04/07
SCALE 1:25,000
McElhanney
McElhanney Associates
FORTISBC
OSOYOOS LAKE

SCHEDULE "D"

Photograph of Transmission Tower

f:\snarch\clients\7328.002\letter of intent\v10clean(jy).doc\ak

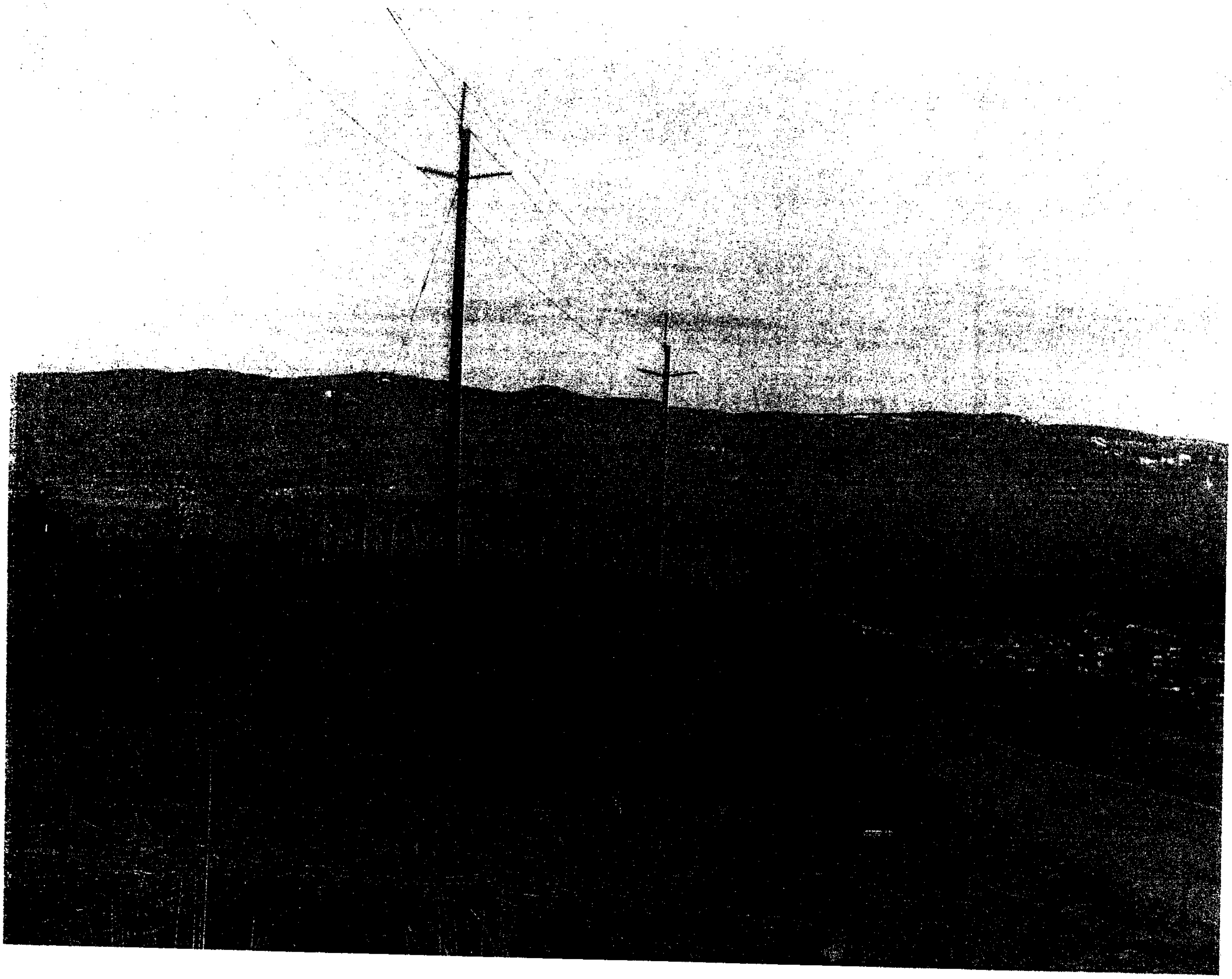




SCHEDULE "E"

Photograph of Pole Structure

f:\snarch\clients\7328.002\letter of intent\v10clean(jy).doc\ak



SCHEDULE "F"

Plan of Nk'Mip Access Route

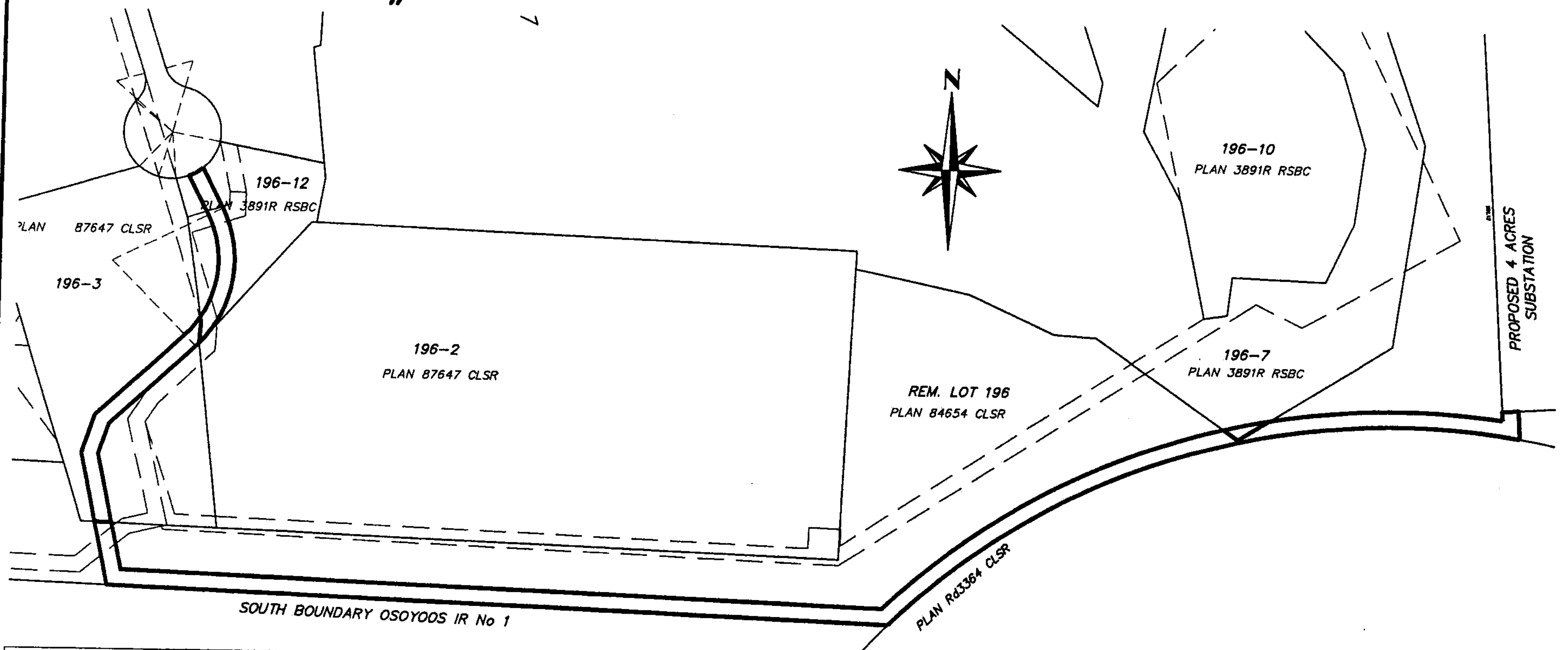
f:\snarch\clients\7328.002\letter of intent\v10clean(jy).doc\ak

SKETCH PLAN OF PROPOSED ACCESS ROAD FOR FORTIS BC, OVER OSOYOOS IR #1.

SCALE : 1: 1500

0 10 20 40 60 80 100m

(ALL DIMENSIONS ARE IN METRES)

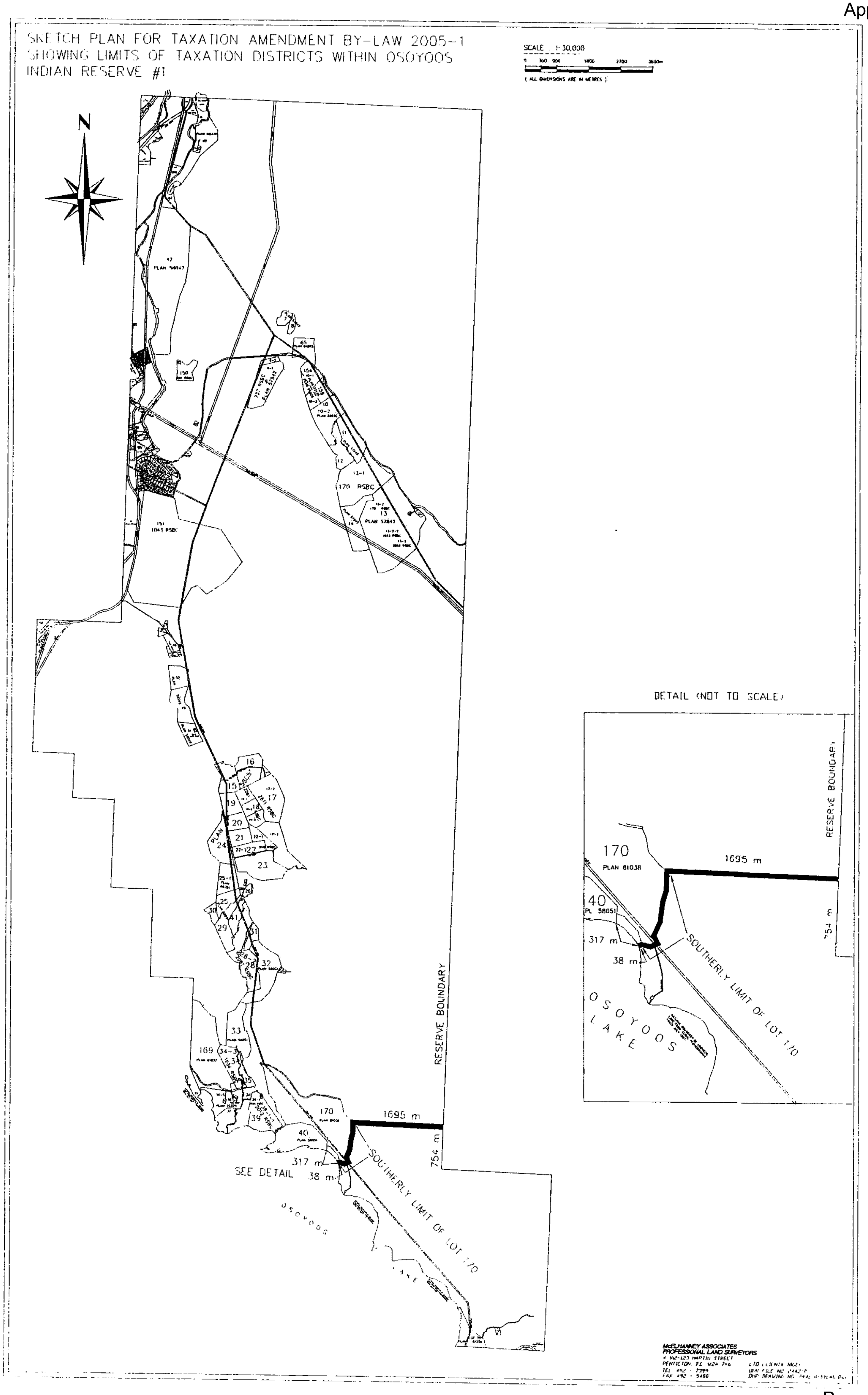


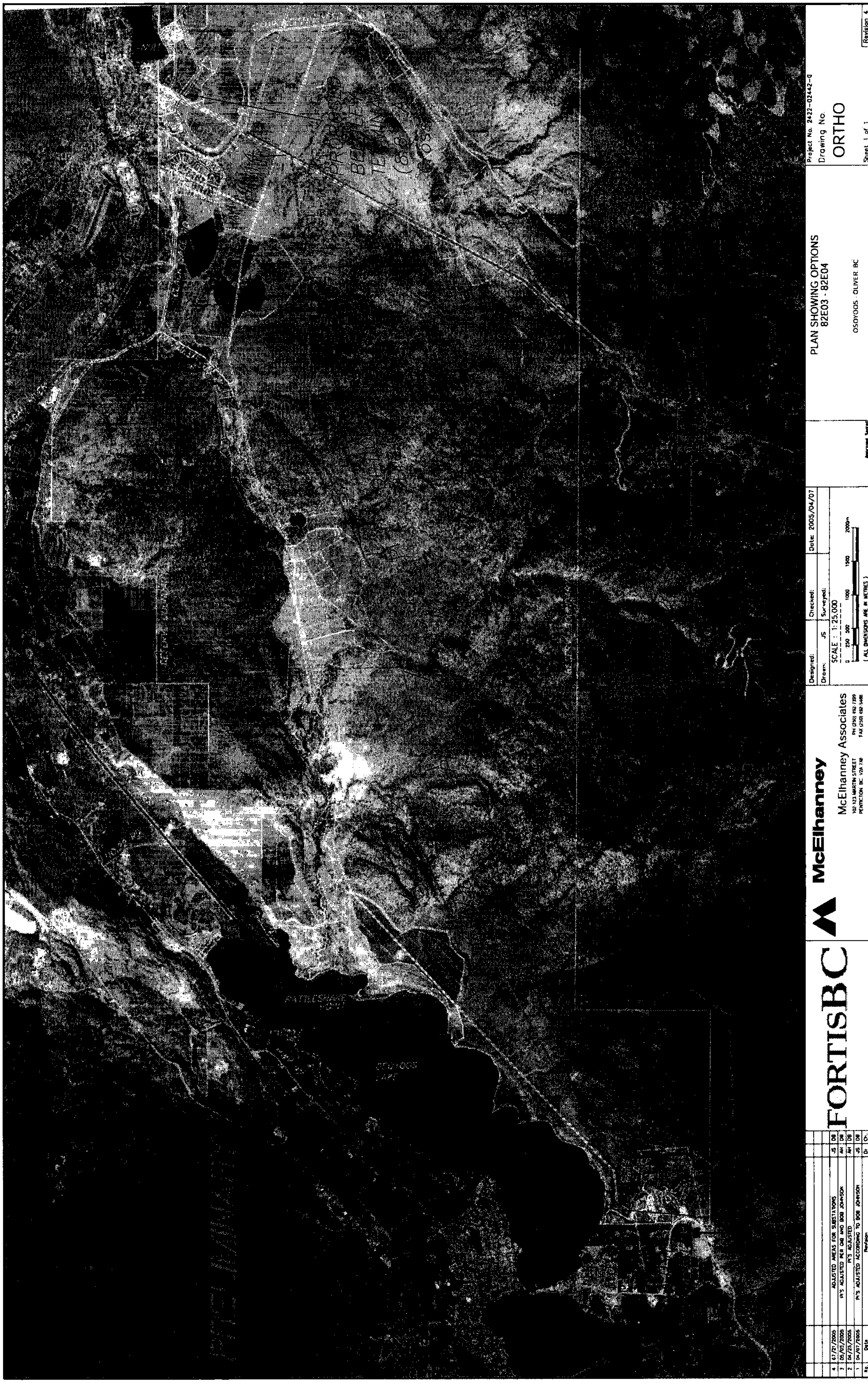
BOOK OF REFERENCE	
DESCRIPTION	AREA
LOT 196-3, PLAN 87647 CLSR	543 sq. m
LOT 196-12, PLAN 3891R RSBC	388 sq. m
REMAINDER OF LOT 196, PLAN 84654 CLSR	3373 sq. m
LOT 196-7, PLAN 3891R RSBC	44 sq. m
TOTAL AREA REQUIRED FOR ACCESS RIGHT OF WAY	4348 sq. m

McELHANNEY ASSOCIATES
PROFESSIONAL LAND SURVEYORS
102-123 MARTIN STREET,
PENTICTON, B.C. V2A 7X6
TEL: 492 - 7399
FAX: 492 - 5488
OUR FILE NO. 2442-0
OUR DRAWING NO. 2442-0-ROAD-2005-05-20.DWG

SCHEDULE "G"

Plan Showing Demarcation Line of the Two Proposed Taxation Districts within Osoyoos Indian Reserve No. 1


SKETCH PLAN FOR TAXATION AMENDMENT BY-LAW 2005-1
SHOWING LIMITS OF TAXATION DISTRICTS WITHIN OSOYOOS
INDIAN RESERVE #1
SCALE 1:30,000
N
RESERVE BOUNDARY
170
40
1695 m
754 m
317 m
38 m
SEE DETAIL
SOUTHERLY LIMIT OF LOT 170
DETAIL (NOT TO SCALE)
PLAN 81038
PL 58051
RESERVE BOUNDARY
OSOYOOS LAKE
McELHANEY ASSOCIATES
PROFESSIONAL LAND SURVEYORS



4 07/21/2005 ADJUSTED AREAS FOR SUBSTATIONS JS DB
3 05/05/2005 PI'S ADJUSTED PER DB AND BOB JOHNSON AH DB
2 04/25/2005 PI'S ADJUSTED AH DB
1 04/07/2005 PI'S ADJUSTED ACCORDING TO BOB JOHNSON JS DB
No. Date Revision Dr. Ch.
FORTISBC
McElhanney
McElhanney Associates
Designed: Checked: Date: 2005/04/07
Drawn: JS Surveyed:
SCALE : 1: 25,000
0 250 500 1000 1500 2000m
(ALL DIMENSIONS ARE IN METRES)
PLAN SHOWING OPTIONS
82E03 - 82E04
OSOYOOS - OLIVER BC
Project No. 2422-02442-0
Drawing No.
ORTHO
Sheet 1 of 1
Revision 4

1.0 COST ESTIMATES

1.1 EXISTING RIGHT OF WAY COST ESTIMATES: ROUTE ALTERNATIVES 1A AND 1B

Alternatives 1A and 1B are preliminary design cost estimates (+20 / -10%).

Both estimates include planning, environmental, consultation, properties, engineering, project and construction management, procurement, construction and commissioning for:

Bentley Terminal Station (BEN):
This component requires the construction of a new station at Oliver, BC adjacent to the existing Oliver Terminal station to connect 230 kV from Vaseux Terminal station to 63 kV for the local load, a 161 kV tie line to the FortisBC system at Warfield and a 138 kV line to Keremeos and Princeton.

RG Anderson Terminal Station (RGA):
The existing station is built to 230 kV standards and part of it is operated at 230 kV for a line north from Kelowna. The reminder is operated at 161 kV and requires conversion to 230 kV operation. This conversion involves adding three 230 kV, 2000A dead tank circuit breakers, replacement of the existing Transformer 2 with a new 230/63/25 kV auto power transformer and adding a 63 kV, 2000A dead tank 70 circuit breaker to split 63 kV bus.

Vaseux Lake Terminal Station (VAS):
The low voltage portion of Vaseux Lake terminal station is operated at 161 kV. This segment requires its complete conversion to 230 kV. In order to make this conversion additional equipment is required which includes: Two 230 kV circuit breakers, three 230 kV motor operated disconnect switches, two 230 kV manually operated disconnect

switches, five set of three 230 kV current voltage transformers (CVTs), six sets of three 230 kV surge arresters and related civil, electrical, protection and control works.

Oliver Terminal Station (OLI):

Oliver Terminal station presently connects 161 kV to 63 kV and 138 kV plus a small 13 kV distribution station. In this component the major transformation is to be removed, converting to a 63 kV switching station plus a new 63-13 kV distribution station.

FA Lee Terminal Station (LEE):

An addition of a 20 MVAR, 138 kV shunt capacitor bank and related switching equipment.

DG Bell Terminal Station (BELL):

An addition of a 20 MVAR, 138 kV shunt capacitor.

VAS to RGA 230 kV Transmission Line, Double Circuit Single Steel Poles:

The new transmission line to replace the existing 161 kV single circuit will be comprised of double circuits 230 kV AC transmission lines from Vaseux Lake Terminal station (VAS) near Okanagan Falls to RG Anderson (RGA) Terminal station in Penticton. The existing ROW will be used for this work. The length of the transmission line would be approximately 28 kilometres.

Vaseux Lake Terminal station to New Bentley Terminal station 230 kV Alternative Circuit Transmission Line, Single Circuit Steel Poles:

The new transmission line to replace the existing 161 kV single circuit will be comprised of single circuit 230 kV transmission lines from Vaseux Lake Terminal station to the new Bentley Terminal station. The length of the transmission line would be approximately 11 kilometres.

63 kV, 138 kV, and 138 kV Re-Termination Work presently into Oliver Terminal station but moving to the new Bentley Terminal station:

The work involves the re-termination of existing transmission lines into the new Bentley Terminal station.

Contingency

Project contingency is at 15% on all engineering, procurement, construction and project and construction management services.

Inflation

Estimates are based on May 2007 dollars. Project Inflation for civil, substation and transmission components will increase at 6% for the remainder of 2007 and 5%, 5%, 4%, 3% and 3% years 2008, 2009, 2010, 2011 and 2012 respectively.

Basis of Pricing

The pricing is based on historical costs, previous purchase orders and installation tenders for other similar projects received from supplier(s) and installation contractors.

Table G1 Summarizes all costs for Route Alternative 1A
Table G2 Planning and Preliminary Engineering Costs for Route Alternative 1A
Table G3 Transmission Line Cost Estimates for Route Alternative 1A
Table G4 Stations Costs Estimates
Table G5 Summarizes all costs for Alternative 1B

Table G1: Route Alternative 1A: Single Pole Double Circuit 230 kV (75 Line and 76 Line), Existing Right of Way

	2007	2008	2009	2010	Total
			($ 000s)		
Double Circuit 230kV Vaseux to Penticton (75/76 Line)		5,553	27,764	22,211	55,527
Single Circuit 230kV Vaseux to Bentley (40 Line)		455	2,275	1,820	4,550
63 & 138kV Circuits Bentley to Oliver		67	336	269	672
New Bentley Terminal		3,099	15,495	12,396	30,990
Oliver Substation Upgrade		569	2,844	2,275	5,687
RG Anderson Terminal Upgrade		1,050	5,249	4,199	10,498
Lee Terminal 138kV Capacitor Upgrade		167	837	670	1,675
Bell Terminal 138kV Capacitor Upgrade		162	811	649	1,622
Vaseux 230kV Terminal Upgrade		444	2,220	1,776	4,440
Vaseux 500kV Terminal Upgrade		293	1,464	1,171	2,928
Planning & Preliminary Engineering	3,972	1,391			5,363
Project Management, Engineering & Operations Support		381	1,903	1,523	3,807
Sub Total	3,972	13,631	61,199	48,959	127,760
AFUDC		647	2,892	6,197	9,736
Removals & Salvage			1,174	2,738	3,912
TOTAL	3,972	14,278	65,264	57,894	141,408

Table G2: Route Alternative 1A Planning and Preliminary Engineering

	2006	2007	2008	Total
		($ 000s)		
Planning	922	1,926		2,848
Environmental		535		535
Lands		54	535	589
Consultation		321		321
Regulatory		214	856	1,070
Total	922	3,050	1,391	5,363

Table G3: Route Alternative 1A Transmission Line Estimates

	Double Circuit 230kV Vaseux to Penticton (75/76 Line)	Single Circuit 230kV Vaseux to Bentley (40 Line)	63 & 138kV Circuits Bentley to Oliver	Total
		($ 000s)		
Engineering	630	162	75	867
Materials	10,805	1,391	163	12,359
Construction Overhead Transmission	25,828	1,496	235	27,559
Commissioning	95	13	4	112
BCH EPCM Services	5,410	443	69	5,922
Sub Total	42,768	3,505	546	46,819
Contingency	6,221	510	79	6,811
Inflation	6,538	536	46	7,120
Total	55,527	4,550	672	60,749
Removals & Salvage	1,177	400		
Contingency	171	58		
Inflation	180	61		
Total	1,528	520		

Table G4: Route Alternative 1A Stations Estimates

($ 000s)

	New Bentley Terminal	Oliver Substation Upgrade	RG Anderson Terminal Upgrade	Lee Terminal 138kV Capacitor Upgrade	Bell Terminal 138kV Capacitor Upgrade	Vaseux 230kV Terminal Upgrade	Vaseux 500kV Terminal Upgrade	Total
Engineering	1,749	562	542	276	276	569	336	4,311
Equipment	7,334	1,210	3,525	301	296	434	797	13,897
Materials	4,740	896	1,071	202	202	478	391	7,980
Construction	6,208	881	1,657	253	221	1,297	599	11,116
Commissioning	819	278	268	95	95	209	133	1,896
BCTC EPC Services							172	172
BCH EPC Services	3,019	554	1,023	163	158	433		5,350
Sub Total	23,869	4,380	8,086	1,290	1,249	3,420	2,428	44,723
Contingency	3,472	637	1,176	188	182	498	348	6,500
Inflation	3,649	670	1,236	197	191	523	152	6,618
Total	30,990	5,687	10,498	1,675	1,622	4,440	2,928	57,841

		Oliver Substation Upgrade
Removals & Salvage		1,436
Contingency		209
Inflation		220
Total		1,864

Table G5: Route Alternative 1B: H-Frame Double Circuit 230 kV (75 Line and 76 Line), Existing Right of Way

	2007	2008	2009	2010	Total
			($ 000s)		
Double Circuit 230kV Vaseux to Penticton (75/76 Line)		4,403	22,015	17,612	44,030
Single Circuit 230kV Vaseux to Bentley (40 Line)		463	2,317	1,854	4,634
63 & 138kV Circuits Bentley to Oliver		68	342	274	685
New Bentley Terminal		3,156	15,782	12,625	31,564
Oliver Substation Upgrade		579	2,896	2,317	5,792
RG Anderson Terminal Upgrade		1,069	5,346	4,277	10,692
Lee Terminal 138kV Capacitor Upgrade		171	853	682	1,706
Bell Terminal 138kV Capacitor Upgrade		165	826	661	1,652
Vaseux 230kV Terminal Upgrade		452	2,261	1,809	4,523
Vaseux 500kV Terminal Upgrade		293	1,464	1,171	2,928
Planning & Preliminary Engineering	3,972	1,391			5,363
Project Management, Engineering & Operations Support		347	1,737	1,389	3,473
Sub Total	3,972	12,559	55,839	44,671	117,041
AFUDC		615	2,667	5,682	8,964
Removals & Salvage			1,173	2,737	3,910
TOTAL	3,972	13,174	59,679	53,090	129,915

1.2 UPLAND ROUTE COST ESTIMATES: ROUTE ALTERNATIVES 2A, 2B & 3

Upland route Alternatives 2A and 3 are planning level cost estimates (+35 / -15%). Alternative 2B is a preliminary design cost estimate (+20 / -10%) providing there is no deviation from the new Upland route right-of-way as currently defined.

All estimates include all planning, environmental, properties, consultation, engineering, project and construction management, procurement, construction and commissioning for the construction of the Bentley, RG Anderson, Vaseux Lake, Oliver, FA Lee, and DG Bell Terminal stations, as well as Vaseux Lake to RG Anderson 230 kV Transmission Line, Vaseux Lake to New Bentley Terminal station 230 kV transmission line, and the 63 kV, 138 kV, and 138 kV re-termination work.

Contingency

Due to uncertainties associated with acquisition of the upland route project contingency is at 20% on all engineering, procurement, construction and project and construction management services.

Inflation

Estimates are based on May 2007 dollars. Project Inflation for civil, substation and transmission components will increase at 6% for the remainder of 2007 and 5%, 5%, 4%, 3% and 3% years 2008, 2009, 2010, 2011 and 2012 respectively.

Basis of Pricing

The pricing is based on historical costs, previous purchase orders and installation tenders for other similar projects received from supplier(s) and installation contractors.

Table G6 summarize all costs for Route Alternative 2A.
Table G7 summarize all costs for Route Alternative 2B.
Table G8 summarize all costs for Route Alternative 3.

Table C6: Route Alternative 2A: Upland Single Pole Double Circuit 230kV (75& 76 Lines), 40 meter Right-of-Way

	2007	2008	2009	2010	2011	2012	Total
				($ 000s)			
Double Circuit 230kV Vaseux to Penticton (75/76 Line)				6,605	33,024	26,419	66,048
Single Circuit 230kV Vaseux to Bentley (40 Line)				508	2,541	2,033	5,082
63 & 138kV Circuits Bentley to Oliver				70	350	280	699
New Bentley Terminal				3,461	17,307	13,845	34,613
Oliver Substation Upgrade				635	3,176	2,541	6,352
RG Anderson Terminal Upgrade				1,173	5,863	4,690	11,725
Lee Terminal 138kV Capacitor Upgrade				187	935	748	1,870
Bell Terminal 138kV Capacitor Upgrade				181	906	725	1,812
Vaseux 230kV Terminal Upgrade				496	2,480	1,984	4,959
Vaseux 500kV Terminal Upgrade				320	1,601	1,281	3,203
Planning & Preliminary Engineering	3,972	1,605	2,033	1,231			8,840
Project Management, Engineering & Operations Support				584	2,918	2,335	5,836
Sub Total	3,972	1,605	2,033	15,451	71,100	56,880	151,041
AFUDC		286	396	920	3,517	7,356	12,475
Removals & Salvage					1,310	3,057	4,367
TOTAL	3,972	1,891	2,429	16,371	75,927	67,293	167,883

Table G7: Route Alternative 2B: Upland Two Circuits (75 Line and 76 Line), New 60 meter Right-of-Way

	2007	2008	2009	2010	2011	2012	Total
				($ 000s)			
Double Circuit 230kV Vaseux to Penticton (75/76 Line)				5,158	25,788	20,630	51,575
Single Circuit 230kV Vaseux to Bentley (40 Line)				520	2,598	2,078	5,196
63 & 138kV Circuits Bentley to Oliver				71	357	286	714
New Bentley Terminal				3,539	17,695	14,156	35,391
Oliver Substation Upgrade				649	3,247	2,598	6,495
RG Anderson Terminal Upgrade				1,199	5,994	4,796	11,989
Lee Terminal 138kV Capacitor Upgrade				191	956	765	1,912
Bell Terminal 138kV Capacitor Upgrade				185	926	741	1,853
Vaseux 230kV Terminal Upgrade				507	2,535	2,028	5,071
Vaseux 500kV Terminal Upgrade				320	1,601	1,281	3,203
Planning & Preliminary Engineering	3,972	1,605	2,033	1,231			8,840
Project Management, Engineering & Operations Support				528	2,641	2,113	5,281
Sub Total	3,972	1,605	2,033	14,098	64,340	51,472	137,520
AFUDC		286	396	880	3,233	6,707	11,501
Removals & Salvage					1,311	3,059	4,369
TOTAL	3,972	1,891	2,429	14,978	68,883	61,238	153,391

Table G8: Route Alternative 3: Two Single Circuits (75 Line and 76 Line), One on Existing Right-of-Way, One Upland on new 40 meter Right-of-Way

	2007	2008	2009	2010	2011	2012	Total
				($ 000s)			
Double Circuit 230kV Vaseux to Penticton (75/76 Line)				5,797	28,986	23,189	57,972
Single Circuit 230kV Vaseux to Bentley (40 Line)				515	2,575	2,060	5,150
63 & 138kV Circuits Bentley to Oliver				71	354	284	709
New Bentley Terminal				3,507	17,537	14,030	35,075
Oliver Substation Upgrade				644	3,218	2,575	6,437
RG Anderson Terminal Upgrade				1,188	5,941	4,753	11,882
Lee Terminal 138kV Capacitor Upgrade				190	948	758	1,895
Bell Terminal 138kV Capacitor Upgrade				184	918	734	1,836
Vaseux 230kV Terminal Upgrade				503	2,513	2,010	5,026
Vaseux 500kV Terminal Upgrade				320	1,601	1,281	3,203
Planning & Preliminary Engineering	3,972	1,605	2,033	1,231			8,840
Project Management, Engineering & Operations Support				553	2,765	2,212	5,529
Sub Total	3,972	1,605	2,033	14,702	67,356	53,885	143,553
AFUDC		286	396	898	3,359	6,997	11,936
Removals & Salvage					1,309	3,054	4,363
TOTAL	3,972	1,891	2,429	15,599	72,025	63,936	159,852

2. PROJECT SCHEDULE

The following assumptions were made when preparing the OTR Project implementation schedule. If the basis for these assumptions proves incorrect or conditions or events supersede them, then the OTR Project schedule will require revision and there is the possibility of schedule delay. At this point the schedule assumes an early third quarter 2008 date for receipt of all major permits.

The OTR Project schedule includes known species at risk (SAR) constraints on construction work in certain ecological areas of the project that may impact those species as follows:

- SAR legislation on federal lands precludes destruction of residence for Behr's hairstreak butterfly at the Bentley site. This schedule shows removal of antelope brush during the June adult phase to minimize impact with some offsetting alternatives to be determined.
- Scheduling to avoiding disturbance due to line construction for bird and bat roosting and rearing periods. These are expected to be a similar time frame unless bat winter hibernacula are located within an impacted disturbance zone.
- Scheduling to avoiding disturbance due to line construction for snake denning and migration.
- Scheduling to avoiding disturbance due to line construction for California big horn sheep in areas used for lambing.

The above constraints are seasonal and if the work periods are missed then significant schedule impacts are possible if the work must be delayed to the next non-environmentally constrained work period.

The OTR Project schedule is based on being able to schedule periods for the existing 76 Line and 40 Line to be out of service for construction work periods that do not fall in the FortisBC system peak load season from November to the end of February. Similarly the Oliver Terminal station distribution loads will need to be temporarily shifted to other stations for the station upgrade conversion. These outages and load transfers were reviewed and considered feasible during project planning based on existing conditions and load forecasts. If significant load changes occur versus forecast or other system conditions changes or equipment failures occur that reduce the planning construction periods, the OTR Project schedule could be delayed.

The OTR Project schedule is also based on current forecasts for major equipment and material procurement and delivery times. It assumes that key engineering work for the long lead items such as transformers and structural steel poles will begin in early third quarter 2008 to maintain a fourth quarter 2010 in service date. If supplier delivery schedules change significantly from current forecasts then the OTR Project may have some delays.

The OTR Project schedule also assumes that qualified contractors will be available in the time periods needed.

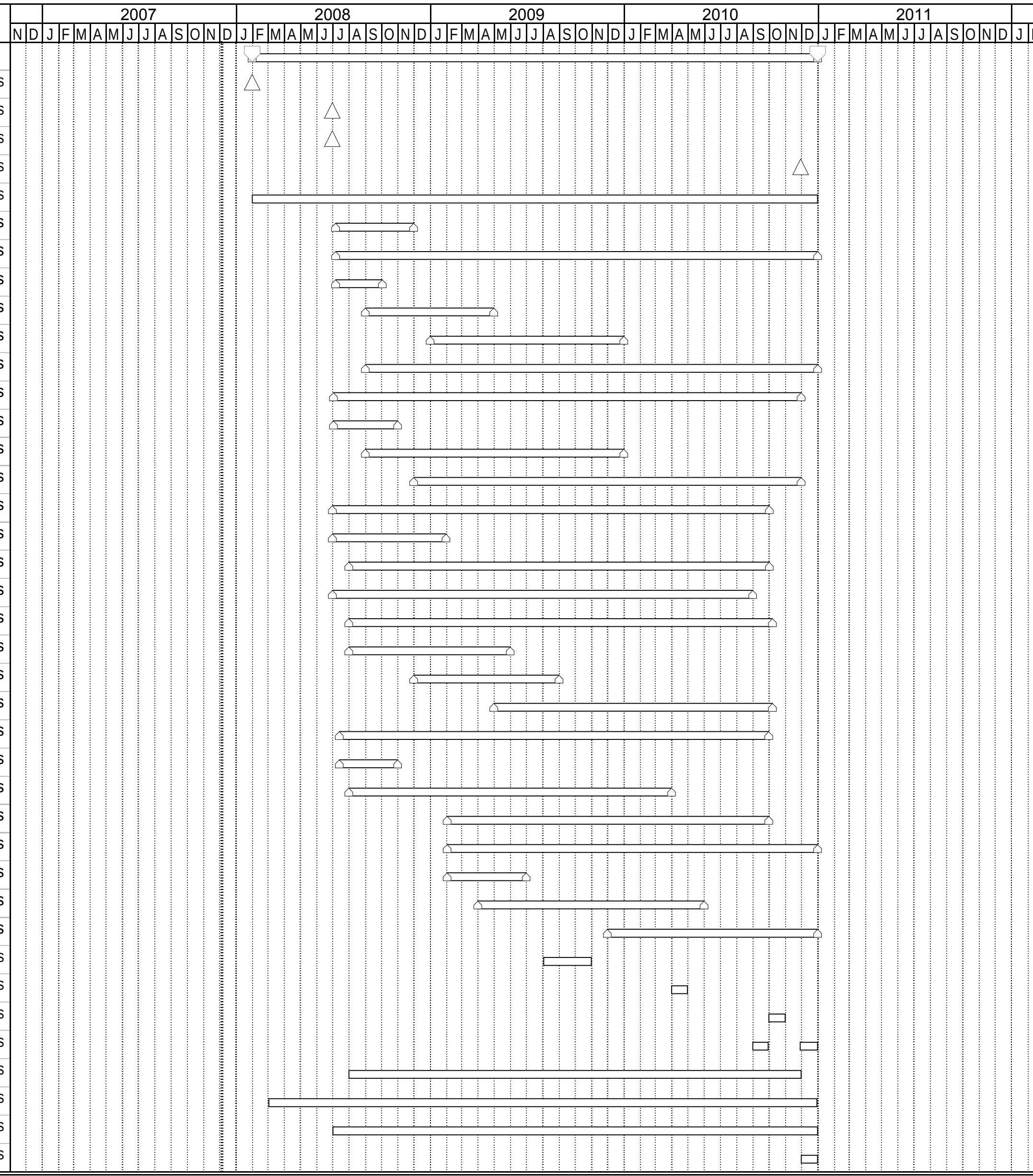
Appendix G

Project Manager:
Schedule Revision No.:

Okanagan Transmission Reinforcement

FORTISBC

ID	WBS	Task Description	Start	Finish	Duration
0	*0*	*OTR Schedule*	*'08 Feb 01*	*'10 Dec 31*	*761 days*
1	1	Assumed Date Key Permits Received	'08 Feb 01	'08 Feb 01	0 days
2	2	Project Approved by BCUC (incl Permits)	'08 Jul 01	'08 Jul 01	0 days
3	3	Project Schedule Updated per Approval Date	'08 Jul 01	'08 Jul 01	0 days
4	4	Project In-Service Date	'10 Nov 30	'10 Nov 30	0 days
5	5	Project Management	'08 Feb 01	'10 Dec 31	761 days
6	6	Right of Way and Access (BEN to RGA)	'08 Jul 07	'08 Nov 30	105 days
12	7	Lines VAS to RGA (Existing R/W) (2-230kV Line)	'08 Jul 07	'10 Dec 31	650 days
13	7.1	Design	'08 Jul 07	'08 Oct 02	64 days
17	7.2	Material Procurement	'08 Sep 01	'09 Apr 30	174 days
20	7.3	Material Delivery	'09 Jan 01	'09 Dec 31	261 days
25	7.4	Construction	'08 Sep 01	'10 Dec 31	610 days
35	8	Lines VAS to Bentley (Existing R/W) (1-230kV Line) /:	'08 Jul 03	'10 Nov 30	629 days
36	8.1	Design	'08 Jul 03	'08 Oct 31	87 days
40	8.2	Material Procurement	'08 Sep 01	'09 Dec 31	349 days
43	8.3	Construction	'08 Dec 01	'10 Nov 30	522 days
51	9	BENTLEY and OLIVER Substations	'08 Jul 01	'10 Oct 01	589 days
52	9.1	Design	'08 Jul 01	'09 Jan 30	154 days
56	9.2	Material Procurement	'08 Aug 01	'10 Oct 01	566 days
59	9.3	Construction	'08 Jul 01	'10 Aug 31	566 days
72	10	VASEUX (230) Substation	'08 Aug 01	'10 Oct 07	570 days
73	10.1	Design	'08 Aug 01	'09 May 31	216 days
77	10.2	Material Procurement	'08 Dec 01	'09 Aug 31	196 days
80	10.3	Construction	'09 May 01	'10 Oct 07	375 days
86	11	RG Anderson Substation	'08 Jul 14	'10 Sep 30	579 days
87	11.1	Design	'08 Jul 14	'08 Oct 31	80 days
91	11.2	Material Procurement	'08 Aug 01	'10 Mar 31	434 days
94	11.3	Construction	'09 Feb 02	'10 Sep 30	434 days
99	12	FA LEE and DG BELL Cap Banks	'09 Feb 02	'10 Dec 31	500 days
100	12.1	Design	'09 Feb 02	'09 Jun 30	107 days
104	12.2	Material Procurement	'09 Apr 01	'10 May 31	304 days
107	12.3	Construction	'09 Dec 01	'10 Dec 31	284 days
111	13	FBC Outage Preparations	'09 Aug 03	'09 Oct 31	65 days
112	14	VAS- BEN-OLI Commissioning	'10 Apr 01	'10 Apr 30	22 days
113	15	VAS- RGA Commissioning	'10 Oct 01	'10 Oct 31	21 days
114	16	RGB and FAL Cap Bank Commissioning	'10 Sep 01	'10 Dec 31	46 days
115	17	Property Services	'08 Aug 01	'10 Nov 30	608 days
116	18	Project Communications - Public	'08 Mar 03	'10 Dec 30	739 days
117	19	Environmental Services	'08 Jul 02	'10 Dec 31	653 days
118	20	Project Completion & Closure	'10 Dec 01	'10 Dec 31	23 days



Report: Level 4 Tasks
Rev. Date:
Printed: '07 Dec 04

Task | Progress | Summary | Preliminary CAR | CAR | In-Service | One Line Diagram | P&C Application | C&C Application | Contract Award | Gov't Approval | Milestone | Milestone Complete | Project Summary | External Milestone | Deadline

BC hydro

Reliable power, at low cost, for generations

RECOMMENDED PROJECT INFLATION RATES

17 SEPTEMBER 2007

BACKGROUND

The rapid growth in B.C. in both the residential and non-residential construction sectors has caused construction costs to inflate at rates not seen since the early 1980's. Over the past 15 years the B.C. Consumers Price Index (CPI) was a benchmark that allowed our budgets and estimates to keep up with actual market conditions but in about 2001 there was a divergence between CPI and the non-residential construction index. In 2004 the divergence became significant and Engineering has been including an additional construction inflation allowance in our estimates. This allowance is now being expressed as a task activity in INFO_PM.

Estimating the rate of inflation into the future has proved to be difficult, especially on multi-year projects. To keep up with construction inflation a concerted effort has and is being made by EARG to reflect this in our estimating practices.

In January 2007, Engineering awarded MMK Consulting (a Vancouver-based firm specializing in economic and financial consulting) a contract to prepare a report every six months to forecast construction inflation in the non-Residential Construction sector as it relates to BC Hydro and BCTC Capital works. The second of four reports was received on September 17, 2007 and is the basis of this briefing note.

KEY FINDINGS IN MMK REPORT

Some of the key findings in MMK's second report are:

- Vancouver's Industrial construction index increased 6.3% in the first 6 months of 2007(end of fourth quarter of 2006 to end of second quarter 2007), continuing the double-digit pace recorded in 2006.
- While the Canadian price index for industrial construction increased by a total of 28.7% between 2003 and 2006, electric utility industry indices (for distribution systems, transmission lines and substations) increased only a cumulative total of 4.8% to 6.8% over the same three years. These low increases are believed to reflect the strengthening Canadian dollar and its dampening effect on the cost of imported equipment.
- In the United States, equipment price indices for electric power and specialty transformer manufacturing have increased approximately 42% over three years.
- U.S. industry publications are forecasting high levels of transmission construction over the next few years, indicating continued price pressure on transmission equipment and construction.
- Rider Levett Bucknall reports that it's US selling price index ("what the market will bear") for construction increased 2.3% in the first quarter of 2007, and its annual escalation rate is projected to be 7.5%.
- Component cost trends are mixed:
    - Construction union wage rates over the next 4 years are contracted to increase by 2-3.5% per annum.
    - Concrete materials price indices have increased 3.1% to 5.7% in the first six months of 2007. Most of the increase occurred in the first three months.
    - Rates of increase in metal price indices (copper, aluminum and steel) have eased from recent years. Although prices are high, there has generally there has been less volatility for these particular commodities in recent months.
    - ENR (Engineering News Record) is forecasting a 2.7% increase in 2007 in its US-based "Construction Cost Index" (composite of component cost trends).
- B.C. Ministry of Transportation has adopted (September 2006) annual inflation allowances of 5.2% for construction and 10% for property acquisitions from 2007 to 2009.

RECOMMENDED ALLOWANCES

Based on the MMK report, discussions with other Utilities (Manitoba Hydro and Hydro Quebec), other owners' recommended rates (e.g. YVR and MOTH) and our own experiences, we are recommending for all projects the following cost inflation allowances:

Fiscal Year	% Infla. Sept. 17/07
FY08	6%
FY09	5%
FY10	5%
FY11	4%
FY12 and beyond	3%

These allowances reflect minor adjustments from those of March 2007 in that we are now applying these rates to all projects and that they are applied by fiscal year (ending 31 March) rather than calendar year.

CONCLUSION

Construction costs are inflating at a rate that far exceeds B.C. CPI. The recommended allowances are based on the entire Capital program we manage and should not be adopted blindly. We still need to estimate and review each project on an individual basis. The inflationary outlook in the construction sector of our economy continues to be uncertain, so stay tuned again for the next report in six months.

John Boots

MMK CONSULTING

— BC HYDRO —

CONSTRUCTION COST TRENDS AND OUTLOOK

Prepared for:

BC Hydro
Mr. John Boots, P. Eng.
Principal Engineer
Estimating & Scheduling Engineering
BC Hydro
6911 Southpoint Drive (B03)
Burnaby BC V3N 4X8

Prepared by:

MMK Consulting Inc.
- Stuart MacKay
- Angela Rey

September 17, 2007

MMK CONSULTING

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1. Introduction and Executive Summary

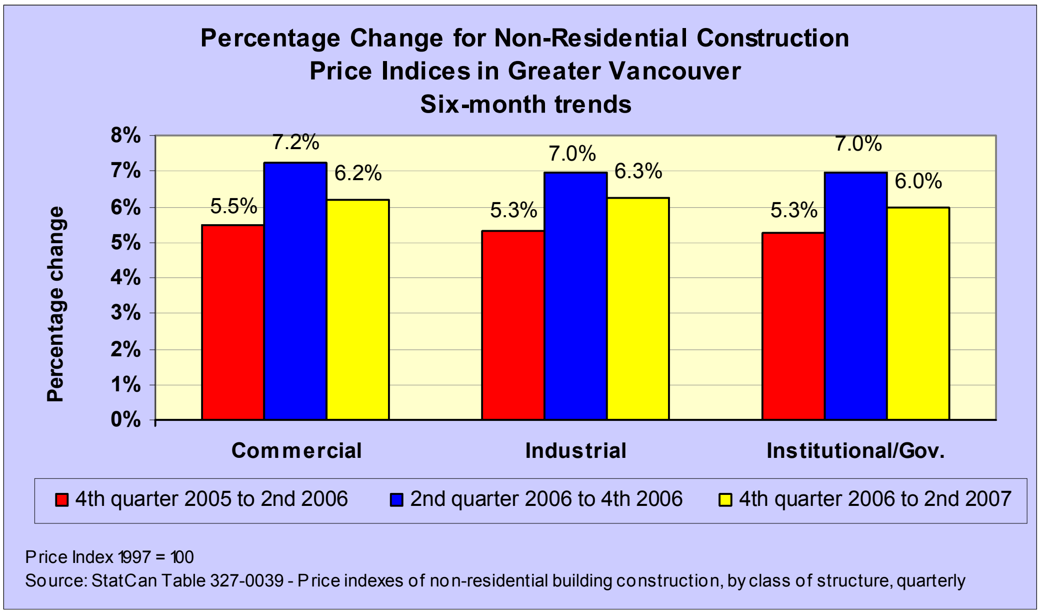
This report is the second of four semi-annual reviews of construction cost trends in British Columbia, and the implications for BC Hydro's cost inflation[1] allowances on future major construction projects[2].

1.1 General trends

The general non-residential construction industry in BC continues to experience strong levels of building activity, led by commercial construction. While the value of industrial building permits in BC in the first six months of 2007 is down from the same period in 2006, strong markets in Alberta and Ontario continue to put pressure on industrial construction in BC.

Price indices continue to increase sharply for non-residential construction in BC. Industrial construction price levels in Vancouver rose 6.3% between the fourth quarter of 2006 and second quarter of 2007. This rate of increase was down from the previous six months, but up from the same period in the preceding year.

Exhibit 1a — Changes in non-residential construction price indices in the past three six-month periods - Greater Vancouver



[1] Unless otherwise indicated, the term "cost inflation" refers to upward construction price trends *specifically* in the non-residential, industrial and electric utility industries (rather than to general price inflation in the overall economy).

[2] This report also updates three previous (December 2005, July 2006, and March 2007) MMK reports for BC Hydro.

1.2 Trends in the electric utility industry

In the Canadian electric utility industry, reported price index increases through 2006 have been much lower for electric utility transmission/distribution construction than for overall industrial construction. While Statistics Canada's price index for industrial construction increased by 28.7% between 2003 and 2006, its construction price indices for distribution-related electric utility construction (distribution systems, transmission lines and substations) increased only by a cumulative total of 4.8% to 6.8% over three years. (No data are available yet for 2007.)

In the United States, equipment price indices for electric power and specialty transformer manufacturing have increased approximately 42% over three years, compared with 8% for turbine and power transmission equipment manufacturing[1]. US industry publications are also forecasting high levels of transmission and distribution construction activity over the next few years.

On balance, we expect that the Canadian electric utility transmission/distribution construction price indices for 2007, when they become available in 2008, will show significantly higher increases than for 2006 and prior years. Going forward, we expect future price index trends in transmission/distribution to be subject to the same type of cost inflation pressures experienced by power generation and other heavy construction projects.

1.3 Price trends by cost component

While component cost trends have been mixed during the first half of 2007, there has been a general tendency towards less volatility than was experienced in 2005 and 2006 – albeit at significantly higher price levels in many cases.

While component cost trends are important contributors to cost inflation in the BC industrial construction industry, they are only partial indicators of the total impact of prices, since they do not account for market-driven (supply and demand) cost inflation pressures.

1.4 Regional trends in BC

While regional BC price index data is not available, construction activity levels provide an indication of regional cost inflation pressures.

Based on the available data on construction activity levels (building permit values, construction industry employment trends), the greatest market-driven regional cost inflation pressures are being experienced in Vancouver Island, Northeast BC and the Lower Mainland.

[1] See section 3.4, Exhibit 3d.

1.5 Other agencies' estimates and forecasts

Other agencies have a wide range of approaches to estimating and forecasting construction cost inflation:

- **BTY Group,** a Canadian construction project management firm, significantly reduced its cost inflation forecast between December 2005 and December 2006, and is now projecting BC construction cost increases of 6% in 2007, 5% in 2008, and 3% in each of 2008 and 2009.
- **US ENR (Engineering News Record)** is forecasting a 2.7% increase in its US-based "Construction Cost Index" in 2007, reflecting modest expectations for materials cost increases. (The ENR figure is a composite of labor, materials, and other component costs, and does not directly measure construction price trends.)
- **Rider Levett Bucknall** reports that its US selling price index ("what the market will bear") increased 2.3% in the first quarter of 2007, and its annual cost inflation rate is projected to be 7.5%.
- **BC Ministry of Advanced Education** has developed (September 2006) annual cost inflation guidelines of 15% for 2007, 12% for 2008, 9% for 2009, and 8% for 2010.
- **BC Ministry of Transportation** has adopted (September 2006) annual cost inflation expectations of 5.2% (construction costs) and 10% (property acquisition costs).
- **Statistics Canada** (as discussed earlier) has recorded price index increases for industrial construction in the range of 10% to 14% annually, and increases for industry-specific electric utility distribution construction price indices in the range of 2% to 4% annually.

1.6 Cost inflation outlook for BC Hydro

For **heavy construction**, there are some signs of softening in component price indices. However, both the BC construction industry and the Canadian industrial construction industries continue to show high activity levels and price inflation. Accordingly, for 2007 to 2010, our recommended cost inflation allowance range is unchanged at 4% to 6% annually. For 2011 through 2015, our recommended range is 3% to 4% annually, up slightly from our March report.

For **transmission, stations and distribution**, based on the recent strength of US equipment price indices, confirmed by the recent experiences of BC Hydro staff, we expect future Canadian cost inflation pressures for transmission, stations and distribution to be much stronger than in the past few years. Accordingly, we have increased our recommended cost inflation ranges for transmission, stations and distribution construction to bring them into line with those for heavy construction and power generation.

In summary, our recommended cost inflation allowances, for all major construction projects, are 4% to 6% for 2007 through 2010, and 3% to 4% for 2011 through 2015.

Exhibit 1b — Recommended construction cost inflation allowances

Previous report vs. this update		2007 to 2010	2011 to 2015
Mar. 2007	• Generation (heavy construction)	4% to 6%	2.5% to 4%
	• Utility transmission/distribution	2% to 4%	2% to 4%
Sep. 2007	• All construction projects	4% to 6%	3% to 4%

The recommended allowances:

- Are for “hard” construction costs only, and do not include “soft” costs such as design and project management.
- Assume that BC Hydro takes appropriate cost mitigation measures to dampen the impact of cost inflation through procurement strategies, value engineering, and other cost mitigation initiatives.
- Assume that the strong construction market in BC between 2003 and 2007 will continue through 2010, and that the market will have a “soft landing” in 2010 and 2011 as market demand and supply forces come more into balance.

2. General Price and Activity Level Trends

This chapter presents overall price and activity level trends for non-residential and industrial construction.

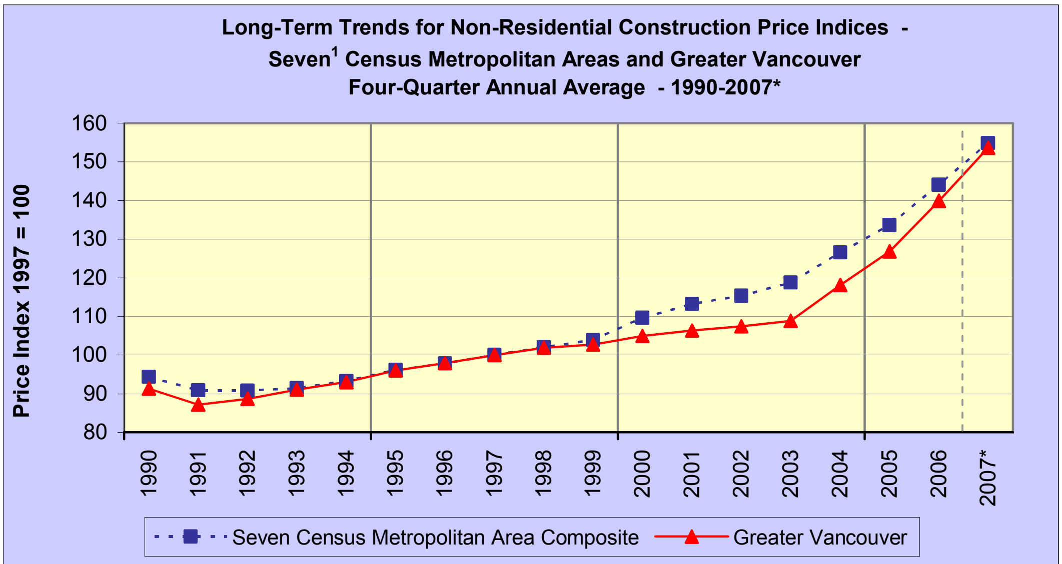
2.1 Non-residential construction price index

a) Annual trends

Non-residential construction price index[1] trends for Greater Vancouver, as well as the composite index for seven Canadian metropolitan areas, are illustrated in Exhibit 2a. For Vancouver, price index trends were stable between 1992 and 2003, increasing approximately 1.9% per year. However, the situation changed dramatically starting in 2004, and the Vancouver non-residential price index increased by an average of approximately 9% per year over the past four years.

The seven Canadian metropolitan areas' price index increased more rapidly than the Vancouver index between 1999 and 2003, but has increased less rapidly since 2003.

Exhibit 2a — Long-range construction cost trends in the non-residential sector



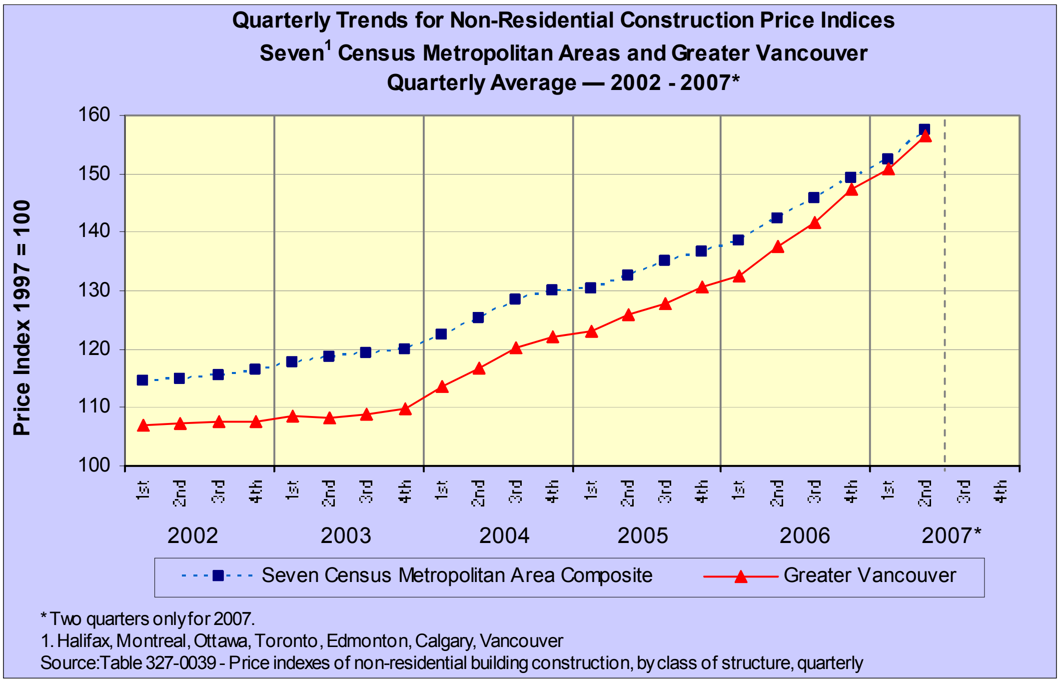
* Two first quarters only.
1 . Halifax, Montreal, Ottawa, Toronto, Edmonton, Calgary, Vancouver
Source: StatCan Table 327-0039 - Price indexes of non-residential building construction, by class of structure, quarterly

[1] The non-residential construction price index (NRBCPI) is defined by Statistics Canada as "...a quarterly series measuring the changes in contractors' selling prices of non-residential building construction (i.e. commercial, industrial and institutional)". It includes both general and trade contractors' work, but excludes the cost of land, land assembly, design, development and real estate fees.

b) *Quarterly trends*

As illustrated in Exhibit 2b, the change in Statistics Canada's price index trends dates from the first quarter of 2004.

Exhibit 2b — Short-term quarterly trends for non-residential construction price indices



For BC Hydro, the Vancouver index is more relevant to smaller locally-sourced Lower Mainland projects, while the seven-CMA average is more relevant to larger nationally-sourced projects.

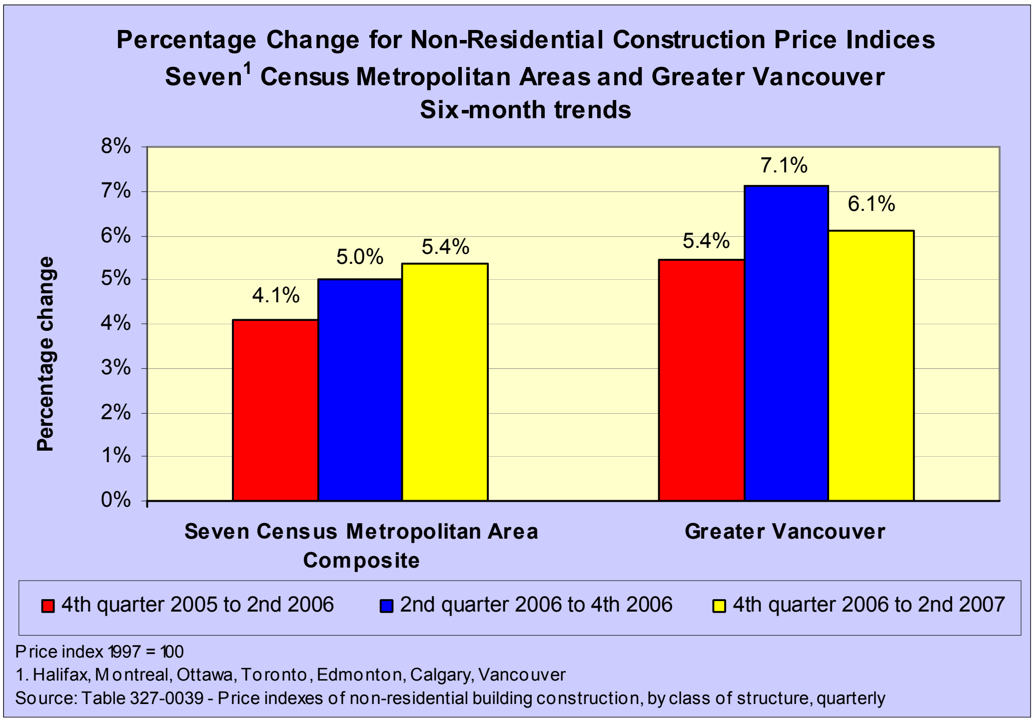
Recent rates of increase in Vancouver have been higher than the composite of Canadian Metropolitan Areas, as shown in Exhibit 2b[1].

[1] Although the seven-city CMA price index using 1997 as the base year, is still slightly higher than the Vancouver price index, the Vancouver price index has been catching up and is now less than one point below the CMA's index.

c) *Six-month trends (since previous report)*

Over the six months from the fourth quarter of 2006 to the second quarter of 2007, the Vancouver price index increased 6.1% compared to 5.4% for the CMA average. Both rates of increase were higher than for the same time period in 2006, although the Vancouver rate was down from the immediately preceding six months.

Exhibit 2c — Changes in non-residential construction price indices in the past two six-month intervals



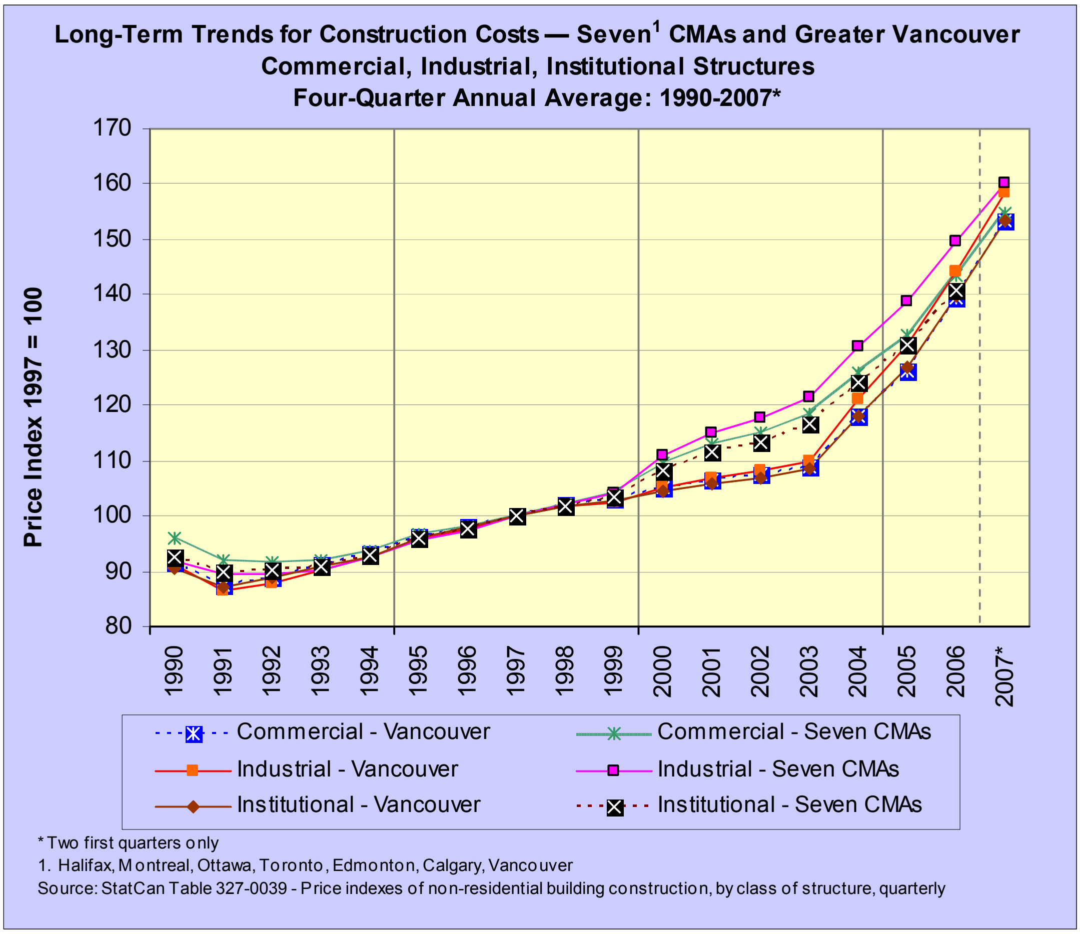
Annually, (Q2-06 to Q2-07), Statistics Canada's non-residential construction price index increased by 14.3% for Greater Vancouver and 10.7% for the CMA composite.

2.2 Commercial, industrial, and institutional

a) Annual trends

Statistics Canada's non-residential construction price index may be broken out into commercial, institutional/government and industrial construction (of most interest to BC Hydro). Exhibit 2d illustrates long-term annual trends for each of these subgroups, for both Greater Vancouver and the seven-city CMA[1] composite.

Exhibit 2d — BC Construction non-residential price index trends, by sector



Since 1997, long-term non-residential price index increases have been slightly higher for industrial construction, both for the seven-city CMA composite and for Greater Vancouver.

b) Quarterly trends

As illustrated in Exhibit 2e, similar rates of price index increase have occurred for all three categories of non-residential building structures in Vancouver.

[1] Halifax, Montreal, Ottawa, Toronto, Edmonton, Calgary, Vancouver

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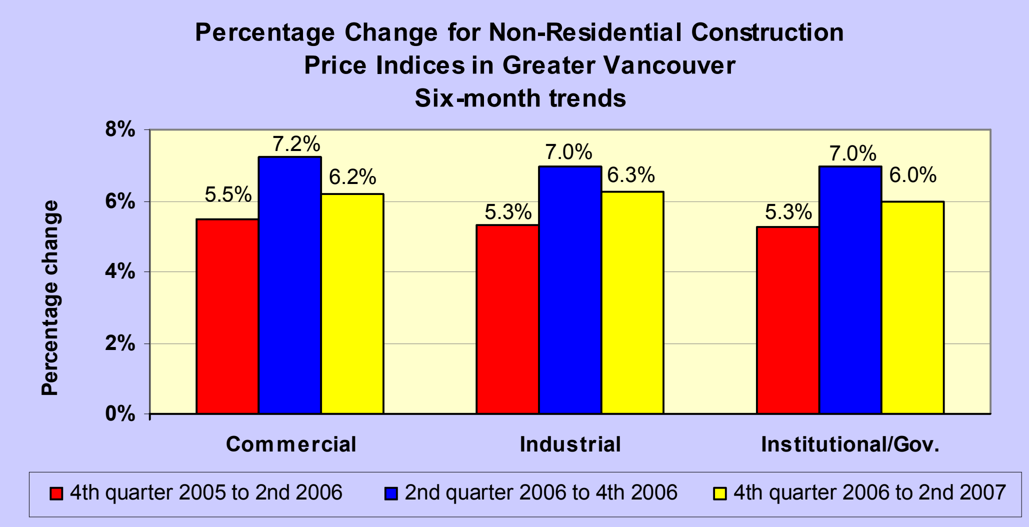
Exhibit 2e — Short-term quarterly trends for different types of building structure

*Two quarters only for 2007.
Source: StatCan Table 327-0039 - Price indexes of non-residential building construction, by class of structure, quarterly

c) *Six-month trends (since previous report)*

As illustrated in Exhibit 2f, recent six-month price index trends are reported by Statistics Canada as being similar for all three types of non-residential construction. Rates of price index increases continued to be strong in the first half of 2007 — down from the second half of 2006, but up from the same six-month period in 2006.

Exhibit 2f — Changes in non-residential construction price indices in the past three six-month periods - Greater Vancouver



Price Index 1997 = 100
Source: StatCan Table 327-0039 - Price indexes of non-residential building construction, by class of structure, quarterly

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2.3 General construction activity trends

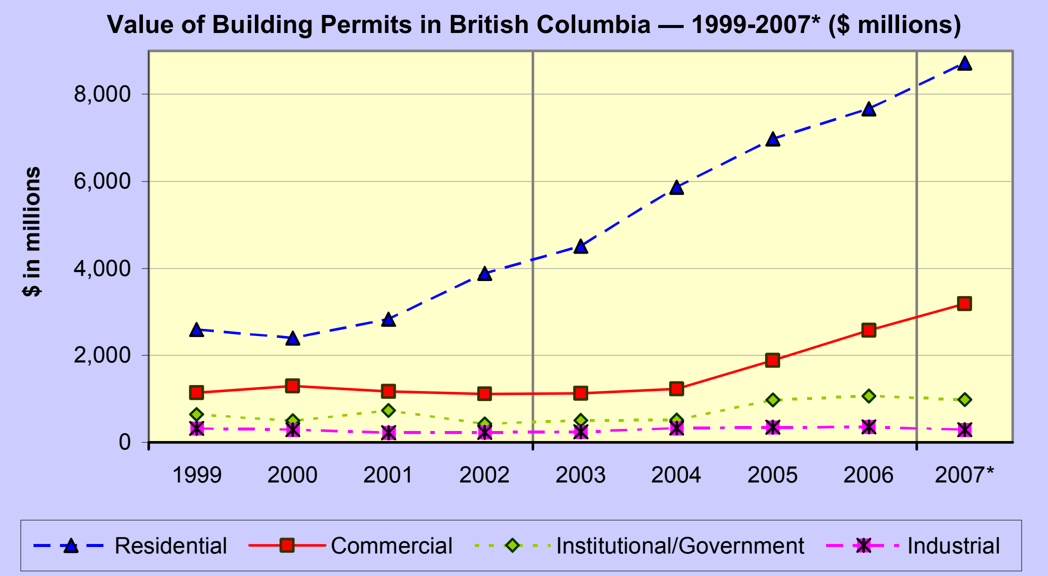
a) Annual trends

As illustrated in Exhibit 2g, the value of building permits has increased dramatically in BC since 2001, driven in initial years by residential construction, and also in more recent years by commercial construction[1].

Exhibit 2g — Value of building permits ($ million) by sector, 2000 to 2007

	Annual trends								Six-month data (Jan -Jun)		
	2000	2001	2002	2003	2004	2005	2006	Change 05-06 (%)	Jan-Jun 2006	Jan-Jun 2007	Change 06-07 (%)
Residential	2,403	2,830	3,888	4,514	5,869	6,979	7,669	9.9%	3,633	4,360	20.0%
- as % of total	53.5%	57.1%	68.7%	70.6%	73.9%	68.5%	65.7%		66.8%	66.1%	
Non-residential											
▪ Industrial	296	221	230	244	328	346	358	3.5%	165	148	-10.7%
- as % of total	6.6%	4.5%	4.1%	3.8%	4.1%	3.4%	3.1%		2.4%	2.1%	
▪ Commercial	1,297	1,171	1,117	1,130	1,228	1,886	2,576	36.6%	1,077	1,594	48.0%
- as % of total	28.9%	23.6%	19.7%	17.7%	15.5%	18.5%	22.1%		24.5%	23.9%	
▪ Institut./Govt	496	732	424	506	514	980	1,067	9.0%	607	493	-18.8%
- as % of total	11.0%	14.8%	7.5%	7.9%	6.5%	9.6%	9.1%		7.9%	7.1%	
BC Total	4,492	4,955	5,659	6,394	7,939	10,191	11,670	14.5%	5,483	6,594	20.3%

Source: StatCan Table: 26-0006 - Building permits, by type of structure and area, seasonally adjusted, monthly.



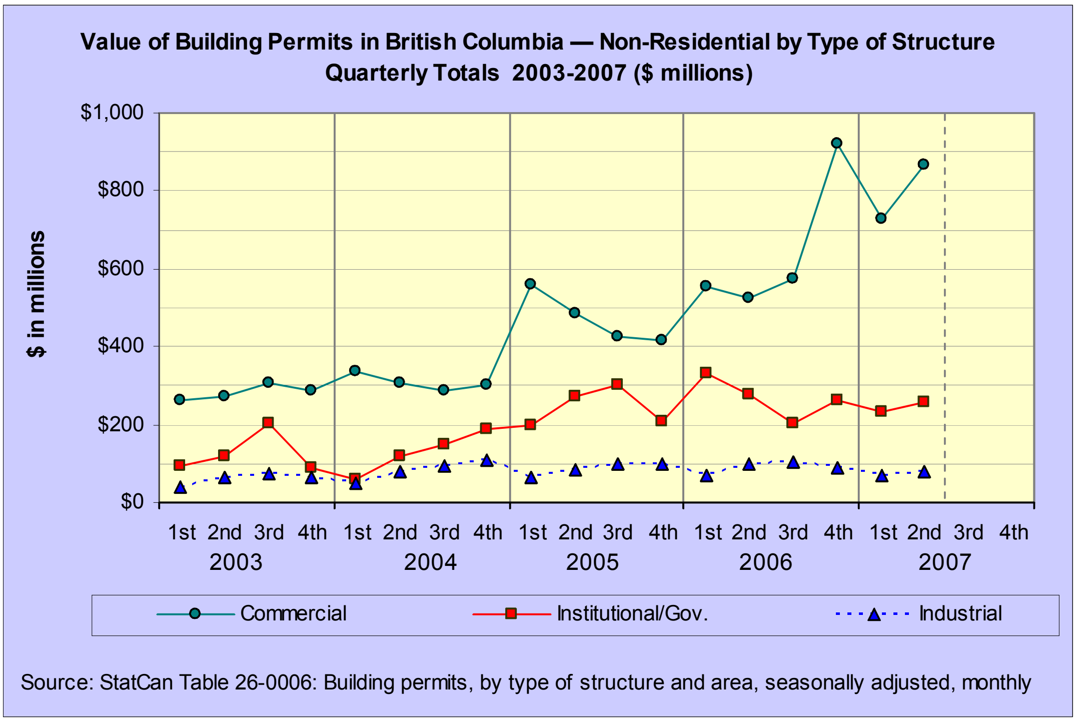
* Six-month data for 2007 has been pro-rated to 12 months.
Source: StatCan Table 26-0006: Building permits, by type of structure and area, seasonally adjusted, monthly

[1] BC Hydro and some other agencies (MoTH, BCTC, etc.) do not require building permits for industrial construction.

b) Quarterly trends – Commercial, institutional, industrial

As shown in Exhibit 2h, the value of non-residential building permits in BC has varied significantly on a quarterly basis for commercial construction, and to a lesser extent for institutional/government construction.

Exhibit 2h — Quarterly trends of BC non-residential building permits values, by type of structure



Industrial building activity, the sector most relevant to BC Hydro, has shown the greatest stability in terms of activity levels.

c) Trends since previous report

As illustrated in Exhibit 2g and 2h, growth in commercial construction activity continues to dominate the non-residential market, with the value of commercial building permits in BC up 48% for the first half of 2007 over the same period in 2006, far outweighing the declines in industrial and institutional/government building permit values.

Industrial building permit values in BC have actually declined during the first half of 2007, although the decrease is more than offset by the increase in Alberta for the same period (see following section).

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2.4 Price and activity trends — BC vs. Ontario/Alberta

BC Hydro's contract bidders for major projects tend to be large firms that operate at the national level. All contractors are affected, directly or indirectly, by trends for major projects in other provinces, particularly in Ontario and Alberta.

2.4.1 Price trends – Non-residential construction

a) Annual trends

Exhibit 2i compares annual trends for non-residential construction costs in Toronto, Calgary and Vancouver. In 2004 and 2005, annual increases were highest in Vancouver. In 2006, cost inflation rates in Calgary were nearly doubled those in Toronto and higher than in Vancouver.

Exhibit 2i — Annual non-residential construction cost trends— Toronto, Calgary, Vancouver

	Toronto		Calgary		Vancouver	
	Index	Change	Index	Change	Index	Change
2002	119.4	-	115.8	-	107.5	-
2003	123.8	3.7%	119.4	3.1%	108.8	1.3%
2004	132.0	6.6%	127.4	6.7%	118.2	8.6%
2005	139.0	5.3%	136.1	6.9%	126.9	7.3%
2006	148.3	6.7%	153.7	12.9%	139.9	10.3%

Source: StatCan Table 327-0039: Price indices of non-residential building construction, by class of structure, annually.

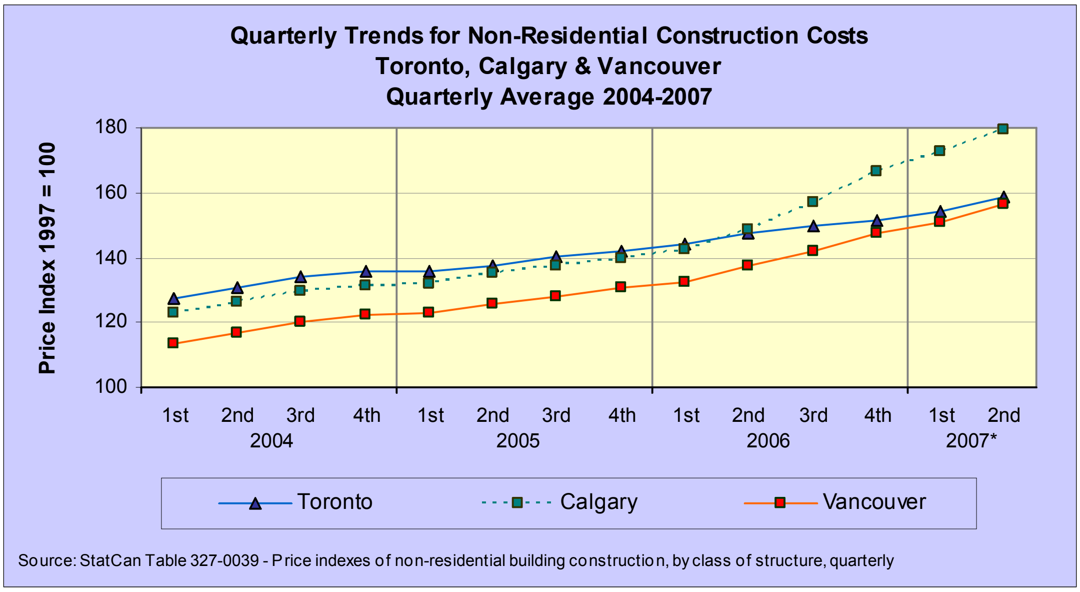
b) Recent trends

Exhibit 2j illustrates quarterly cost inflation rate trends in recent years for non-residential construction. (Results are similar for industrial construction only.) As Exhibit 2j shows, rates of increase have diverged sharply over the past 12 months (Q2 2006 to Q2 2007):

	12-month increase in price indices	
	Non-residential	Industrial only
• Calgary	20.6%	20.0%
• Toronto	7.6%	8.1%
• Vancouver	13.7%	13.7%

Vancouver's 12-month price index increase has been much higher than that of Toronto, but much lower than that of Calgary.

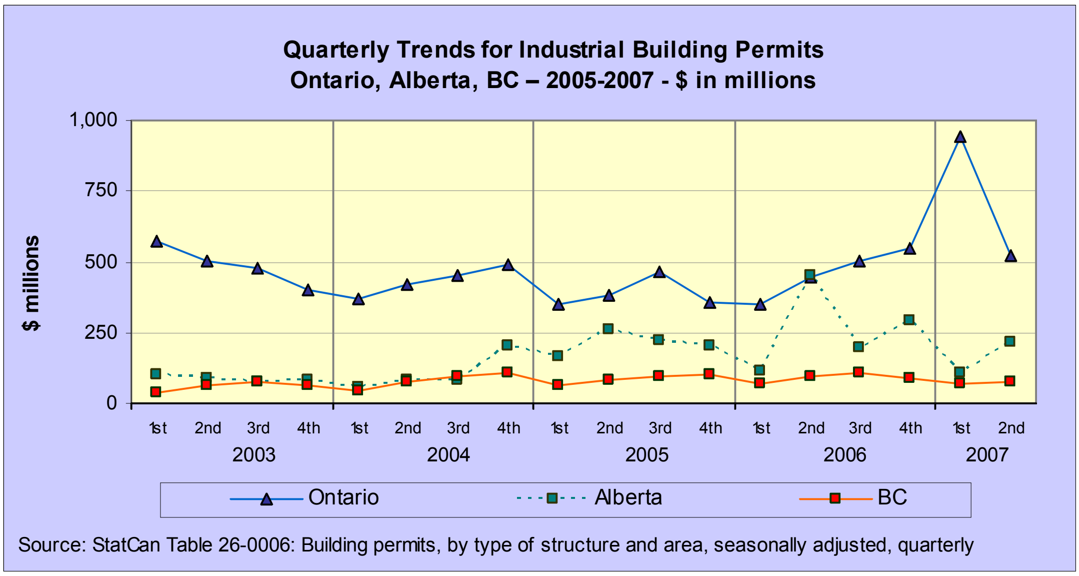
Exhibit 2j – Quarterly trends for total non-residential construction costs – Toronto, Calgary and Vancouver



2.4.2 Activity level trends

Quarterly trends in the value of building permits are illustrated in Exhibit 2k.

Exhibit 2k – Quarterly activity trends — Ontario, Alberta, BC

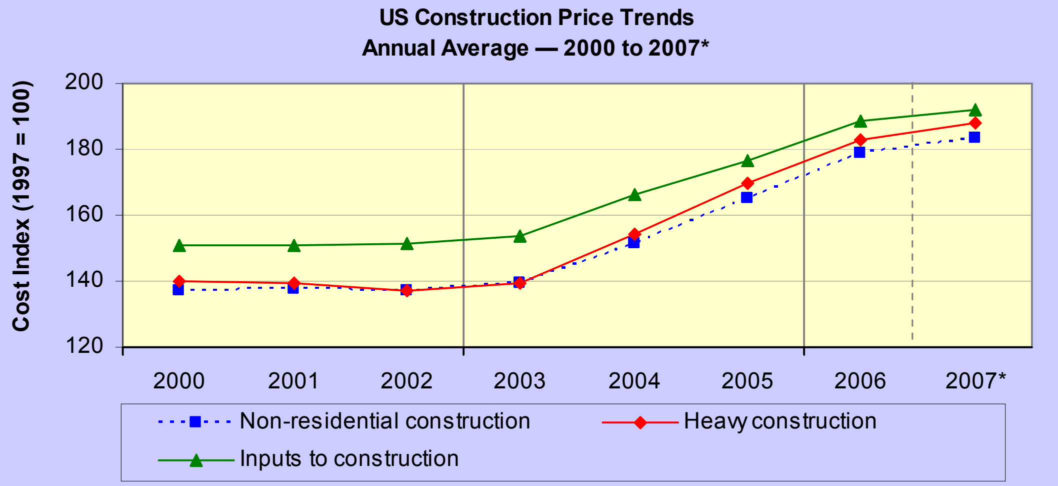


The data indicate a significant increase in industrial construction activity in Alberta, starting in 2004, and also the significance of the Ontario industrial construction industry. While industrial construction activity levels in BC have been relatively flat, the strength of the Alberta and Ontario markets has put price pressure on BC industrial construction projects.

2.5 US construction price trends

Between 2000 and 2003, US Bureau of Labor Statistics (BLS) data indicate flat annual price increases in US non-residential and heavy construction. In 2004, prices started to escalate at a higher rate, increasing 7.1% to 10.6% annually.

Exhibit 21
(i) US annual construction price trends



* Six-month average
Source: US Department of Labour Statistics, Producer Price Index: Non-residential construction BMNR; heavy construction BHVY; Inputs to construction WPUSOP2200

(ii) US annual price indices and percentage change

	Non-residential		Heavy construction		Inputs to construction	
	Index	Change	Index	Change	Index	Change
2000	137.1	-	139.8	-	138.9	-
2001	137.9	0.6%	139.6	-0.1%	139.1	0.1%
2002	137.0	-0.7%	137.3	-1.6%	138.3	-0.6%
2003	139.7	2.0%	139.4	1.5%	140.8	1.8%
2004	151.7	8.6%	154.2	10.6%	151.8	7.8%
2005	165.1	8.8%	169.5	9.9%	163.7	7.8%
2006	178.6	8.2%	182.6	7.7%	175.4	7.1%
2007[1]	183.3	2.6%	188.3	3.1%	179.6	2.4%

1 Six-month average
Source: US Department of Labor Statistics, Producer Price Index.

For the first six months of 2007, price indices are up between 2.4% and 3.1% over the 2006 annual average.

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2.6 Conclusion — General activity and price trends

In summary, the non-residential construction industry in BC continues to experience strong levels of activity, led by commercial construction. While the value of industrial building permits in BC in the first six months of 2007 is down from the same period in 2006, strong markets in Alberta and Ontario continue to put pressure on industrial construction in BC.

Price indices continue to increase sharply for non-residential construction in BC. Industrial construction price levels in Vancouver rose 6.3% between the fourth quarter of 2006 and second quarter of 2007. This rate of increase was down from the previous six months, but up from the same period in the preceding year.

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3. Price and Activity Trends — Electric Utility Industry

This chapter presents price index information that is particularly relevant to the Canadian electric utility industry.

3.1 Canadian electric utilities price trends

Exhibit 2a presents the Statistics Canada price index data for Canada-wide electric utility costs with respect to:

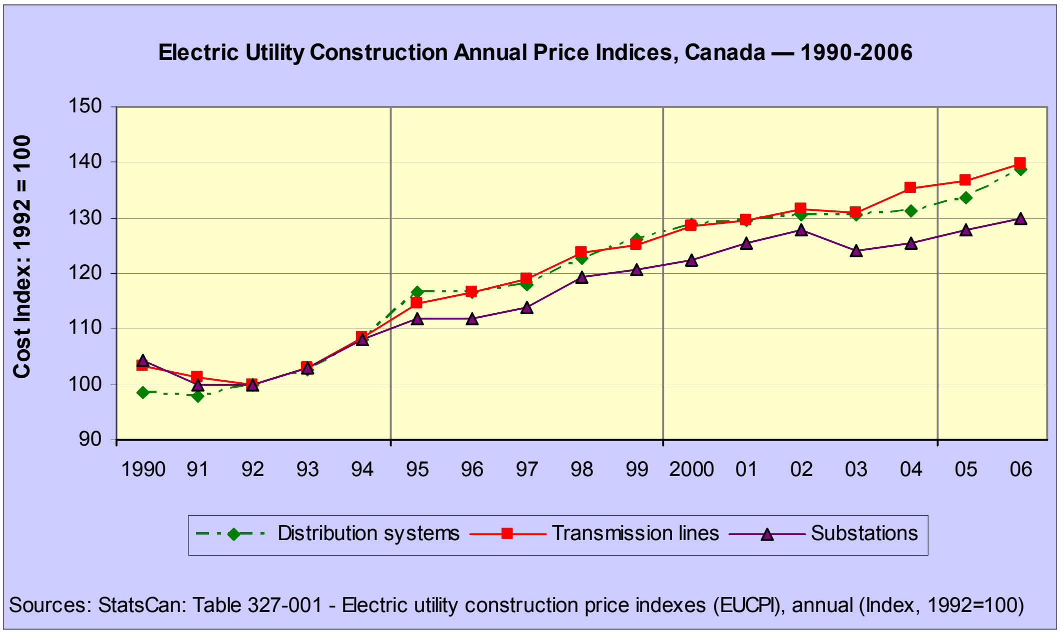
(1) distribution systems,

(2) transmission lines, and

(3) substations.

The long-term Canada-wide index trends for electric utility construction are significantly lower than for the broader industrial construction price index.

Exhibit 3a — Electric utility construction price trends – Canada



Data on quarterly trends are not available, as Statistics Canada cost indices for electric utility construction costs are only reported on an annual basis.

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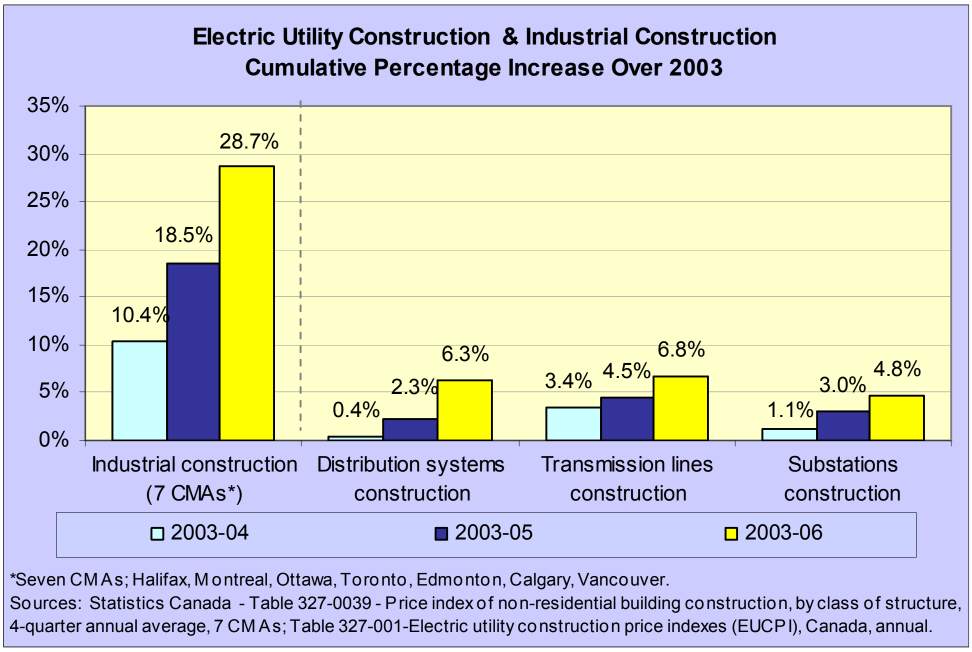
3.2 Comparison — Electric utility vs. industrial construction

Exhibit 3b compares three-year cumulative trends in Statistics Canada's electric utility construction indices to cumulative trends in the industrial construction price index.

Exhibit 3b – Comparison of general industrial construction price index with electric utility indices



Since 2003, Statistics Canada's distribution system, transmission, and substation indices have increased by 4.8% to 6.8%, far less than the 28.7% increase in industrial construction price indices during the same period.

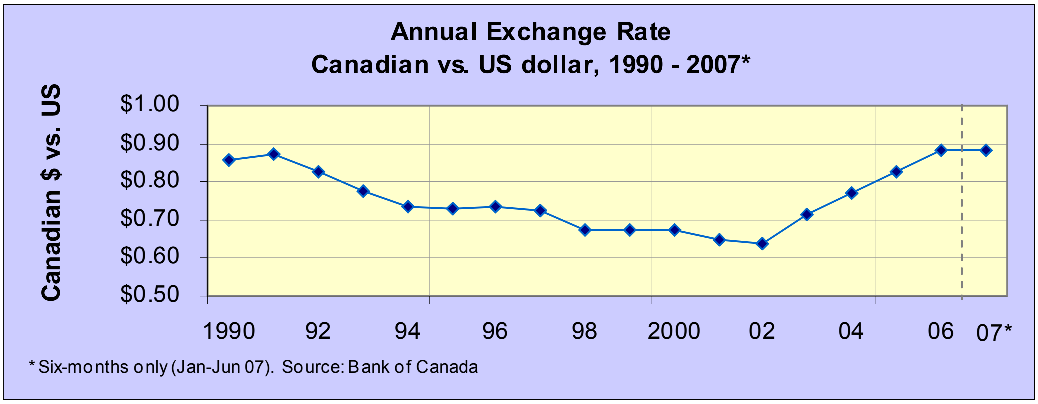
3.3 Factors contributing to low recent-year electric utility construction price increases in Canada

One factor that has likely contributed to the lower cost inflation trends for electric utility construction is the specialized nature of this construction segment. There may be less ability of firms to cross over into other industry sectors where activity levels have increased dramatically.

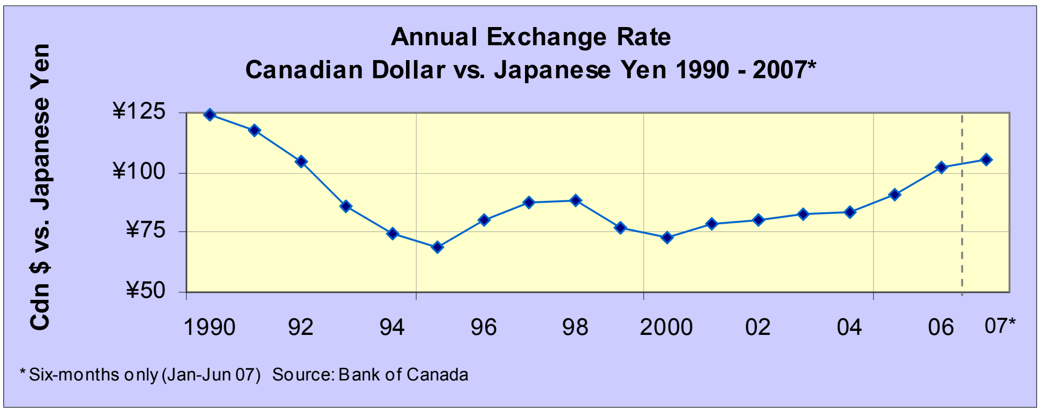
Another contributing factor may be the structure of the Canadian electric utility industry, with a limited number of larger utilities, that may make it easier for these utilities to resist upward price pressures.

Another contributing factor is the rising value of the Canadian dollar in recent years, as illustrated in Exhibit 3c. A strengthening Canadian dollar tends to lower the cost of purchasing imported[1] electric utility materials (e.g. cables, etc.) and equipment (e.g. transformers), on which the Canadian electric utility construction industry relies heavily.

Exhibit 3c – Long-term annual exchange rate:
(i) Canadian vs. US dollar



(ii) Canadian dollar vs. Japanese Yen



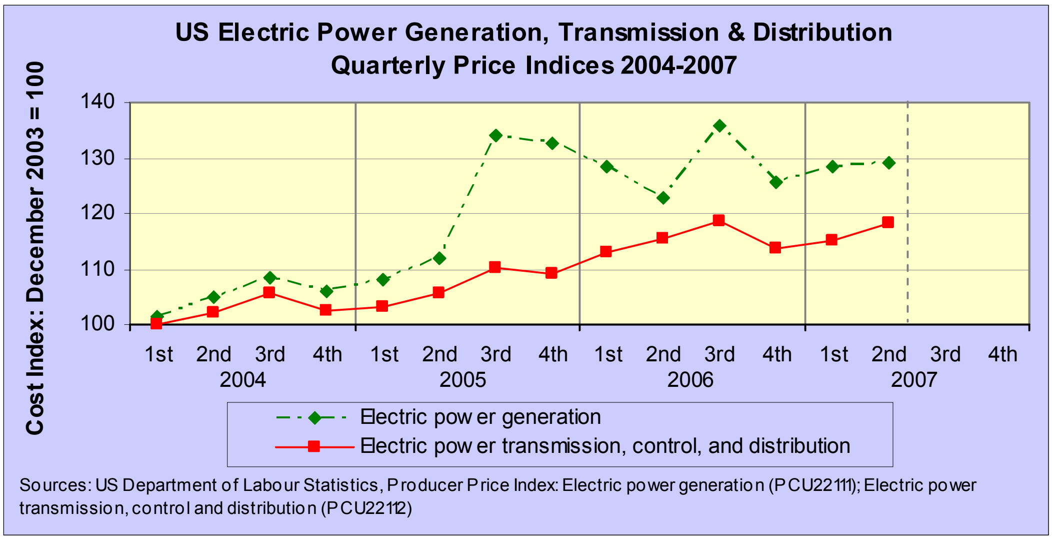
[1] With respect to its Industrial Producer Price Index, Statistics Canada has estimated that "if the impact of the exchange rate [shift relative to US dollar] had been excluded, producer prices would have risen 1.7% instead of falling 0.3% between July 2006 and July 2007."

3.4 Recent US electric utility trends

a) Price trends — Generation, transmission and distribution systems

Recent quarterly US price trends of electric power generation, transmission and distribution are illustrated in Exhibit 3d.

Exhibit 3d – US electric power generation, transmission & distribution – Quarterly trends 2004-07



These US data relate to producer prices, and are not directly applicable to the construction industry. However, they demonstrate the relatively moderate overall upward trends for US producer prices in recent years, as well as the tendency in the US for generation price indices to have increased at higher rates than distribution price indices.

b) Price trends — US electric utility equipment manufacturing

A very different story emerges with respect to US electric utility equipment manufacturing prices. As illustrated in Exhibit 3e, US electric power and specialty transformer equipment manufacturing price indices have risen approximately 42% over the past 3 years (2nd quarter 2007 versus 2nd quarter 2004). Turbine and power transmission equipment manufacturing has increased at a much lower rate, approximately 8%, over the same period.

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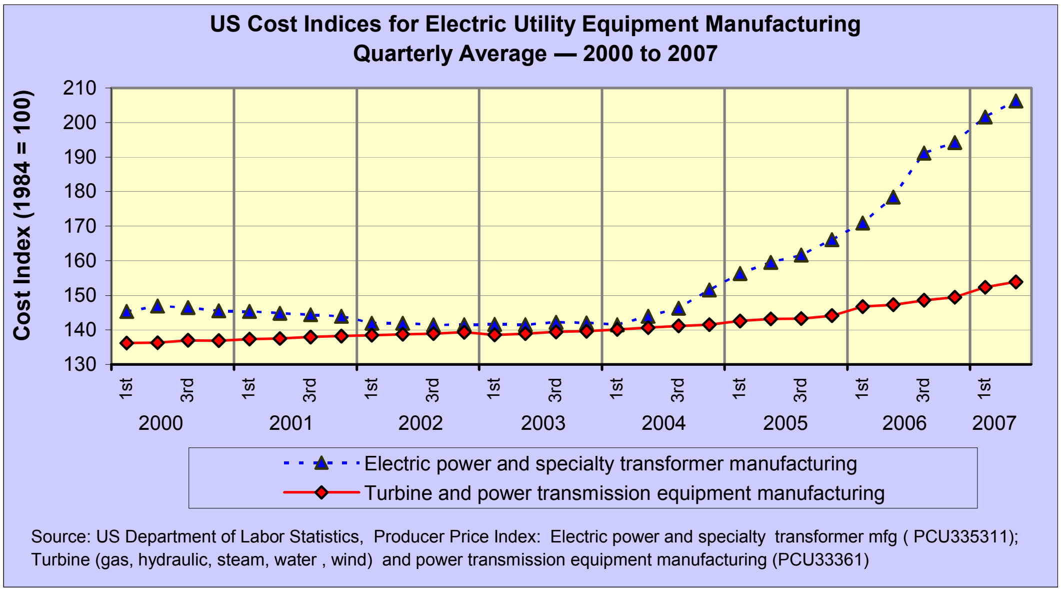
Exhibit 3d – US electric utility equipment manufacturing
Quarterly trends 2004-07



c) Construction activity trends — US transmission and delivery

There is also general industry consensus in the US that electrical construction activity is increasing significantly. According to the Edison Electric Institute:

> "The [US electric utilities] industry has been investing and will continue to invest in the nation's transmission infrastructure at levels not seen in 30 years …. From 2006-2009…, the industry is planning to invest $31.5 billion… nearly a 60% increase over the amount invested from 2002-2005." [1]

These activity level estimates and projections help to explain the rapidly increasing manufacturing price index trends illustrated in Exhibit 3d.

3.5 Recent BC Hydro purchasing experience

BC Hydro staff members confirm that, in recent months, they have experienced very significant increases in manufacturers' prices for materials and equipment purchases relating to BC Hydro's transmission, stations and distribution projects. They report materials and equipment purchase costs of up to 25%-30% above those expected, consistent with the US price index data illustrated in Exhibit 3d.

These reported increases are in strong contrast to the situation noted in our previous reports, where Canadian data and BC Hydro's own experiences were both pointing to lower cost inflation pressures for transmission/distribution projects than for power generation projects.

[1] Source: "Energy Data Alert", Edison Electric Institute, December 2006, as quoted in Engineering News Report, February 19, 2007, page 10.

3.6 Conclusion — Electric utility construction price and activity trends

In Canada, price index increases have been much lower in recent years for electric utility transmission/distribution construction than for overall industrial construction. While the Statistics Canada price index for industrial construction increased by 28.7% between 2003 and 2006, its construction price indices for distribution-related electric utility construction (distribution systems, transmission lines and substations) increased only by a cumulative total of 4.8% to 6.8% over three years. (Because Statistics Canada reports these indices on an annual basis only, no data are available yet for 2007.)

In the United States, equipment price indices for electric power and specialty transformer manufacturing have increased approximately 42% over three years, compared with 8% for turbine and power equipment manufacturing. US industry publications are also forecasting high levels of transmission and distribution construction activity over the next few years.

On balance, we expect that the Canadian electric utility transmission/distribution construction price indices for 2007, when they become available in 2008, will show significantly higher increases than for 2006 and prior years. Going forward, we expect future price index trends in transmission/distribution to be subject to the same type of cost inflation pressures experienced by power generation and other heavy construction projects.

4. Price Trends — By Cost Component

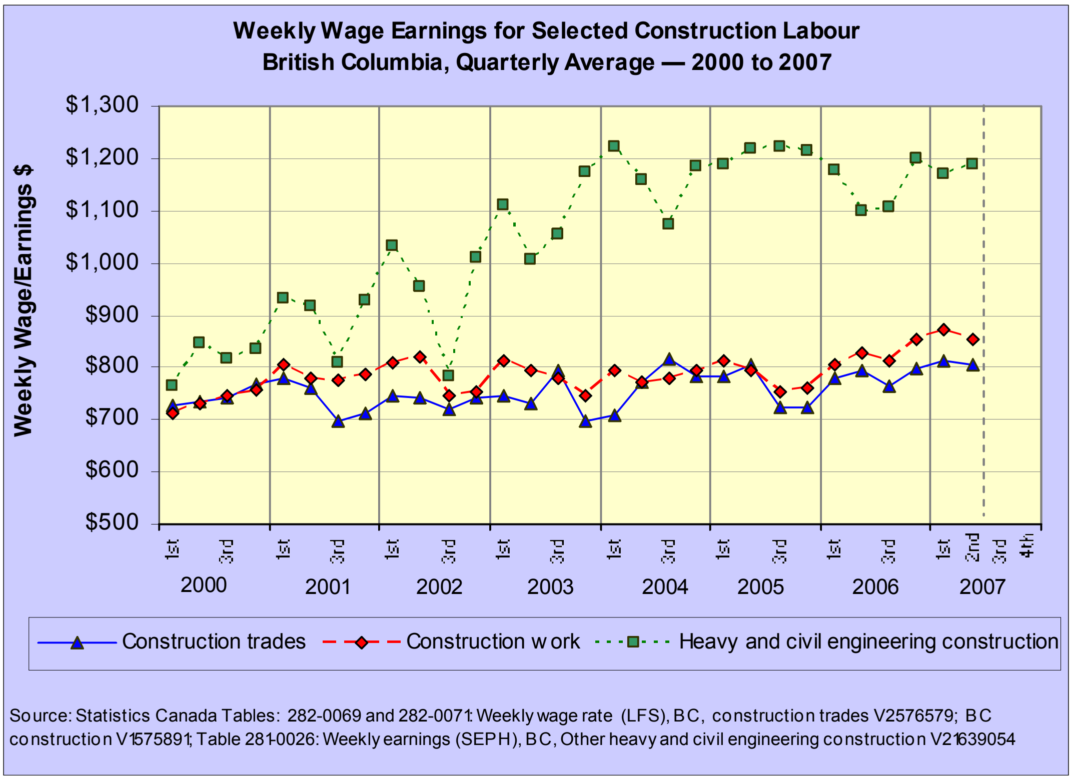
This chapter analyzes price index trends in many of the component cost factors (labour, materials, fuel, etc.) that underlie industrial construction cost estimates and contractor bid prices.

4.1 Construction labour

a) *Quarterly trends in wage earnings*

As illustrated in Exhibit 4a, average wage earnings for construction trades and workers have not increased at the same rate as construction cost indices in recent years.

Exhibit 4a — Weekly wage earnings for selected construction labour in British Columbia



These trends appear at first glance to be inconsistent with anecdotal industry sources, which report very significant increases in wages paid for similarly qualified labour. One possible explanation of these results is that the rapid growth of the BC construction industry has resulted in a decline in average experience levels, partly masking the increase in wage earnings for equally qualified individuals.

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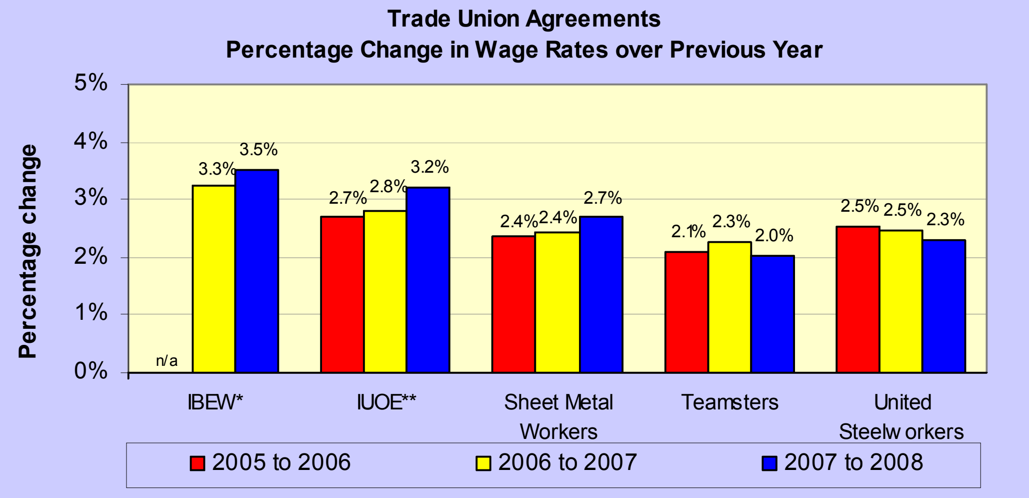
b) *Trade union wage rate agreements*

A number of collective agreements were renewed in BC in 2006. As illustrated in Exhibit 4b, annual wage rate increases (excluding benefits and other adjustments) are generally in the range of 2.0% to 3.5% annually.

Exhibit 4b — Wage rate increases for sample union trade positions

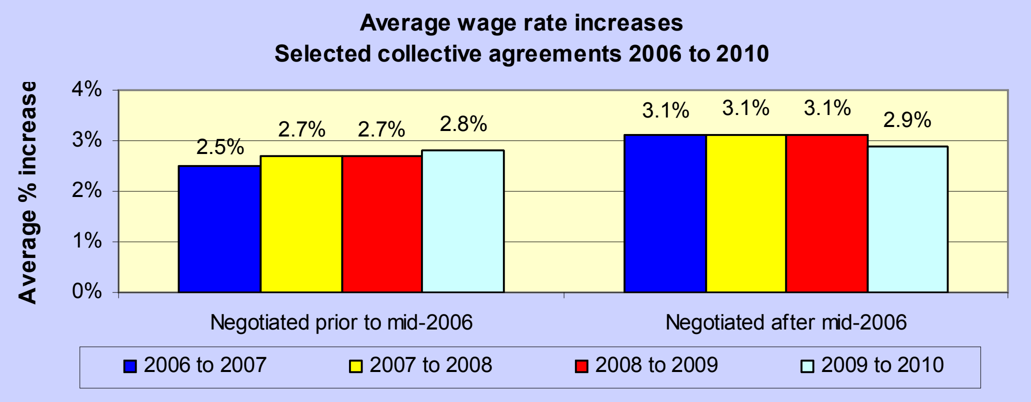


*IBEW = International Brotherhood of Electrical Workers: 2005-2006 rates not available.
**IUOE = International Union of Operating Engineers
Source: Collective agreements, Labour Relations Board, BC (http://www.lrb.bc.ca/cas/)

c) *Recent trends in union wage raises*

Exhibit 4c illustrates the trends in size of collective agreement wage increases in recent months. For collective agreements negotiated in the second half of 2006, trends show average annual wage increases that are modestly higher than wage increases negotiated in earlier agreements.

Exhibit 4c — Recent years wage rate increases for sample union trade agreements



Source: MMK analysis of collective agreements: Labour Relations Board of BC (http://www.lrb.bc.ca/)

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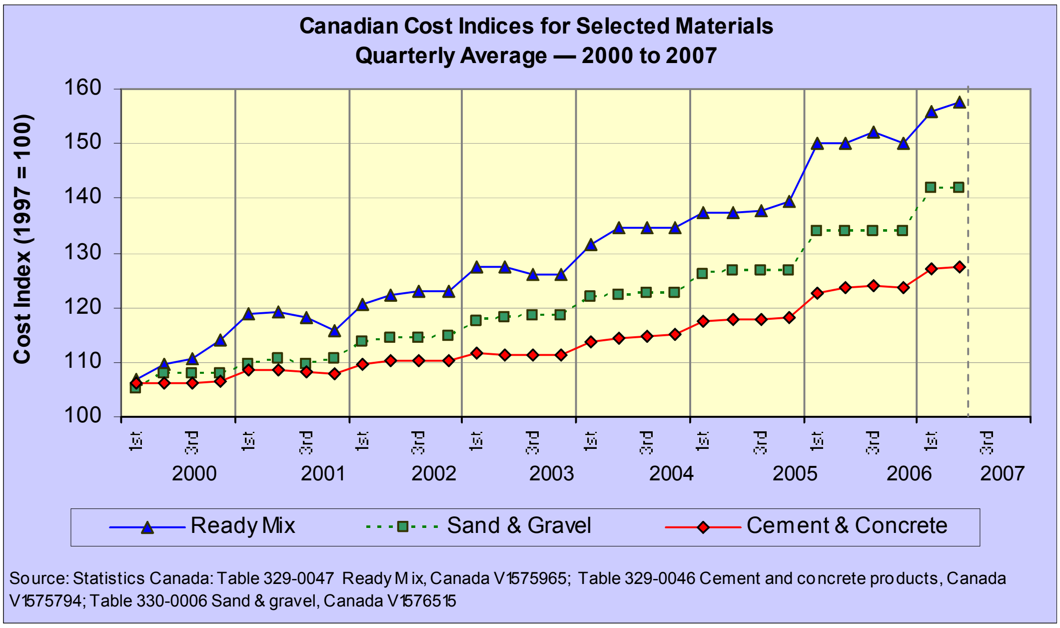
4.2 Concrete materials

a) Quarterly trends in recent years

Concrete materials price indices have been trending steadily upwards over the past few years, as illustrated in Exhibit 4d.

Exhibit 4d — Cost indices for selected construction materials



b) Recent trends

As illustrated in Exhibit 4d, concrete materials price indices have increased 3.1% to 5.7% between fourth quarter of 2006 and the second quarter of 2007, with most of the increase coming in the first quarter of 2007.

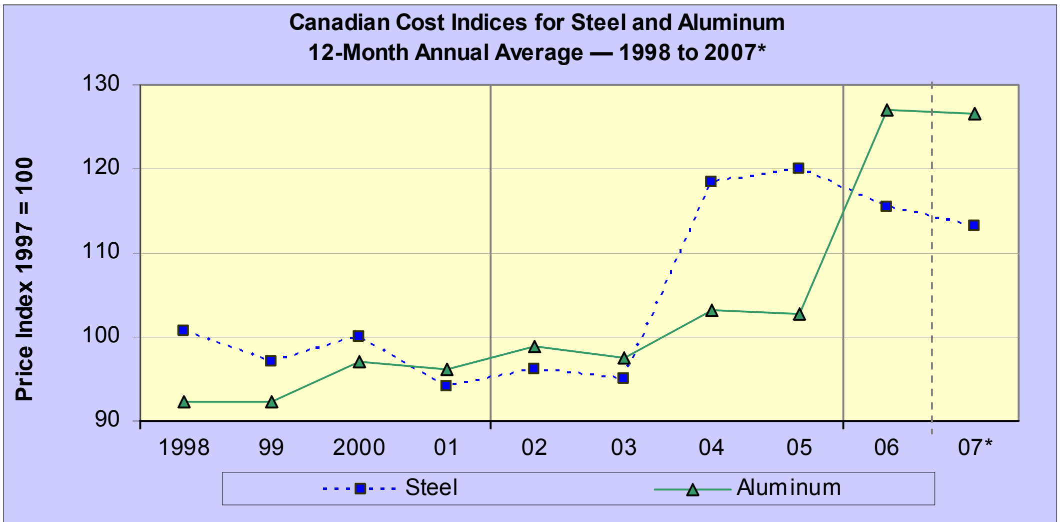
The increase in early 2007 was not as sharp as in early 2006 (up 7% to 10% over the first half of 2005), but is still strongly upwards.

4.3 Metal prices[1]

a) Annual trends

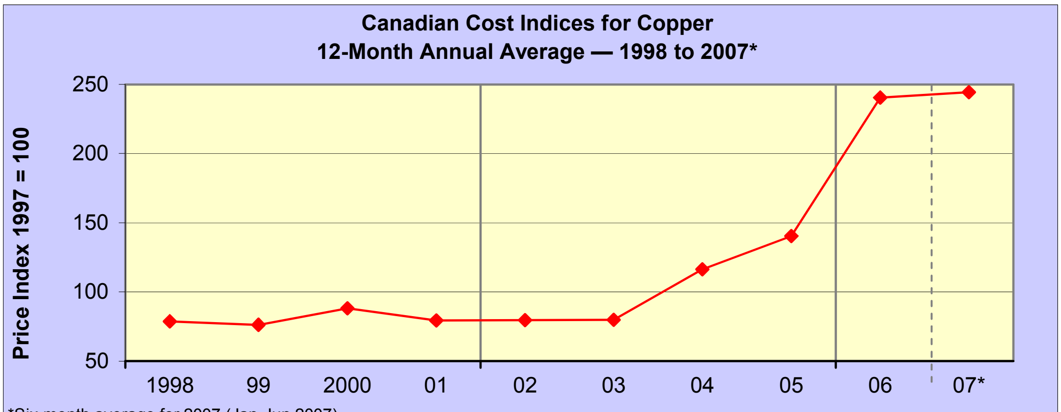
Exhibit 4e illustrates annual Canadian trends in steel, copper and aluminum.

Exhibit 4e — Selected metal cost trends – Canada
(i) Steel and aluminum



*Six-month average for 2007 (Jan-Jun 2007)
Source:StatsCan: Table 329-0044: Primary aluminum products V1575263; Table 329-0038: Iron and steel mills & ferro-alloy manufacturing V3822696

(ii) Copper



*Six-month average for 2007 (Jan-Jun 2007)
Source:StatsCan: Table 329-0044: Copper and copper alloys in primary form V1575281;

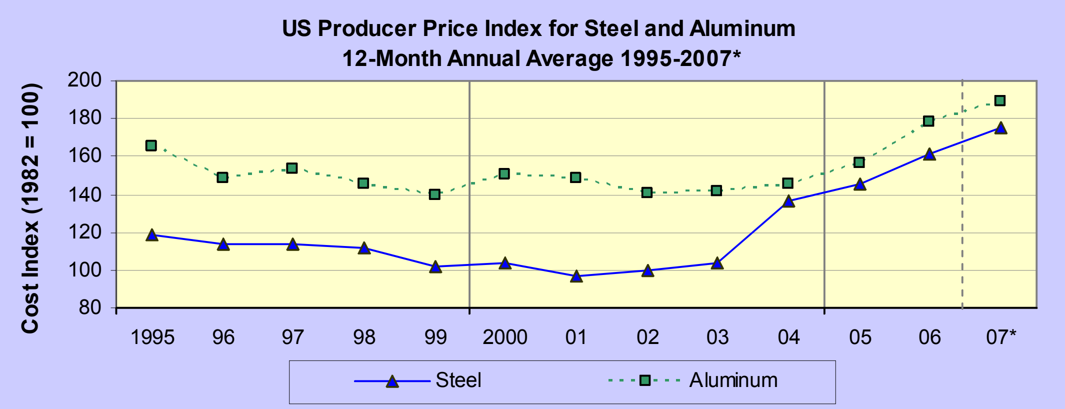
[1] Caution should be used in assessing the implications of metal price trends for electric utility construction costs. Metal commodity prices may not be indicative of the short and medium term trends in the cost of metal materials used in major utility construction projects, since these trends may be outweighed by industry-specific supply and demand trends.

For these three metals:

- **Copper** has experienced the greatest price increases since 2003, especially between 2005 and 2006. The first half of 2007, copper prices averaged close to 2006 average levels.
- **Steel** experienced a two-year increase of more than 25% between 2003 and 2005, before flattening in 2006.
- **Aluminum** prices rose moderately throughout 2005, before increasing sharply in 2006 and flattening in the first half of 2007.

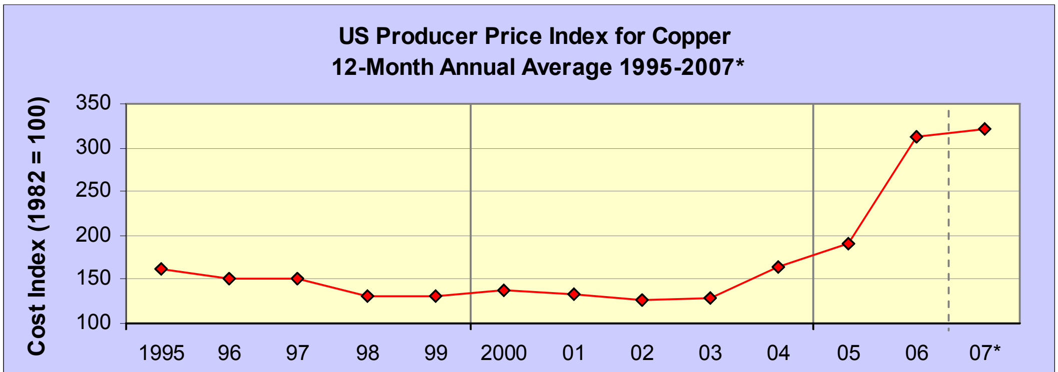
US price index trends (Exhibit 4f) are similar to Canadian trends.

Exhibit 4f — US producer price index for selected metal products
(i) Steel and aluminum



*Six-month average (Jan-Jun) for 2007
Source: US Bureau of Labor Statistics Data —Producer Price Index Industry Data: Aluminum sheet, plate & foil manufacturing (PCU331315). Iron and steel mills (PCU331111)

(ii) Copper



*Six-month average (Jan-Jun) for 2007
Source: US Bureau of Labor Statistics Data —Producer Price Index Industry Data: Copper rolling, drawing & extruding (PCU331421).

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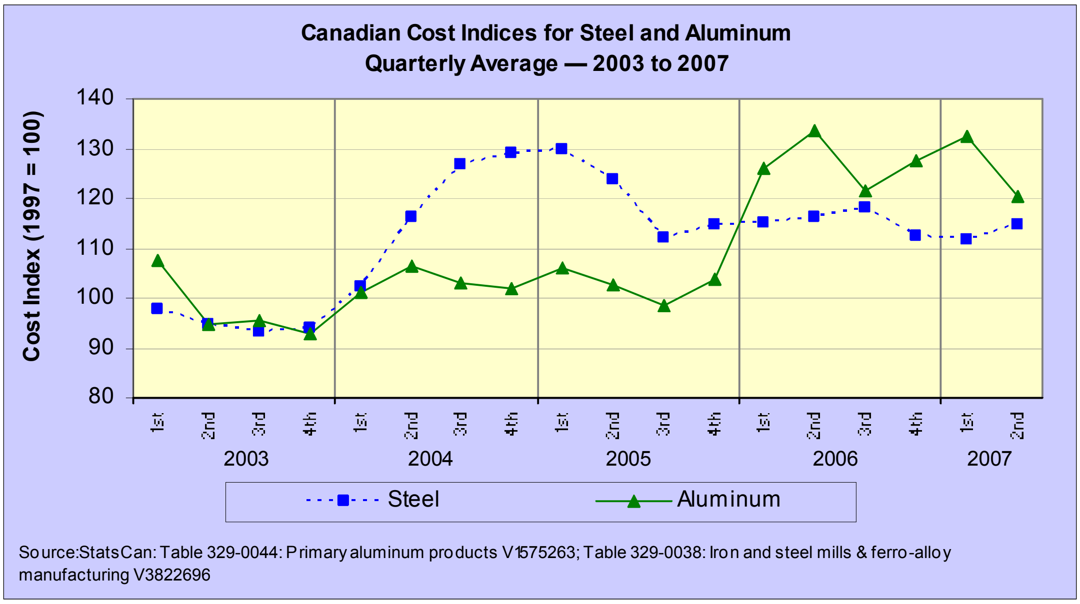
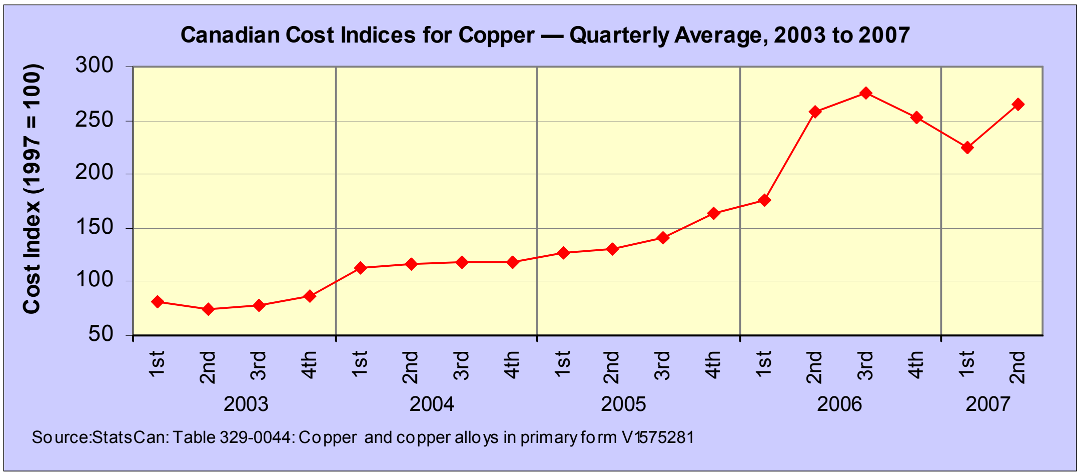
b) *Recent trends*

Quarterly cost index trends for steel, aluminum and copper are illustrated in Exhibit 4g.

Exhibit 4g — Canadian cost indices for selected metals
(i) Steel and aluminum



(ii) Copper



Copper prices rebounded in the second quarter of 2007, following a decline between the third quarter of 2006 and first quarter of 2007. Prices have recently been at or near all-time highs, following the dramatic increases in early 2006.

Aluminum prices continued to be strong the first half of 2007, at or close to record 2006 levels, following the significant increase in prices between 2005 and 2006. In the US, aluminum prices were at record highs in the first half of 2007.

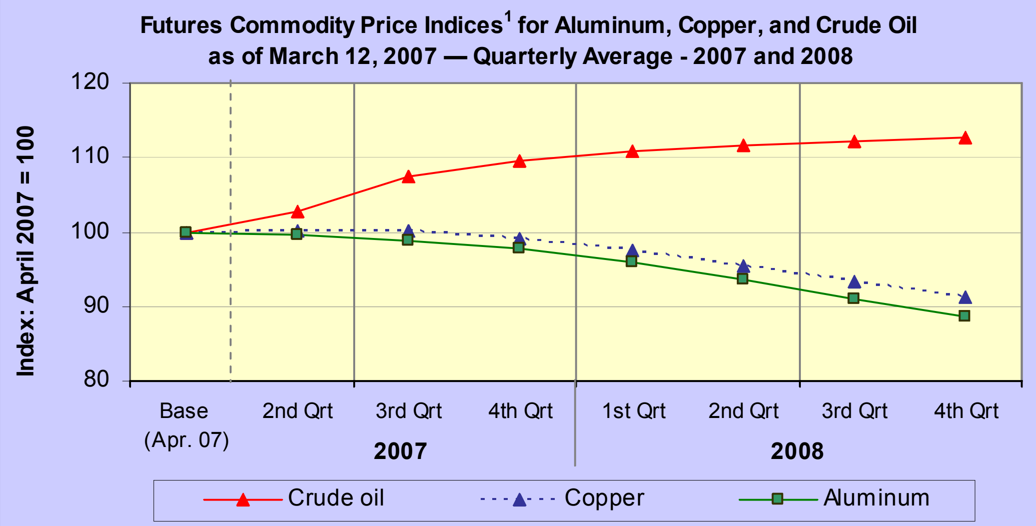
Steel prices also continued to be strong during the first half of 2007, at or close to record 2006 levels.

4.3.2 Changes in Futures markets

a) Previous outlook (February 2007)

Exhibit 4h illustrates the futures prices as recorded by the Futures New York Mercantile Exchange (NYMEX) on February 1, 2007, for aluminum, copper and crude oil, (translated to a common index).

Exhibit 4h — Futures commodity price indices, based on the Futures New York Mercantile Exchange



1 Indices calculated by MMK, using April 2007 Futures prices as the base of 100.
Source: TFC Commodity (http://www.tfc-charts.w2d.com/marketquotes/CL.html): COMEX Copper High Grade; Comex Aluminum, NYMEX Crude Oil (Light)

As of March 12, 2007, the market was expecting the following price changes by the fourth quarter of 2008:

- **Crude oil** – projected to <u>increase</u> from US $58 to $66.
- **Copper** – projected to <u>decrease</u> from US $2.85/lb to $2.53/lb.
- **Aluminum** – projected to <u>decrease</u> from US $1.23/lb to $1.05/lb.

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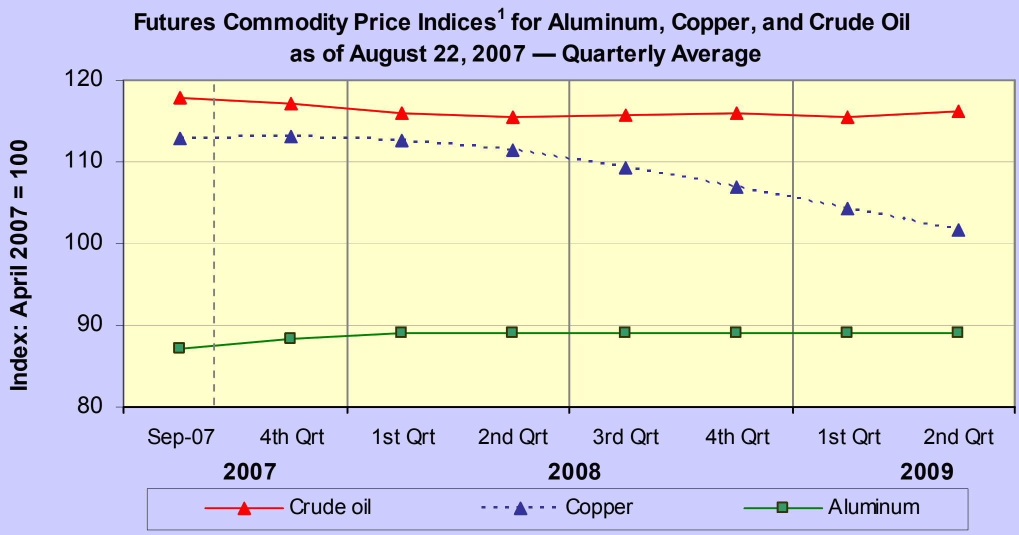
b) *Updated outlook (August 2007)*

Exhibit 4i illustrates futures commodity prices as of August 2007.

Exhibit 4i — Futures commodity price indices, based on the Futures New York Mercantile Exchange



1 Indices calculated by MMK, using September 2007 Futures prices as the base of 100.
Source: TFC Commodity (http://futures.tradingcharts.com/): COMEX Copper High Grade; Comex Aluminum, NYMEX Crude Oil (Light)

As of August 2007, the market was expecting future prices to change as follows from the last quarter of 2007 to the first half of 2009:

- **Crude oil** – projected to remain stable at approximately $US 69.
- **Copper** – projected to decrease from US $3.21/lb to $2.85/lb.
- **Aluminum** – projected to increase slightly from US 1.07/lb to $1.10.

c) *Interpretation of futures markets trends*

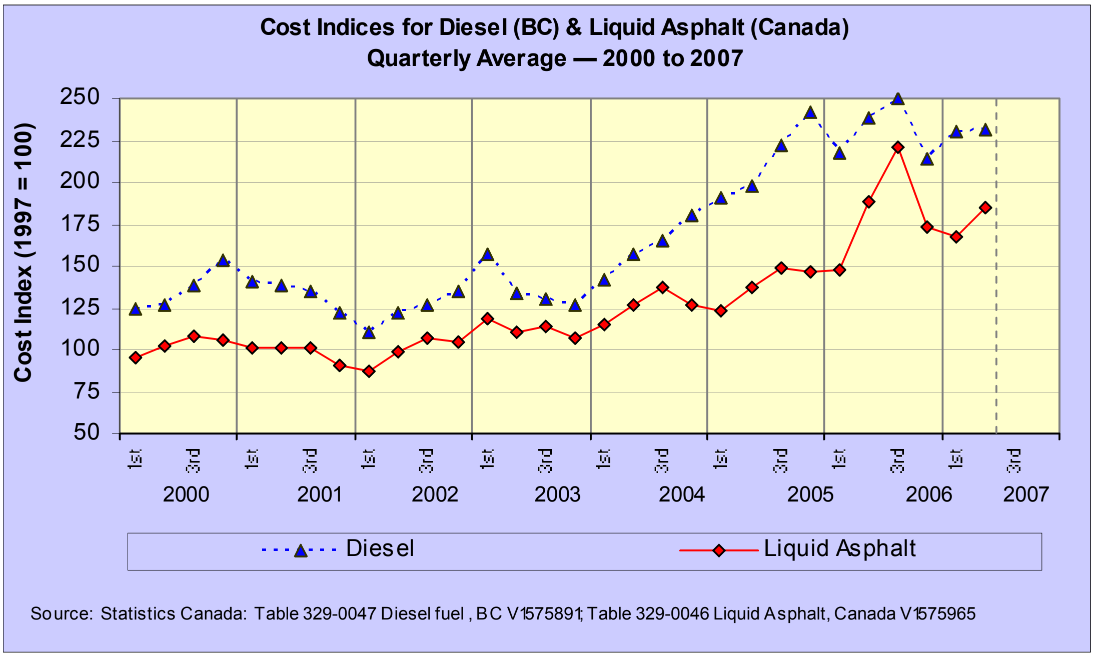
The market expectations in August 2007 are for more stable commodity price trends than were expected in March – albeit at higher general price levels than foreseen in March.

4.4 Diesel fuel and asphalt

a) Recent trends

Quarterly price index trends for diesel fuel and asphalt are illustrated in Exhibits 4j.

Exhibit 4j — Cost indices for diesel and liquid asphalt



Diesel fuel prices declined seasonally between the third and fourth quarter of 2006, before rebounding during the first quarter of 2007. Prices in mid 2007 are slightly lower than the record highs established in 2006.

Asphalt prices declined seasonally between the third quarter of 2006 and first quarter of 2007. Prices during the second quarter of 2007 were close to 2006 second-quarter levels.

b) Outlook in August 2007

As previously illustrated in Exhibit 4i, the New York Mercantile Exchange Futures market expects the price of crude oil to remain stable around US $69/barrel over the next several quarters.

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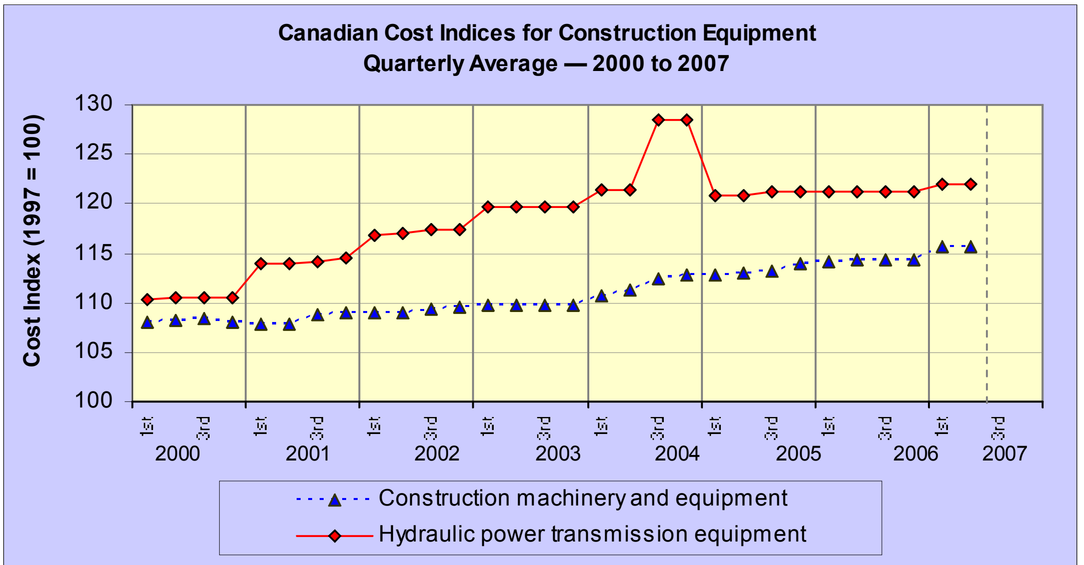
4.5 Construction machinery & equipment

a) Quarterly trends in recent years

As illustrated in Exhibit 4k, for construction machinery and equipment, and for hydraulic power and transmission equipment, price indices have been increasing slowly in recent years. Results for 2007 are slightly higher than in recent years, but are still modest in relation to increases in other indices.

Exhibit 4k — Cost indices for construction equipment



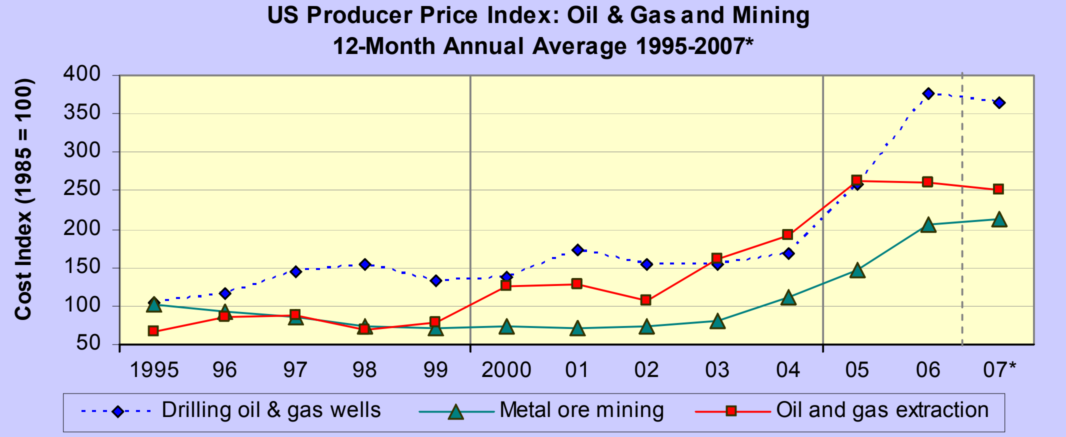
Source: Statistics Canada: Table 329-0045 - Industry price indexes for machinery and equipment, autos, trucks and other transport equipment, Canada: Construction machinery and equipment V1575466; Hydraulic power transmission equipment V1575474

4.6 Oil & gas drilling/extraction and mining costs

a) Annual trends

Exhibit 41 illustrates price trends for selected US oil, gas and mining indices. (These indices relate to the cost of drilling/extracting/mining activity, rather than the value of the product.)

Exhibit 41 — US producer price index for selected mining activities



*Six-month average for 2007 (Jan-Jun)
Source: US Bureau of Labor Statistics Data —Producer Price Index Industry Data: Metal ore mining (PCU2122). Oil and gas extraction (PCU211). Drilling oil and gas wells (PCU213111)

Exhibit 4e illustrates that:

- **Oil and gas drilling** price indices have more than doubled between 2003 and 2006.
- **Metal ore** mining price indices were flat between 1998 and 2003, but have more than doubled between 2003 and 2006.
- **Oil and gas extraction** price indices also more than doubled between 2003 and 2005, before flattening between 2005 and 2006.

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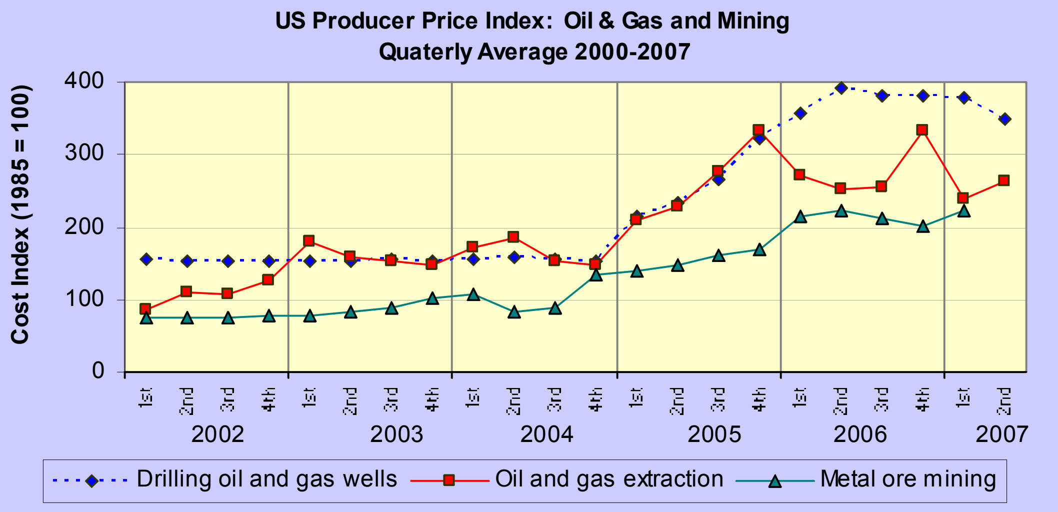
b) *Recent trends*

Quarterly trends are illustrated in Exhibit 4m:

- **Oil and gas drilling** prices indices declined in the first quarter and second quarters of 2007
- **Oil and gas extraction** price indices declined significantly in the first quarter of 2007, but recovered to mid-2006 levels in the second quarter.
- **Metal ore** mining price indices decreased in the first quarter of 2007, but increased in the second quarter to 2006 peak levels.

Exhibit 4m — Price indices in the US mining and oil & gas industry sectors



Source: US Bureau of Labor Statistics Data — Producer Price Index Industry Data: Metal ore mining (PCU2122). Oil and gas extraction (PCU211). Drilling oil and gas wells (PCU213111)

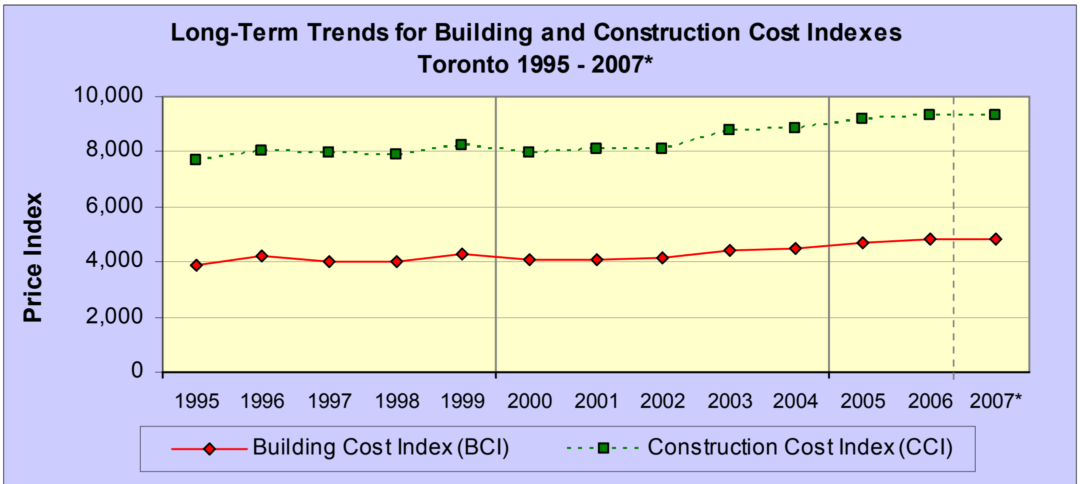
4.7 ENR composite measure of construction cost components

Engineering News Record (ENR) publishes two composite indices of construction cost components, for a number of cities in the US and Canada, including Toronto: the Building Cost Index (BCI), and the Construction Cost Index (CCI) [1].

As illustrated in Exhibit 4n, ENR construction cost inflation rates for Toronto show moderate increases in recent years, and less than 1% over the past six months.

These indices do not take into account factors such as profit margins, insurance costs, employee bonuses and incentives, lower productivity levels related to labour shortages, etc. They are therefore only partial indicators of construction cost trends.

Exhibit 4n - ENR construction cost indices for Toronto 1995-2007



*Six-month average for 2007 (Jan-Jun 07)

Source:Engineering News-Record (ENR). ENR indices are weighted aggregate indices of the prices of constant quantities of structural steel, portland cement, lumber and labor. The BCI index is weighted towards skilled trade labour, and the CCI is weighted towards common laborers.

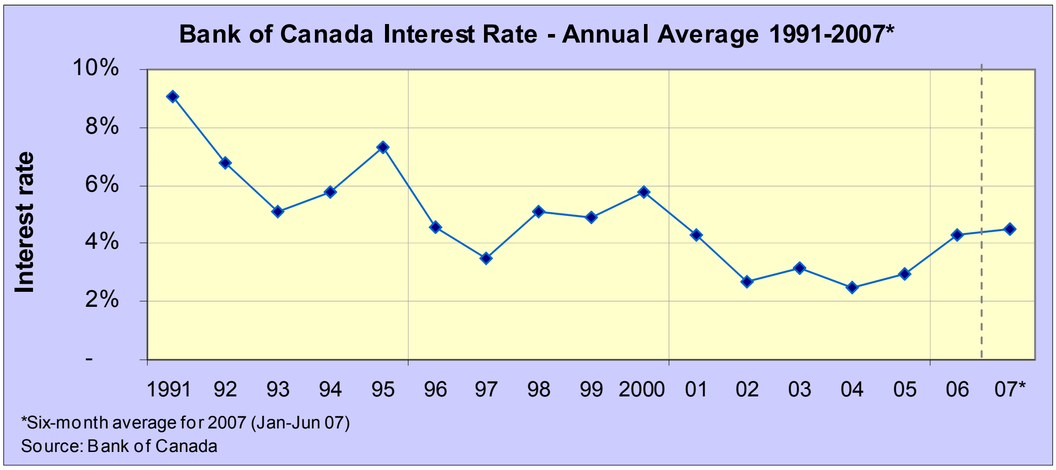
[1] ENR indices are weighted aggregate indices of the prices of constant quantities of structural steel, portland cement, lumber and labor. The BCI index is weighted more towards skilled trade labour, and the CCI is weighted more towards entry-level laborers.

4.8 Trends in interest rates

a) Longer-term annual trends

Long-run trends in the Bank of Canada interest rate are illustrated in Exhibit 4o. They demonstrate the historically low interest rates that have prevailed during the past few years. Rates increased in 2006, but are still relatively low in relation to historical levels of the past two decades. Many observers have identified the low cost of borrowing as a driver of the residential and non-residential construction boom in British Columbia and across Canada.

Exhibit 4o — Long-term Bank of Canada interest rates



b) Recent trends

Quarterly interest rate trends, shown in Exhibit 4p, illustrate the upturn in interest rates in late 2005 and early 2006. These increases affect non-residential construction prices in two ways:

- **Cost impact on contractors.** Interest rate increases add to the contractor's cost of doing business, especially where the contractor's business is financed through debt instruments (operating lines of credit, loans on capital equipment, etc.).

- **Demand impact.** Interest rate increases also add to the owner's costs, especially where these costs are debt-financed. Higher interest rates will tend to dampen the demand for construction activity, encouraging greater price competition.

Based on the construction boom of the past few years, the demand impacts of interest rates shifts appear to outweigh the contractor cost impacts, at least in a low interest rate environment.

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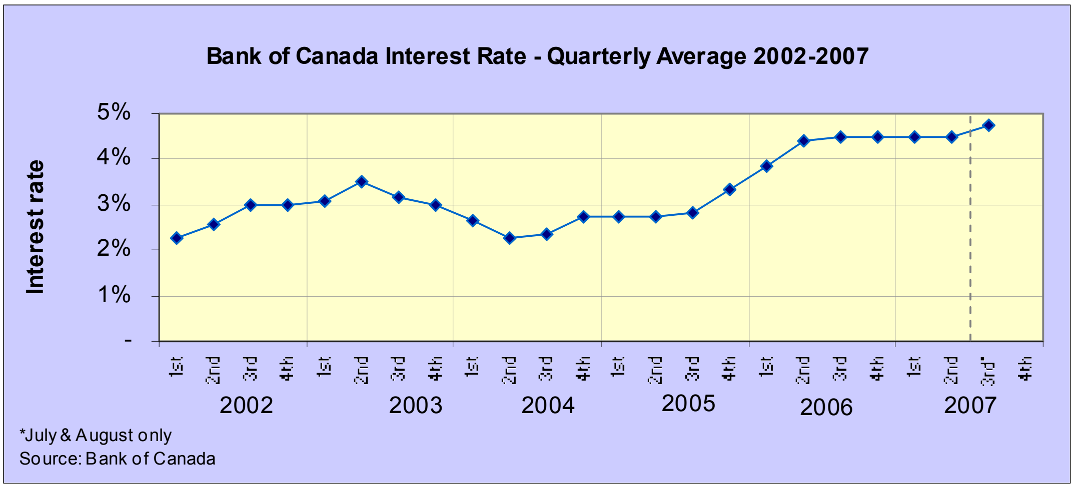
Exhibit 4p — Quarterly Bank of Canada interest rates



The Bank of Canada interest rate remained stable between the second quarters of 2006 and 2007, before being increased to 4.75% in July 2007.

4.9 Conclusion — Component cost trends

While component cost trends have been mixed during the first half of 2007, there has been a general tendency towards less volatility than was experienced in 2005 and 2006 – albeit at much increased price levels.

While component cost trends are important contributors to cost inflation in the BC industrial construction industry, they are only partial indicators of the total impact of prices, since they do not account for market-driven (supply and demand) cost inflation pressures.

5. BC Regional Trends

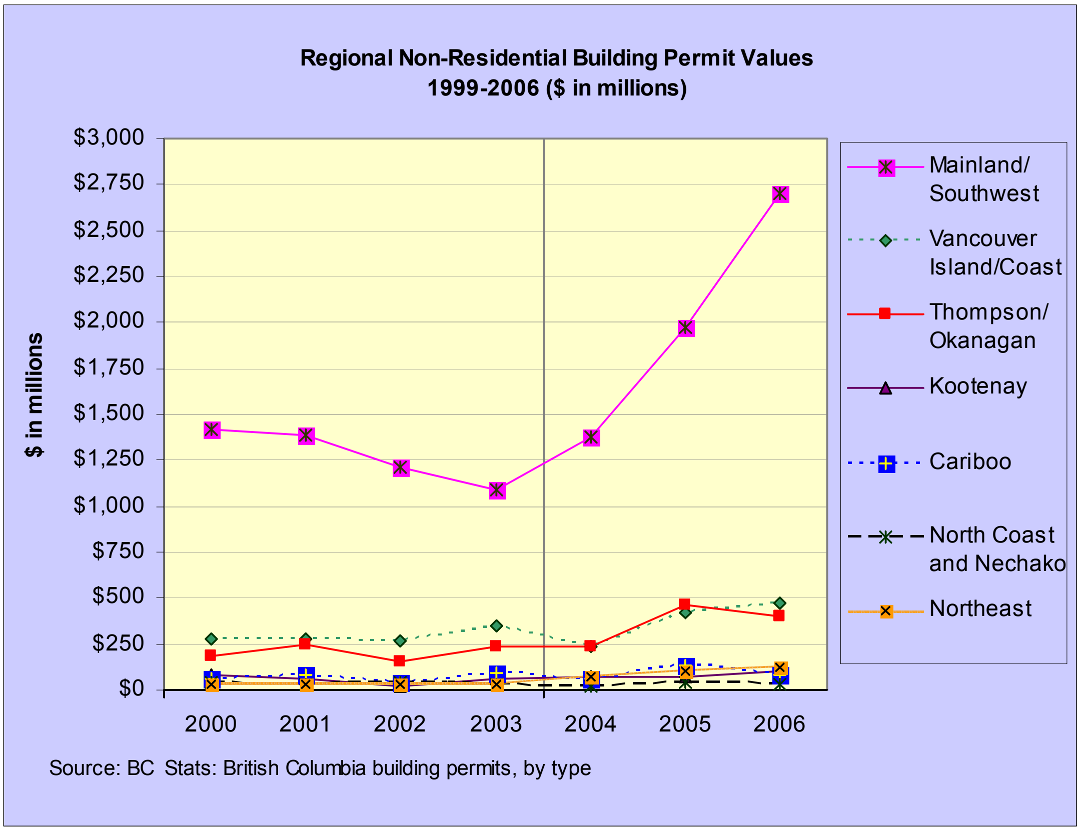
Regional construction price indices are not kept by Statistics Canada or BC Stats. However, regional construction activity levels provide an indirect indicator of those regions in which construction cost inflation pressures can be expected to be significant in BC.

5.1 Regional trends in construction activity levels

a) Annual trends

Regional trends in non-residential construction levels are illustrated in Exhibit 4a, based on the data contained in Exhibit 5a.

Exhibit 5a — Regional annual trends in non-residential building permit values



The Mainland/Southwest region accounts for approximately two-thirds of all non-residential construction activity in BC. This region also had the largest dollar increase in building permit values in 2006.

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Exhibit 5b — BC value of building permits, by region

	2000	2001	2002	2003	2004	2005	2006	Jan-May 2006	Jan-May 2007	Change 06 vs 07
British Columbia (Total)										
Total value	4,492.0	4,954.7	5,659.4	6,394.2	7,938.7	10,191.1	11,541.1	4,303.2	5,210.6	21.1%
Non-residential										
Industrial	296.0	221.0	230.0	244.0	328.0	346.2	358.2	113.9	113.6	-0.3%
Commercial	1,297.0	1,171.0	1,117.0	1,130.0	1,228.0	1,886.4	2,491.4	847.3	1,183.0	39.6%
Institutional/Government	496.0	732.0	424.0	506.0	514.0	979.5	1,067.4	534.6	370.5	-30.7%
Total non-residential	2,089.0	2,124.0	1,771.0	1,880.0	2,070.0	3,212.1	3,917.0	1,495.8	1,667.1	11.5%
Residential	2,403.0	2,830.7	3,888.4	4,514.2	5,868.7	6,979.0	7,624.1	2,807.6	3,543.5	26.2%
Vancouver Island/Coast										
Total value	581.5	632.0	769.2	993.4	1,098.4	1,459.9	1,705.7	621.9	871.3	40.1%
Non-residential										
Industrial	29.7	34.8	16.5	33.6	18.5	20.7	31.4	11.6	15.6	34.5%
Commercial	147.6	145.1	155.2	202.5	139.1	257.4	281.9	84.6	89.2	5.4%
Institutional/Government	99.3	102.6	93.5	113.6	81.0	148.3	161.8	53.6	175.0	226.5%
Total non-residential	276.6	282.5	265.2	349.7	238.6	426.4	475.2	149.8	279.8	86.8%
Residential	304.9	349.5	504.0	643.7	859.8	1,033.5	1,230.5	472.1	591.6	25.3%
Mainland/ Southwest										
Total value	3,079.8	3,396.6	4,028.3	4,165.0	5,371.6	6,387.3	7,443.1	2,730.6	3,334.3	22.1%
Non-residential										
Industrial	194.9	150.5	162.7	129.8	198.4	187.7	227.9	72.3	63.9	-11.6%
Commercial	953.0	799.3	787.7	697.4	861.5	1,204.7	1,802.8	611.2	896.9	46.7%
Institutional/Government	269.2	433.9	257.7	262.7	315.1	582.9	672.1	365.3	148.7	-59.3%
Total non-residential	1,417.1	1,383.7	1,208.1	1,089.9	1,375.0	1,975.3	2,702.7	1,048.8	1,109.5	5.8%
Residential	1,662.7	2,012.9	2,820.2	3,075.1	3,996.6	4,412.0	4,740.4	1,681.8	2,224.7	32.3%
Thompson/ Okanagan										
Total value	397.01	531.256	515.998	774.3	963.7	1,560.7	1,551.7	629.4	712.3	13.2%
Non-residential										
Industrial	30.2	17.4	23.4	49.2	30.5	48.3	69.1	17.2	13.6	-20.9%
Commercial	96.2	159.4	94.2	116.2	135.3	293.6	209.8	93.8	162.2	72.9%
Institutional/Government	54.6	70.2	35.6	70.1	70.0	122.0	125.8	54.2	29.0	-46.5%
Total non-residential	181.0	247.0	153.2	235.5	235.8	464.0	404.6	165.2	204.8	24.0%
Residential	216.0	284.3	362.8	538.8	727.9	1,096.8	1,147.0	464.2	507.4	9.3%
Kootenay										
Total value	219.001	174.291	164.2	239.4	244.6	369.7	402.4	164.5	148.2	-9.9%
Non-residential										
Industrial	27.8	8.8	6.5	6.7	13.9	8.9	13.4	9.1	1.8	-80.2%
Commercial	44.0	18.3	13.5	28.6	33.4	22.9	33.0	12.3	9.3	-24.4%
Institutional/Government	15.3	34.7	5.0	23.5	23.8	38.6	55.7	25.3	14.1	-44.3%
Total non-residential	87.1	61.8	25.0	58.8	71.1	70.4	102.1	46.7	25.2	-46.0%
Residential	131.9	112.5	139.2	180.6	173.5	299.3	300.3	117.8	123.0	4.4%
Cariboo										
Total value	101.8	115.2	88.5	125.4	121.2	203.0	174.0	74.5	76.3	2.4%
Non-residential										
Industrial	7.5	4.0	10.2	6.5	16.2	38.0	7.2	2.4	3.9	62.5%
Commercial	22.4	21.3	25.7	52.0	32.3	30.3	39.8	8.0	11.3	41.3%
Institutional/Government	29.9	55.9	9.8	31.2	11.1	62.0	33.4	29.5	2.4	-91.9%
Total non-residential	59.8	81.2	45.7	89.7	59.6	130.4	80.4	39.9	17.6	-55.9%
Residential	42.0	34.0	42.8	35.7	61.6	72.6	93.7	34.7	58.8	69.5%
North Coast and Nechako										
Total value	57.7	45.9	46.4	41.2	33.3	61.5	63.1	21.4	21.2	-0.9%
Non-residential										
Industrial	2.2	4.1	5.9	11.4	1.5	11.8	4.5	1.1	0.5	-54.5%
Commercial	13.5	11.8	10.9	13.1	7.7	10.8	21.9	5.2	6.1	17.3%
Institutional/Government	24.3	18.3	21.3	4.0	10.9	18.8	5.2	0.5	1.3	160.0%
Total non-residential	39.9	34.2	38.1	28.5	20.1	41.3	31.6	6.8	7.9	16.2%
Residential	17.7	11.7	8.3	12.6	13.2	20.1	31.5	14.6	13.3	-8.9%
Northeast										
Total value	55.2	59.5	46.7	55.6	105.9	149.1	201.2	60.9	47.0	-22.8%
Non-residential										
Industrial	3.3	1.7	5.0	6.8	49.0	30.8	4.8	0.2	14.3	7050.0%
Commercial	20.7	16.0	19.5	19.9	18.7	66.7	102.2	32.2	8.0	-75.2%
Institutional/Government	3.5	16.6	1.5	1.3	1.9	6.9	13.4	6.2	0.0	-100.0%
Total non-residential	27.5	34.3	26.0	28.0	69.5	104.4	120.5	38.6	22.3	-42.2%
Residential	27.7	25.2	20.7	27.6	36.4	44.6	80.7	22.4	24.7	10.3%

Source: BC Stats – British Columbia building permits, by type.

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b) *Recent trends*

Exhibit 5c compares percentage changes for 2005 over 2006, plus partial-year comparisons of 2007 versus 2006.

Exhibit 5c — Value of building permits, by region

	Value of non-residential building permits					
	2005 ($ M)	2006 ($ M)	Change 2005 to 2006	Jan-May 2006	Jan–May 2007	Change Jan-May 2007 vs 06
Total non-residential						
■ Vancouver Island/Coast	426	475	+11%	149.8	279.8	+87%
■ Mainland/Southwest	1,975	2,703	+37%	1048.8	1109.5	+6%
■ Thompson/Okanagan	464	405	-13%	165.2	204.8	+24%
■ Kootenay	70	102	+45%	46.7	25.2	-46%
■ Cariboo	130	80	-38%	4039.9	17.6	-56%
■ North Coast & Nechako	41	31	-24%	6.8	7.9	+16%
■ Northeast	104	121	+15%	38.6	22.3	+42%
Industrial construction						
■ Vancouver Island/Coast	21	31	+52%	11.6	15.6	+35%
■ Mainland/Southwest	188	228	+21%	72.3	63.9	-12%
■ Thompson/Okanagan	48	69	+43%	17.2	13.6	-21%
■ Kootenay	9	13	+51%	9.1	1.8	-80%
■ Cariboo	38	7	-81%	2.4	3.9	+63%
■ North Coast & Nechako	12	5	-62%	1.1	0.5	-54%
■ Northeast	31	5	-84%	0.2	14.3	>+100%

Comparing industrial construction activity over the five-month period January-May 2007 to the same period in 2006:

- Vancouver Island/Coast shows a 35% increase, continuing the strong upward trend between 2005 and 2006.
- The Cariboo and the Northeast regions show significant increases for early 2007, reversing the drop between 2005 and 2006.
- Industrial activity levels in the Lower Mainland/Southwest, Thompson/Okanagan and Kootenay regions show declines in early 2007 over early 2006, compared with increases in 2006 over 2005.

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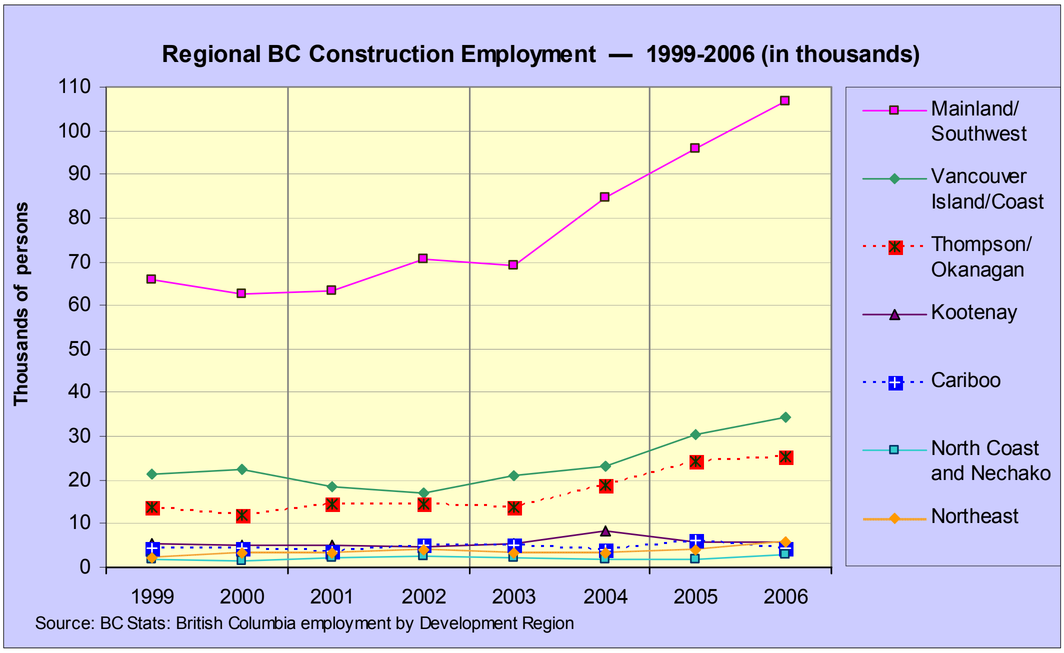
5.2 Regional trends in construction employment

a) Annual trends

Regional trends in construction employment are illustrated in Exhibit 5d. In absolute terms, the highest rates of growth in construction employment between 2003 and 2006 were in the BC Mainland/Southwest, Vancouver Island/Coast, and Thompson/Okanagan.

Exhibit 5d — Regional construction employment trends 1999-2006 (000s)[1]



1. See also table overleaf.

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Exhibit 5d (cont'd) — Regional construction employment trends 1999-2006 (000s)

	1999	2000	2001	2002	2003	2004	2005	2006	% change 2005 to 2006
British Columbia									
Construction employment	114.3	111.1	110.7	118.1	119.8	144.0	168.0	185.3	10.3%
- % of total employment	6.0%	5.8%	5.8%	6.0%	5.9%	7.0%	7.9%	8.4%	
Vancouver Island/Coast									
Construction employment	21.2	22.4	18.5	17.1	20.9	23.0	30.3	34.4	13.5%
- % of total employment	6.4%	6.8%	6.0%	5.4%	6.5%	6.9%	8.7%	9.3%	
Mainland/Southwest									
Construction employment	65.8	62.6	63.4	70.4	69.2	84.6	95.8	106.9	11.6%
- % of total employment	5.8%	5.4%	5.4%	5.8%	5.5%	6.6%	7.3%	7.9%	
Thompson/Okanagan									
Construction employment	13.7	12.0	14.6	14.3	13.6	18.8	24.1	25.3	5.1%
- % of total employment	6.6%	5.7%	6.9%	6.9%	6.2%	8.2%	9.9%	9.8%	
Kootenay									
Construction employment	5.3	5.0	5.1	4.6	5.5	8.3	5.8	5.8	-0.6%
- % of total employment	7.6%	7.1%	7.2%	6.9%	8.2%	12.4%	8.4%	8.2%	
Cariboo									
Construction employment	4.4	4.5	3.7	4.9	4.9	4.1	6.2	4.3	-30.6%
- % of total employment	5.4%	5.7%	4.7%	6.3%	6.3%	5.1%	7.7%	5.2%	
North Coast and Nechako									
Construction employment	1.9	1.5	2.3	2.6	2.2	1.9	1.8	2.9	59.3%
- % of total employment	4.1%	3.2%	4.9%	5.8%	4.9%	4.5%	3.9%	6.7%	
Northeast									
Construction employment	2.1	3.1	3.1	4.0	3.4	3.4	3.9	5.7	47.0%
- % of total employment	6.8%	9.7%	9.5%	12.0%	9.7%	10.2%	11.4%	16.4%	

In percentage terms, construction employment in 2006 was up in all areas except Kootenay (flat) and Cariboo (down -31%).

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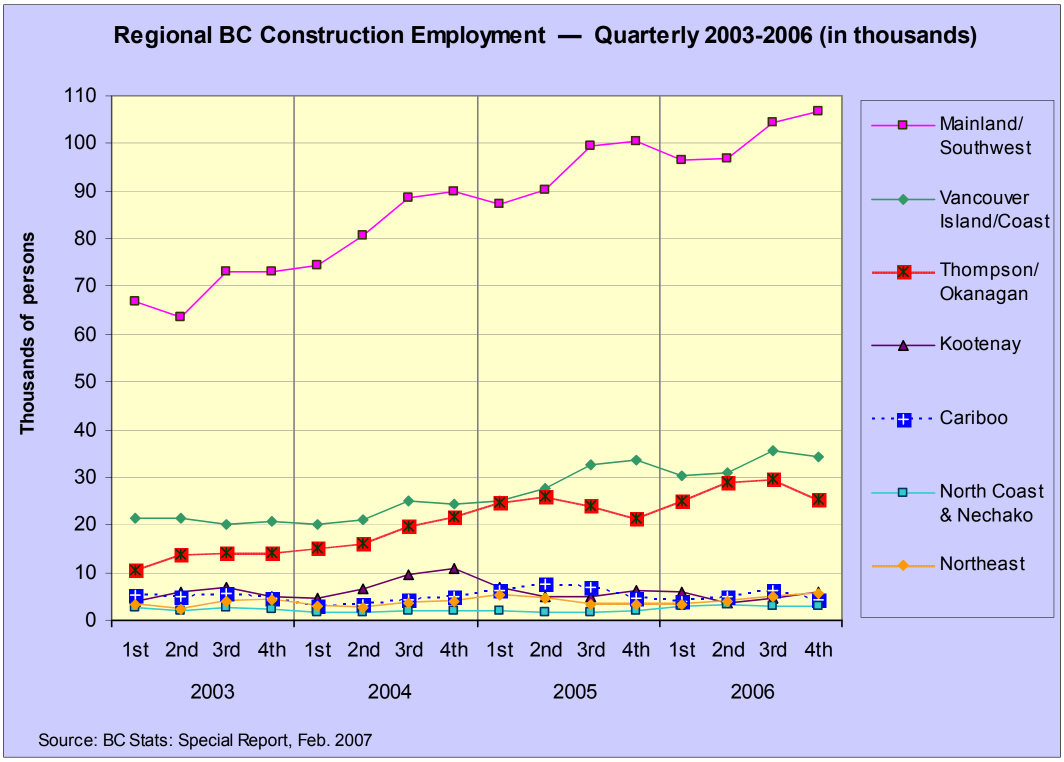
b) *Recent trends*

Quarterly construction employment trends for 2003-06 are illustrated in Exhibit 5e.

(Quarterly construction employment is not yet available on a regional basis for early 2007.)

Exhibit 5e – Regional BC construction employment



In **Mainland/Southwest**, quarterly trends in 2005/06 were similar to those in 2005 — a seasonal decline in the first quarter, followed by an increase throughout the balance of the year. However, the seasonal trends in 2006 occurred at an overall employment level approximately 8% higher than in 2005.

In **other regions**, Vancouver Island/Coast returned to normal seasonal downward trends after having had no downturn during winter 2004/05, and in Thompson/ Okanagan construction employment increased in the first quarter of 2006 after dropping in the fourth quarter of 2005.

5.3 Conclusions — Regional trends

Based on the available data on construction activity levels (building permit values, construction industry employment trends), the greatest market-driven regional cost inflation pressures are for Vancouver Island, Northeast BC and the Lower Mainland.

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6. Other Agencies' Estimates and Forecasts

This chapter briefly outlines some approaches undertaken by other agencies in estimating historical construction cost inflation and/or in forecasting future trends, where we have used the information in developing recommendations for BC Hydro. These approaches are illustrated in Exhibit 6a and are described in the following pages.

Exhibit 6a – Other agencies' cost inflation estimates and forecasts

Cost inflation estimates/forecasts		2006	2007	2008	2009	2010	2011-2015
BTY	BC Lower Mainland construction						
	• December 2005	11%	10%	10%	9%	8%	
	• December 2006	11%	5-7%	5%	3%	3%	
ENR (US)	Component cost Index						
	• Building Cost Index (BCI)	3.9%	3.5%[1]				
	• Construction Cost Index (CCI)	4.1%	3.7%[1]				
RLB (US)	Selling price index						
	• US	10.4%	9.9%[2]				
	• Seattle	n/a	12.9%[2]				
BC MoT	Construction cost allowances						
	• Property acquisition		10.0%	10.0%	10.0%		
	• Construction costs		5.2%	5.2%	5.2%		
BC AVED	Construction cost allowances	15%	15%	12%	9%	8%	
YVR	Construction cost allowances		8%	6%	5%	3.5%	2.5%
StatsCan	Industrial construction						
	• Seven CMAs	7.8%	9.6%[3]				
	• Vancouver	10.3%	13.7%[3]				
	Electric utility construction						
	• Distribution systems	4.0%	n/a				
	• Transmission lines	2.3%	n/a				
	• Substations	1.8%	n/a				

1 August 06 to August 07
2 July 1/06 to July 1/07
3 June 06 to July 06

6.1 BTY Group

BTY Group is a Canadian-based construction project management consulting firm that periodically issues cost inflation forecasts. BTY's December 2005 newsletter forecast that construction cost inflation in the BC Lower Mainland would be 11% in 2006, 10% in each of 2007 and 2008, 9% in 2009, and 8% in 2010. These estimates were subsequently revised downwards in a BTY December 2006 newsletter which forecast construction cost inflation of 6% (5% to 7%) in 2007, 5% in 2008, and 3% in each of 2009 and 2010.

6.2 ENR composite cost index

As discussed earlier, Engineering News Record (ENR), a US-based McGraw-Hill industry publication, publishes two US indexes—a "Building Cost Index" and a "Construction Cost Index".

- ENR's US **Building Cost Index** (BCI) is more heavily weighted towards materials costs. Based on relatively modest materials cost inflation expectations (ranging from -9% for softwood lumber to +9% for asphalt paving), ENR is forecasting a 0.7% increase in its Building Cost Index for 2007, versus an estimated actual increase of 2.6% in 2006. In August of 2007, ENR reports a Building Cost Index increase of 1.6% since December 2006. If this trend continues, the annual BCI increase for 2007 will be around 2.4%, higher than ENR projections in December 2006.

- ENR's US **Construction Cost Index** (CCI) is more heavily (79%) weighted towards labour costs. In late 2006, ENR is forecasting a 2.7% increase in this index for 2007, slightly down from the 3.2% increase in 2006. ENR's Building Cost Index increased by 1.5% between December 2006 and August 2007. If this trend continues, the annual CCI increase for 2007 will be around 2.3%, lower than ENR projections in December 2006.

It should be noted that these indices do not take into account contractors costs such as profit margins, insurance costs, employees bonuses and incentives, lower productivity levels related to labour shortages, etc.

6.3 Rider Levett Bucknall (RLB) "selling price" index

Rider Levett Bucknall (RLB) is a US/UK firm specializing in construction project management, cost consulting and advisory services that publishes a construction "selling price[1]". RLB's most recent quarterly cost report estimates:

- That its <u>overall</u> US construction cost index (based on bid prices) increased by 9.9% for the year July 1/06 to July 1/07.

- That its <u>Seattle</u> construction cost index increased by 12.9% during the same period.

[1] The "selling price" index is an estimate of what the market will bear. It tracks the true bid cost of construction, including contractor/subcontractor overhead costs and fees (profit).

6.4 Conference Board of Canada report

The Conference Board of Canada's summer 2007 report on Canadian industrial outlook[1] forecasts that both revenues and costs in the construction industry will increase 10% in 2007. It warns however, that by 2008 labour and materials costs will start to surpass revenue. Profit levels are expected to fall every year through 2011 (to 2.3% from 4.3%), but will still be considered high by historical standards — in the range of 1.8% over the past 15 years.

A major cause of projected reduced profit margins is the rising cost of labour, resulting from the labour shortage which compels contractors to hire less-skilled workers (lower productivity), and pay higher wages, bonuses and benefits, driving overall labour costs upward.

6.5 BC Ministry of Transportation (MoT)

This BC Ministry has an annual capital budget in the range of $650-$700 million. Capital projects range widely in size, from small projects costing a few hundred thousand dollars up to major projects of hundreds of millions. Projects may be cost-shared with other levels of government (municipality, federal), with cost inflation risk typically being assumed by the party that is responsible for construction.

Because many of the larger contracts are "design-build", it is often difficult to separate cost factors from design and cost estimating factors in assessing the impact of cost inflation. A previous MMK study for the Ministry estimated that cost inflation of cost components (asphalt, equipment, labour, etc.) can explain approximately 15%-17% of increases between 2003 and 2005, before allowing for market forces.

MoT's strategies for mitigating cost inflation pressures include:

- Breaking larger projects into smaller tenders, to encourage bidding by a wider range of contractors.
- Spacing of tender closing dates, to make it easier for contractors to bid on several projects.
- Making scope adjustments, to at least partially offset cost inflation pressures.
- Clarifying and revising contract language, to make projects less risky for bidders and to share risk where appropriate.

In mid-2006, the Ministry revised its project estimating system to explicitly include cost inflation allowances for various types of project. Annual cost inflation allowances have been established as follows:

- 5.2% annually for project planning & design, project management and construction.
- 10% annually for property acquisition costs.

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[1] Conference Board of Canada: Canadian Industrial Outlook: Canada's Non-Residential Construction Industry — Summer 2007.

6.6 BC Ministry of Advanced Education (AVED)

In 2006, the Ministry of Advanced Education (AVED) issued cost inflation estimates and projections for construction projects as follows:

- 14% for 2003
- 15% for 2004
- 16% for 2005
- 15% for each of 2006 and 2007
- 12% for 2008
- 9% for 2009
- 8% for 2010

These figures represent a significant increase from previous AVED cost inflation allowances, which in 2003 had been established as being in the range of 3% to 4.25%.

6.7 Vancouver International Airport (YVR)

We also understand (from BC Hydro) that Vancouver International Airport is using the following construction cost inflation allowances:

- 8% for 2007
- 6% for 2008
- 5% for 2009
- 3.5% for 2010
- 2.5% for 2011-2015

6.8 Statistics Canada

As discussed earlier in detail, Statistics Canada industrial price index data indicate that industrial construction cost inflation in Vancouver has been in the general range of 10% to 14% annually over the past eighteen months.

On the other hand, Statistics Canada's price index for electric utility transmission and distribution was in the range of 2% to 4% for 2006 (data for 2007 not yet available), indicating that cost inflation for industry-specific electric power delivery systems has been significantly lower than for general industrial construction.

6.9 Summary — Other agencies' estimates and forecasts

Other agencies have a wide range of approaches and results, both in estimating recent price index inflation and in developing future cost inflation allowances.

This wide range illustrates the different approaches to measuring cost inflation, different expectations about the duration of the current construction boom, and different approaches in determining how generously to allow for cost inflation pressures.

7. Cost Inflation Outlook for BC Hydro

This final chapter assesses the outlook for BC Hydro's allowances for future major construction projects.

7.1 Trends since last report

The cost inflation allowances recommended in our March 2007 report are illustrated in Exhibit 7a. In our March report, we noted that "a number of industry participants and observers have expressed their views that cost inflation pressures and expectations have begun to ease in the past six months…"

Six months later, while there is some evidence of weakening of some cost component indices, general construction price indices themselves do not yet show a significant weakening of upward price pressures for industrial construction in general.[1]

Within the industry, US-based utility equipment price indices, particularly for transmission and distribution equipment, have risen significantly over the past few years. Anecdotally, BC Hydro staff are reporting significant price increases for imported transmission and distribution materials and equipment in recent months, despite the increase in value of the Canadian dollar. This is a significant shift from earlier reports, where BC Hydro's experience more closely matched the relatively low Canadian price index movements for transmission and distribution construction.

7.2 Recommended cost inflation allowances for BC Hydro

Our recommended cost inflation allowances are illustrated in Exhibit 7a:

- **Heavy construction (power generation)** — While there are some signs of softening in component price indices, the BC construction industry and the Canadian industrial construction industries continue to show high activity levels and price inflation. Accordingly, for 2007 to 2010, our recommended cost inflation allowance range is unchanged at 4% to 6% annually. For 2011 through 2015, our recommended range is 3% to 4% annually, up slightly from our March report.

- **Transmission, stations and distribution** — Given the recent strength of US equipment price indices, combined with the experiences of BC Hydro staff, we expect the cost inflation pressures for transmission, stations and distribution to be similarly strong as for heavy industrial construction. Accordingly, we have increased our recommended cost inflation ranges for transmission, stations and distribution construction to bring them into line with those for heavy construction and power generation.

In summary, our recommended cost inflation allowances, for all major construction projects, are 4%-6% for 2007-2010, and 3%-4% for 2011-2015.

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[1] Data released by Statistics Canada in September 2007 indicate a short-term decline in new building permits in British Columbia between June 2007 and July 2007. However, it is premature to conclude whether this indicates a shift in medium-term trends.

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Exhibit 7a — Recommended construction cost inflation allowances

Previous report vs. this update		2007 to 2010	2011 to 2015
Mar. 2007	• Generation (heavy construct.) • Utility transmission/distribut.	4% to 6% 2% to 4%	2.5% to 4% 2% to 4%
Sep. 2007	• All construction projects	4% to 6%	3% to 4%

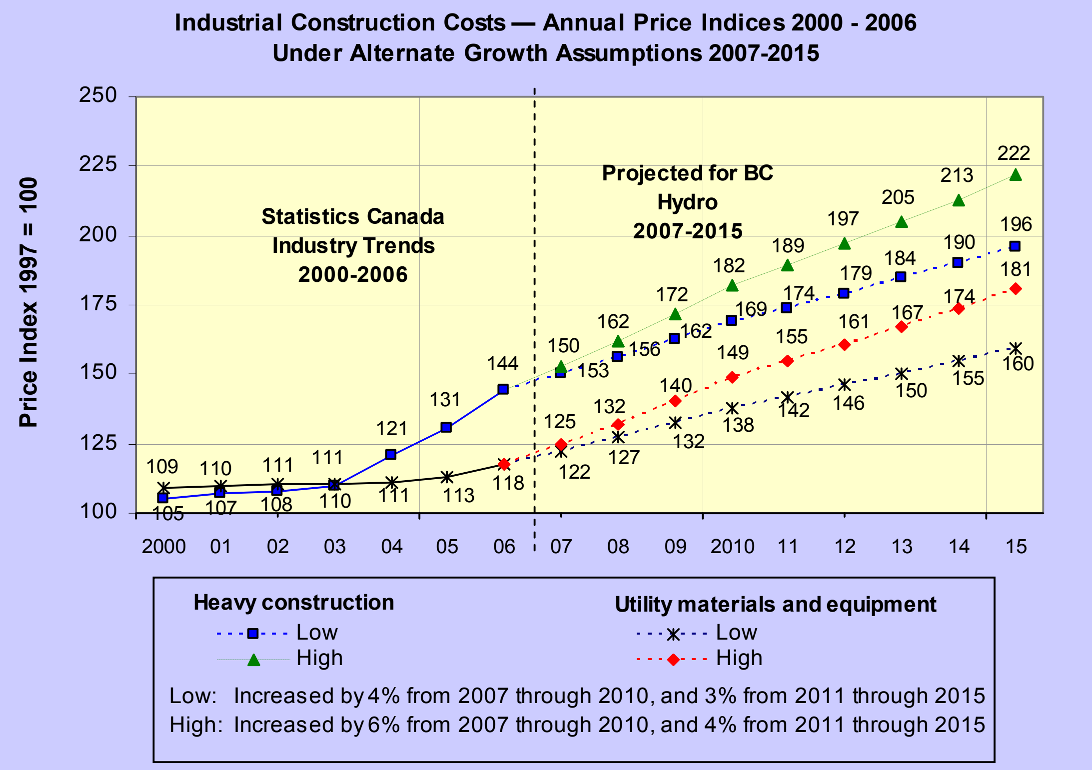
7.3 Future price index projections

These recommended ranges, applied to the relevant price indices, are illustrated in Exhibit 7b:

- For power generation and other heavy construction projects, the annual allowances have been applied to Statistics Canada's Vancouver industrial construction price index.

- For transmission and distribution projects, the allowances have been applied to the Canadian Electric Utility Annual Price Index (index numbers re-stated to make the 1997 base year consistent with the broader industrial construction price index).

Exhibit 7b — Future industrial construction price index projections, for recommended range of cost inflation allowances



Based on StatCan CANSIM Tables: (1) 327-0039: Price index of industrial building construction; Vancouver, BC
(2) 327-00111: Price index of distribution systems (V735224)

7.4 Interpretation of recommended allowances

The recommended allowances are for BC Hydro “hard” construction costs only, and exclude other “soft” project cost elements such as project design, administrative overheads, environmental mitigation, property acquisition, and other non-construction costs.

The recommended allowances also assume that the strong construction market in BC between 2003 and 2007 will continue through 2010, and that the market will have a “soft landing” in 2010 and 2011 as market demand and supply forces come more into balance.

The recommended allowances are also based on the assumption that BC Hydro takes appropriate cost mitigation measures to dampen the impact of construction cost inflation, through procurement strategies, value engineering and other cost mitigation initiatives.

All forecasts and allowances are by their nature uncertain, and we cannot represent that any of the projections in this report will be realized in whole or in part.

FortisBC
Capital Project Analysis
OTR - Okanagan Transmission Reinforcement

break after

Alternative 1A - 2010 in service

Line No.		Year: Reference	1 Dec-07	2 Dec-08	3 Dec-09	4 Dec-10	5 Dec-11	6 Dec-12	7 Dec-13	8 Dec-14	9 Dec-15	10 Dec-16	15 Dec-21	20 Dec-26	25 Dec-31	30 Dec-36	35 Dec-41	39 Dec-45	40 Dec-46	41 Dec-47
	Summary																			
	Revenue Requirements																			
1	Operating Expense (Incremental)	Line 26	0	0	0	300	(554)	(670)	(799)	(943)	(1,104)	(1,284)	(2,535)	(4,014)	(6,217)	(9,487)	(14,330)	(19,823)	(21,485)	(23,282)
2	Depreciation Expense	Line 32	0	0	0	0	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	0	0	0
3	Carrying Costs	Line 39	0	0	0	5,133	10,112	9,805	9,499	9,192	8,886	8,579	7,046	5,512	3,979	2,446	913	0	0	0
4	Income Tax	Line 60	0	0	0	(1,284)	(606)	(306)	(75)	134	321	489	1,089	1,391	1,497	1,473	1,363	(228)	(210)	(193)
5	Total Revenue Requirement for Project		0	0	0	4,149	13,059	12,937	12,732	12,490	12,210	11,892	9,707	6,997	3,366	(1,462)	(7,946)	(20,051)	(21,695)	(23,475)
6	**Net Present Value of Revenue Requirement @**	10.0%	69,421	0	0	2,834	8,109	7,303	6,534	5,827	5,178	4,585	2,324	1,040	311	(84)	(283)	(487)	(479)	(472)
					0	2,834	10,943	18,245	24,779	30,605	35,784	40,368	56,079							
	Rate Impact																			
7	**Forecast Revenue Requirements**		209,300	226,200	244,100	249,000	254,000	259,100	264,300	269,600	275,000	280,500	309,700	341,900	377,500	416,900	460,200	498,200	508,200	518,400
8	Rate Impact		0.00%	0.00%	0.00%	1.67%	5.14%	4.99%	4.82%	4.63%	4.44%	4.24%	3.13%	2.05%	0.89%	-0.35%	-1.73%	-4.02%	-4.27%	-4.53%
	Annual Incremental Rate Impact over previous year		0.00%	0.00%	0.00%	1.67%	3.48%	-0.15%	-0.18%	-0.18%	-0.19%	-0.20%	-0.23%	-0.22%	-0.24%	-0.26%	-0.29%	-0.80%	-0.24%	-0.26%
9	**NPV of Project / Total Revenue Requirements**		2.28%																	
	Regulatory Assumptions																			
10	Equity Component		40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
11	Debt Component		60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
12	Equity Return		8.77%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%
13	Debt Return		6.40%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%
	Capital Cost																			
14	Capital Costs		3,972	13,631	61,199	48,959														
15	AFUDC			647	2,892	6,197														
16	Total Cash Outlay in Year		**3,972**	**14,278**	**64,091**	**55,156**	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Cumulative Cash Outlay		3,972	18,250	82,340	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496
18			0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Cumulative Project Cost		3,972	18,250	82,340	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496
20	Additions to Plant		0	0	0	137,496	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Cummulative Additions to Plant		0	0	0	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496
22	CWIP		3,972	18,250	82,340	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	Line Losses						(1,204)	(1,333)	(1,475)	(1,633)	(1,808)	(2,001)	(3,327)	(4,888)	(7,183)	(10,554)	(15,507)	(21,097)	(22,785)	(24,608)
24	Maintenance																			
25	Property Taxes					300	650	663	676	690	704	718	792	875	966	1,066	1,177	1,274	1,300	1,326
26	Total Incremental Operating Costs (Savings)		0	0	0	300	(554)	(670)	(799)	(943)	(1,104)	(1,284)	(2,535)	(4,014)	(6,217)	(9,487)	(14,330)	(19,823)	(21,485)	(23,282)
	(Forecast inflation rate 2%)																			
27	Land					589														
	Depreciation Expense																			
28	Opening Cash Outlay		0	0	0	0	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908
29	Additions in Year	Line 20 less Line27	0	0	0	136,908	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Cumulative Total		0	0	0	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908	136,908
31	Depreciation Rate - composite average		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
32	Depreciation Expense		0	0	0	0	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	0	0	0
	Net Book Value																			
33	Gross Property	Line 21	0	0	0	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496	137,496
34	Accumulated Depreciation		0	0	0	0	(4,107)	(8,214)	(12,322)	(16,429)	(20,536)	(24,643)	(45,179)	(65,716)	(86,252)	(106,788)	(127,324)	(137,496)	(137,496)	(137,496)
35	Net Book Value		0	0	0	137,496	133,389	129,282	125,174	121,067	116,960	112,853	92,317	71,780	51,244	30,708	10,172	0	0	0
	Carrying Costs on Average NBV																			
36	Return on Equity		0	0	0	2,480	4,887	4,739	4,590	4,442	4,294	4,146	3,405	2,664	1,923	1,182	441	0	0	0
37	Interest Expense		0	0	0	2,652	5,225	5,067	4,908	4,750	4,592	4,433	3,641	2,849	2,056	1,264	472	0	0	0
38	AFUDC		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	**Total Carrying Costs**		0	0	0	5,133	10,112	9,805	9,499	9,192	8,886	8,579	7,046	5,512	3,979	2,446	913	0	0	0
	Income Tax Expense																			
40	Combined Income Tax Rate		34.12%	31.50%	31.00%	30.00%	28.50%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
	Income Tax on Equity Return																			
41	Return on Equity	Line 36	0	0	0	2,480	4,887	4,739	4,590	4,442	4,294	4,146	3,405	2,664	1,923	1,182	441	0	0	0
42	Gross up for revenue (Return / (1- tax rate)		0	0	0	3,543	6,835	6,491	6,288	6,085	5,882	5,679	4,664	3,649	2,634	1,619	604	0	0	0
43	Less: Income tax on Equity Return		0	0	0	1,063	1,948	1,753	1,698	1,643	1,588	1,533	1,259	985	711	437	163	0	0	0
44	Net Income (equal return on equity)		0	0	0	2,480	4,887	4,739	4,590	4,442	4,294	4,146	3,405	2,664	1,923	1,182	441	0	0	0
	Income Tax on Timing Differences																			
45	Depreciation Expense		0	0	0	0	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	4,107	0	0	0
46	Less: Capital Cost Allowance	Line 67	0	0	0	5,476	10,514	9,673	8,899	8,188	7,533	6,930	4,567	3,010	1,984	1,308	862	617	568	523
47	Total Timing Differences		0	0	0	(5,476)	(6,407)	(5,566)	(4,792)	(4,080)	(3,425)	(2,823)	(460)	1,097	2,123	2,800	3,245	(617)	(568)	(523)
48	Income Tax on Timing Differences		0	0	0	(1,643)	(1,826)	(1,503)	(1,294)	(1,102)	(925)	(762)	(124)	296	573	756	876	(167)	(153)	(141)
49	Before Tax Revenue Requirement [=Line48/(1-tax)		0	0	0	(2,347)	(2,554)	(2,059)	(1,772)	(1,509)	(1,267)	(1,044)	(170)	406	785	1,035	1,200	(228)	(210)	(193)
60	**Total Income Tax**	Lines 43 + 49	0	0	0	(1,284)	(606)	(306)	(75)	134	321	489	1,089	1,391	1,497	1,473	1,363	(228)	(210)	(193)
	Capital Cost Allowance																			
61	Opening Balance - UCC		0	0	0	0	131,431	120,917	111,243	102,344	94,156	86,624	57,092	37,628	24,800	16,345	10,773	7,718	7,100	6,532
62	Additions in Year		0	0	0	136,908	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	Subtotal UCC		0	0	0	136,908	131,431	120,917	111,243	102,344	94,156	86,624	57,092	37,628	24,800	16,345	10,773	7,718	7,100	6,532
64	Capital Cost Allowance Rate		8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
65	CCA on Opening Balance		0	0	0	0	10,514	9,673	8,899	8,188	7,533	6,930	4,567	3,010	1,984	1,308	862	617	568	523
66	CCA on Capital Expenditures (1/2 yr rule)		0	0	0	5,476	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	Total CCA		0	0	0	5,476	10,514	9,673	8,899	8,188	7,533	6,930	4,567	3,010	1,984	1,308	862	617	568	523
68	Ending Balance UCC		0	0	0	131,431	120,917	111,243	102,344	94,156	86,624	79,694	52,525	34,618	22,816	15,038	9,911	7,100	6,532	6,010

FortisBC
Capital Project Analysis
OTR - Okanagan Transmission Reinforcement

break after

Alternative 1B - 2010 in service

Line No.		Year: Reference	1 Dec-07	2 Dec-08	3 Dec-09	4 Dec-10	5 Dec-11	6 Dec-12	7 Dec-13	8 Dec-14	9 Dec-15	10 Dec-16	15 Dec-21	20 Dec-26	25 Dec-31	30 Dec-36	35 Dec-41	39 Dec-45	40 Dec-46	41 Dec-47
	Summary																			
	Revenue Requirements																			
1	Operating Expense (Incremental)	Line 26	0	0	0	300	(554)	(670)	(799)	(943)	(1,104)	(1,284)	(2,535)	(4,014)	(6,217)	(9,487)	(14,330)	(19,823)	(21,485)	(23,282)
2	Depreciation Expense	Line 32	0	0	0	0	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	0	0	0
3	Carrying Costs	Line 39	0	0	0	4,704	9,267	8,986	8,705	8,424	8,143	7,863	6,458	5,053	3,649	2,244	840	0	0	0
4	Income Tax	Line 60	0	0	0	(1,176)	(554)	(280)	(68)	123	295	449	998	1,275	1,372	1,350	1,250	(209)	(192)	(177)
5	Total Revenue Requirement for Project		0	0	0	3,828	11,921	11,799	11,601	11,367	11,097	10,790	8,684	6,077	2,566	(2,131)	(8,478)	(20,032)	(21,678)	(23,459)
6	**Net Present Value of Revenue Requirement @ 10.0%**		**61,840**	0	0	2,615	7,402	6,660	5,953	5,303	4,706	4,160	2,079	903	237	(122)	(302)	(487)	(479)	(471)
					0	2,615	10,017	16,677	22,630	27,933	32,639	36,799	50,961							
	Rate Impact																			
7	**Forecast Revenue Requirements**		209,300	226,200	244,100	249,000	254,000	259,100	264,300	269,600	275,000	280,500	309,700	341,900	377,500	416,900	460,200	498,200	508,200	518,400
8	Rate Impact		0.00%	0.00%	0.00%	1.54%	4.69%	4.55%	4.39%	4.22%	4.04%	3.85%	2.80%	1.78%	0.68%	-0.51%	-1.84%	-4.02%	-4.27%	-4.53%
	Annual Incremental Rate Impact over previous year		**0.00%**	0.00%	0.00%	1.54%	3.16%	-0.14%	-0.16%	-0.17%	-0.18%	-0.19%	-0.22%	-0.21%	-0.23%	-0.25%	-0.28%	-0.76%	-0.24%	-0.26%
9	**NPV of Project / Total Revenue Requirements**		**2.03%**																	
	Regulatory Assumptions																			
10	Equity Component		40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
11	31.50%		60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
12	Equity Return		8.77%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%
13	Debt Return		6.40%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%
	Capital Cost																			
14	Capital Costs		3,972	12,559	55,839	44,671														
15	AFUDC			615	2,667	5,682														
16	Total Cash Outlay in Year		**3,972**	**13,174**	**58,506**	**50,354**	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	Cumulative Cash Outlay		3,972	17,146	75,652	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006
18			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Cumulative Project Cost		3,972	17,146	75,652	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006
20	Additions to Plant		0	0	0	126,006	0	0	0	0	0	0	0	0	0	0	0	0	0	0
21	Cummulative Additions to Plant		0	0	0	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006
22	CWIP		3,972	17,146	75,652	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23	Line Losses						(1,204)	(1,333)	(1,475)	(1,633)	(1,808)	(2,001)	(3,327)	(4,888)	(7,183)	(10,554)	(15,507)	(21,097)	(22,785)	(24,608)
24	Maintenance																			
25	Property Taxes					300	650	663	676	690	704	718	792	875	966	1,066	1,177	1,274	1,300	1,326
26	Total Incremental Operating Costs (Savings)		0	0	0	300	(554)	(670)	(799)	(943)	(1,104)	(1,284)	(2,535)	(4,014)	(6,217)	(9,487)	(14,330)	(19,823)	(21,485)	(23,282)
	(Forecast inflation rate 2%)																			
27	Land					589														
	Depreciation Expense																			
28	Opening Cash Outlay		0	0	0	0	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417
29	Additions in Year	Line 20 less Line27	0	0	0	125,417	0	0	0	0	0	0	0	0	0	0	0	0	0	0
30	Cumulative Total		0	0	0	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417	125,417
31	Depreciation Rate - composite average		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
32	Depreciation Expense		0	0	0	0	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	0	0	0
	Net Book Value																			
33	Gross Property	Line 21	0	0	0	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006	126,006
34	Accumulated Depreciation		0	0	0	0	(3,763)	(7,525)	(11,288)	(15,050)	(18,813)	(22,575)	(41,388)	(60,200)	(79,013)	(97,825)	(116,638)	(126,006)	(126,006)	(126,006)
35	Net Book Value		0	0	0	126,006	122,243	118,481	114,718	110,956	107,193	103,431	84,618	65,805	46,993	28,180	9,368	0	0	0
	Carrying Costs on Average NBV																			
36	Return on Equity		0	0	0	2,273	4,478	4,343	4,207	4,071	3,935	3,800	3,121	2,442	1,763	1,085	406	0	0	0
37	Interest Expense		0	0	0	2,431	4,789	4,644	4,498	4,353	4,208	4,063	3,337	2,611	1,886	1,160	434	0	0	0
38	AFUDC		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	**Total Carrying Costs**		0	0	0	4,704	9,267	8,986	8,705	8,424	8,143	7,863	6,458	5,053	3,649	2,244	840	0	0	0
	Income Tax Expense																			
40	Combined Income Tax Rate		34.12%	31.50%	31.00%	30.00%	28.50%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
	Income Tax on Equity Return																			
41	Return on Equity	Line 36	0	0	0	2,273	4,478	4,343	4,207	4,071	3,935	3,800	3,121	2,442	1,763	1,085	406	0	0	0
42	Gross up for revenue (Return / (1- tax rate)		0	0	0	3,247	6,264	5,949	5,763	5,577	5,391	5,205	4,275	3,345	2,416	1,486	556	0	0	0
43	Less: Income tax on Equity Return		0	0	0	974	1,785	1,606	1,556	1,506	1,456	1,405	1,154	903	652	401	150	0	0	0
44	Net Income (equal return on equity)		0	0	0	2,273	4,478	4,343	4,207	4,071	3,935	3,800	3,121	2,442	1,763	1,085	406	0	0	0
	Income Tax on Timing Differences																			
45	Depreciation Expense		0	0	0	0	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	3,763	0	0	0
46	Less: Capital Cost Allowance	Line 67	0	0	0	5,017	9,632	8,861	8,153	7,500	6,900	6,348	4,184	2,758	1,818	1,198	790	566	520	479
47	Total Timing Differences		0	0	0	(5,017)	(5,870)	(5,099)	(4,390)	(3,738)	(3,138)	(2,586)	(422)	1,005	1,945	2,565	2,973	(566)	(520)	(479)
48	Income Tax on Timing Differences		0	0	0	(1,505)	(1,673)	(1,377)	(1,185)	(1,009)	(847)	(698)	(114)	271	525	692	803	(153)	(140)	(129)
49	Before Tax Revenue Requirement [=Line48/(1-tax)		0	0	0	(2,150)	(2,340)	(1,886)	(1,624)	(1,382)	(1,161)	(956)	(156)	372	719	949	1,100	(209)	(192)	(177)
60	**Total Income Tax**	Lines 43 + 49	0	0	0	(1,176)	(554)	(280)	(68)	123	295	449	998	1,275	1,372	1,350	1,250	(209)	(192)	(177)
	Capital Cost Allowance																			
61	Opening Balance - UCC		0	0	0	0	120,400	110,768	101,907	93,754	86,254	79,354	52,301	34,470	22,719	14,974	9,869	7,070	6,504	5,984
62	Additions in Year		0	0	0	125,417	0	0	0	0	0	0	0	0	0	0	0	0	0	0
63	Subtotal UCC		0	0	0	125,417	120,400	110,768	101,907	93,754	86,254	79,354	52,301	34,470	22,719	14,974	9,869	7,070	6,504	5,984
64	Capital Cost Allowance Rate		8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
65	CCA on Opening Balance		0	0	0	0	9,632	8,861	8,153	7,500	6,900	6,348	4,184	2,758	1,818	1,198	790	566	520	479
66	CCA on Capital Expenditures (1/2 yr rule)		0	0	0	5,017	0	0	0	0	0	0	0	0	0	0	0	0	0	0
67	Total CCA		0	0	0	5,017	9,632	8,861	8,153	7,500	6,900	6,348	4,184	2,758	1,818	1,198	790	566	520	479
68	Ending Balance UCC		0	0	0	120,400	110,768	101,907	93,754	86,254	79,354	73,005	48,117	31,713	20,901	13,776	9,079	6,504	5,984	5,505

FortisBC
Capital Project Analysis
OTR - Okanagan Transmission Reinforcement

break after

Alternative 1A - 2012 in service

Line No.		Year: Reference	1 Dec-07	2 Dec-08	3 Dec-09	4 Dec-10	5 Dec-11	6 Dec-12	7 Dec-13	8 Dec-14	9 Dec-15	10 Dec-16	15 Dec-21	20 Dec-26	25 Dec-31	30 Dec-36	35 Dec-41	39 Dec-45	40 Dec-46	41 Dec-47
	Summary																			
	Revenue Requirements																			
1	Operating Expense (Incremental)	Line 26	0	0	0	0	0	0	(799)	(944)	(1,105)	(1,284)	(2,535)	(4,014)	(6,217)	(9,488)	(14,330)	(19,823)	(21,486)	(23,282)
2	Depreciation Expense	Line 32	0	0	0	0	0	0	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	2,062	0
3	Carrying Costs	Line 39	0	0	0	0	0	5,524	10,883	10,553	10,223	9,893	8,242	6,591	4,941	3,290	1,640	319	77	0
4	Income Tax	Line 60	0	0	0	0	0	(1,193)	(606)	(330)	(81)	144	960	1,397	1,585	1,608	1,523	1,402	509	(246)
5	Total Revenue Requirement for Project		0	0	0	0	0	4,331	13,899	13,701	13,459	13,174	11,089	8,396	4,730	(168)	(6,746)	(13,681)	(18,837)	(23,528)
6	**Net Present Value of Revenue Requirement @ 10.0%**		**60,106**	0	0	0	0	2,445	7,133	6,392	5,708	5,079	2,655	1,248	437	(10)	(240)	(332)	(416)	(473)
					0	0	0	2,445	9,577	15,969	21,677	26,756	44,434							
	Rate Impact																			
7	**Forecast Revenue Requirements**		209,300	226,200	244,100	249,000	254,000	259,100	264,300	269,600	275,000	280,500	309,700	341,900	377,500	416,900	460,200	498,200	508,200	518,400
8	Rate Impact		0.00%	0.00%	0.00%	0.00%	0.00%	1.67%	5.26%	5.08%	4.89%	4.70%	3.58%	2.46%	1.25%	-0.04%	-1.47%	-2.75%	-3.71%	-4.54%
	Annual Incremental Rate Impact over previous year		**0.00%**	0.00%	0.00%	0.00%	0.00%	1.67%	3.59%	-0.18%	-0.19%	-0.20%	-0.24%	-0.23%	-0.25%	-0.27%	-0.30%	-0.33%	-0.96%	-0.83%
9	**NPV of Project / Total Revenue Requirements**		**1.97%**																	
	Regulatory Assumptions																			
10	Equity Component		40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
11	Debt Component		60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
12	Equity Return		8.77%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%
13	Debt Return		6.40%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%
	Capital Cost																			
14	Capital Costs		3,972	1,445	107	13,235	65,638	52,510												
15	AFUDC			282	328	728	3,095	6,639												
16	Total Cash Outlay in Year		**3,972**	**1,726**	**435**	**13,963**	68,732	59,149	0	0	0	0	0	0	0	0	0	0	0	0
17	Cumulative Cash Outlay		3,972	5,698	6,133	20,096	88,828	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977
18			0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0
19	Cumulative Project Cost		3,972	5,698	6,133	20,096	88,828	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977
20	Additions to Plant		0	0	0	0	0	147,977	0	0	0	0	0	0	0	0	0	0	0	0
21	Cummulative Additions to Plant		0	0	0	0	0	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977
22	CWIP		3,972	5,698	6,133	20,096	88,828	0	0	0	0	0	0	0	0	0	0	0	0	0
23	Line Losses								(1,475)	(1,633)	(1,808)	(2,001)	(3,327)	(4,888)	(7,183)	(10,554)	(15,507)	(21,097)	(22,785)	(24,608)
24	Maintenance																			
25	Property Taxes								676	690	703	717	792	874	965	1,066	1,177	1,274	1,299	1,325
26	Total Incremental Operating Costs (Savings)		0	0	0	0	0	0	(799)	(944)	(1,105)	(1,284)	(2,535)	(4,014)	(6,217)	(9,488)	(14,330)	(19,823)	(21,486)	(23,282)
	(Forecast inflation rate 2%)																			
27	Land							589												
	Depreciation Expense																			
28	Opening Cash Outlay		0	0	0	0	0	0	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389
29	Additions in Year	Line 20 less Line27	0	0	0	0	0	147,389	0	0	0	0	0	0	0	0	0	0	0	0
30	Cumulative Total		0	0	0	0	0	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389	147,389
31	Depreciation Rate - composite average		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
32	Depreciation Expense		0	0	0	0	0	0	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	2,062	0
	Net Book Value																			
33	Gross Property	Line 21	0	0	0	0	0	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977	147,977
34	Accumulated Depreciation		0	0	0	0	0	0	(4,422)	(8,843)	(13,265)	(17,687)	(39,795)	(61,903)	(84,012)	(106,120)	(128,228)	(145,915)	(147,977)	(147,977)
35	Net Book Value		0	0	0	0	0	147,977	143,556	139,134	134,712	130,291	108,182	86,074	63,966	41,857	19,749	2,062	0	0
	Carrying Costs on Average NBV																			
36	Return on Equity		0	0	0	0	0	2,670	5,259	5,100	4,940	4,781	3,983	3,185	2,388	1,590	792	154	37	0
37	Interest Expense		0	0	0	0	0	2,854	5,624	5,453	5,283	5,112	4,259	3,406	2,553	1,700	847	165	40	0
38	AFUDC		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	**Total Carrying Costs**		0	0	0	0	0	5,524	10,883	10,553	10,223	9,893	8,242	6,591	4,941	3,290	1,640	319	77	0
	Income Tax Expense																			
40	Combined Income Tax Rate		34.12%	31.50%	31.00%	30.00%	28.50%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
	Income Tax on Equity Return																			
41	Return on Equity	Line 36	0	0	0	0	0	2,670	5,259	5,100	4,940	4,781	3,983	3,185	2,388	1,590	792	154	37	0
42	Gross up for revenue (Return / (1- tax rate)		0	0	0	0	0	3,657	7,204	6,986	6,767	6,549	5,456	4,363	3,271	2,178	1,085	211	51	0
43	Less: Income tax on Equity Return		0	0	0	0	0	987	1,945	1,886	1,827	1,768	1,473	1,178	883	588	293	57	14	0
44	Net Income (equal return on equity)		0	0	0	0	0	2,670	5,259	5,100	4,940	4,781	3,983	3,185	2,388	1,590	792	154	37	0
	Income Tax on Timing Differences																			
45	Depreciation Expense		0	0	0	0	0	0	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	4,422	2,062	0
46	Less: Capital Cost Allowance	Line 67	0	0	0	0	0	5,896	11,319	10,414	9,581	8,814	5,809	3,829	2,524	1,663	1,096	785	722	665
47	Total Timing Differences		0	0	0	0	0	(5,896)	(6,898)	(5,992)	(5,159)	(4,393)	(1,388)	593	1,898	2,758	3,325	3,636	1,340	(665)
48	Income Tax on Timing Differences		0	0	0	0	0	(1,592)	(1,862)	(1,618)	(1,393)	(1,186)	(375)	160	512	745	898	982	362	(179)
49	Before Tax Revenue Requirement [=Line48/(1-tax)		0	0	0	0	0	(2,181)	(2,551)	(2,216)	(1,908)	(1,625)	(513)	219	702	1,020	1,230	1,345	496	(246)
60	**Total Income Tax**	Lines 43 + 49	0	0	0	0	0	(1,193)	(606)	(330)	(81)	144	960	1,397	1,585	1,608	1,523	1,402	509	(246)
	Capital Cost Allowance																			
61	Opening Balance - UCC		0	0	0	0	0	0	141,493	130,174	119,760	110,179	72,617	47,861	31,544	20,790	13,702	9,816	9,031	8,308
62	Additions in Year		0	0	0	0	0	147,389	0	0	0	0	0	0	0	0	0	0	0	0
63	Subtotal UCC		0	0	0	0	0	147,389	141,493	130,174	119,760	110,179	72,617	47,861	31,544	20,790	13,702	9,816	9,031	8,308
64	Capital Cost Allowance Rate		8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
65	CCA on Opening Balance		0	0	0	0	0	0	11,319	10,414	9,581	8,814	5,809	3,829	2,524	1,663	1,096	785	722	665
66	CCA on Capital Expenditures (1/2 yr rule)		0	0	0	0	0	5,896	0	0	0	0	0	0	0	0	0	0	0	0
67	Total CCA		0	0	0	0	0	5,896	11,319	10,414	9,581	8,814	5,809	3,829	2,524	1,663	1,096	785	722	665
68	Ending Balance UCC		0	0	0	0	0	141,493	130,174	119,760	110,179	101,365	66,808	44,032	29,021	19,127	12,606	9,031	8,308	7,644

FortisBC
Capital Project Analysis
OTR - Okanagan Transmission Reinforcement

break after

Alternative 1B - 2012 in service

Line No.		Year: Reference	1 Dec-07	2 Dec-08	3 Dec-09	4 Dec-10	5 Dec-11	6 Dec-12	7 Dec-13	8 Dec-14	9 Dec-15	10 Dec-16	15 Dec-21	20 Dec-26	25 Dec-31	30 Dec-36	35 Dec-41	39 Dec-45	40 Dec-46	41 Dec-47
	Summary																			
	Revenue Requirements																			
1	Operating Expense (Incremental)	Line 25	0	0	0	0	0	0	(799)	(944)	(1,105)	(1,284)	(2,535)	(4,014)	(6,217)	(9,488)	(14,330)	(19,823)	(21,486)	(23,282)
2	Depreciation Expense	Line 31	0	0	0	0	0	0	4,050	4,050	4,050	4,050	4,050	4,050	4,050	4,050	4,050	4,050	1,938	0
3	Carrying Costs	Line 38	0	0	0	0	0	5,061	9,972	9,669	9,367	9,064	7,553	6,041	4,529	3,017	1,505	296	72	0
4	Income Tax	Line 60	0	0	0	0	0	(1,093)	(554)	(302)	(74)	132	880	1,281	1,453	1,474	1,396	1,285	485	(225)
5	Total Revenue Requirement for Project		0	0	0	0	0	3,969	12,668	12,474	12,239	11,962	9,947	7,357	3,814	(947)	(7,379)	(14,193)	(18,990)	(23,508)
6	**Net Present Value of Revenue Requirement @**	10.0%	53,335	0	0	0	0	2,240	6,501	5,819	5,190	4,612	2,381	1,094	352	(54)	(263)	(345)	(420)	(472)
					0	0	0	2,240	8,741	14,560	19,750	24,362	40,323							
	Rate Impact																			
7	**Forecast Revenue Requirements**		209,300	226,200	244,100	249,000	254,000	259,100	264,300	269,600	275,000	280,500	309,700	341,900	377,500	416,900	460,200	498,200	508,200	518,400
8	Rate Impact		0.00%	0.00%	0.00%	0.00%	0.00%	1.53%	4.79%	4.63%	4.45%	4.26%	3.21%	2.15%	1.01%	-0.23%	-1.60%	-2.85%	-3.74%	-4.53%
	Annual Incremental Rate Impact over previous year		0.00%	0.00%	0.00%	0.00%	0.00%	1.53%	3.26%	-0.17%	-0.18%	-0.19%	-0.23%	-0.22%	-0.24%	-0.26%	-0.29%	-0.33%	-0.89%	-0.80%
9	**NPV of Project / Total Revenue Requirements**		1.75%																	
	Regulatory Assumptions																			
10	Equity Component		40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
			60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
11	Equity Return		8.77%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%
12	Debt Return		6.40%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%
	Capital Cost																			
13	Capital Costs		3,972	1,445	107	12,078	59,857	47,886												
14	AFUDC			282	328	694	2,852	6,084												
15	Total Cash Outlay in Year		**3,972**	**1,726**	**435**	**12,772**	62,709	53,970	0	0	0	0	0	0	0	0	0	0	0	0
16	Cumulative Cash Outlay		3,972	5,698	6,133	18,905	81,614	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584
17			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	Cumulative Project Cost		3,972	5,698	6,133	18,905	81,614	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584
19	Additions to Plant		0	0	0	0	0	135,584	0	0	0	0	0	0	0	0	0	0	0	0
20	Cummulative Additions to Plant		0	0	0	0	0	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584
21	CWIP		3,972	5,698	6,133	18,905	81,614	0	0	0	0	0	0	0	0	0	0	0	0	0
										1.107	1.107	1.107	1.107							
22	Line Losses								(1,475)	(1,633)	(1,808)	(2,001)	(3,327)	(4,888)	(7,183)	(10,554)	(15,507)	(21,097)	(22,785)	(24,608)
23	Maintenance																			
24	Property Taxes								676	690	703	717	792	874	965	1,066	1,177	1,274	1,299	1,325
25	Total Incremental Operating Costs (Savings)		0	0	0	0	0	0	(799)	(944)	(1,105)	(1,284)	(2,535)	(4,014)	(6,217)	(9,488)	(14,330)	(19,823)	(21,486)	(23,282)
	(Forecast inflation rate 2%)																			
26	Land							589												
	Depreciation Expense																			
27	Opening Cash Outlay		0	0	0	0	0	0	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995
28	Additions in Year	Line 19 less Line26	0	0	0	0	0	134,995	0	0	0	0	0	0	0	0	0	0	0	0
29	Cumulative Total		0	0	0	0	0	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995	134,995
30	Depreciation Rate - composite average		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
31	Depreciation Expense		0	0	0	0	0	0	4,050	4,050	4,050	4,050	4,050	4,050	4,050	4,050	4,050	4,050	1,938	0
	Net Book Value																			
32	Gross Property	Line 20	0	0	0	0	0	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584	135,584
33	Accumulated Depreciation		0	0	0	0	0	0	(4,050)	(8,100)	(12,150)	(16,199)	(36,449)	(56,698)	(76,947)	(97,197)	(117,446)	(133,645)	(135,584)	(135,584)
34	Net Book Value		0	0	0	0	0	135,584	131,534	127,484	123,434	119,384	99,135	78,886	58,637	38,387	18,138	1,938	0	0
	Carrying Costs on Average NBV																			
35	Return on Equity		0	0	0	0	0	2,446	4,819	4,673	4,527	4,380	3,650	2,919	2,189	1,458	727	143	35	0
36	Interest Expense		0	0	0	0	0	2,615	5,153	4,996	4,840	4,684	3,903	3,122	2,340	1,559	778	153	37	0
37	AFUDC		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	**Total Carrying Costs**		0	0	0	0	0	5,061	9,972	9,669	9,367	9,064	7,553	6,041	4,529	3,017	1,505	296	72	0
	Income Tax Expense																			
39	Combined Income Tax Rate		34.12%	31.50%	31.00%	30.00%	28.50%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
	Income Tax on Equity Return																			
40	Return on Equity	Line 35	0	0	0	0	0	2,446	4,819	4,673	4,527	4,380	3,650	2,919	2,189	1,458	727	143	35	0
41	Gross up for revenue (Return / (1- tax rate)		0	0	0	0	0	3,351	6,601	6,401	6,201	6,001	5,000	3,999	2,998	1,997	997	196	48	0
42	Less: Income tax on Equity Return		0	0	0	0	0	905	1,782	1,728	1,674	1,620	1,350	1,080	810	539	269	53	13	0
43	Net Income (equal return on equity)		0	0	0	0	0	2,446	4,819	4,673	4,527	4,380	3,650	2,919	2,189	1,458	727	143	35	0
	Income Tax on Timing Differences																			
44	Depreciation Expense		0	0	0	0	0	0	4,050	4,050	4,050	4,050	4,050	4,050	4,050	4,050	4,050	4,050	1,938	0
45	Less: Capital Cost Allowance	Line 67	0	0	0	0	0	5,400	10,368	9,538	8,775	8,073	5,321	3,507	2,311	1,523	1,004	719	662	609
46	Total Timing Differences		0	0	0	0	0	(5,400)	(6,318)	(5,488)	(4,725)	(4,023)	(1,271)	543	1,739	2,527	3,046	3,331	1,277	(609)
47	Income Tax on Timing Differences		0	0	0	0	0	(1,458)	(1,706)	(1,482)	(1,276)	(1,086)	(343)	147	469	682	822	899	345	(164)
48	Before Tax Revenue Requirement [=Line47/(1-tax)		0	0	0	0	0	(1,997)	(2,337)	(2,030)	(1,748)	(1,488)	(470)	201	643	934	1,127	1,232	472	(225)
60	**Total Income Tax**	Lines 42 + 48	0	0	0	0	0	(1,093)	(554)	(302)	(74)	132	880	1,281	1,453	1,474	1,396	1,285	485	(225)
	Capital Cost Allowance																			
61	Opening Balance - UCC		0	0	0	0	0	0	129,596	119,228	109,690	100,915	66,511	43,836	28,892	19,042	12,550	8,991	8,272	7,610
62	Additions in Year		0	0	0	0	0	134,995	0	0	0	0	0	0	0	0	0	0	0	0
63	Subtotal UCC		0	0	0	0	0	134,995	129,596	119,228	109,690	100,915	66,511	43,836	28,892	19,042	12,550	8,991	8,272	7,610
64	Capital Cost Allowance Rate		8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
65	CCA on Opening Balance		0	0	0	0	0	0	10,368	9,538	8,775	8,073	5,321	3,507	2,311	1,523	1,004	719	662	609
66	CCA on Capital Expenditures (1/2 yr rule)		0	0	0	0	0	5,400	0	0	0	0	0	0	0	0	0	0	0	0
67	Total CCA		0	0	0	0	0	5,400	10,368	9,538	8,775	8,073	5,321	3,507	2,311	1,523	1,004	719	662	609
68	Ending Balance UCC		0	0	0	0	0	129,596	119,228	109,690	100,915	92,841	61,190	40,329	26,580	17,519	11,546	8,272	7,610	7,001

FortisBC
Capital Project Analysis
OTR - Okanagan Transmission Reinforcement

break after

Alternative 2A - 2012 in service

Line No.		Year: Reference	1 Dec-07	2 Dec-08	3 Dec-09	4 Dec-10	5 Dec-11	6 Dec-12	7 Dec-13	8 Dec-14	9 Dec-15	10 Dec-16	15 Dec-21	20 Dec-26	25 Dec-31	30 Dec-36	35 Dec-41	39 Dec-45	40 Dec-46	41 Dec-47
	Summary																			
	Revenue Requirements																			
1	Operating Expense (Incremental)	Line 25	0	0	0	0	0	0	(799)	(944)	(1,105)	(1,284)	(2,535)	(4,014)	(6,217)	(9,488)	(14,330)	(19,823)	(21,486)	(23,282)
2	Depreciation Expense	Line 31	0	0	0	0	0	0	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	58
3	Carrying Costs	Line 38	0	0	0	0	0	6,104	12,029	11,670	11,311	10,952	9,157	7,362	5,568	3,773	1,978	543	184	2
4	Income Tax	Line 60	0	0	0	0	0	(1,280)	(624)	(324)	(53)	191	1,079	1,554	1,759	1,784	1,691	1,559	1,520	(245)
5	Total Revenue Requirement for Project		0	0	0	0	0	4,824	15,413	15,210	14,961	14,666	12,508	9,710	5,917	877	(5,853)	(12,914)	(14,974)	(23,467)
6	**Net Present Value of Revenue Requirement @** 10.0%		68,698	0	0	0	0	2,723	7,909	7,095	6,345	5,655	2,994	1,443	546	50	(208)	(314)	(331)	(471)
					0	0	0	2,723	10,632	17,728	24,073	29,727	49,532							
	Rate Impact																			
7	**Forecast Revenue Requirements**		209,300	226,200	244,100	249,000	254,000	259,100	264,300	269,600	275,000	280,500	309,700	341,900	377,500	416,900	460,200	498,200	508,200	518,400
8	Rate Impact		0.00%	0.00%	0.00%	0.00%	0.00%	1.86%	5.83%	5.64%	5.44%	5.23%	4.04%	2.84%	1.57%	0.21%	-1.27%	-2.59%	-2.95%	-4.53%
	Annual Incremental Rate Impact over previous year		0.00%	0.00%	0.00%	0.00%	0.00%	1.86%	3.97%	-0.19%	-0.20%	-0.21%	-0.25%	-0.25%	-0.26%	-0.28%	-0.31%	-0.34%	-0.35%	-1.58%
9	**NPV of Project / Total Revenue Requirements**		2.26%																	
	Regulatory Assumptions																			
10	Equity Component		40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
			60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
11	Equity Return		8.77%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%
12	Debt Return		6.40%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%
	Capital Cost																			
13	Capital Costs		3,972	1,605	2,033	15,451	71,100	56,880												
14	AFUDC			286	396	920	3,517	7,356												
15	Total Cash Outlay in Year		**3,972**	**1,891**	**2,429**	**16,371**	74,617	64,236	0	0	0	0	0	0	0	0	0	0	0	0
16	Cumulative Cash Outlay		3,972	5,863	8,292	24,663	99,279	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516
17			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	Cumulative Project Cost		3,972	5,863	8,292	24,663	99,279	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516
19	Additions to Plant		0	0	0	0	0	163,516	0	0	0	0	0	0	0	0	0	0	0	0
20	Cummulative Additions to Plant		0	0	0	0	0	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516
21	CWIP		3,972	5,863	8,292	24,663	99,279	0	0	0	0	0	0	0	0	0	0	0	0	0
22	Line Losses								(1,475)	(1,633)	(1,808)	(2,001)	(3,327)	(4,888)	(7,183)	(10,554)	(15,507)	(21,097)	(22,785)	(24,608)
23	Maintenance																			
24	Property Taxes								676	690	703	717	792	874	965	1,066	1,177	1,274	1,299	1,325
25	Total Incremental Operating Costs (Savings)		0	0	0	0	0	0	(799)	(944)	(1,105)	(1,284)	(2,535)	(4,014)	(6,217)	(9,488)	(14,330)	(19,823)	(21,486)	(23,282)
	(Forecast inflation rate 2%)																			
26	Land							3,264												
	Depreciation Expense																			
27	Opening Cash Outlay		0	0	0	0	0	0	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252
28	Additions in Year	Line 19 less Line26	0	0	0	0	0	160,252	0	0	0	0	0	0	0	0	0	0	0	0
29	Cumulative Total		0	0	0	0	0	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252	160,252
30	Depreciation Rate - composite average		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
31	Depreciation Expense		0	0	0	0	0	0	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	58
	Net Book Value																			
32	Gross Property	Line 20	0	0	0	0	0	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516	163,516
33	Accumulated Depreciation		0	0	0	0	0	0	(4,808)	(9,615)	(14,423)	(19,230)	(43,268)	(67,306)	(91,344)	(115,382)	(139,419)	(158,650)	(163,457)	(163,516)
34	Net Book Value		0	0	0	0	0	163,516	158,708	153,900	149,093	144,285	120,248	96,210	72,172	48,134	24,096	4,866	58	0
	Carrying Costs on Average NBV																			
35	Return on Equity		0	0	0	0	0	2,950	5,813	5,639	5,466	5,293	4,425	3,558	2,691	1,823	956	262	89	1
36	Interest Expense		0	0	0	0	0	3,154	6,216	6,030	5,845	5,659	4,732	3,805	2,877	1,950	1,022	280	95	1
37	AFUDC		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	**Total Carrying Costs**		0	0	0	0	0	6,104	12,029	11,670	11,311	10,952	9,157	7,362	5,568	3,773	1,978	543	184	2
	Income Tax Expense																			
39	Combined Income Tax Rate		34.12%	31.50%	31.00%	30.00%	28.50%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
	Income Tax on Equity Return																			
40	Return on Equity	Line 35	0	0	0	0	0	2,950	5,813	5,639	5,466	5,293	4,425	3,558	2,691	1,823	956	262	89	1
41	Gross up for revenue (Return / (1- tax rate)		0	0	0	0	0	4,041	7,963	7,725	7,488	7,250	6,062	4,874	3,686	2,498	1,310	359	122	1
42	Less: Income tax on Equity Return		0	0	0	0	0	1,091	2,150	2,086	2,022	1,958	1,637	1,316	995	674	354	97	33	0
43	Net Income (equal return on equity)		0	0	0	0	0	2,950	5,813	5,639	5,466	5,293	4,425	3,558	2,691	1,823	956	262	89	1
	Income Tax on Timing Differences																			
44	Depreciation Expense		0	0	0	0	0	0	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	4,808	58
45	Less: Capital Cost Allowance	Line 67	0	0	0	0	0	6,410	12,307	11,323	10,417	9,584	6,316	4,163	2,744	1,808	1,192	854	786	723
46	Total Timing Differences		0	0	0	0	0	(6,410)	(7,500)	(6,515)	(5,609)	(4,776)	(1,509)	645	2,064	2,999	3,616	3,954	4,022	(664)
47	Income Tax on Timing Differences		0	0	0	0	0	(1,731)	(2,025)	(1,759)	(1,515)	(1,290)	(407)	174	557	810	976	1,068	1,086	(179)
48	Before Tax Revenue Requirement [=Line47/(1-tax)		0	0	0	0	0	(2,371)	(2,774)	(2,410)	(2,075)	(1,766)	(558)	238	763	1,109	1,337	1,462	1,488	(246)
60	**Total Income Tax**	Lines 42 + 48	0	0	0	0	0	(1,280)	(624)	(324)	(53)	191	1,079	1,554	1,759	1,784	1,691	1,559	1,520	(245)
	Capital Cost Allowance																			
61	Opening Balance - UCC		0	0	0	0	0	0	153,842	141,535	130,212	119,795	78,955	52,038	34,297	22,605	14,898	10,673	9,819	9,034
62	Additions in Year		0	0	0	0	0	160,252	0	0	0	0	0	0	0	0	0	0	0	0
63	Subtotal UCC		0	0	0	0	0	160,252	153,842	141,535	130,212	119,795	78,955	52,038	34,297	22,605	14,898	10,673	9,819	9,034
64	Capital Cost Allowance Rate		8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
65	CCA on Opening Balance		0	0	0	0	0	0	12,307	11,323	10,417	9,584	6,316	4,163	2,744	1,808	1,192	854	786	723
66	CCA on Capital Expenditures (1/2 yr rule)		0	0	0	0	0	6,410	0	0	0	0	0	0	0	0	0	0	0	0
67	Total CCA		0	0	0	0	0	6,410	12,307	11,323	10,417	9,584	6,316	4,163	2,744	1,808	1,192	854	786	723
68	Ending Balance UCC		0	0	0	0	0	153,842	141,535	130,212	119,795	110,211	72,638	47,875	31,553	20,796	13,706	9,819	9,034	8,311

FortisBC
Capital Project Analysis
OTR - Okanagan Transmission Reinforcement

break after

Alternative 2B - 2012 in service

Line No.		Year: Reference	1 Dec-07	2 Dec-08	3 Dec-09	4 Dec-10	5 Dec-11	6 Dec-12	7 Dec-13	8 Dec-14	9 Dec-15	10 Dec-16	15 Dec-21	20 Dec-26	25 Dec-31	30 Dec-36	35 Dec-41	39 Dec-45	40 Dec-46	41 Dec-47
	Summary		9.02%																	
	Revenue Requirements																			
1	Operating Expense (Incremental)	Line 25	0	0	0	0	0	0	(799)	(944)	(1,105)	(1,284)	(2,535)	(4,014)	(6,217)	(9,488)	(14,330)	(19,823)	(21,486)	(23,282)
2	Depreciation Expense	Line 31	0	0	0	0	0	0	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	348
3	Carrying Costs	Line 38	0	0	0	0	0	5,563	10,963	10,636	10,310	9,983	8,351	6,719	5,086	3,454	1,822	516	189	13
4	Income Tax	Line 60	0	0	0	0	0	(1,162)	(564)	(291)	(44)	178	985	1,418	1,603	1,626	1,542	1,422	1,387	(112)
5	Total Revenue Requirement for Project		0	0	0	0	0	4,401	13,973	13,775	13,534	13,250	11,174	8,495	4,845	(35)	(6,594)	(13,513)	(15,537)	(23,033)
6	**Net Present Value of Revenue Requirement @ 10.0%**		**60,778**	0	0	0	0	2,484	7,170	6,426	5,740	5,108	2,675	1,263	447	(2)	(235)	(328)	(343)	(463)
					0	0	0	2,484	9,654	16,080	21,820	26,928	44,724							
	Rate Impact																			
7	**Forecast Revenue Requirements**		209,300	226,200	244,100	249,000	254,000	259,100	264,300	269,600	275,000	280,500	309,700	341,900	377,500	416,900	460,200	498,200	508,200	518,400
8	Rate Impact		0.00%	0.00%	0.00%	0.00%	0.00%	1.70%	5.29%	5.11%	4.92%	4.72%	3.61%	2.48%	1.28%	-0.01%	-1.43%	-2.71%	-3.06%	-4.44%
	Annual Incremental Rate Impact over previous year		**0.00%**	0.00%	0.00%	0.00%	0.00%	1.70%	3.59%	-0.18%	-0.19%	-0.20%	-0.24%	-0.23%	-0.25%	-0.27%	-0.30%	-0.33%	-0.34%	-1.39%
9	**NPV of Project / Total Revenue Requirements**		**2.00%**																	
	Regulatory Assumptions																			
10	Equity Component		40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
			60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
11	Equity Return		8.77%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%
12	Debt Return		6.40%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%
	Capital Cost																			
13	Capital Costs	137520	3,972	1,605	2,033	14,098	64,340	51,472												
14	AFUDC	11501		286	396	880	3,233	6,707												
15	Total Cash Outlay in Year	149021	**3,972**	**1,891**	**2,429**	**14,978**	67,573	58,179	0	0	0	0	0	0	0	0	0	0	0	0
16	Cumulative Cash Outlay		3,972	5,863	8,292	23,270	90,843	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022
17			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	Cumulative Project Cost		3,972	5,863	8,292	23,270	90,843	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022
19	Additions to Plant		0	0	0	0	0	149,022	0	0	0	0	0	0	0	0	0	0	0	0
20	Cummulative Additions to Plant		0	0	0	0	0	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022
21	CWIP		3,972	5,863	8,292	23,270	90,843	0	0	0	0	0	0	0	0	0	0	0	0	0
22	Line Losses								(1,475)	(1,633)	(1,808)	(2,001)	(3,327)	(4,888)	(7,183)	(10,554)	(15,507)	(21,097)	(22,785)	(24,608)
23	Maintenance																			
24	Property Taxes								676	690	703	717	792	874	965	1,066	1,177	1,274	1,299	1,325
25	Total Incremental Operating Costs (Savings)		0	0	0	0	0	0	(799)	(944)	(1,105)	(1,284)	(2,535)	(4,014)	(6,217)	(9,488)	(14,330)	(19,823)	(21,486)	(23,282)
	(Forecast inflation rate 2%)																			
26	Land							3,264												
	Depreciation Expense																			
27	Opening Cash Outlay		0	0	0	0	0	0	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758
28	Additions in Year	Line 19 less Line26	0	0	0	0	0	145,758	0	0	0	0	0	0	0	0	0	0	0	0
29	Cumulative Total		0	0	0	0	0	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758	145,758
30	Depreciation Rate - composite average		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
31	Depreciation Expense		0	0	0	0	0	0	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	348
	Net Book Value																			
32	Gross Property	Line 20	0	0	0	0	0	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022	149,022
33	Accumulated Depreciation		0	0	0	0	0	0	(4,373)	(8,745)	(13,118)	(17,491)	(39,355)	(61,218)	(83,082)	(104,946)	(126,810)	(144,300)	(148,673)	(149,022)
34	Net Book Value		0	0	0	0	0	149,022	144,649	140,276	135,903	131,531	109,667	87,803	65,939	44,076	22,212	4,721	348	0
	Carrying Costs on Average NBV																			
35	Return on Equity		0	0	0	0	0	2,688	5,298	5,140	4,982	4,825	4,036	3,247	2,458	1,669	880	249	91	6
36	Interest Expense		0	0	0	0	0	2,875	5,665	5,496	5,328	5,159	4,315	3,472	2,628	1,785	941	266	98	7
37	AFUDC		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
38	**Total Carrying Costs**		0	0	0	0	0	5,563	10,963	10,636	10,310	9,983	8,351	6,719	5,086	3,454	1,822	516	189	13
	Income Tax Expense																			
39	Combined Income Tax Rate		34.12%	31.50%	31.00%	30.00%	28.50%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
	Income Tax on Equity Return																			
40	Return on Equity	Line 35	0	0	0	0	0	2,688	5,298	5,140	4,982	4,825	4,036	3,247	2,458	1,669	880	249	91	6
41	Gross up for revenue (Return / (1- tax rate)		0	0	0	0	0	3,683	7,257	7,041	6,825	6,609	5,528	4,448	3,367	2,286	1,206	341	125	9
42	Less: Income tax on Equity Return		0	0	0	0	0	994	1,959	1,901	1,843	1,784	1,493	1,201	909	617	326	92	34	2
43	Net Income (equal return on equity)		0	0	0	0	0	2,688	5,298	5,140	4,982	4,825	4,036	3,247	2,458	1,669	880	249	91	6
	Income Tax on Timing Differences																			
44	Depreciation Expense		0	0	0	0	0	0	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	4,373	348
45	Less: Capital Cost Allowance	Line 67	0	0	0	0	0	5,830	11,194	10,299	9,475	8,717	5,745	3,786	2,496	1,645	1,084	777	714	657
46	Total Timing Differences		0	0	0	0	0	(5,830)	(6,821)	(5,926)	(5,102)	(4,344)	(1,372)	586	1,877	2,728	3,289	3,596	3,658	(309)
47	Income Tax on Timing Differences		0	0	0	0	0	(1,574)	(1,842)	(1,600)	(1,378)	(1,173)	(371)	158	507	737	888	971	988	(83)
48	Before Tax Revenue Requirement [=Line47/(1-tax)		0	0	0	0	0	(2,156)	(2,523)	(2,192)	(1,887)	(1,607)	(508)	217	694	1,009	1,216	1,330	1,353	(114)
60	**Total Income Tax**	Lines 42 + 48	0	0	0	0	0	(1,162)	(564)	(291)	(44)	178	985	1,418	1,603	1,626	1,542	1,422	1,387	(112)
	Capital Cost Allowance																			
61	Opening Balance - UCC		0	0	0	0	0	0	139,928	128,734	118,435	108,960	71,814	47,331	31,195	20,560	13,551	9,708	8,931	8,217
62	Additions in Year		0	0	0	0	0	145,758	0	0	0	0	0	0	0	0	0	0	0	0
63	Subtotal UCC		0	0	0	0	0	145,758	139,928	128,734	118,435	108,960	71,814	47,331	31,195	20,560	13,551	9,708	8,931	8,217
64	Capital Cost Allowance Rate		8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
65	CCA on Opening Balance		0	0	0	0	0	0	11,194	10,299	9,475	8,717	5,745	3,786	2,496	1,645	1,084	777	714	657
66	CCA on Capital Expenditures (1/2 yr rule)		0	0	0	0	0	5,830	0	0	0	0	0	0	0	0	0	0	0	0
67	Total CCA		0	0	0	0	0	5,830	11,194	10,299	9,475	8,717	5,745	3,786	2,496	1,645	1,084	777	714	657
68	Ending Balance UCC		0	0	0	0	0	139,928	128,734	118,435	108,960	100,243	66,068	43,545	28,699	18,915	12,467	8,931	8,217	7,559

FortisBC
Capital Project Analysis
OTR - Okanagan Transmission Reinforcement

break after

Alternative 3 - 2012 in service

Line No.		Year: Reference	1 Dec-07	2 Dec-08	3 Dec-09	4 Dec-10	5 Dec-11	6 Dec-12	7 Dec-13	8 Dec-14	9 Dec-15	10 Dec-16	15 Dec-21	20 Dec-26	25 Dec-31	30 Dec-36	35 Dec-41	39 Dec-45	40 Dec-46	41 Dec-47
	Summary																			
	Revenue Requirements																			
1	Operating Expense (Incremental)	Line 26	0	0	0	0	0	0	(799)	(944)	(1,105)	(1,284)	(2,535)	(4,014)	(6,217)	(9,488)	(14,330)	(19,823)	(21,486)	(23,282)
2	Depreciation Expense	Line 32	0	0	0	0	0	0	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	219
3	Carrying Costs	Line 39	0	0	0	0	0	5,804	11,438	11,097	10,756	10,415	8,711	7,006	5,301	3,596	1,892	528	187	8
4	Income Tax	Line 60	0	0	0	0	0	(1,215)	(590)	(306)	(48)	184	1,027	1,479	1,673	1,697	1,608	1,483	1,446	(171)
5	Total Revenue Requirement for Project		0	0	0	0	0	4,590	14,615	14,415	14,170	13,882	11,769	9,037	5,323	372	(6,263)	(13,245)	(15,286)	(23,227)
6	**Net Present Value of Revenue Requirement @** 10.0%		64,312	0	0	0	0	2,591	7,500	6,725	6,010	5,352	2,817	1,343	491	21	(223)	(322)	(338)	(467)
					0	0	0	2,591	10,091	16,815	22,825	28,177	46,870							
	Rate Impact																			
7	**Forecast Revenue Requirements**		209,300	226,200	244,100	249,000	254,000	259,100	264,300	269,600	275,000	280,500	309,700	341,900	377,500	416,900	460,200	498,200	508,200	518,400
8	Rate Impact		0.00%	0.00%	0.00%	0.00%	0.00%	1.77%	5.53%	5.35%	5.15%	4.95%	3.80%	2.64%	1.41%	0.09%	-1.36%	-2.66%	-3.01%	-4.48%
	Annual Incremental Rate Impact over previous year		0.00%	0.00%	0.00%	0.00%	0.00%	1.77%	3.76%	-0.18%	-0.19%	-0.20%	-0.25%	-0.24%	-0.25%	-0.27%	-0.30%	-0.34%	-0.35%	-1.47%
9	**NPV of Project / Total Revenue Requirements**		2.11%																	
	Regulatory Assumptions																			
10	Equity Component		40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%	40.00%
11			60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%	60.00%
12	Equity Return		8.77%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%	9.02%
13	Debt Return		6.40%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%	6.43%
	Capital Cost																			
14	Capital Costs		3,972	1,605	2,033	14,702	67,356	53,885												
15	AFUDC			286	396	898	3,359	6,997												
16	Total Cash Outlay in Year		**3,972**	**1,891**	**2,429**	**15,599**	70,716	60,882	0	0	0	0	0	0	0	0	0	0	0	0
17	Cumulative Cash Outlay		3,972	5,863	8,292	23,891	94,607	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489
18			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Cumulative Project Cost		3,972	5,863	8,292	23,891	94,607	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489
20	Additions to Plant		0	0	0	0	0	155,489	0	0	0	0	0	0	0	0	0	0	0	0
21	Cummulative Additions to Plant		0	0	0	0	0	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489
22	CWIP		3,972	5,863	8,292	23,891	94,607	0	0	0	0	0	0	0	0	0	0	0	0	0
23	Line Losses								(1,475)	(1,633)	(1,808)	(2,001)	(3,327)	(4,888)	(7,183)	(10,554)	(15,507)	(21,097)	(22,785)	(24,608)
24	Maintenance																			
25	Property Taxes								676	690	703	717	792	874	965	1,066	1,177	1,274	1,299	1,325
26	Total Incremental Operating Costs (Savings)		0	0	0	0	0	0	(799)	(944)	(1,105)	(1,284)	(2,535)	(4,014)	(6,217)	(9,488)	(14,330)	(19,823)	(21,486)	(23,282)
	(Forecast inflation rate 2%)																			
27	Land							3,264												
	Depreciation Expense																			
28	Opening Cash Outlay		0	0	0	0	0	0	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225
29	Additions in Year	Line 20 less Line27	0	0	0	0	0	152,225	0	0	0	0	0	0	0	0	0	0	0	0
30	Cumulative Total		0	0	0	0	0	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225	152,225
31	Depreciation Rate - composite average		3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%	3.00%
32	Depreciation Expense		0	0	0	0	0	0	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	219
	Net Book Value																			
33	Gross Property	Line 21	0	0	0	0	0	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489	155,489
34	Accumulated Depreciation		0	0	0	0	0	0	(4,567)	(9,134)	(13,700)	(18,267)	(41,101)	(63,935)	(86,768)	(109,602)	(132,436)	(150,703)	(155,270)	(155,489)
35	Net Book Value		0	0	0	0	0	155,489	150,922	146,355	141,788	137,222	114,388	91,554	68,720	45,887	23,053	4,786	219	0
	Carrying Costs on Average NBV																			
36	Return on Equity		0	0	0	0	0	2,805	5,528	5,363	5,198	5,033	4,209	3,386	2,562	1,738	914	255	90	4
37	Interest Expense		0	0	0	0	0	2,999	5,911	5,734	5,558	5,382	4,501	3,620	2,739	1,858	977	273	97	4
38	AFUDC		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
39	**Total Carrying Costs**		0	0	0	0	0	5,804	11,438	11,097	10,756	10,415	8,711	7,006	5,301	3,596	1,892	528	187	8
	Income Tax Expense																			
40	Combined Income Tax Rate		34.12%	31.50%	31.00%	30.00%	28.50%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%	27.00%
	Income Tax on Equity Return																			
41	Return on Equity	Line 36	0	0	0	0	0	2,805	5,528	5,363	5,198	5,033	4,209	3,386	2,562	1,738	914	255	90	4
42	Gross up for revenue (Return / (1- tax rate)		0	0	0	0	0	3,842	7,572	7,346	7,121	6,895	5,766	4,638	3,509	2,381	1,252	349	124	5
43	Less: Income tax on Equity Return		0	0	0	0	0	1,037	2,044	1,984	1,923	1,862	1,557	1,252	948	643	338	94	33	1
44	Net Income (equal return on equity)		0	0	0	0	0	2,805	5,528	5,363	5,198	5,033	4,209	3,386	2,562	1,738	914	255	90	4
	Income Tax on Timing Differences																			
45	Depreciation Expense		0	0	0	0	0	0	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	4,567	219
46	Less: Capital Cost Allowance	Line 67	0	0	0	0	0	6,089	11,691	10,756	9,895	9,104	6,000	3,954	2,606	1,718	1,132	811	746	686
47	Total Timing Differences		0	0	0	0	0	(6,089)	(7,124)	(6,189)	(5,328)	(4,537)	(1,433)	612	1,960	2,849	3,435	3,756	3,821	(467)
48	Income Tax on Timing Differences		0	0	0	0	0	(1,644)	(1,924)	(1,671)	(1,439)	(1,225)	(387)	165	529	769	927	1,014	1,032	(126)
49	Before Tax Revenue Requirement [=Line48/(1-tax)		0	0	0	0	0	(2,252)	(2,635)	(2,289)	(1,971)	(1,678)	(530)	226	725	1,054	1,270	1,389	1,413	(173)
60	**Total Income Tax**	Lines 43 + 49	0	0	0	0	0	(1,215)	(590)	(306)	(48)	184	1,027	1,479	1,673	1,697	1,608	1,483	1,446	(171)
	Capital Cost Allowance																			
61	Opening Balance - UCC		0	0	0	0	0	0	146,136	134,445	123,690	113,794	75,000	49,431	32,579	21,472	14,152	10,138	9,327	8,581
62	Additions in Year		0	0	0	0	0	152,225	0	0	0	0	0	0	0	0	0	0	0	0
63	Subtotal UCC		0	0	0	0	0	152,225	146,136	134,445	123,690	113,794	75,000	49,431	32,579	21,472	14,152	10,138	9,327	8,581
64	Capital Cost Allowance Rate		8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
65	CCA on Opening Balance		0	0	0	0	0	0	11,691	10,756	9,895	9,104	6,000	3,954	2,606	1,718	1,132	811	746	686
66	CCA on Capital Expenditures (1/2 yr rule)		0	0	0	0	0	6,089	0	0	0	0	0	0	0	0	0	0	0	0
67	Total CCA		0	0	0	0	0	6,089	11,691	10,756	9,895	9,104	6,000	3,954	2,606	1,718	1,132	811	746	686
68	Ending Balance UCC		0	0	0	0	0	146,136	134,445	123,690	113,794	104,691	69,000	45,476	29,973	19,754	13,020	9,327	8,581	7,895

Environmental

and

Social Impact Assessment

Of the Proposed FortisBC Okanagan Transmission Reinforcement Project

November 2007

ELEMENTS

Environmental and Social Impact Assessment

Of the

FortisBC
Proposed
Okanagan Transmission Reinforcement Project

Prepared for BC Hydro
By
Elements Network Inc.

November 2007

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ELECTRICAL EQUIPMENT DESCRIPTIONS AND TERMINOLOGY

Breaker: A breaker is a switch which "trips out" or disconnects an electric circuit upon overload or abnormal conditions. Breakers (also known as circuit breakers) are located in stations and on transmission and distribution lines throughout a/the network. It operates in the same manner as those found in a home.

Conductor: A conductor is an object or substance which conducts or carries electric current. A wire, cable, rod, or tube can serve as a path for electricity to flow. The most common conductor is an electrical wire.

Counterpoise: A grounding wire attached to the lightning protection wire on a power pole which descends the pole and is buried in the ground to diffuse electricity from a lightning strike. They are commonly installed on the first few poles near a switchyard or station to help protect it from a lightning strike.

Feeder: A feeder is an electrical supply line, either overhead or underground, which runs from the station, through various paths, ending at the transformers. It is a distribution circuit, usually less than 69,000 volts, which carries power from the station.

Guy Wire: A guy wire is an anchor cable used to support a pole.

Insulator: An insulator is a device through which electricity cannot easily pass. An example would be porcelain support used to insulate conductor wires from a pole or tower. An insulator can be made of material such as porcelain, glass, rubber or wood.

Kilovolt (kV): A kilovolt is 1,000 volts. It is frequently used to describe the electrical force in electrical equipment and power lines. For example, a 230kV transmission line is a 230,000 volt transmission line.

Kilowatt hour (kWh): The commercial unit of electric energy; 1,000 watt hours. A kilowatt hour can best be understood as the amount of electricity consumed by ten 100-watt light bulbs burning for one hour.

Lightning Spire: A narrow steel structure that is higher than the equipment in an electrical facility such as a terminal station or switchyard and is intended to intercept a lightning strike that might otherwise strike the equipment, and then dispersing the electricity in the ground.

Overhead Shield Wire: A thin-diameter wire strung above the conductors on poles on either side of a station to intercept and carry lightning strikes to the ground (through the counterpoise).

Switching Station: A switching station is a type of station where connections are made between several distribution and transmission lines.

Transformer: A transformer is a device used to change voltage levels of electricity to enable the transfer of power from the generating plant to the customer. A step-up transformer increases the voltage (force) of electricity while a step-down transformer decreases it.

Transmission Lines: Transmission lines are heavy cables that carry large amounts of electricity over long distances from a generating station for delivery to retail customers.

Voltage: Voltage is the electrical force or potential that causes a current to flow in a circuit (just as pressure causes water to flow in a pipe). Voltage is measured in volts (V) or kilovolts (kV). 1 kV = 1000 V.

Watt: A watt is the scientific unit of electric power; a measure of doing work at the rate of one joule per second. A typical light bulb is rated 25, 40, 60 or 100 watts. One unit of horse power is 746 watts.

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The professional opinions expressed in this report are those of Elements and its professional contributors on the project team. Elements Network Inc. is solely responsible for the content of this report, including any errors, omissions, or shortcomings.

1.0 SUMMARY

1.1 Project Summary

The FortisBC Inc. (FBC) OTR Project is proposed as an improved electrical power supply system for the South Okanagan providing reliable power to meet forecast future growth from Osoyoos through to Penticton. The OTR project meets projected electrical load demand in the Okanagan Valley as a result of increased population and residential demand as well as industrial and agricultural demand. This project is the next in FBC's plan for the South Okanagan and follows the South Okanagan Supply project (Vaseux Lake Terminal Station and related facilities) which was completed in 2005.

The OTR project includes the following components:

- Upgrades within an existing 1.0 ha (2.5 acre) terminal station (RG Anderson) in Penticton;
- Upgrades within an existing 7 ha (17 acre) terminal station (Vaseux Lake) southeast of Vaseux Lake;
- Construction of a new 3.50 ha (8.66 acre) terminal station (Bentley) near the town of Oliver on the Osoyoos Indian Band (OIB) Reserve;
- Partial upgrade to an existing terminal station (Oliver), located in Oliver, west of the proposed Bentley Terminal station;
- Decommissioning of the existing 161kV system between Oliver & Penticton.
- The installation of one 230kV Transmission Line - between Bentley and Vaseux Lake Terminal.
- The installation of two 230kV transmission lines from Vaseux Lake Terminal Station to RG Anderson in Penticton.

1.2 Summary of impacts and General Environmental and Social Guidelines

Impact assessments and general mitigation measures have been developed by the project team through best management practices from previous projects and a consultative process which has included engineering and construction management professionals, community representatives, and the team of environmental professionals.

Initiatives undertaken on this project have identified the environmental and social resources associated with the project and predicted the impact of the project on those same resources. Impacts to some of the key environmental and social resources from the construction and operation of the Okanagan Transmission Reinforcement (OTR) project along the existing right-of-way are:

- Impact to visual resources of residents from Okanagan Falls to Penticton;
- Disturbance to wildlife from anthropogenic activities during construction and operations as well as residual post construction community uses;
- Removal of lower quality Antelope brush vegetation associations at the Bentley station site and temporary disturbance during construction to the vegetation along the transmission line;
- Permanent reduction of lower quality foraging habitat for wildlife at Bentley as well as a short term disruption to foraging on the right-of-way;

- Removal of large hazard trees along the edge of the existing right-of-way some of which provide habitat for wildlife;
- Potential effects on riparian habitat due to crossing of several named as well as unnamed watercourses, some with fisheries and others as tributaries to fish bearing waterbodies in the Okanagan River System.

Mitigation measures will be implemented during the planning, construction and operation of the OTR project on the existing right-of-way to significantly reduce impacts. These include:

- Constraints on access to reduce ground disturbance to sensitive habitats during hazard tree removal and by accessing portions of the 230 kV transmission line in a manner to minimize impact in sensitive areas;
- Salvage of selected vegetation from the Bentley Terminal Station for restoration of other disturbed areas on the OIB reserve to be selected in consultation with the OIB;
- Minimizing the disturbance to sensitive vegetation communities;
- Developing an environmental management plan integrated with engineering design and construction planning;
- Implementing 'permitted–activity timing' windows for construction and related work;
- Avoiding key habitat during critical life cycle periods; and
- Monitoring of construction activities by a Qualified Environmental Professional (QEP) and an environmental inspector from the Osoyoos Indian Band (for the portion of the route located on the OIB reserve and other areas of OIB interest), supported by subject matter specialists onsite to provide guidance and advice.

The tables in this section summarize the key environmental issues related to the project, where they are located, which construction activity is affected and what mitigation measures will be applied to minimize any adverse impact to the environment. The tables cover:

- Bentley Terminal Station site preparation, construction and operation;
- Modifications to the Oliver, Vaseux and RG Anderson terminal stations; and
- 230kV Transmission Lines design, construction and operation.

Summary Tables

Table 1.1 Bentley Terminal Station

Activity	Location	Issue	Mitigation Measures
Access road and site clearing	Areas adjacent to the site boundaries	Disturbance of offsite sensitive vegetation associations	• Install a visible construction limit fence to prevent offsite damage. • Prohibit surface disturbance outside the construction fence line (contract clause)
Access road and site clearing	Inside the surveyed site	Removal of sensitive vegetation associations.	• Salvage and transplant vegetation prior to clearing of the site. • Select an offset area(s) in the OIB reserve lands for habitat enhancement to accept transplants. Receptor site must be available at the time to ensure a successful undertaking. • Situate access roads to minimize impacts to sensitive habitat.
Site clearing	Inside and adjacent to the surveyed site	Disruption, human interaction, mortality, and displacement of snakes.	• Integrate a snake fence into the construction limit fence as well as the permanent station. • Ensure there is a suitable migratory corridor around the station.
Access road and site clearing	Inside the surveyed site	Ensure no bird nesting is initiated on the site.	• Hand clearing of shrubs, such as sagebrush, prior to the nesting period to ensure birds are not initiating new nesting locations on the site (which had not had been previously used for nesting).

Table 1.1 Bentley Terminal Station

Activity	Location	Issue	Mitigation Measures
Clearing, grading and site construction	Inside and adjacent to the surveyed site	Disturbance to wildlife in transit.	• Protect the wildlife corridor of natural habitat to the west of the site. • Relocate any important wildlife if they enter the construction site.
Station design and planning	Inside and adjacent to the surveyed site	Disturbance to wildlife in transit.	• Ensure there is a suitable movement corridor between the terminal station and adjoining habitat
Access road construction		Snakes on the site. (low to moderate potential)	• Apply timing windows to minimize the potential for interaction, or use construction barrier fences and relocate foraging snakes.
Access road and site clearing, grading and installation	Inside the surveyed site	Prevention and management of spills of fuel, oil and other products	• Secondary containment for fuel storage, lubricants, transformer oil. • All spills reported and cleaned up immediately. • Prepare contingency plan and have spill clean-up supplies available on all mobile equipment. • Tarp (i.e. diapers) heavy equipment overnight and during refueling or repairs. • Equipment and vehicles to be regularly inspected for leaks. Any leaks must be fixed immediately. .
Access road and site clearing, grading, and installation	Areas adjacent to the site boundaries	Erosion and sediment control	• Install a silt fence on the down slope areas of the site perimeter (can be combined as part of the construction limit fence). • Monitor surface activities during unusual rainfall events. • Prepare contingency plan and have spill clean-up supplies immediately available on all mobile equipment. • Site design to include gradient (minimal slope) and surfacing material (crushed clean gravel) resistant to erosion.
Operations	External to site	Visual aesthetics (landscape views)	• Establish a visual barrier for the northeast residence if requested.

Table 1.1 Bentley Terminal Station

Activity	Location	Issue	Mitigation Measures
Access road and site clearing, grading and installation	Inside the surveyed site during clearing and grading and subsequently within an adjacent 15m corridor of the residual habitat.	Fire prevention	• Firefighting equipment must be on site including a mobile 500 gallon water tank during fire season (April through October). • Establish a safe designated smoking area well inside the station perimeter with ashtrays. • Ban smoking outside of designated areas.
Access road and site clearing, grading and installation	Inside the surveyed site	Noxious weed control	• All heavy equipment and heavy duty vehicles must be power washed and inspected by the QEP prior to entering site. • All passenger vehicles, including undercarriage areas, must be kept clean and free of mud and soil.
Access road and site clearing, grading and installation	Inside the surveyed site	Protection of archaeological resources	• Discovery of any artifacts or resources must result in an immediate work stoppage, and the find being reported, • In the event of a find, work cannot proceed until authorized by a professional archaeologist and a designated representative of the OIB and/or the PIB.
All activities	All sites	Supervision and control of activity to prevent environmental non conformance to the ESIA	• Ensure a QEP is on site for all key activities who will conduct regular inspections. • Daily tailboard meetings of contractors and company personnel that will include environmental 'heads-up' issues.
Clearing and installation	Inside the surveyed area of disturbance.	Protect invertebrates from disturbance: Behr's Hairstreak and California Hairstreak	• Remove nectaring sources prior to adult emergence. • Remove antelope brush during the peak adult phase. • Plants including small Antelope brush and nectaring forbs to be salvaged and transplanted to OIB disturbed areas with suitable habitat potential. • Monitor site and relocate adults to other adjacent areas with suitable habitat.

Table 1.2 Oliver, Vaseux And RG Anderson Terminal Stations

Activity	Location	Issue	Mitigation Measures
Site upgrades	Inside and adjacent to the surveyed site	Forest wild fire prevention (required at Vaseux only)	• Firefighting equipment must be on site including a mobile 500 gallon water tank during fire season (April through October). • Establish a safe designated smoking area well inside the station perimeter with ashtrays. • Ban smoking outside of designated areas.
Site Upgrades	Inside the surveyed site	Noxious weed control	• All heavy equipment and heavy duty vehicles must be power washed and inspected by the QEP prior to entering site. • All passenger vehicles, including undercarriage areas must be kept clean and free of mud and soil.
Excavations	Inside the surveyed site	Protect archaeological resources	• Discovery of any artifacts or resources will result in an immediate work stoppage, and the find being reported. • Work cannot proceed until authorized by a professional archaeologist and a designated representative of the OIB.
All Activities		Supervision and control of activity to prevent environmental non conformance to the ESIA	• Ensure a QEP is on site for all key activities who will conduct regular inspections. • Daily tailboard meetings of contractors and company personnel that will include environmental 'heads-up' issues
All Activities	Inside and adjacent to the surveyed site	Dust Control	• Monitoring of vehicles and equipment to ensure dust is minimized. • Water truck or system available on standby or short notice to provide dust suppression.
All construction related activities	Inside and adjacent to the surveyed site	Sound levels	• Ensure heavy equipment operates within the time periods designated by the municipal authority. • Respond quickly to complaints and find solutions in consultation with the resident(s), contractor and the FortisBC designated contact.
New equipment operation	Inside and adjacent to the surveyed site	Sound levels	• Implement acoustic control in design. • Conduct an assessment and follow-up retrofit where appropriate.

Table 1.3 230 kV Transmission Lines

Activity	Location	Issue	Mitigation Measures
Engineering design and planning	Throughout the entire right-of-way.	Critical wildlife habitat use periods: Snake migration and denning.	• Review pole placement during design phase to ensure there are no dens directly impacted by the pole locations. • No blasting within 150m of dens. Avoid activity during spring and fall dispersal & convergence periods. Right-of-way work prohibited between March 31 to April 30th and September 15 to October 15th in the vicinity of snake dens (150 m buffer). • Work near dens during dispersal & convergence periods requires snake and construction activity monitoring with work adjustments as appropriate.
R-o-W Preparation and installation	On right-of-way in key natural habitat settings.	Critical wildlife habitat use periods: Large mammals (late winter stress, birth and initial rearing of young)	• Conduct right-of-way work in sheep habitat areas to avoid critical life cycle periods for California Bighorn Sheep. A timing constraint is recommended for March 1 to April 15th in winter range. Avoid disturbance of lambing areas between March 15 and June 25st. • Use of timing constraints for sheep will protect other large mammal species along the same portion of the right-of-way.
R-o-W Preparation and installation	On entire right-of-way	Control of noxious weeds	• All equipment and heavy duty vehicles must be power washed and then inspected by the QEP prior to entering site. • All passenger vehicles, including undercarriage areas must be kept clean and free of mud and soil. • Post construction monitoring and control for three years. • Consider implementing pre-construction weed control program in 2008.
R-o-W Preparation and installation	Throughout the entire right-of-way.	Prevent spills of fuel, oil and solvents.	• No refueling within 100m of a watercourse. • Secondary containment for fuel storage and lubricants including jerry cans (stored inside a plastic tub or bin). • All spills reported and cleaned up immediately. • Prepare contingency plan and supplies for implementation if needed. • Tarp equipment overnight (i.e. diapers). • Tarp during refueling and repairs. • Equipment and vehicles to be regularly inspected and leaks fixed immediately.

Table 1.3 230 kV Transmission Lines

Activity	Location	Issue	Mitigation Measures
Engineering Design and Planning	Throughout the entire right-of-way.	Removal of sensitive vegetation species. Residual impacts to vegetation.	• Review pole placement during design and re-locate poles to avoid sensitive vegetation species.
R-o-W Preparation and installation	Throughout the entire right-of-way.	Removal of sensitive vegetation species. Residual impacts to vegetation.	• Salvageable sensitive vegetation may be transplanted as an alternative if engineering constraints affect pole relocation. • No additional new access roads to be created. • Existing access roads or trails to be upgraded must be promptly reclaimed. • Use helicopter in sensitive areas without access. • Minimize footprint of disturbance: use rock sets for anchors instead of excavated pits in rocky terrain where feasible.
R-o-W Preparation and installation	Throughout the entire right-of-way	Fire prevention	• Firefighting equipment and tools must be on site if work is during a high fire hazard period. Water should be strategically stored along the route in Wajax bags and small refillable containers. • Establish designated smoking areas and break times along the route using ashtrays and water. • Ban smoking outside of designated times and areas. • Remove clearing debris that could be a fire hazard. Excess clearing debris and trees will be burnt during extended wet winter conditions or periods of very low fire hazard. • Merchantable timber may not be burnt without authorization from the Ministry of Forests and Land.
R-o-W Preparation and installation	Throughout the entire right-of-way	Protect archaeological resources	• Discovery of any artifacts or resources must be reported immediately and work must be stopped. • Work cannot resume until authorized by a professional archaeologist and a designated representative of the OIB. • 4 sites identified in AIA to be monitored and flagged in contract documents and EMP.
R-o-W Preparation and installation	Throughout the entire right of way	Protect invertebrates from disturbance: Behr's Hairstreak	• Avoid activity in habitat during adult foraging and egg laying stage. • Poles to be located to avoid disruption of Antelope brush and yarrow in hairstreak habitat where feasible.

Table 1.3 230 kV Transmission Lines

Activity	Location	Issue	Mitigation Measures
R-o-W Preparation and installation	Throughout the entire right-of-way	Erosion and sediment control	• Monitor surface activities during unusual rainfall events. • Prepare contingency plan and additional supplies for implementation if needed. • No unnecessary clearing of low growing trees, shrubs and vegetation. • Disturbed areas to be assessed and erosion control berms installed if necessary under direction of the QEP.
R-o-W Preparation and installation	Throughout the entire right-of-way	Re-vegetation and reclamation of disturbed areas.	• All disturbed areas to be reclaimed and seeded with a native seed mix (where available) matched to the ecosystem. • Monitor for re-vegetation success and weed establishment for 2-3 years post construction or until re-vegetation is successful. • Implement appropriate weed control and management techniques for the type and extent of invasive species.
Engineering Design and Planning	Throughout the entire right-of-way	Disturbance in a Riparian zone	• Review pole placement during design to ensure poles are set back of riparian zones (30m or more from the banks of the watercourse) • Review pole placement and conductor sag to determine if topping and/or clearing is required in the riparian zone. • Ensure power line aerial crossing techniques are included in installation plans to avoid activity in the riparian zone.
Clearing and installation	Throughout the entire right-of-way	Disturbance in a Riparian zone	• Topping of trees in selected locations instead of clearing to reduce the disturbance. • No disturbance to the riparian habitat permitted within 30m of the banks of a watercourse unless otherwise approved under provincial and federal fisheries authorizations. • Crossing of streams and watercourses with vehicles and equipment is not permitted except on designated access roads with installed bridges.

Table 1.3 230 kV Transmission Lines

Activity	Location	Issue	Mitigation Measures
Clearing and installation	Throughout the entire right-of-way	Bird strike potential with overhead shield wires	• Installation of high visibility markers in regular flight route areas of high potential strike species.
Clearing and installation	Throughout the entire right-of-way	Rutting and soil damage during rainfall events	• QEP to assess and stop work or causal activity temporarily if damage occurs or deemed to be not easily corrected.
Clearing and installation	Throughout the entire right-of-way	Small mammals and snakes falling in pole holes.	• Where poles cannot be immediately installed (i.e. blasting and drilling in remote locations), pole holes are to be covered with an animal proof system. • Pole holes left unattended must be inspected regularly and wildlife removed.
Engineering Design and Planning	Selected locations along the right-of-way	Disturbance to wetland vegetation and wildlife species using the wetland	• Review pole placement during design to ensure poles are located well away from wetlands where possible. If not possible, ensure pole placement is mitigated by relocating any valued vegetation (i.e. offset)

2.0 INTRODUCTION

2.1 Scope and Objectives

ELEMENTS Network Inc. (Elements) was retained by BC Hydro to provide environmental assessment services for the FortisBC Okanagan Transmission Reinforcement (OTR) project. This includes:

- Preparation of an Environmental and Social Screening Impact Assessment;
- Participation in consultation activities;
- Coordination of field assessments and inventories;
- Preparation of an Environmental and Social Impact Assessment (ESIA);
- Preparation of an Environmental Management Plan; and
- Development of environmental requirements for construction contracts.

The coordination and management of field assessments included an Archaeological Overview Assessment (AOA) in February 2007 and an Archaeological Impact Assessment (AIA) by Arcas Archaeology Consultants in May 2007 as well as a Background Survey of Sound Levels survey by Brown, Strachan & Associates in June 2007. A number of other environmental field assessments were completed which include the Fisheries and Aquatic Habitat Assessment in July of 2007, a Vegetation Resources Assessment in May of 2007, and Wildlife Assessments for Reptiles, Amphibians, Mammals, Birds and Invertebrates between April and June of 2007.

The proposed Bentley Terminal Station is located on the Osoyoos Indian and the lease for the site was part of a designation vote in October of 2005. In order to prepare for the community designation vote, as well as the site lease process with Indian and Northern Affairs Canada (INAC), assessment activities were conducted in 2005 and 2006. These assessments were reported in the Environmental Assessment (Elements, 2006) for the FortisBC Osoyoos Projects.

This Environmental and Social Impact Assessment (ESIA) contains information on impact assessment, project mitigation measures, and environmental and social resources in the project area between Oliver and Penticton.
The primary objectives of the ESIA process are:

- Provide BC Hydro and FortisBC with environmental information and documentation for regulatory applications and project design activities;
- Collect data for the development of a detailed Environmental Management Plan for construction; and
- Provide information for the effective management and mitigation of project related environmental and social impacts during construction and operations.

2.2 Project Information and Location

The OTR Project is proposed by FortisBC Inc. (FBC) to the BC Utilities Commission to improve the electrical power supply system for the South Okanagan by providing reliable power to meet forecasted future growth from Osoyoos through to Penticton. There has been significant electrical load demand increases in the Okanagan Valley due to increased population and residential demand as well as industrial and agricultural demand. This project is the next in FBC's plan for the South Okanagan following the South Okanagan Supply project (Vaseux Lake Terminal) which was completed in 2005. BC Hydro is the Engineering-Procurement-Construction (EPC) contractor for the proposed FBC OTR project.

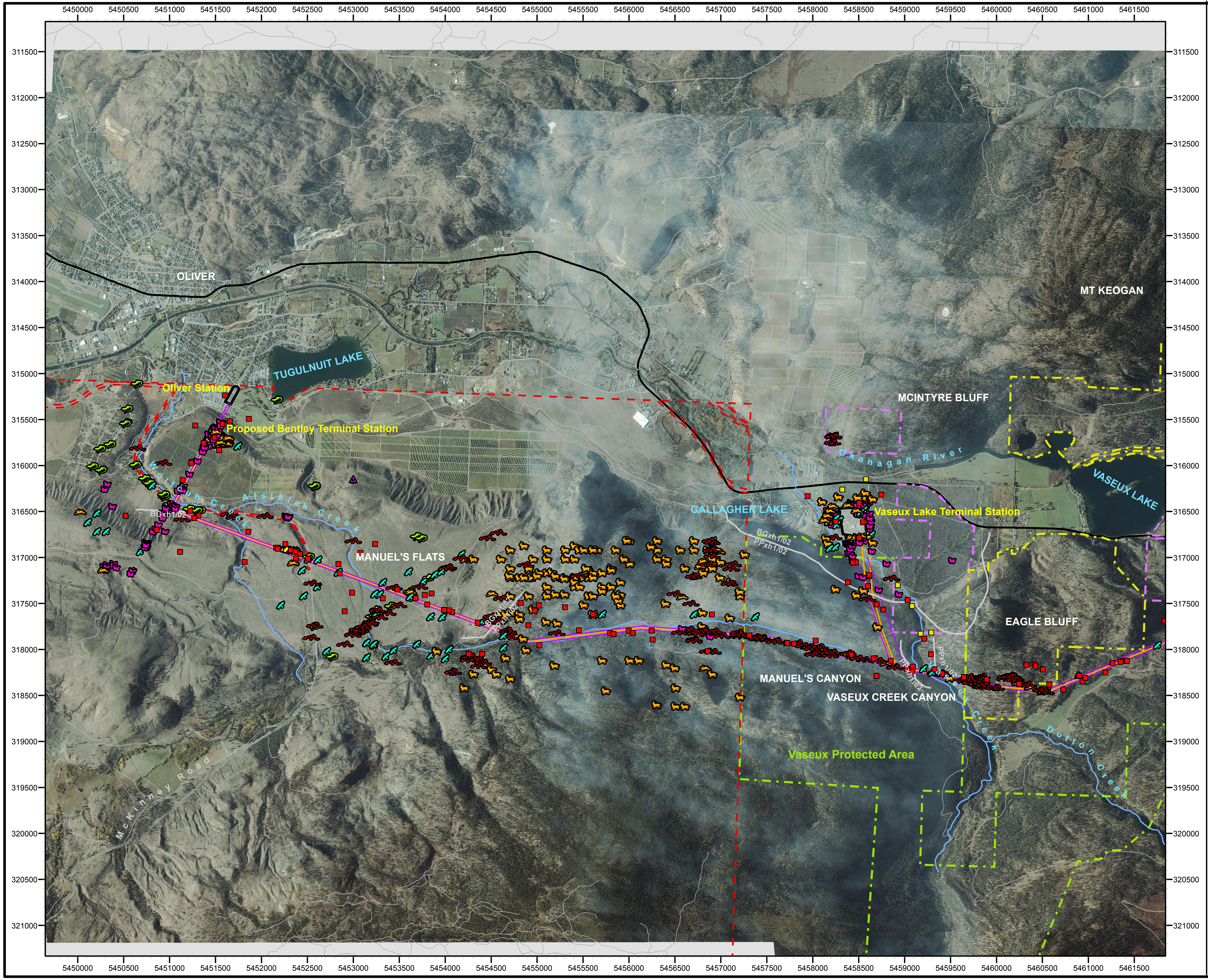
The FortisBC Okanagan service area is supplied with power by two major interconnections:

- BC Transmission Corporation (BCTC)/BC Hydro (BCH) -- from Vernon in the north Okanagan and Vaseux Lake in the south Okanagan; and
- FortisBC Kootenay River generation area from the east by a transmission connection to Oliver.

The proposed OTR Project will strengthen the capacity to move power supplied from the Vaseux Lake BCTC/BCH interconnection to loads within the Okanagan. The majority of the OTR Project work will occur in the transmission line corridor between Oliver and Penticton.

FortisBC proposes that the OTR Project be constructed within existing rights of way with the exception of new property rights acquired for the new Bentley Terminal Station by Oliver.

The proposed Okanagan Transmission Reinforcement Project (OTR Project) will replace the existing 161 kV transmission line between Vaseux Lake and Oliver (40 Line) with a single 230kV line. Between and Vaseux Lake and Penticton (76 Line), there will be 2 transmission lines rated at 230kV replacing the single existing 161kV system. The proposed OTR Project includes modifications to the Oliver, Vaseux Lake, RG Anderson (south Penticton) terminal stations and construction of a new terminal station, Bentley, east of the existing Oliver station



FortisBC
Proposed Okanagan Transmission Reinforcement Project

Legend

- Amphibian
- Arthropod - Butterfly
- Arthropod - Other
- Bird
- Large Mammal
- Small Mammal
- Reptile
- Plant
- Candidate Den
- Confirmed Den
- CDC Endangered
- CDC At Risk
- Vegetation Boundary
- Alternate R/W
- Existing R/W
- Alternate Transmission
- Existing Transmission
- Stream
- Highway 97
- Minor Roads
- Station Area
- Park/Protected Area
- Osoyoos Indian Band Reserve Boundary
- CWS Conservation Area
- TNT Conservation Area - Fee Simple
- TNT Conservation Area - Lease

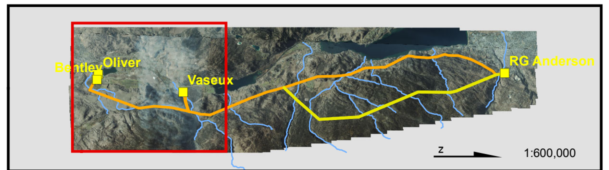
Map 1 of 3

0 500 1,000 1,500 2,000
Meters

1:40,000

FORTISBC

Projection: UTM Zone 11 Datum: NAD83 Map Produced On: 2007-11-27



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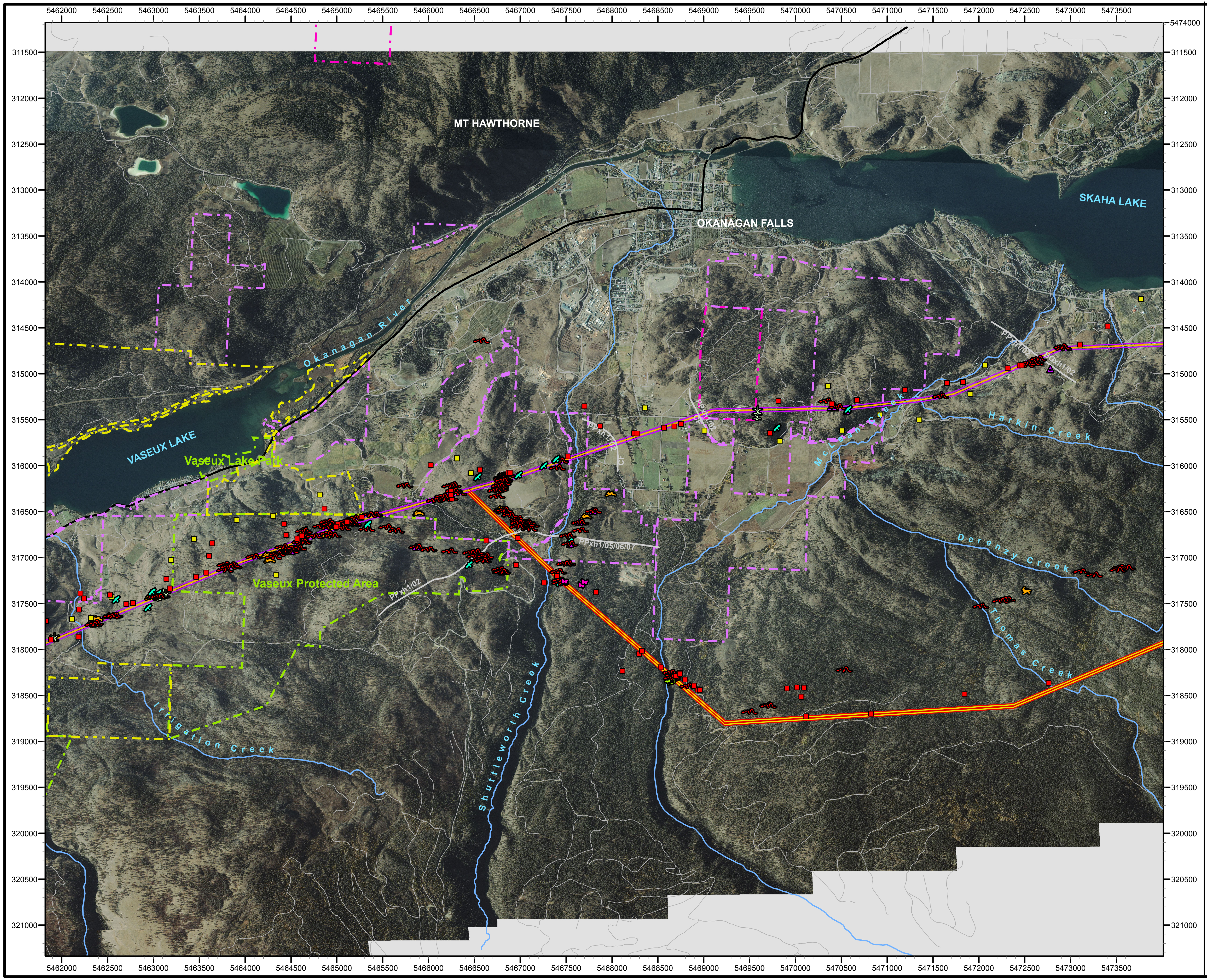
Acquired 2006-10-23

Project Consultant: ELEMENTS

Map Produced By: GISsolutions inc.



FortisBC
Proposed Okanagan Transmission Reinforcement Project

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- Arthropod - Butterfly
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- Minor Roads
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- CWS Conservation Area
- TNT Conservation Area - Fee Simple
- TNT Conservation Area - Lease

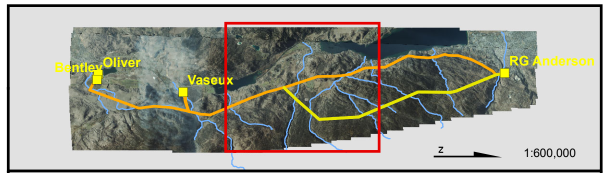
Map 2 of 3

0 500 1,000 1,500 2,000
Meters

1:40,000

FORTISBC

Projection: UTM Zone 11 Datum: NAD83 Map Produced On: 2007-11-27



Imagery:
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1m Nominal Resolution
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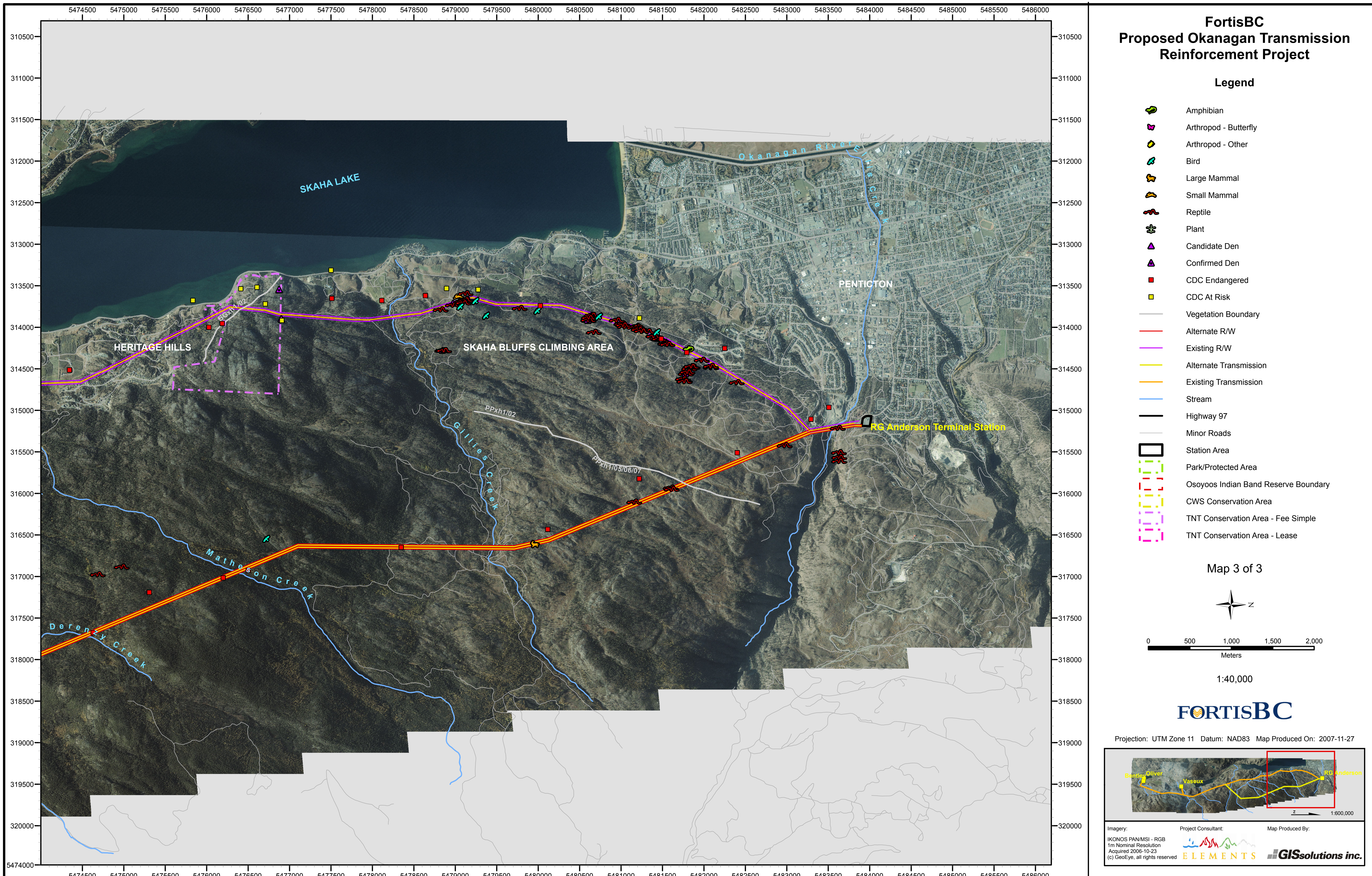
Project Consultant:
ELEMENTS

Map Produced By:
GISsolutions inc.



FortisBC
Proposed Okanagan Transmission Reinforcement Project
Legend
Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
Candidate Den
Confirmed Den
CDC Endangered
CDC At Risk
Vegetation Boundary
Alternate R/W
Existing R/W
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Stream
Highway 97
Minor Roads
Station Area
Park/Protected Area
Osoyoos Indian Band Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Map 3 of 3
Z
0 500 1,000 1,500 2,000
Meters
1:40,000
FORTISBC
Projection: UTM Zone 11 Datum: NAD83 Map Produced On: 2007-11-27
Oliver
Vaseux
RG Anderson
1:600,000
Imagery:
IKONOS PAN/MSI - RGB
1m Nominal Resolution
Acquired 2006-10-23
(c) GeoEye, all rights reserved
Project Consultant:
ELEMENTS
Map Produced By:
GISsolutions inc.
SKAHA LAKE
Okanagan River
Ellis Creek
PENTICTON
HERITAGE HILLS
SKAHA BLUFFS CLIMBING AREA
RG Anderson Terminal Station
Gillies Creek
Matheson Creek
Derenzy Creek
PPxh1/02
PPxh1/05/06/07

Bentley Terminal Station

The proposed location of the Bentley Terminal Station is on a glacial terrace within the Osoyoos Indian Reserve that is immediately east of the existing FortisBC Oliver station, as well as the town of Oliver. This station and site were considered in more detail for the Canadian Environmental Assessment Act (CEAA) review and referral process in the 'Environmental Assessment of the FortisBC Inc. Revised Proposed Osoyoos Projects July 2006' (Elements Network Inc, 2006). The station was initially assessed in association with the other projects at the request of the community and Indian and Northern Affairs Canada (INAC). The rationale for the request was to present a more complete picture of FortisBC plans to the community prior to the designation vote in the fall of 2005 to approve two facility site land leases for Bentley as well as for the Nk'Mip Terminal Station (in construction) .

The Bentley Terminal Station will be constructed starting in 2009 and be operational by 2010. This facility will occupy 3.50 ha and include:

- A switchyard and switches for load control;
- Three transmission voltage transformers;
- Up to10 circuit breakers;
- One transmission line (63 kV) exiting East likely with a three-pole dead end set and anchors adjacent to just inside the station;
- One 230 kV circuit from Vaseux, one 161 kV line (existing Line 11L) to Grand Forks, one 138kV line (existing 43) to Princeton, a connection to the 63 kV line to Nk'Mip, and two 63kV lines to Oliver;
- One control building;
- Associated metering, protection and control facilities;
- A communications cable;
- A graveled yard with cement pads;
- A low-profile, graveled all-weather access road entering from the East;
- A complete chain link perimeter fence incorporating a snake fence;
- Counterpoise dug in at least 3 pole sets out of the station; and
- Lightning spires and overhead shield wires.

Oliver Terminal Station

The existing Oliver Terminal Station is located immediately east of the Town of Oliver and at the foot of a glacial terrace on the Osoyoos Indian Reserve. The station will be converted to primarily a distribution station with some 63kV switching. It will have its two high voltage main transformers and associated equipment removed and the distribution equipment upgraded. This construction will occur in 2009 and be operational by 2010.

The Oliver Terminal Station will be upgraded within the existing footprint and will include the following changes and upgrades:

- The switchyard will remain the same size and all 161kV equipment (including 161 kV transformers) will be removed;
- Replacement of the existing 13 kV transformer and distribution switchgear and installation of the new 13kV equipment on the north side of the yard;

- The addition of one new 60 kV breaker;

- The installation of two new transmission lines (63 kV) exiting East to Bentley using existing steel structure towers;
- The extension of the 138 kV line from Princeton to Bentley station;
- Decommissioning of the 60 kV line from Penticton (existing 41L);
- Modifications to the control building to accommodate changes to cabling;
- Revised metering, protection and control facilities;
- Relocation of communications cable;
- Installation of new concrete footings; and
- Revisions to lightning spires and overhead shield wires.

230kV Transmission Lines

The 230kV transmission lines will connect the RG Anderson Station and the Bentley Terminal Station as well as the Vaseux Lake Terminal Station.

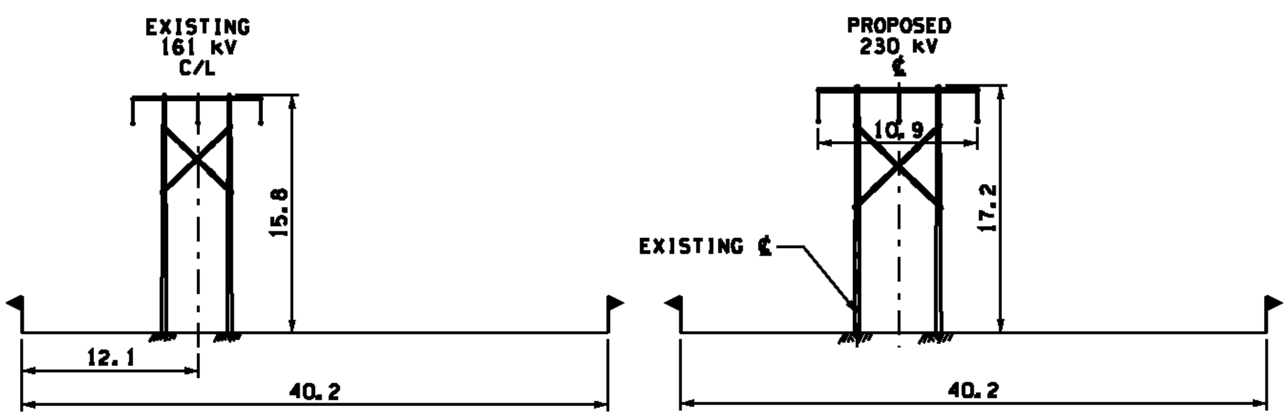
The transmission lines will be constructed from 2008 to 2010 in conjunction with the construction of the other facilities and will include:

- A three phase, three conductor (power line) system;
- Approximately 147-155 new steel structures (pole-style) will replace the existing 145 wood structures, and will be approximately 22 m to 47m high, primarily in single pole configuration for Vaseux to Penticton ,and H-frame for Vaseux to Oliver;
- The existing right-of-way easement, at 40 m wide where there is single pole double circuit construction (other pole and circuit combinations could require additional right-of-way);
- Possible two-pole or three-pole sets with anchors at the stations, inflection (turning) points and large spans, such as crossings of creeks, canyons and valleys depending on the type of pole and load on the pole;
- Overhead shield wires on at least the first three poles or pole sets at each station, perhaps extending further depending on design;
- Likely, a counterpoise (grounding cable) dug in at the first three poles out of each station and connecting to the overhead shield wire; and
- Relocation of the existing fibre-optic cable on the lines to the new structures.

2.3 Preferred Potential Pole and Circuit configurations

Below is an artist's rendering of the preferred single steel pole double circuit recommended for use on the existing right-of-way from Vaseux to Penticton.

The sketch below is of the existing 161kV H-frame (left side) from Vaseux to Oliver which would be replaced with a 230kV H-frame (right side) which is 2 m taller with heavier conductors (power lines), steel poles and larger insulators.



Vaseux Lake Terminal Station

The existing Vaseux Lake Terminal Station will be upgraded to include a third 230kV rated transmission line exiting north and to the east for 2km. The station upgrade will be constructed in 2009 and be operational by 2010.

The Vaseux Lake Terminal Station will be upgraded within the existing footprint and will include the following changes and upgrades:

- The switch yard will remain the same size and several new switches for load control will be added; several new 230 and 500 kV circuit breakers will be added;
- One new transmission line (230 kV) exiting north then east to the interconnect on 76L line. It will likely include one, perhaps two three-pole sets and anchors adjacent to the station and is approximately 2km long across the protected area;
- Minor modifications to existing equipment to operate at 230 kV;
- Modifications to the control building to add cabling;
- Revised metering, protection and control facilities;
- Installation of new concrete footings;
- Revisions to lightning spires and overhead shield wires; and
- The installation of counterpoise on three or four pole sets for the new 230 kV line exiting the station.

RG Anderson Station

Some older equipment at the existing RG Anderson station will be partially decommissioned and equipment will be upgraded or replaced to meet the growing demand. The station is located adjacent to a residential area in the southeast edge of Penticton on a terrace near Ellis Creek. The station will be partially re-constructed in 2009 and be operational by 2010.

The RG Anderson Station will be upgraded within the existing footprint and will include the following changes and upgrades:

- The switch yard will remain the same size and switches for load control will be added;
- One transformer will be replaced;
- Three new 230 kV breakers and one new 60 kV breaker will be added;
- Two new 230 kV lines will replace the existing 161 kV line exiting the south side of the station. It will likely include a three-pole dead end set and anchors adjacent to the station;
- Revised metering, protection and control facilities;
- Relocation of communications cable;
- Installation of new concrete footings; and
- Revisions to lightning spires, overhead shield wires and counterpoise.

3.0 ENVIRONMENTAL SETTING

The proposed project area is located within the South Okanagan through an area that is located primarily within two bio-geo-climatic zones; the Very Dry Hot Bunchgrass and the Very Dry Hot Ponderosa Pine (Habitat Atlas, edited by Holm). Because these areas are situated in the rain-shadow of the Coast and Cascade ranges, they generally have a dry, continental climate. The valley bottom has a predominantly semi-arid steppe climate. The Okanagan Valley's long chain of lakes moderates the winter and summer climate.

These bio-geo-climatic zones represent the northern extension of the American Great Basin physiographic region and support many species that do not occur elsewhere in B.C. or in Canada. Many of these species are at the northern or southern extent of their natural range adding a tremendous level of natural diversity in Canada (Habitat Atlas, edited by Holm). Populations at the edge of natural ranges tend to be genetically diverse but less resilient and more sensitive to habitat alteration and disturbance (Habitat Atlas, edited by Holm).

On the east side of the Okanagan Valley near the south end of the project there are deep soiled, shrub steppe grasslands that are part of the Very Dry Hot Bunchgrass Zone (BGCZ). These plant communities support many of the species at risk on both the federal and provincial lists for the project area. Along the proposed project area where these vegetation communities are traversed by the proposed projects, the terrain is primarily a series of flat to gently rolling (undulating) plateau-like benches or terraces along the sides of the valley bottom.

Photo 3.1 Picture of the shrub steppe grassland community east of Oliver near the existing 161 kV land on the Osoyoos Indian Band (OIB) lands (by S.Morck).

The right-of-way also crosses more rugged terrain associated with the Very Dry Hot Ponderosa Pine bio-geo-climatic zone, which also provides habitat for 'Designated' species at risk. The terrain features associated with this zone along the proposed right-of-way are low to mid elevation mountainous transition slopes to the valley bottom. Fires, selective logging and grazing have occurred throughout the project area. Much of the area transected by facilities and the transmission route provides wildlife habitat for diverse populations of large mammals, birds, reptiles, small mammals, amphibians and invertebrates.

Photo 3.2 Typical shrub steppe habitat with antelope brush in the low elevation Ponderosa Pine zone along the route (by T. McIntosh).

There are several tributaries to the Okanagan River System and Skaha Lake along the project area. Some of these creeks or watercourses are usually dry and have flowing water only during spring runoff or unusual rainfall events. They are frequently referred to as *'ephemeral'* in nature, primarily wetted during the spring freshet (runoff).
Some of the watercourses may have water flowing throughout the year depending on weather and watershed elements that affect the sustainability of the water.
There are named watercourses along the route including Wolfcub Creek, Atsiklak Creek, Vaseux (McIntyre) Creek, Matheson Creek, Shuttleworth Creek, McLean Creek, Gillies Creek, and Ellis Creek. Creeks such as Vaseux Creek, McLean Creek and Ellis Creek with larger headwater basins have the potential for sustained flow throughout the year. There are many unnamed seasonal ephemeral watercourses traversed along the project area.

4.0 ENVIRONMENTAL AND SOCIAL IMPACT SCREENING ASSESSMENT METHODOLGY

The methodology for this report is based primarily on the environmental assessment guidelines of regulatory agencies such as the Canadian Environmental Assessment Agency and BC Ministry of Environment. BC Hydro developed the scope for the report based on their extensive experience with environmental and social impact assessments. As part of the project crosses federal land in the jurisdiction of Indian and Northern Affairs Canada, their guidelines for the ESIA's (INAC- BC Region, 2005) are considered in the process too.

This assessment is intended to describe project effects on environmental and social resources with enough detail about the current understanding of the ecology of species as well as the observations from field studies, and knowledge of linear projects and associated facilities to interpret the potential effects of the project. The report also utilizes the knowledge of subject matter experts as well as research of existing reports which included status reports on species at risk, in the consideration of direct, indirect and cumulative effects.

This report provides an initial impact assessment of the preferred route, and a discussion of route selection, as well as impacts associated with facility upgrades and the development of a new facility (Bentley). General environmental guidelines which have been developed as best management practices on a number of electrical projects will also be part of this report.

A detailed environmental management plan (EMP) will be prepared in collaboration with refined engineering design for the project in the winter of 2007 which will be site specific as well as linked to construction environmental compliance.

4.1 Field Studies and Inventories

Field studies were undertaken to provide site specific information and to refine existing information. Study teams were assembled using local residents as much as possible, including members of the Osoyoos Indian Band (OIB) and Penticton Indian Band (PIB). Senior Biologists and Archaeologists were assigned to each field assessment team to provide expert opinion on the project issues, impacts and possible mitigation measures. There are some background studies and general regional information available for some of the ecosystem components of the project. Field studies were undertaken where there was a need for data for environmental planning.

Field assessments collected information on:

- Wildlife: Reptiles, Arthropods/Invertebrates, Amphibians, Birds, Large Mammals and Small Mammals;
- Archaeology: prehistoric and historic resources and aboriginal heritage and cultural resources;
- Vegetation;

- Background sound level assessments;
- Water resources and aquatic habitat assessments;
- Social considerations;
- Cumulative Effects assessment of valued ecosystem components; and
- Other areas of consideration such as aesthetic viewscapes.

Teams led by qualified professionals were set up to multi-task the biophysical studies to improve efficiencies, reduce overlap and to address any timing considerations. In some cases such as archaeology and sound level assessments, subject matter experts were required to conduct independent surveys.

There was a focus on at risk species and the identification of issues that will drive the detailed environmental protection plans in the environmental management plan (EMP). Field study teams have also gathered data about species that are not at risk. Mitigation measures developed for 'Species at risk' tend to also minimize the impact to species not at risk. Field studies were non-intrusive and observation based along the preferred route corridor, assessing the presence of resources on or near the existing right-of-way.

4.2 Identification of Issues

Based on the review of existing information, discussions with regulatory agency representatives and input from the community during initial consultations, the study team developed a macro list of environmental and social issues that provide a focus for the ESIA. Preliminary issue selection below is based on knowledge of the project area and an understanding of the types of impacts typically associated with transmission line and station development.

The potential impacts and benefits associated with different project components have been reviewed with reference to the following broad issue categories:

- Geophysical Environment
- Fish and Aquatic Habitat
- Wildlife and Terrestrial Habitat
- Vegetation Resources
- Archaeological and Heritage Resources
- Land Use
- Agriculture
- Parks and Recreation
- Aesthetics and Viewsheds
- Navigation
- Transportation and Utilities
- Contaminated Sites
- Social
- Public Health
- First Nations Interests
- Cumulative Effects

4.3 Assessment of Potential Environmental and Social Impacts

Potential impacts associated with each component of the FortisBC OTR project have been evaluated with respect to the environmental and social issues identified above.

Professional Judgment

Qualified professionals have drawn upon their specialist expertise and their experience with assessments of other similar projects to identify issues of relevance to the project. As part of the team, they have interpreted findings from research and field studies in the context of potential effects. These experienced professionals have also recommended measures to mitigate the effects either using standard industry best management practices or where required, novel approaches to reduce the negative effects of the project. In many instances interpretation and mitigation planning is done through a collaborative process with agencies and other stakeholders.

4.4 Assessment Approach

The ESIA involved identifying biophysical and social components that could be affected by the development of the project. These are defined as the fundamental elements of the natural environment, which usually include air, water (surface and groundwater), soils, terrain, vegetation, wildlife, aquatics and resource use. For this project, air quality is not considered an issue.

The focus of the assessment is to provide a description of the ecosystem component or subcomponent within the study area, then to describe potential impacts associated with project activities. The significance of impacts, positive or negative, are discussed relative to the resource sensitivity, the magnitude of the impact as well as the duration, and ecological context (i.e. population impacts). The project team uses experienced, seasoned team leaders for the field studies and relies on their expertise and judgment in the field of 'importance' and 'magnitude' as well as the focus of the field assessment.

4.5 Identification of Valued Ecosystem Components

Valued Ecosystem Components (VECs) are components that are considered important or valuable, which must be considered during the Environmental and Social Impact Assessment (ESIA) process. The VECs were determined through previous experience on other projects in the Valley as well as through the ESIA consultation process with the community representatives and the key agencies. Based on the experience of ELEMENTS Network Inc. (Elements) and FortisBC on other projects in the South Okanagan, the categories of VECs are:

- Sensitive Vegetation Associations;
- Species at risk (federal and provincial);
- Wildlife and wildlife habitat;
- Fisheries and Aquatic Habitat;
- Parks and Protected areas;
- Agriculture and Viticulture;

- Landscape and Visual Resources; and
- Archaeological and Heritage Resources.

4.6 Cumulative Effects (CE) Assessment

Assessments of cumulative effects consider the impacts likely to result from the project in combination with other pre-existing developments and certain known future developments, as well as any developments that are reasonably anticipated to occur as a direct result of this project. The cumulative effects assessment is integrated into the ESIA where applicable in relation to the discussions of both short term and residual project effects.

4.7 Focus of Cumulative Effects Assessment

For a series of projects of this nature, the cumulative effects (CE) assessment may be considered locally or regionally. The primary focus will be on local areas in proximity to the projects, however, it will be important to provide a context, with some regional issues such as the shrub steppe grassland community or other significant issues related to impacted VECs. The timing of the assessment includes known recent projects with an overview of development historically. It also includes upcoming developments that can be confidently predicted in the near future (5+yrs).

The CE assessment addresses the issues arising during ESIA research and preparation. Some factors the CE process considers are:

- Infrastructure growth inducement;
- Residual access considerations;
- Long term incremental impact to sensitive vegetation communities and wildlife habitat;

The cumulative effects assessment may in turn drive some mitigation measures which are within the scope of the project and in the control of the project proponent. The CE, could for example, affect site selection or route selection if a long term population effect were to occur to a species at risk on federal lands.

These issues are in many ways intertwined. For example, some of the wildlife habitat has species at risk issues which are also affected by both the access and development issues.

The primary focus of the cumulative effects assessment for this project is on the vegetation associations as their long term change and disturbance is considered the key factor affecting much of the wildlife.

5.0 FACILITY SITE SELECTION

Considerations for facility site selection include:

- Community input (i.e. visual aesthetics, traditional use, other issues);
- Identified environmental concerns;
- Construction and operations access;
- Engineering requirements;
- Operations and maintenance issues;
- Safety, cost, and operational reliability;
- Use of existing facilities; and
- Regulatory requirements if applicable.

5.1 Oliver Terminal Station

The selection of the location for the Oliver station was determined through a business and engineering planning process at the time of the original construction in the 1960s. The existing site is suitable for modifications as part of the OTR project because it:

- Uses an existing industrial site;
- Avoids further disturbance and fragmentation near residential areas to provide service to the Oliver area;
- Maintains the existing visual resources in the vicinity;
- Provides a suitable site from a geotechnical and engineering perspective; and
- Does not warrant a site change due the nature of the modifications.

At this date, there has been no reconnaissance in the area to evaluate other sites as this site can be modified and continue to be used for distribution service in the Oliver area.

5.2 R.G. Anderson Terminal Station

The selection of the location for the R.G. Anderson station was determined through a business and engineering planning process at the time of the original construction in the early 1960's. The existing site has been determined to be suitable for an upgrade as part of the OTR project because it:

- Uses an existing industrial site;
- Avoids further disturbance and fragmentation near residential areas to provide service to the Penticton area;
- Maintains the existing visual resources in the vicinity;
- Provides a suitable site from a geotechnical and engineering perspective; and
- Provides a cost effective site by avoiding acquisition of a new site.

At this date, there has been no reconnaissance in the area to evaluate other sites as this site can be upgraded and continue to be used for service to Penticton.

5.3 Vaseux Lake Terminal Station

The selection of the location for the Vaseux Lake station was determined through a business, environmental, social and engineering planning process in 2001/2002 and approved by the BCUC prior to the construction of the facility in 2004/2005. The existing site was built with accommodations for this proposed upgrade within the existing footprint of the site. No alternatives were considered for the OTR project because the Vaseux station:

- Recently used current site selection criteria for facilities of this size and scope;
- Uses an existing industrial site built to accommodate this expansion;
- Avoids further disturbance and fragmentation of the natural habitat in the area;
- Maintains the existing visual resources in the vicinity; and
- Provides a suitable site from a geotechnical and engineering perspective;

At this date, there has been no reconnaissance needed in the area to evaluate other sites as this site meets all other requirements for a power supply point to the Okanagan valley.

5.4 Bentley Terminal Station

The first site selected for the Bentley Terminal Station was a former station site along McKinney Road east of Oliver where the existing transmission lines cross the site. However, upon extensive review this site was eventually rejected. A number of factors at this site contributed to further site selection:

- Community input indicated concerns with the site visually, and the close proximity to residences;
- The existing disturbed area was less than one hectare and almost 4 hectares were required;
- The steep slopes of the valley required significant grading and back-sloping outside the station, increasing the footprint well beyond the proposed 4 ha which countered any potential savings in using the small area of old station; and
- There was input from the OIB community members helping to locate a site with lower environmental values and residential concerns.

In total, four sites were initially identified and considered as potential candidates for the location of the Bentley Terminal Station during the site selection process. One site well away from the others in an old abandoned field failed to meet engineering thresholds for technical feasibility as well as cost effectiveness and was subsequently discarded from a detailed review. The main benefits and constraints/impacts of the three remaining sites are summarized in the tables on the next two pages. The overall site selection was influenced significantly by the OIB community representatives working in close consultation with FortisBC and its representatives.

Figure 5.1 Overview Map with the location of the three sites considered for the Bentley Terminal Station Site.

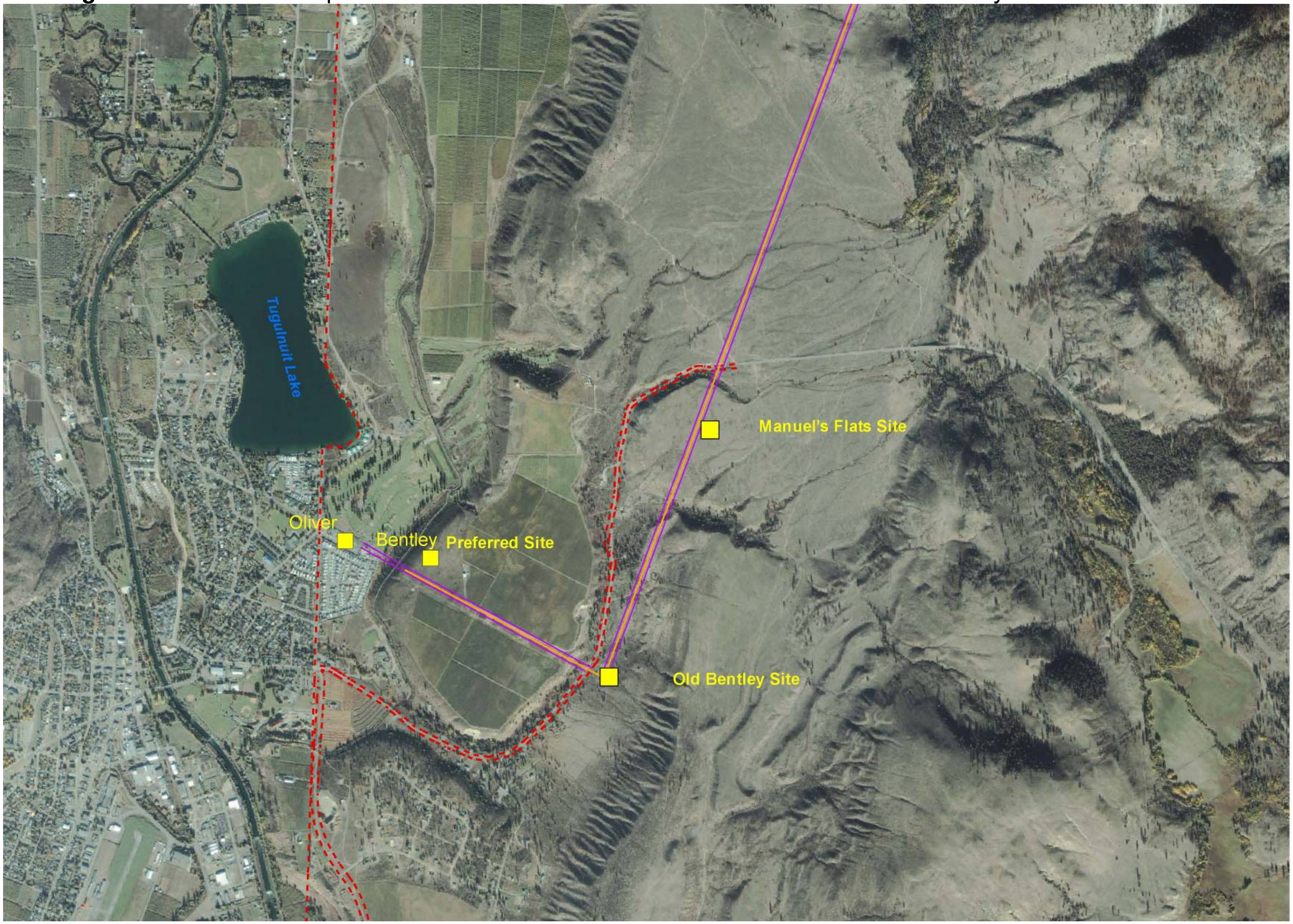


Table 5.1 Bentley Terminal Station Alternate Site Descriptions

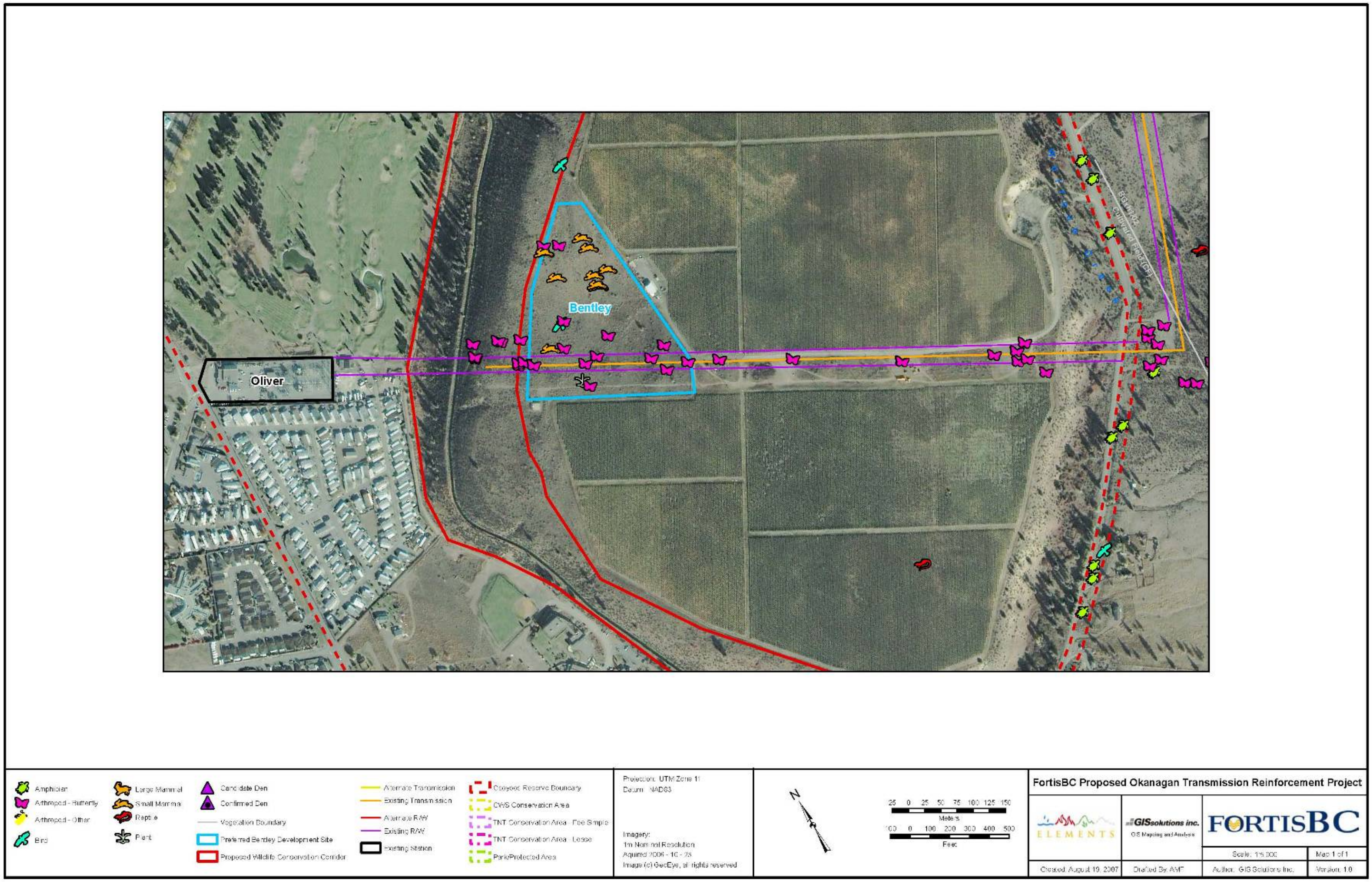
Ecosystem Element	Old Bentley/Former Sub Site	Manuel's Flats	Benchland adjacent to Oliver (Preferred)
Setting Description	▪ **Located on a small terrace in the Wolfcub Creek valley east of the McKinney Road.** ▪ **Good quality Antelope brush community with a small area 0.4 ha previous disturbance.**	▪ **Benchland on sagebrush grassland immediately adjacent to Line 40L transmission line.** ▪ **Located up on the flatlands in a prominent viewscape.**	▪ **On a depressional benchland terrace east of the Town of Oliver and immediately East of the Fortis BC Office/Station in Oliver.** ▪ **Ranked low quality Antelope brush grassland community.**
Aesthetics and Viewscape	▪ **In view of several adjacent residences on the OIB.** ▪ **Visible adjacent by travelers along the McKinney Road for a distance of about 0.3-0.5 km each way.**	▪ **In view of a few residences and travelers on the McKinney Road has an impact to the horizon of the viewscape due to terrain conditions** ▪ ***OIB community representatives considered this to be the most visually intrusive to the OIB Indian Reserve landscape.***	▪ **In the side view of two residences approximately 200 m north.** ▪ **In view of the town of Oliver and will be seen by from many residences in town. The closest residences view is buffered by the intervening slope and terrain.** ▪ ***Preferred by the OIB community representatives as the least visually intrusive to the OIB Indian Reserve landscape.***
Fisheries and Aquatic Habitat	▪ **Near Wolfcub Creek (within 100m)** ▪ **Known to have Rainbow trout and other species near the mouth to the Okanagan River.** ▪ ***Not expected to impact Fisheries and Aquatic habitat*** ▪ ***No preference in this category***	▪ **Near Wolfcub Creek (within 100m)** ▪ **Known to have Rainbow trout and other species near the mouth to the Okanagan River.** ▪ ***Not expected to impact Fisheries and Aquatic habitat*** ▪ ***No preference in this category***	▪ **Adjacent to Town of Oliver Irrigation Canal (about 100m)** ▪ **Known to have Rainbow trout and Bass in the system on a temporary basis.** ▪ ***Not expected to impact Fisheries and Aquatic habitat*** ▪ ***No preference in this category***

Ecosystem Element	Old Bentley/Former Sub Site	Manuel's Flats	Benchland adjacent to Oliver (Preferred)
Vegetation Resources	▪ No timber on site ▪ Shrub steppe community. ▪ *Rated as good quality antelope brush needle and thread grass community except for about 0.4 ha of old site pad.*	▪ No timber on site ▪ Shrub steppe community. ▪ *Rated as moderate quality (impacted by grazing) sagebrush grassland community* ▪ *Has an excellent concentration of traditional plants still harvested regularly by community members. Concern about protection of these plants was raised during site selection*	▪ No timber on site ▪ Shrub steppe community ▪ Adjacent to a corridor of higher quality antelope brush needle and thread grass community ▪ *Rated as degraded antelope brush needle and thread grass community.* ▪ *Extensive presence of invasive species.* ▪ *Preferred from a vegetation community perspective (lowest quality site)*
Wildlife and Terrestrial Habitat	▪ Species at risk in the immediate vicinity includes snakes, spadefoot, and Behr's hairstreak ▪ Critical habitat for Behr's Hairstreak, spadefoot (breeding). ▪ Other wildlife includes songbirds, deer and coyotes.	▪ Species at risk in the immediate vicinity includes spadefoot, and Curlew. ▪ Critical habitat for Curlew (nesting) and spadefoot (breeding). ▪ Other wildlife includes songbirds, deer and coyotes.	▪ Species at risk in the immediate vicinity include Behr's hairstreak, pallid bat and spotted bat. ▪ Foraging habitat for bats. Behr's hairstreak habitat considered to be low quality marginal habitat. ▪ Other wildlife includes songbirds, deer and coyotes. ▪ *Preferred from a wildlife habitat perspective with the least amount of critical habitat as well as lower quality habitat.*
Archaeological and Heritage Resources	▪ Not assessed ▪ *Probably acceptable from an archaeological perspective due to prior site development.*	▪ Not assessed but has traditional use concerns. ▪ Reported that elders still harvest traditional plants from this location.	▪ AIA determined there are no resources of concern. ▪ *Acceptable from an archaeological perspective.*

Ecosystem Element	Old Bentley/Former Sub Site	Manuel's Flats	Benchland adjacent to Oliver (Preferred)
OIB Community Input	▪ **Community concerns due to proximity to residences, effect on their viewscape as well as occurrence of Species at risk.** ▪ **Future community development plans for the area**	▪ **Community concerns due to significant effect on their viewscape as well as occurrence of Species at risk and traditional plant harvesting area.** ▪ **Future community development plans for the area.**	▪ **Recommended by OIB community environmental technologist as an alternative and supported by the leadership of the community.** ▪ ***Preferred by the OIB community representatives participating in the site selection process.***
Site Preparation Cost and Constructability	▪ **Moderate site preparation costs due to terrain and slope conditions.** ▪ **Constructability was considered most challenging of the sites due to terrain and soil conditions.**	▪ **Considered the most cost effective site by FortisBC during preliminary site assessments.** ▪ **Constructability is considered very good due to terrain and soil conditions.** ▪ ***Preferred site from a constructability and site preparation cost perspective with little or no grading.***	▪ **Some slope across the site and a depressional area are expected to affect site preparation costs.** ▪ **Considered acceptable by FortisBC assessment for constructability.**
Land Use Agriculture Residential etc.	▪ **Currently has limited grazing with low potential for additional agricultural development.** ▪ **Future residential development planned in the immediate vicinity.**	▪ **Currently has significant grazing and moderate to high potential for agricultural development.** ▪ **Future residential, viticultural and recreation (golf course) development potential.**	▪ **Currently has limited grazing and some refuse dumping with low to moderate potential for agricultural development. Note site is a frost sink and would not support grapes.** ▪ **No future plans or value for residential or recreational development.** ▪ ***Preferred from a current and future land use perspective.***

Ecosystem Element	Old Bentley/Former Sub Site	Manuel's Flats	Benchland adjacent to Oliver (Preferred)
Summary	**Least preferred site in almost all categories**	**Preferred site from a Constructability and Site Preparation Cost perspective.**	**Preferred site regarding the following comparative ecosystem elements:** ▪ **Aesthetics Visual landscape** ▪ **Vegetation Community** ▪ **Wildlife Habitat** ▪ **OIB Community Input** ▪ **Land Use**

Figure 5.2 Overview Map of the Bentley Terminal Station Site with the Oliver Terminal Station



6.0 ROUTE SELECTION FOR 230 KV TRANSMISSION LINES

Typical route selection and design strategies for electrical transmission lines consider the following factors:

- Alignment with existing corridors wherever possible (providing the existing corridor is compatible with environmental, archaeological and engineering constraints);
- Use of disturbed areas and existing access roads wherever possible to facilitate construction and future maintenance and improvements;
- Timing and the duration of construction;
- Potential impacts to critical habitat that cannot be effectively mitigated;
- Landowner input and requirements;
- Probable future land use plans and development;
- Aesthetics;
- Traditional land use and heritage features;
- Sensitive natural environments;
- Operations and maintenance;
- Engineering requirements; and
- Safety, cost, and operational reliability.

Emphasis on these above mentioned considerations and their relative importance varies between different types of industrial projects. For the OTR project, two route alignments were considered with variations of width and pole design within the routes.

Preferred Route

Based on the assessment results several environmental and community issues have been identified that influence the route selection process. From an environmental perspective use of the existing right-of-way is preferred because it:

- Minimizes the amount of disturbance, particularly clearing of wildland habitat in an area where there are no anthropogenic disturbances to date;
- Is a desirable practice encouraged in route selection methodology in regulatory agency environmental assessment guidelines;
- Includes emphasis on low impact construction access constraints to maintain the habitat on the existing right-of-way;
- Minimizes impact to the natural environmental resources in the area including forested areas with excellent potential as pristine undisturbed habitat for species at risk including the White headed woodpecker (*Picoides albolarvatus)* and Williamson's sapsucker (*Sphyrapicus thyroideus thyroideus*) ;
- Minimizes disruption to undisturbed traditional use areas for back country subsistence hunting;
- Avoids crossings and disturbances to natural upland watershed basins providing high quality tributary water to Okanagan Rivers system and associated lakes with high historical and current fishery values; and

- Attempts to parallel, where feasible, existing infrastructure which in this case is the utilization of the existing transmission line corridor between Oliver and Penticton

Alternate Route Consideration from Oliver and Shuttleworth Creek

An initial high level evaluation of the potential route alternatives on the south half of the route between Oliver and the Shuttleworth Creek area indicated there were only two possibilities, both with significant additional challenges. Any route off the existing right-of-way in Manuel's canyon through the Vaseux Protected Area would force another route to be located entirely outside of this protected area due to legislative constraints. One option to go east around the protected area would add over 15 km to the length of the line and would significantly increase costs. That option would also feature higher altitude construction and operations constraints and was quickly rejected. Terrain in the area restricts a western option to the narrow corridor near highway 97, however infrastructure growth through that corridor around Gallagher Lake and Vaseux Lake and the presence of the Vaseux Lake Provincial Park precludes any potential space for a transmission line right-of-way so this too was rejected from any further consideration. Because of existing infrastructure, rugged terrain and park constraints, there are no reasonable alternatives to using the existing corridor between Oliver and Shuttleworth Creek.

Alternate Route Consideration from Shuttleworth Creek to Penticton

The two alternative corridors from Shuttleworth Creek north included the existing right-of-way and a route which deviates east of the existing corridor just south of the McLean Creek country residential and farming area and traverses the mid slope terraces of the low altitude mountainous terrain to Penticton on the East side of Skaha Lake. Both routes are considered technically and economically feasible.

Overview of the Existing Right-of-Way

The existing right-of-way bisects acreage estates near Okanagan Falls including McLean Creek and Heritage Hills and skirts an area near the proposed Skaha Bluffs Park.

An assessment of the potential impacts to stream and riparian habitat for the existing corridor indicates that impact risk to riparian vegetation is low on this route. In addition, this route alternative would require three less crossings of named streams. Fish habitat values are similar to those found along the upland route. At the time of the field assessment however, it was noted that these streams show some effects from residential, infrastructure, and agricultural development. Of the two routes considered, the existing lower route along the existing corridor would have the lowest overall impacts to riparian vegetation and fish habitat.

The existing transmission corridor traverses areas of California Bighorn Sheep (*Ovis Canadensis californiana*) winter range. Winter range for most ungulates is considered to be a critical limiting factor. The existing route is also within 500m of three lambing areas known to be essential for the recruitment of the population. The project was discussed with a Ministry of Environment representative, (Stepaniuk D. 2007) who indicated that the primary concern is to ensure that ewes are protected from late winter stress and that they are not disturbed in their traditional lambing areas. These objectives will be facilitated through the implementation of timing constraints (March 15 to June 25) to project activities. It is critical to maintain the functionality of California Bighorn Sheep winter range by minimizing long term impacts to natural vegetation along the right-of-way. Short-term impacts may be tolerated as generally speaking sheep have sufficient range for dispersal and adaptive response to activities during most of the winter unless unusually high snow load forces them into more restricted range.

Portions of the existing right-of-way with established natural vegetation communities associated with identified species at risk are under severe pressure from development in the valley. Construction activities associated with this project may affect a small percentage of this vegetation short term. However, no significant clearing and salvage activities will be required along the existing corridor. It is expected that low impact construction methods and constraints on access via existing trails will mitigate most of the effects of construction on the shrub steppe community along the right-of-way. In some areas of residential development, the existence of the right-of-way provides a corridor of natural vegetation beneficial to wildlife that would likely be lost to development if the right-of-way were abandoned.

Overview of the New Upland Right-of-Way

The upland alternate route right-of-way avoids acreage estates near Okanagan Falls including McLean Creek and Heritage Hills and skirts an area near the proposed Skaha Bluffs Park. It however transects an area proposed for a Wildlife Management Area (Derenzy) and an area with an outstanding timber claim of the Penticton Indian Band. The area is also used for trapping, guiding and outfitting, hunting and remote wildland hiking and recreation.

An assessment of the potential impacts to stream and riparian habitat for the alternate upland corridor indicates that impact risk to riparian vegetation is significantly greater on this route. In addition, the upland route alternative would require three additional named streams to be crossed. Fish habitat values on this route are similar to those found along the existing right-of-way, however, at the time of the field assessment, they were observed to be pristine showing no evidence of anthropogenic effects. Of the two routes considered, the existing lower route along the existing corridor would have the lowest overall impacts to riparian vegetation and fish habitat.

The upland transmission corridor traverses locations areas of California Bighorn Sheep (*Ovis Canadensis californiana*) summer and fall range. The project was discussed with a Ministry of Environment representative, (Stepaniuk D. 2007) who indicated that the primary concern with summer range is to manage the effects of the right-of-way with respect to residual access and associated increased hunting pressure, habitat change and disturbance. Short-term impacts may be tolerated as generally speaking sheep have sufficient range for dispersal and adaptive response to activities during most of the summer and fall unless unusually activity forces them into more restricted range and makes them more susceptible to disturbance or increased hunting pressure.

The entire upland right-of-way has well established natural forested vegetation communities associated with identified species at risk which are under severe pressure from development in the valley. Construction activities associated with this project would have a much larger impact to vegetation on this route and the associated habitat it provides for wildlife. It is expected that low impact construction methods and constraints on access would mitigate some of the effects of construction however the presence of a new corridor and probable increased use and access by the public cannot be completely mitigated.

Environmental Team Perspective

Experienced professionals on the assessment team who were also team leads for various specialty teams provided their input to the route selection process. The key members on the environmental assessment team are:

- Steve Morck, the Project Environmental Coordinator and professional biologist with 30 years experience and over 100 linear facility route selection assessments as well as over 200 Fisheries and Aquatic Habitat assessments.

- Dick Cannings, a professional biologist with 30 years experience and considered a leading biologist on birds as well as Species at risk and Species at risk habitat in the Okanagan.

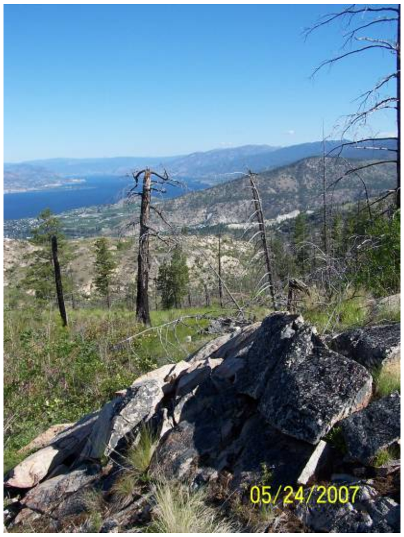
- Mike Sarell, a professional wildlife biologist with 25 years experience and considered a leading biologist on Species at risk and Species at risk habitat in the Okanagan and South Central BC.

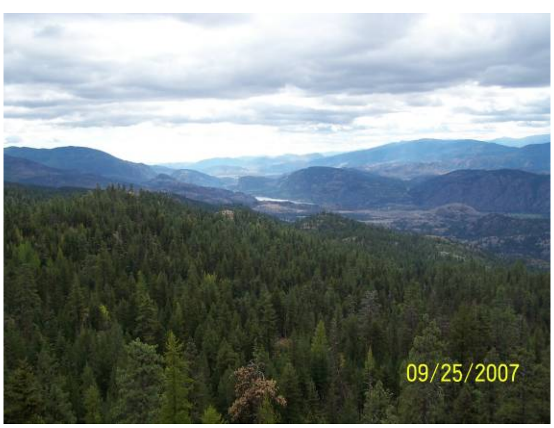
- Terry McIntosh, a professional botanist with 30 years experience and considered a leading expert in the desert vegetation communities throughout the Central BC Interior.

- Glenn Smith, a professional biologist with 20 years experience with over 1000 Fisheries and Aquatic Habitat assessments.

These team leaders and experienced environmental practitioners are unanimous in their professional judgment that the existing route is preferred from an environmental perspective because the upland route creates a new residual access corridor through wildlife habitat and across aquatic resources that are deemed to be more affected by the project if the upland route is used.

Photo Series 6.1 Photos of the Upland Route (by W. Alcock & M. Sarell)





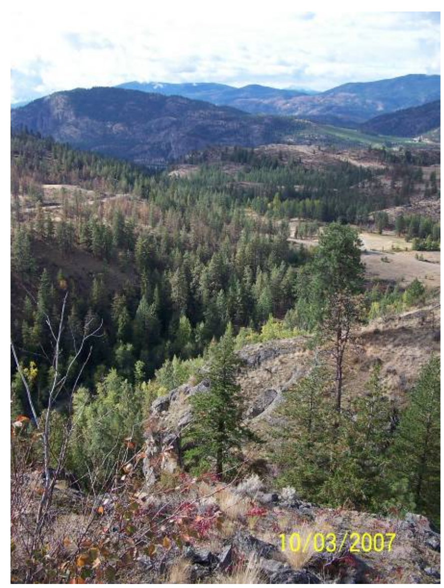
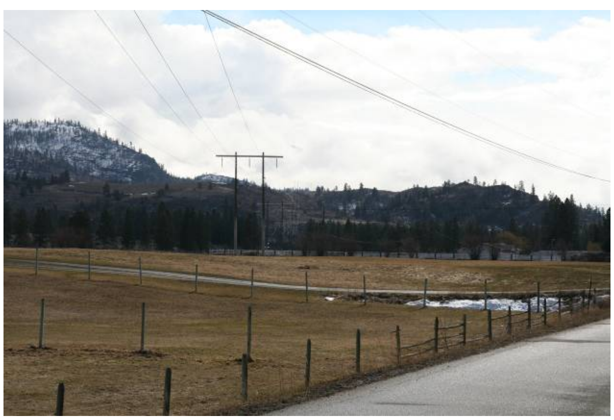


Photo Series 6.2 Photos of the Preferred Existing Route (by T. McIntosh & S. Morck)



Description of Alternates

The five alternatives for the line section for the two circuits from Shuttleworth Creek to RG Anderson Terminal Station, using combinations of the two technically and environmentally feasible routes and structure configurations are summarized as follows:

Alternative 1A – Uses the existing route, 18.5 kilometres long with primarily a 30 metre high, single steel pole, two-circuit configuration located on the existing 40 metre wide right-of-way. This configuration has features that minimize right-of-way usage, and that reduce the aesthetic impacts and EMF aspects of the lines on the existing right of way.

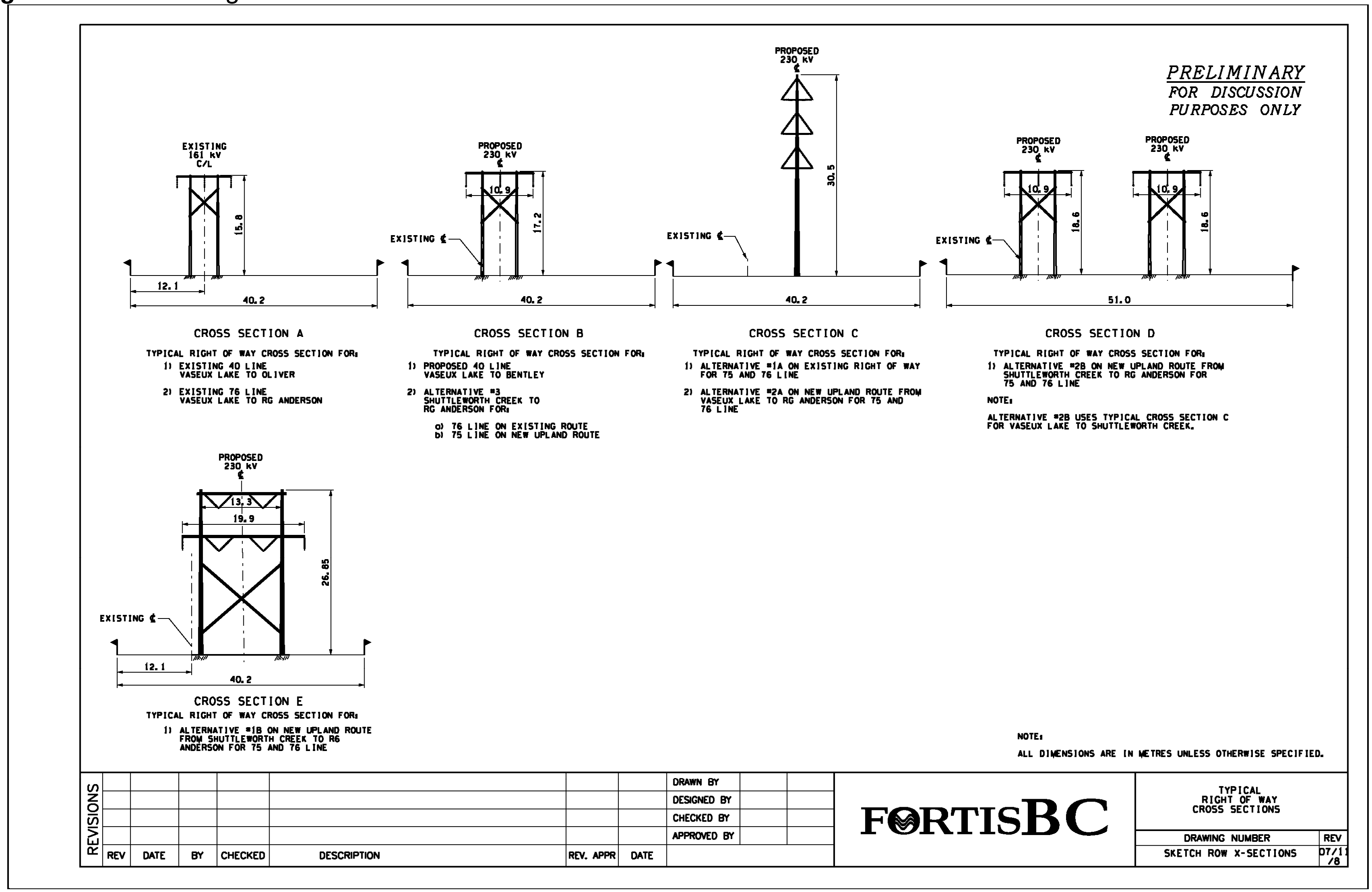
Alternative 1B – Uses the existing route, 18.5 kilometres long with primarily a 30 metre high H-frame steel pole, two circuit configuration located on the existing 40 metre wide right-of-way. This configuration has features that minimize construction costs but occupies more of the right-of- way, and has less aesthetic and EMF mitigation features than Alternative 1A.

Alternative 2A – Uses the upland route, 19.2 kilometres long with primarily a 30 metre high, single steel pole, two circuit configuration, requiring a new 40 metre wide right-of-way through tenured Crown land. This configuration has features that minimize right-of- way usage, and reduces the aesthetic impact and EMF aspects of the lines on the required new right of way.

Alternative 2B – Uses the upland route, 19.2 kilometres long with primarily a 19 metre high, H-frame steel pole, two single-circuit configuration,requiring a new 51 to 60 metre wide right-of-way through tenured Crown land. This configuration reduces construction costs but requires a wider right-of-way than Alternative 2A.

Alternative 3 – Combination of the existing (18.5 kilometres) and upland (19.2 kilometres) routes with primarily a 19 metre high, steel pole H-frame, single-circuit configuration on each route. A new 40 metre wide right-of-way is required over Crown lands for the Upland Route in addition to re-use of the existing right-of-way. This configuration offers higher system security due to diversity of the line routes and uses structures smaller than Alternatives 1A, 1B and 2A.

Figure 6.1 Pole Configurations for the Alternate Routes



Route Selection Steps

The evolution and selection of a preferred route has a number of steps that occur over a continuum to make a determination.

Step One

Initial route selection was conducted through a high level screening process utilizing existing maps, data, known engineering constraints and local environmental knowledge. This initial evaluation was conducted by the project team and resulted in development of the project proposal for the existing right-of-way. This was subsequently presented at a series of public consultation open houses in March of 2007. The concerns identified were primarily about the visual landscapes effects of the project by residents, most whom have developed their property adjacent to the existing right-of-way since it was first built. It was then determined that feasible alternative(s) be further considered and evaluated for the route around the McLean Creek country residential area through to Penticton (See Overview maps 2 & 3 pages 23 & 24).

Step Two

Initial public consultation suggested that the alternates originally considered in Step One be further assessed beyond high level screening. During this phase, initial environmental field assessments were conducted and there was a comparison of the various alternates based initially on the extent of the footprint, recognizing two principles of route selection. These two principles considered the ability to parallel or utilize existing corridors and to minimize new disturbance. The result at this point was a route and configuration ranking based on the above two principles (See Table 6.1) preferring the existing corridor in either configuration 1A or 1B. Alternates were presented in a second series of public consultation open houses.

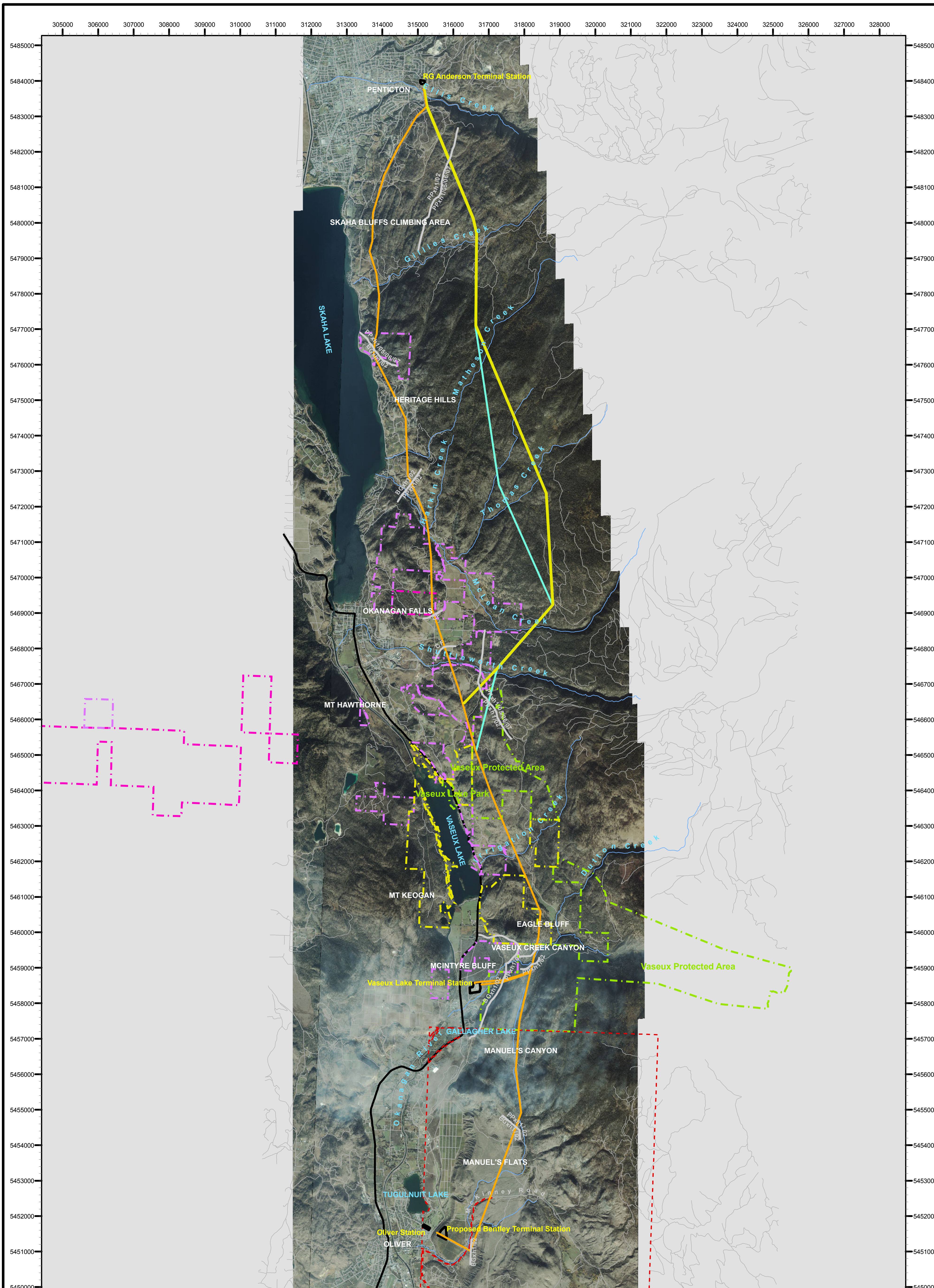
As the routes were assessed, feedback was received from the field study teams recommending the upland route be further located to the east because of the pristine habitat and the potential to use terrain to reduce the effects of residual access and fragmentation. Similarly, during public consultation in May, comments from community members echoed the field team recommendations that the upland route be located further east for similar reasons.

Step Three

Additional analysis of the options was conducted along with project risks and other constraints resulting in the need to further assess a revised (due to environmental input) upland route and a revised configuration for the existing route. Further analysis is presented in Tables 6.2 and 6.3 from an environmental perspective. This effort resulted in the existing route, 1A being the preferred route from an environmental perspective largely because the 1B pole configuration was assessed as having a greater landscape visual effect near residential areas.

Step Four

The environmental analysis and ranking from Step 3 was evaluated against other important considerations including engineering, safety and reliability. This analysis affected the ranking of some alternates however the existing route remained the preferred route as a result of this analysis. The following Tables and discussion present the sequence and outcome of the route selection process on this project.



Imagery:

IKONOS PAN/MSI - RGB
1m Nominal Resolution
Acquired 2006-10-23
(c) GeoEye, all rights reserved

Project Consultant:

ELEMENTS

Map Produced By:

GISsolutions inc.

FortisBC Proposed Okanagan Transmission Reinforcement Project

Figure 6.2

1:100,000

FORTISBC

Legend

- Alternate Transmission
- Existing Transmission
- Original Alternate Transmission
- Vegetation Boundary
- Stream
- Highway 97
- Minor Roads
- Station Area
- Park/Protected Area
- Osoyoos Reserve Boundary
- CWS Conservation Area
- TNT Conservation Area - Fee Simple
- TNT Conservation Area - Lease

Projection: UTM Zone 11 Datum: NAD83 Map Produced On: 2007-11-14

6.1.1 Description of the Route Alternatives and Configurations (See Overview Maps 2 and 3)

The following table describes the two route alternatives north of Shuttleworth Creek. The upland route is also described with 3 configurations of poles and right of way width.

Table 6.1 Description of the Route Alternatives and Configurations

Route Alternatives and Configurations					
	1A Existing Corridor Double Circuit	**1B Existing Corridor Double Circuit H-Frame**	**2A Upland Double Circuit**	**2B Upland Two Single Circuit H-frames**	**3 Two Single Circuit H-frames – One Existing, One Upland**
Description of Transmission Line Options					
Facility Configuration	▪ Existing line corridor from Shuttleworth Creek at the 400-500m elevation north to R.G. Anderson with a single pole double circuit.	▪ Double circuit h-frame from Vaseux Creek north to Penticton.	▪ Upland double circuit route south of Shuttleworth Creek diverting east, and uphill to the 1000-1200m elevation then north to R.G. Anderson.	▪ Upland two single circuits route south of Shuttleworth Creek diverting east, and uphill to the 1000-1200m elevation then north to R.G. Anderson.	▪ One line on Alternative 1 route (existing) the second line on Alternative 2 route (Upland) Shuttleworth Creek to R.G. Anderson.
Total Length (km)	▪ 28.5 km of double circuit pole structures	▪ 28.0 km of double circuit H-frame structures	▪ 29.2 km of double circuit structures	▪ 10 km of double circuits structures and 19.2 km of two single circuit structures	▪ 10 km double circuit and 18.5 single circuit existing and 19.2 km single circuit upland.
Extent of the landscape footprint of the Alternate Routes					
Length of Alternates (m)	▪ 18,500	▪ 18,500	▪ 19,200	▪ 19,200	▪ 19,200 +18,500
Width (m)	▪ 40 m width	▪ 40 m width	▪ 40m width	▪ 51 to 60 m	▪ 40m existing and 40 m upland
Total Area (m^2) for Alternate	▪ 740,000 (74Ha)	▪ 740,000 (74 Ha)	▪ 768,000 (76.8 Ha)	▪ 1,056,000 (105.6 Ha)	▪ 1,504,000 (146.4 Ha)
Total Habitat Clearing (m^2)	▪ 0	▪ 0	▪ 768,000 (76.8 Ha)	▪ 1,056,000 (105.6 Ha)	▪ 768,000 (76.8 Ha)
Watercourse Crossings	▪ 4 Named	▪ 4 Named	▪ 7 Named	▪ 7Named	▪ 11 (4 Named + 7 named)
****Landscape Footprint Ranking**	**1***	**1***	**3**	**4**	**5**

*Both configurations for the existing route tie for most preferred route based on the extent of the landscape footprint of the options.
**Landscape footprint ranking reflects the overall size of the alternate on the landscape. The lowest number (1) is the most preferred with the least area affected.

6.1.1 Discussion of Alternatives

The following table presents a summary of points of comparison between the routes alternatives and configurations north of Shuttleworth Creek. No alternates are presented south of Shuttleworth Creek as the only practical route consideration is to using the existing right-of-way.

Table 6.2 Description of the Issues and Considerations for the Route Alternatives and Configurations

	1A Existing Corridor Double Circuit	1B Existing Corridor Double Circuit H-Frame	2A Upland Double Circuit	2B Upland Two Single Circuits	3 Two Single Circuits – One Existing, One Upland
Environmental Considerations					
Stream Crossings, Fisheries and Aquatic Resources	▪ Lower reaches show some anthropogenic effects from adjacent land uses. ▪ 4 named watercourse crossings identified	▪ Lower reaches show some anthropogenic effects from adjacent land uses. ▪ 4 named watercourse crossings identified	▪ Mid to upper reaches are natural and undisturbed riparian habitat. ▪ 7 named watercourse crossings identified includes headwater tributaries	▪ Mid to upper reaches are natural and undisturbed riparian habitat. ▪ 7 named watercourse crossings identified includes headwater tributaries	▪ Mid to upper reaches are natural and undisturbed riparian habitat. ▪ 7 named watercourse crossings identified includes headwater tributaries plus the 4 on the existing route.
Adjacent Lakes ***(No impact to Lakes is expected by either route options)***	▪ Vaseux Lake is500m west separated by a height of land. ▪ Skaha Lake is within 100-500m for 6.0 km of the route	▪ Vaseux Lake is500m west separated by a height of land. ▪ Skaha Lake is within 100-500m for 6.0 km of the route	▪ Vaseux Lake is 500m west separated by a height of land. ▪ Skaha Lake is about 1500m west for 6.0 km of the route	▪ Vaseux Lake is 500m west separated by a height of land. ▪ Skaha Lake is about 1500m west for 6.0 km of the route	▪ Vaseux Lake is 500m west separated by a height of land. ▪ Skaha Lake is about 1500m west for 6.0 km of the upland route ▪ Skaha Lake is within 100-500m for 6.0 km of the existing route
Wildlife Habitat	▪ High Quality habitat used by a variety of species adapted to the existing right-of-way and residual impacts.	▪ High Quality habitat used by a variety of species adapted to the existing right-of-way and residual impacts	▪ High quality habitat used by a variety of species in a natural pristine setting. ▪ Residual access is a key concern ▪ Winter Range for Deer and Moose	▪ High quality habitat used by a variety of species in a natural pristine setting. ▪ Residual access is a key concern ▪ Winter Range for Deer and Moose	▪ High quality habitat used by a variety of species in a natural pristine setting ▪ Residual access is a key concern ▪ Winter Range for Deer and Moose ▪ Quality habitat used by a variety of species adapted to the existing right-of-way and residual impacts.
California Bighorn Sheep	▪ Traverses sheep wintering areas. ▪ About 400m from lambing areas	▪ Traverses sheep wintering areas. ▪ About 400m from lambing areas	▪ Traverses sheep summer and fall foraging areas.	▪ Traverses sheep summer and fall foraging areas.	▪ Traverses sheep summer and fall foraging areas. ▪ Existing route Traverses sheep wintering areas and is about 400m from lambing areas.
Sensitive Vegetation	▪ Lowland areas in vicinity of existing route with higher potential for species at risk plants. ▪ Some habitat includes shrub steppe grasslands	▪ Lowland areas in vicinity of existing route with higher potential for species at risk plants. ▪ Some habitat includes shrub steppe grasslands	▪ Forest cover partially destroyed by fire but in recovery. ▪ Forested pine, fir and larch stands potentially provide habitat for Species at risk wildlife and birds.	▪ Forest cover partially destroyed by fire but in recovery. ▪ Forested pine, fir and larch stands potentially provide habitat for Species at risk wildlife and birds.	▪ Forest cover partially destroyed by fire but in recovery. ▪ Forested pine, fir and larch stands potentially provide habitat for Species at risk wildlife and birds.

	1A Existing Corridor Double Circuit	1B Existing Corridor Double Circuit H-Frame	2A Upland Double Circuit	2B Upland Two Single Circuits	3 Two Single Circuits – One Existing, One Upland
Environmental Considerations Continued					
Reptiles	▪ Present throughout the area including residence features ▪ Most are species at risk	▪ Present throughout the area including residence features ▪ Most are species at risk	▪ Present throughout the area including residence features ▪ Most are species at risk	▪ Present throughout the area including residence features ▪ Most are species at risk	▪ Present throughout the area including residence features ▪ Most are species at risk
Bird Nesting	▪ Bird nesting habitat is adjacent to the right-of-way. No “nesting” identified on the right-of-way to date. ▪ Species at risk occur throughout the area.	▪ Most bird nesting habitat is adjacent to the right-of-way. No “nesting” identified on the right-of-way to date. ▪ Species at risk occur throughout the area.	▪ Potential Bird Nesting Habitat on the right-of way for woodpeckers and other species that use the pine overstory. ▪ Larch stand appears to have Sapsucker residence features with high potential for Williamson’s Sapsucker ▪ Species at risk occur throughout the area.	▪ Potential Bird Nesting Habitat on the right-of-way for woodpeckers and other species that utilize pine overstory. ▪ Larch stand appears to have Sapsucker residence features with high potential for Williamson’s Sapsucker ▪ Species at risk occur throughout the area.	▪ Potential Bird Nesting Habitat on the right-of-way for woodpeckers and other species that use the pine overstory. ▪ Larch stand appears to have Sapsucker residence features with high potential for Williamson’s Sapsucker ▪ Existing route has nesting adjacent to right-of-way ▪ Species at risk occur throughout the area.
Wetland Features	▪ There are 2 wetland features on this route, providing habitat for amphibians.	▪ There are 2 wetland features on this route, providing habitat for amphibians.	▪ 3 wetland features are in close proximity to or traversed by the right-of-way. One wetland is a rare and excellent example of a higher altitude wetland in a lowland setting.	▪ 3 wetland features are in close proximity to or traversed by the right-of-way. One wetland is a rare and excellent example of a higher altitude wetland in a lowland setting.	▪ 3 wetland features are in close proximity to or traversed by the right-of-way. One wetland is a rare and excellent example of a higher altitude wetland in a lowland setting. There are 2 wetland features on this route, providing habitat for amphibians on the existing r-o-w.
Residual Access	▪ The right-of-way has some residual access. Species use appears to have adapted to the access.	▪ The right-of-way has some residual access. Species use appears to have adapted to the access. ▪	▪ Residual access to new pristine undisturbed area is a concern re: increased hunting pressure, loss and disturbance of species at risk residence features, effects on the watershed and water quality	▪ Residual access to new pristine undisturbed area is a concern re: increased hunting pressure, loss and disturbance of species at risk residence features, effects on the watershed and water quality	▪ Residual access to new pristine undisturbed area is a concern re: increased hunting pressure, loss and disturbance of species at risk residence features, effects on the watershed and water quality
Landscape Fragmentation	▪ No incremental effects to existing landscape. R-o-w established in 1965.	▪ Some incremental effects to existing R-o-w established in 1965 due to widening of the R-o-W.	▪ Pristine habitat setting without anthropogenic fragmentation. ▪ New R-o-W would cause fragmentation affecting wildlife habitat and use as well as visual impacts and potential increased access in the heart of high quality habitat.	▪ Pristine habitat setting without anthropogenic fragmentation. ▪ New R-o-W would cause fragmentation affecting wildlife habitat and use as well as visual impacts and potential increased access in the heart of high quality habitat.	▪ Pristine habitat setting without anthropogenic fragmentation. No incremental effects to existing R-o-W. ▪ New R-o-W would cause fragmentation affecting wildlife habitat and use as well as visual impacts and potential increased access in the heart of high quality habitat.
Invasive Plant Species	▪ Some areas of the existing R-o-W have weeds.	▪ Some areas of the existing R-o-W have weeds.	▪ No invasive plant species present. ▪ Pristine habitat setting where the potential for invasive plant species would be a long term concern.	▪ No invasive plant species present. ▪ Pristine habitat setting where the potential for invasive plant species would be a long term concern.	▪ No invasive plant species present. ▪ Pristine habitat setting where the potential for invasive plant species would be a long term concern.

	1A Existing Corridor Double Circuit	1B Existing Corridor Double Circuit H-Frame	2A Upland Double Circuit	2B Upland Two Single Circuits	3 Two Single Circuits – One Existing, One Upland
Social Considerations					
Land Use	▪ Utilizes existing linear corridor for 100% of the 28km route. ▪ Some development around 4-5 km of the route. ▪ Crosses more agricultural and residential areas.	▪ Utilizes existing linear corridor for 100% of the 28km route. ▪ Some development around 4-5 km of the route. ▪ Crosses more agricultural and residential areas	▪ 18 km of new corridor primarily on Crown Land a minimum of 40m wide. ▪ Number of tenure holders in area. ▪ Natural forested area crosses trapping, guiding and outfitting and backcountry recreational use areas.	▪ 18.6 km of new corridor primarily on Crown land a minimum of 52 to 60m wide. ▪ Number of tenure holders in area ▪ Natural forested area crosses trapping, guiding and outfitting and backcountry recreational use areas.	▪ 18.6 km of new corridor on Crown land plus 18 km of existing corridor average about 40m wide. ▪ Number of tenure holders in area ▪ Natural forested area crosses trapping, guiding and outfitting and backcountry recreational use areas. ▪ Existing route uses r-o-w and crosses agricultural and residential areas.
First Nations	▪ Existing right-of-way appears to have no claims or traditional use concerns.	▪ Existing right-of-way appears to have no claims or traditional use concerns	▪ Potential traditional use areas of the First Nations. ▪ PIB Timber Claim ▪ Concerns about protecting the pristine environmental conditions.	▪ Potential traditional use areas of the First Nations. ▪ PIB Timber Claim ▪ Concerns about protecting the pristine environmental conditions.	▪ Potential traditional use areas of the First Nations on upland route. ▪ Concerns about protecting the pristine environmental conditions. ▪ PIB Timber Claim on upper route. ▪ Existing right-of-way appears to have no claims or traditional use concerns.
Archaeological Resources	▪ Heritage Resources are present adjacent to the right-of-way.	▪ Heritage Resources are present adjacent to edge of existing R-o-W.	▪ Low potential for heritage resources	▪ Low potential for heritage resources	▪ Low potential for heritage resources ▪ Heritage resources present adjacent to the existing r-o-w.
Parks, Heritage and Other Identified Recreation Areas	▪ Near area of recreational rock climbing which is a Proposed Protected Area (for recreation)	▪ Near area of recreational rock climbing which is a Proposed Protected Area (for recreation).	▪ Crown land area has guiding and other tenure holders. ▪ Proposed Wildlife Management Area and Resource Management Zone in the area.	▪ Crown land area has guiding and other tenure holders. ▪ Proposed Wildlife Management Area and Resource Management Zone in the area.	▪ Crown land area has guiding and other tenure holders. ▪ Proposed Wildlife Management Area and Resource Management Zone in the area. ▪ Skaha Bluffs is nearby on the existing route.
Visual Resources	▪ Residences adjacent to the existing R-o-W in residential areas expressed concern about the upgrade impacting the viewscape of residents to the east of the right-of-way.	▪ Residences adjacent to the existing R-o-W in residential areas expressed concern about the upgrade impacting the viewscape of residents to the east of the right-of-way.	▪ Would alleviate the viewscape impact of residences east of the R-o-W but would create a linear corridor at higher altitude that may be more visible to residents in other locations (i.e. west side of Skaha Lake)	▪ Would alleviate the viewscape impact of residences east of the R-o-W but would create a linear corridor at higher altitude that may be more visible to residents in other locations (i.e. west side of Skaha Lake)	▪ Would partially alleviate the viewscape impact of residences east of the R-o-W but would create a linear corridor at higher altitude that may be more visible to residents in other locations (i.e. west side of Skaha Lake). ▪ Maintains a circuit on the existing R-o-W near the areas of concern about the visual landscape.

	1A Existing Corridor Double Circuit	1B Existing Corridor Double Circuit H-Frame	2A Upland Double Circuit	2B Upland Two Single Circuits	3 Two Single Circuits – One Existing, One Upland
Line Design, Construction, and Maintenance Issues					
Maintenance and Operations	• Existing access to the route.	• Existing access to the route.	• New access required for 18 km about 2/3 helicopter only access. • Higher elevation exposure to lightning and icing.	• New access required for 18 km about 2/3 helicopter only access. • Higher elevation exposure to lightning and icing.	• New access required for 18 km about 2/3 helicopter only access. • The route diversity may reduce risk of some double line outages. • Access on many portions of the existing route.
Design & Construction	• Tall (30m), compact width steel structures to fit double circuit in existing right of way.	• 30 m typical H-frame poles designed to fit within the existing right-of -way of the right of way.	• Areas of difficult terrain, longer spans, with fewer but bigger steel pole (30m+) structures compared to Alt. #1A. • Residual access is a concern, requiring helicopter construction on some sections.	• Areas of difficult terrain, longer spans. More common 22m tall steel H-frame pole construction for two single circuits. • Need to address residual access: May require helicopter construction	• Areas of difficult terrain, longer spans. More common 22m tall steel H-frame pole construction for two single circuits. • Need to address residual access: May require helicopter construction. • Poles shorter on the existing route by 8 metres.

	1A Existing Corridor Double Circuit	1B Existing Corridor Double Circuit H-Frame	2A Upland Double Circuit	2B Upland Two Single Circuits	3 Two Single Circuits – One Existing, One Upland
BC Ministry of Environment	▪ Protection of species at risk	▪ Protection of species at risk	▪ Protection of species at risk . ▪ Residual access into new wildlife habitat ▪ Probable Wildlife Management Area	▪ Protection of species at risk . ▪ Residual access into new wildlife habitat ▪ Probable Wildlife Management Area	▪ Protection of species at risk . ▪ Residual access into new wildlife habitat ▪ Probable Wildlife Management Area
BC Ministry of Forests and Range	▪ No significant concerns	▪ No significant concerns	▪ Fire protection and minimize loss of timber	▪ Fire protection and minimize loss of timber	▪ Fire protection and minimize loss of timber ▪ No significant concerns on existing route
Integrated Land Management Bureau (BC Ministry of Agriculture and Lands)	▪ Right-of-way established including on crown lands.	▪ Right-of-way established including on crown lands.	▪ Requires acquisition of tenure on crown land. ▪ Project Schedule impacts ▪ Requires ESIA review ▪ Requires sign-off by tenure holders ▪ Require First Nations consultation	▪ Requires acquisition of tenure on crown land. ▪ Project Schedule impacts ▪ Requires ESIA review ▪ Requires sign-off by tenure holders ▪ Require First Nations consultation	▪ Requires acquisition of tenure on crown land. ▪ Project Schedule impacts ▪ Requires ESIA review ▪ Requires sign-off by tenure holders ▪ Require First Nations consultation ▪ Right-of-way established including on crown lands.
Canadian Wildlife Service	▪ Protection of species at risk and wildlife habitat (lands of interest are only on existing R-o-W in the OIB as well as their owned land)	▪ Protection of species at risk and wildlife habitat (lands of interest are only on existing R-o-W in the OIB as well as their owned land)	▪ No jurisdiction	▪ No jurisdiction	▪ No jurisdiction on upland route ▪ Protection of species at risk and wildlife habitat (lands of interest are only on the existing R-o-W in the OIB)
Indian and Northern Affairs Canada	▪ Protection of species at risk and wildlife habitat (lands of interest are only on the existing R-o-W in the OIB)	▪ Protection of species at risk and wildlife habitat (lands of interest are only on the existing R-o-W in the OIB)	▪ No jurisdiction	▪ No jurisdiction	▪ No jurisdiction on upland route. ▪ Protection of species at risk and wildlife habitat (lands of interest are only on the existing R-o-W in the OIB)

6.1.1 Environmental Comparison of Alternatives

The following table (6.3) presents a summary of the environmental ranking of the route alternatives and configurations north of Shuttleworth Creek based on a number of factors used to rank the potential effects of construction of the 230kV Transmission Lines.

Numeric ranking categories were assigned based on the assessment of both routes in the field, by qualified environmental professionals. The effects of the project assume standard mitigation will be used. There are 4 categories of potential effects with a range in some cases. For example, effects may be considered low for the alternates but there may be some difference within a category necessitating a comparative difference.

Nil:	0
Low:	0.1-1.0
Med:	1.0-2.0
High:	2.0-3.0

7 of the ranking categories were considered to have increased importance in decision making for the route assessment and are noted with an asterisk. These factors were ranked with the following system with more weighting.

Nil:	0
Low:	0.1-2.0
Med:	2.0-3.5
High:	3.5-5.0

Table 6.3 Environmental Analysis and Ranking of Route Alternatives and Configurations

Ecosystem Evaluation Factor	Impact Ranking Rationale	*Weighted Level of Impact	1A Existing double circuit	1B Existing H frame double circuit	2A Upland double circuit	2B Upland 2 single circuit	3 Upland & Existing single circuits
*Sensitive Vegetation Associations	No anticipated effects	Nil: 0					
	Temporary Disruption or loss of Sensitive Vegetation Communities	Low: 0.1-2.0	0.5	0.5			
	Permanent Reduction or Disruption of sensitive vegetation association	Med: 2.0-3.5			2	3	2.5
	Permanent Reduction and or Disruption redlisted vegetation association	High: 3.5-5.0					
*Plant Species at Risk	No anticipated effects	Nil: 0			0	0	
	Temporary but Recoverable Disturbance	Low: 0.1-2.0	0.5	0.5			0.5
	Permanent Reduction or Loss	Med: 2.0-3.5					
	Significant Population Impacts	High: 3.5-5.0					
*Wildlife Species at Risk	No anticipated effects	Nil: 0					
	Displacement / Disruption during non key phases	Low: 0.1-2.0			1.75	2	
	Disruption of key life cycle phases	Med: 2.0-3.5	2	2			3.5
	Mortality & Population Impacts	High: 3.5-5.0					
Wildlife	No anticipated effects	Nil: 0					
	Displacement / Disruption during non key phases	Low: 0.1-1.0					
	Disruption of key life cycle phases	Med: 1.0-2.0	1.5	1.5	1.25	2	
	Significant Mortality & Population Impacts	High: 2.0-3.0					2.5
Wildlife Habitat	No anticipated effects	0					
	Temporary Disruption or loss of Non Critical Habitat	Low: 0.1-1.0					
	Permanent Reduction of Non Critical Habitat or Temporary Disruption and loss of critical habitat	Med: 1.0-2.0	1	1	2		
	Permanent Disruption and loss of critical habitat	High: 2.0-3.0				2.5	3
Parks and Protected Areas	No anticipated effects	Nil: 0					
	Held as freehold for conservation or valued by community for conservation	Low: 0.1-2.0	2	2			
	Existing or certain future conservation area	Med: 2.0-3.5			3	3	3
	Certain future park	High: 3.5-5.0					
Fisheries and Aquatic Resources	No anticipated effects	Nil: 0					
	Effects limited to overstory topping or removal and foot access in riparian zone	Low: 0.1-1.0	0.25	0.25	0.75	1	1
	Right-of-way clearing & equipment crossings of riparian zone	Med: 1.0-2.0					
	Fish Mortality, Stream diversion & permanent significant effects on habitat	High: 2.0-3.0					
**ROUTE COMPARISON SUM			7.75	7.75	10.75	13.5	16

Table 6.3 Continued: Environmental Analysis and Ranking of Route Alternatives and Configurations

Ecosystem Evaluation Factor	Impact Ranking Rationale	*Weighted Level of Impact	1A Existing double circuit	1B Existing H frame double circuit	2A Upland double circuit	2BUpland 2 single circuit	3 Upland & Existing single circuits
**ROUTE COMPARISON SUM From Previous Page			7.75	7.75	10.75	13.5	16
Habitat without invasive plant species	No anticipated effects	Nil: 0					
	Existing weeds with limited potential to spread	Low: 0.1-1.0	1	1			
	No existing weeds with potential to be introduced short term or moderate existing noxious weeds	Med: 1.0-2.0			1.5	2	
	No existing weeds with potential to be introduced as long term or significant existing noxious weeds	High: 2.0-3.0					2.5
Agriculture & Viticulture	No anticipated effects	Nil: 0					
	Temporary construction disturbance and/or poles in pasture	Low: 0.1-1.0			0.5	0.5	
	Poles affect operations and temporary short term crop loss	Med: 1.0-2.0	1	1			1.5
	Extensive loss of large tracts of long term crops (orchards & vineyards), poles affect operations	High: 2.0-3.0					
Archaeological and Heritage Resources	No anticipated effects	Nil: 0			0	0	
	Historically signifcant resources nearby & potential exists for additional resources	Low: 0.1-1.0	1	1			1
	Disturbance to resources requires relocation or monitoring	Med: 1.0-2.0					
	Valued sites will be permanently altered or lost or require site excavation and collection	High: 2.0-3.0					
*Landscape & Habitat Connectivity	No anticipated effects	Nil: 0					
	Existing corridor is used with limited incremental effects	Low: 0.1-2.0	1	1			
	Significant incremental effects to an existing corridor or establishment of a new R-o-W in non sensitive area	Med: 2.0-3.5					
	Permanent and significant incremental effects where there has been no significant prior anthropogenic disturbance	High: 3.5-5.0			3.5	4.5	5
Landscape Visual Resources	No anticipated effects	Nil: 0					
	Minor distant effects on viewscape due to visibility of R-o-W	Low: 0.1-2.0			0.5	0.5	
	Incremental Effects to Exisiting Viewscape (increased pole height/more poles/larger conductors/wider R-o-W)	Med: 2.0-3.5	3	3.5			3.5
	New transmission poles and conductors close to residences and in direct line of site of high value viewscape	High: 3.5-5.0					
Forestry Resources	No current or future merchantable timber	Nil: 0	0	0			
	Potential Future merchantable timber areas reduction	Low: 0.1-1.0					
	Up to 50% of R-o-W has merchantable timber	Med: 1.0-2.0			1.5	2	1.5
	High quality & volume of merchantable timber	High: 2.0-3.0					
*Habitat wthout Incremental Access	No anticipated effects	Nil: 0					
	New corridor increases pedestrian or equestrian access or existing traditional access	Low: 0.1-2.0	1	1			
	Limited human OHV access into non sensitive habitat or vegetation communities	Med: 2.0-3.5			2	3	3
	Permanent Increased human access with OHVs into critical habitat and disruption of critical life cylces	High: 3.5-5.0					
**ROUTE COMPARISON SUM			15.75	16.25	20.25	26	34
ROUTE RANKING ORDER	MOST PREFERRED (1) to LEAST PREFERRED (5)		1	2	3	4	5
LANDSCAPE FOOTPRINT RANKING	From Table 6.1		1	1	3	4	5
Final Environmental Ranking			**1**	**2**	**3**	**4**	**5**

6.1.2 Consultation with Environmental Agencies and Non Governmental Organizations

During the development and refinement of the route, a draft of the ESIA was also prepared and circulated to key environmental resource agencies at both the federal and provincial level as well as a number of environmental nongovernmental organizations (ENGOs). Comments were received by groups including the BC Ministry of Environment who stated that based on a review of the information provided; the existing right-of-way was preferable from an environmental perspective. In addition, the Penticton Indian Band has indicated its support of the existing route in light of their outstanding timber claim in the area of the upland route. The Integrated Land Management Bureau (ILMB) has been part of the consultation process and have indicated that there are concerns associated with granting a new easement when a satisfactory one exists. The ILMB has also provided an update suggesting that the implementation of a Wildlife Management Area under the Okanagan Shuswap Land and Resource Management Plan (LRMP) is moving forward and is a key consideration in route selection.

6.1.3 Non-Financial Comparison of the Alternate Routes

Route 1A is the preferred route from an environmental perspective. While route 1B was very similar it is influenced by the anticipated visual concerns of the larger H-frame system proposed for that option. Detailed environmental information was collected along the existing right of way with emphasis on alternate #1A for the ESIA. This information formed the technical foundation for communication and consultation with regulators, stakeholders and the project design team. It will also form the basis for the environmental management plan which further refines mitigation measures in step with the detailed project engineering and construction planning effort.

The environmental route criteria and preferences were forwarded to the project planning team for further analysis which is presented in Section 4.0 of the OTR CPCN application. This phase of the route selection process considered 11 separate factors including environment, reliability, operations and safety and risk of delay. For a number of reasons (including least environmental impact) Alternate #1A was identified as the preferred alternate route option. However the emphasis of reliability and operations do affect the final ranking of the alternates, particularly #3. The final rankings for the CPCN application are presented in Table 6.4 below.

Table 6.4 Results of the route analysis presented in the CPCN application.

	1A Existing Corridor Single Pole Double Circuit	1B Existing Corridor Double Circuit H-Frame	2A Upland Double Circuit	2B Upland Two Single Circuits	3 Two Single Circuits – One Existing, One Upland
CPCN Ranking	1	2	5	3	3

7.0 ENVIRONMENTAL ASSESSMENT

A combination of information from readily available data, including field studies, review of research data and input from local subject matter experts, along with other sources of information, have been used to identify the environmental resources associated with the project and determine potential effects of the project.

Throughout the report, some species may be referred to as red-listed and blue-listed which are designations assigned under the BC endangered species and ecosystems rating process. Some of the species may have been assessed through the rigorous federal species at risk process and have a COSEWIC (Committee on the Status of Endangered Wildlife in Canada) status such as endangered or threatened. COSEWIC status affords national recognition of the species and depending on the status level, it may trigger additional management considerations and requirements.

Note: Detailed site specific impact mitigation measures will be further developed and reported in the Environmental Management Plan.

7.1 Description of the Facility Development Activities

7.1.1 Bentley Terminal Station

The placement of an electrical substation in a natural environmental setting results in the permanent removal of the vegetation within the developed area of the station. As is typical, the clearing, site preparation and grading of a station will be undertaken with the use of heavy equipment such as excavators and dozers. The installation steps will take the most time in the project and is also the period when the most people are on site. There will be trucks, specialty equipment and cranes on site during installation. The following steps summarize the key activities:

Step 1: Clearing and removal of vegetation with heavy equipment, including disposal (i.e. burning or land filling).
Step 2: Removal of the overburden layer, which is typically the top 15-30 cm of material with soil and organic material.
Step 3: Grading is undertaken to level the site and incorporate a slight slope for drainage. Depending on the type of material present in the subsoil, material may have to be removed and replaced. The site will then be packed and prepared for the installation process.
Step 3a: Installation of a ground grid will occur during the grading before packing of the site. A ground grid is a crisscross pattern of interconnected copper cables buried in the station to diffuse excess electricity in the station for safety purposes.
Step 4: Once the site is prepared, it will be completely fenced with a permanent chain link fence for public safety and to secure equipment and materials.
Step 5: Installation of concrete pads and footings.
Step 6: Installation of the electrical equipment, including the transformers, controls, switches and breakers.
Step 7: After the installation is completed, testing and commissioning follows.

Step 8: Operation commences. This is when the power supply is turned on at the terminal station connected to the transmission lines entering and exiting the site. Typically, a larger terminal such as Bentley is visited by an operations employee on a regular basis (once or twice per week) unless there are equipment repairs or malfunctions requiring service.

Photo 7.1 Bentley Terminal Station Site: View is to the Southwest towards Oliver (by S. Morck).

7.1.2 230 kV Transmission Lines

The installation of a transmission line in a natural environmental setting results in the permanent removal of larger trees only within a right-of-way easement and in some cases within the safety zone outside the right-of-way. Tree removal is required because trees present a hazard to the conductors (powerlines) for construction and operation. Vegetation such as low-growing shrub communities can remain on the right-of-way, mostly undisturbed. Tree removal on an existing right-of-way is usually limited to hazard trees or areas where the full right-of-way width may not have been cleared. No additional clearing is planned for watercourse crossings, however, it is expected that some trees will be topped at the Vaseux Creek Crossing near the Vaseux Lake Terminal Station.

In an environmentally sensitive area, FortisBC arborists have used a 10 year tree-free zone to allow smaller trees to grow on the edge of the right-of-way and to allow trees with good wildlife potential on the right of way to be partially retained with the tops removed. For the

OTR project, it is expected that the limited amount of clearing of hazard trees and right-of-way preparation may be done by hand and with the use of light duty vehicles. As there is not enough volume for salvage, most of the timber would be either used in habitat features or piled and burnt. Line trucks and drill trucks would be used, where there is suitable access to drill holes, to install power poles and pull the conductor through and onto the poles. The following steps summarize the key activities:

Step 1: Hazard tree assessment.
Step 2: Removal of hazard trees adjacent to and any remaining trees or tops of trees on the existing right-of-way.
Step 3: Disposing of clearing residue, such as branches and tree tops. This is done by burning during a low fire hazard time, such as winter or early spring.
Step 4: Drilling and controlled blasting to make holes for the poles, or prepare rock anchored or shallow earth concrete foundations for the poles. Access permitting; drill trucks or backhoes will be used. Otherwise crews and equipment are brought in by helicopter.
Step 5: Installation of the poles and insulators with line trucks and cranes, access permitting. In remote areas without access, or sensitive areas with access restrictions, this is done with the use of a helicopter.
Step 6: Stringing or pulling of the rope or small diameter wire used to pull the conductor.
Step 6a: Pulling the conductor through various sections and attaching it to the insulators on the poles.
Step 7: After the conductor installation is completed, the communications cable(s) are installed on the pole below the conductors.
Step 8: After the installation is completed, an overhead shield wire and counterpoise (ground wire) are installed on poles near the stations to protect from lightning strikes.
Step 9: There will be a testing and commissioning step to ensure the system is operating correctly.
Step 10: Operation commences.

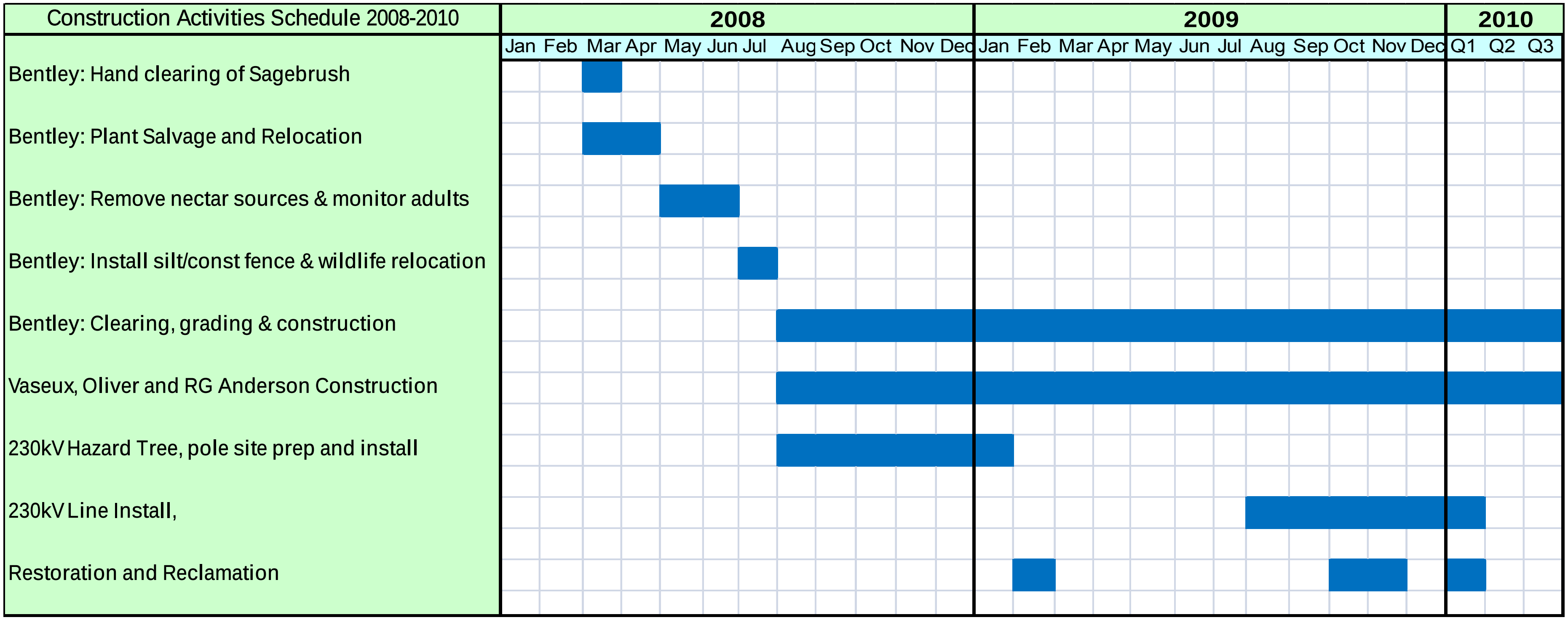
7.1.3 Station Upgrades and Changes: RGA Anderson, Vaseux and Oliver

There are three existing terminal stations which will have modifications to upgrade them for service in association with the 230kV transmission lines. Two stations, Oliver in Oliver and RG Anderson in Penticton are in urban areas. The other station, Vaseux, was recently completed in 2005 in a rural setting north of the community of Gallagher Lake.

The upgrades and additions to these facilities as planned are confined to the existing footprint inside the fenceline. Activities will include:
Step 1: Upgrade of the ground grid if necessary.
Step 2: Upgrade of concrete pads and footings.
Step 3: Installation of the electrical equipment, including the transformers, controls, switches and breakers.
Step 4: After the installation is completed, testing and commissioning is initiated followed by decommissioning of old equipment. (Note: decommissioning may occur earlier where there is a suitable alternative system component to provide service).
Step 5: Operation commences. This is when the power supply is turned on at the terminal station connected to the transmission lines entering and exiting the site.

Anticipated Project Schedules

Blue is the permitted or anticipated activity window



8.0 GEOPHYSICAL ENVIRONMENT

The south Okanagan valley is divided into two basic physiographic regions: the valley floor which consists of a series of lakes, rivers, deltas and alluvial fans and; the valley slopes consisting of benchlands, terrace and outcrops of bedrock. Almost the entire project area is located within the valley slopes.

The proposed upgrade of the FortisBC transmission system utilizes existing rights-of-way and facilities wherever possible. The existing right-of-way and the alternates cross a variety of terrain types with different soil materials and geological characteristics.

8.1 Physiography and Topography

The power line route will cross a variety of terrain and geological formations:

- In the south region around Bentley and on the OIB Reserve, surficial materials are largely quaternary glaciofluvial deposits and the terrain is flat to gently sloping. The elevation at the south end of the route is about 300m.

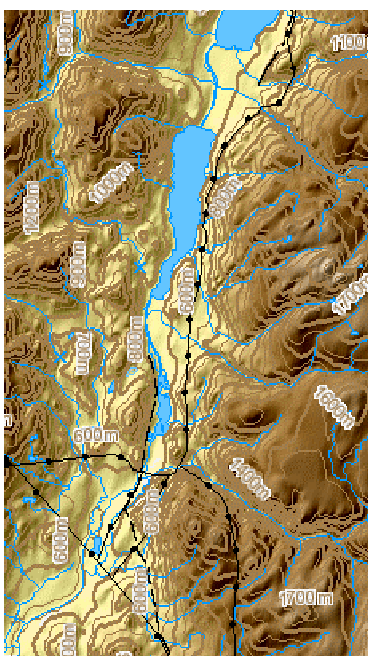
Photos 8.1 and 8.2: Views of the valley bottom with deep sandy brown soil materials on the OIB Reserve which will be crossed by the 230kV line from Oliver to Vaseux (by D. Deyell).

- The route heads north across primarily open desert and follows a small valley (Manuel's Canyon see Photo 8.3) which rises marginally in elevation until it reaches the junction point to Vaseux Terminal Station. The right-of-way connecting to Vaseux drops down a moderate slope to the valley bottom where Vaseux is located on level glaciofluvial deposits.

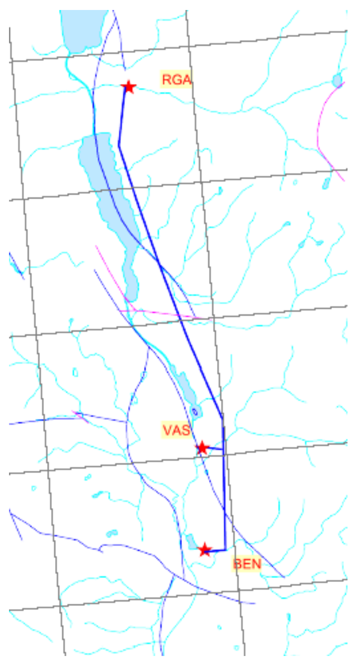
Photo 8.3: Right of way through Manuel's Canyon in the Vaseux Protected Area (by D. Deyell).

- From the connection point to VAS, the route heads north across primarily bedrock intermixed with some glaciofluvial material to RGA. The terrain consists of moderate slopes transected by a number of streams and creeks. The highest point of elevation is approximately 1000m.

Figures 8.1 and 8.2:



(NRC – The Atlas of Canada)

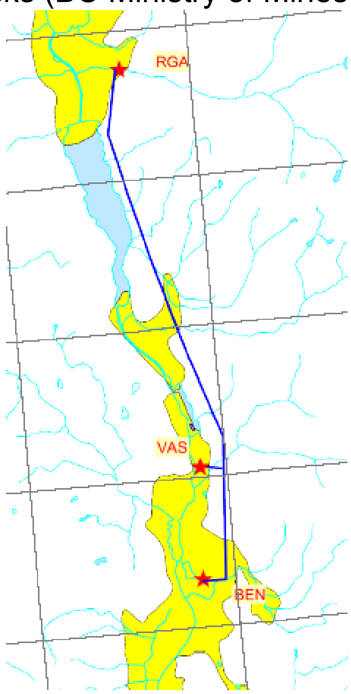


(NRC – The Atlas of Canada)

8.2 Soils and Geology

Soil materials in the bottom of the valley adjacent to the route are comprised primarily of deep sandy brown soil materials while on the slopes they are mixture of shallow potentially erodable luvisols and lactrusine deposits interspersed among bare rock.

Quaternary deposits of alluvial material (shaded yellow in the sketch below) are found mostly along the bottom of the Okanagan valley, while the slopes of the valley consist of a mixture of lacustrine deposits and bedrock outcrops. Most of the project area is underlain by Proterozoic formations of quartz-biotite, quartzite, gneiss and marble. There is a small region south of Pentiction which consists of Cretaceous formations of granite, granodiorite and monzonite and also a small region north of Oliver of Jurassic formations of granodioritic intrusive rocks (BC Ministry of Mines, Energy and Petroleum Resources).



(NRC – The Atlas of Canada)

Along the project route, there are four mineral leases (399971, 399972, 387258 and 539829) – see sketch) but no mines. The potential for the development of mineral mines is low except for aggregate material (i.e. gravel pit) which can be found around both ends of the project area.

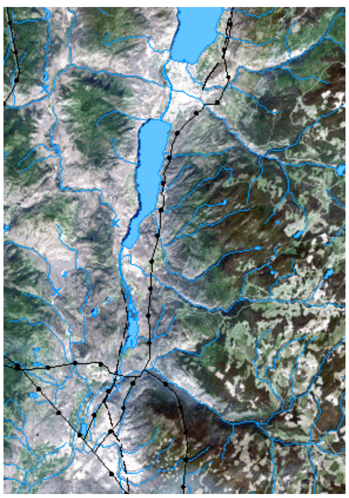
(Mineral Leases – Mineral Titles Online BC)

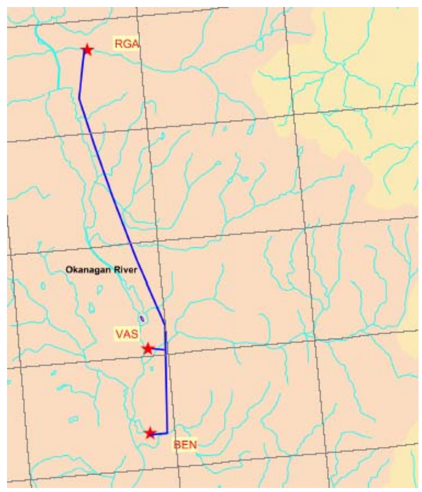
8.3 Surface Water Quality

Some of the creeks and streams that the powerline project will transect contain fish, as well as being a source of drinking water for nearby residents. The proposed project is not likely to impact any surface waters, although a detailed environmental protection plan will address any issues that may arise upon approval and final location of the project.

8.4 Surface Water Hydrology

The project route crosses named creeks and numerous small drainages which all drain from the same watershed (sketch below on the right) into the Okanagan valley.   There are no lake crossings on this project.





(NRC – The Atlas of Canada)   (NRC – The Atlas of Canada)

8.5 Hydrogeology and Groundwater

The proposed route of the project is well away from the valley bottom (i.e. varying from 0.5km to several kms) where groundwater may be expected nearer the surface, with the majority of the route being located on the east slopes of the Okanagan valley.   Holes or footings for power poles do not typically exceed 2 metres in depth and are likely to have minimal, if any impact, on local groundwater regimes.

Most of the project area is outside of known vulnerable aquifers, except for a small portion near Okanagan Falls.

Effects

The potential effects related to the project information for the preceding sections 7.1 through to 7.5 include:

- Slopes are moderate and where there are such slopes, erosion of soils may pose a concern if there is significant disturbance to the vegetation mat and understory that stabilizes soils.
- Mass movements of slopes may cause an issue with the integrity of the line and have localized environmental effects. Mass movements or head scarps, indicators of potential for slumping on slopes creating exposed soil faces are not evident along the project route.
- The undulating desert areas also have soils that are susceptible to erosion along the southern portion of the project area. These soils are difficult to reclaim once the organic mat is disturbed.
- Construction of a new powerline is expected to have a low impact, if any, on the watercourses that are crossed, as powerline structures will be set well back from the these sensitive areas, and vehicle crossings of watercourses during construction will be restricted except for locations where authorized
- Water diversion from access trails and other activities may cause localized temporary or permanent dewatering of wetlands, or impact surface drainage. With an existing right-of-way there does not appear to be any requirement to conduct extensive grading which could divert surface water on this project. The Bentley site may interrupt localized drainage to the low area and will require design considerations for surface water flow.
- Powerline structures located near areas where groundwater is near the surface, near springs, and in wetlands may affect shallow ground water causing it to rise to the surface or divert from its normal pathway. In addition, the use of treated wood power poles has the potential, albeit an extremely low potential, for chemical leaching into the groundwater. If new access locations and trails are required for this project, there may be additional erosion as well as the introduction of weeds which typically are short term concerns when managed effectively during post construction.

Mitigation

The potential mitigation measures related to the project information for the preceding sections 7.1 through to 7.5 include:

- No mitigation is anticipated with respect to mineral resources and mining activity.
- Mitigation measures will be limited to specific conditions related to the exact positioning of individual power poles. There appears to be few, if any, geophysical constraints with establishing a new powerline along the existing transmission corridor. Site specific mitigation measures will be included in the Environmental Management Plan once the precise location of the power poles has been determined.
- Water quality protection measures will be included in the Environmental Management Plan to address any construction activities that may be adjacent or near to any watercourse/waterbody.

- Final pole locations will be field assessed in areas with shallow ground water to ensure that the location is not an intercept point.
- If poles are located on significant slopes, where exposed excess material from the hole is erodable, the soils will be seeded with a native grass mix with an option to cover it with an erosion control blanket to prevent erosion.
- Any disturbed areas along the right-of-way will be reclaimed and restored with suitable native vegetation species (subject to the availability) or with non invasive agronomic species at the completion of the construction.

9.0 FISH AND AQUATIC HABITAT

9.1 Facility Sites

The Vaseux Lake Terminal Station is located on the historic floodplain of Vaseux Creek but is more than 30m from the watercourse and is well back of the riparian zone. There is a large recently upgraded dyke that separates the watercourse from the land in and around the Vaseux station. The station is located well away from the Okanagan River, Gallagher Lake and Vaseux Lake and there are interceding terrain features, residences and infrastructure. The Vaseux station also has an integrated spill containment recovery system on the transformers to ensure that potential oil spills are contained and cannot enter the local environment in the unlikely event they should occur. There are no impacts to fish or aquatic resources anticipated for this project component and no further assessment or mitigation is required.

The RG Anderson Station in the City of Penticton is located on a terrace of the valley of Ellis Creek well away from the riparian zone. This station has been operation since 1963 and there are no records of events or issues that posed a threat to natural environment or the watercourse. The upgrades will consider the need for additional spill containment and recovery subject to the risk scenario. There are no impacts to Fish or Aquatic resources anticipated for this project and no further assessment or mitigation is required.

The Oliver Station in Oliver is located about 40 m west of the Town of Oliver's Irrigation canal. The proposed Bentley Terminal Station is on a terrace east of the Oliver station about 100m from the canal. This canal is a concrete structure located at a slightly higher elevation than the station site. Over the 65+ years of operation the canal has had a modest influence on vegetation within 3-4 m of the canal with a riparian like zone. Oliver has been in operation for over 40 years and there are no records of events or issues that posed a threat to natural environment or the canal. The stations are located well away from the Okanagan River, Wolfcub Creek and Tuc El Nuit Lake .The modifications at Oliver and the new equipment design process at Bentley will consider the need for additional spill containment and recovery subject to the risk scenario. There are no impacts to Fish or Aquatic resources anticipated from the Oliver or Bentley sites and no further assessment or mitigation is required.

9.2 230kV Transmission Lines

There are several tributaries to the Okanagan River System and Skaha Lake along the project area. Some of these creeks or watercourses are dry and have flowing water only during spring runoff or unusual rainfall events. They are frequently referred to as *'ephemeral'* in nature, primarily wetted during the spring freshet (runoff). There are named watercourses along the route including Wolfcub Creek, Atsiklak Creek, Vaseux (McIntyre) Creek, Matheson Creek, Shuttleworth Creek, Harkin Creek, McLean Creek, Gillie Creek and Ellis Creek. There are also many unnamed seasonal watercourses carrying the spring freshet from snow melt as well as runoff from significant rainfall events.

Vaseux Lake, Gallagher Lake, Skaha Lake and the Okanagan River are well to the west of the right-of-way. The distance and terrain offsets from the lakes and the river ensure it is likely there will be no impacts to any of these water bodies providing:

- the disturbance to the riparian zone is minimal or non-existent on the tributaries; and
- there are no unforeseen events such as a significant spill or a natural disaster combining with other circumstances to cause an effect on the lake or river.

There are no records of fisheries and aquatic assessments completed at the crossing locations for most of the existing powerline right-of-way (other than the one that was completed for the Vaseux Lake Terminal Station project) likely due to the fact there was no requirement for these types assessments when the powerline was built in 1963. The existing database confirms the presence of fish in a number of the streams and field assessments confirm suitable habitat for trout species and Mountain whitefish. In addition, the mouth and lower reaches of Vaseux Creek downstream of the Highway 97 bridge are reported by biologists, from Fisheries and Oceans Canada as well as the Okanagan Nation Alliance, as hosting spawning sockeye salmon from the Okanagan River. Depending on crossing techniques and locations, a federal fisheries approval for HADD (Harmful, Alteration, Disruption or Destruction) to fisheries habitat under the federal Fisheries Act will be required as well as approval under the Provincial Water Act. It is expected that this will be required for Vaseux Creek if the same pole configuration is used as in 2004 at the station.

Photo 9.1 Vaseux Creek near the Vaseux Lake Terminal Station east of Highway 97 during the spring freshet of 2005. View is Northeast (by S. Morck).

Photo 9.2 The Vaseux Creek crossing of the 2-230 kV lines showing the topped treas. This crossing was an aerial crossing installed with helicopters and required Federal and Provincial authorizations under the Federal Fisheries Act and the Provincial Water Act for the activity in the riparian zone (by S. Morck).

Table 9.1 Fisheries Information on named watercourses crossed by the proposed Transmission Lines (BC SRM, 2007 FISS) .

No. #	Watercourse	Species
1	Vaseux (McIntyre) Creek	Bridgelip Sucker *(Catostomus columbianus)* Prickly Sculpin *(Cotus asper)* Longnose Dace (*Rhinichthys cataractae)* Mountain Whitefish *(Prosopium willimasoni)* Rainbow Trout *(Oncorhynchus myskiss)* Sockeye Salmon *(Oncorhynchus nerka)*
2	Irrigation Creek	None identified
3	Shuttleworth Creek	Longnose Dace (*Rhinichthys cataractae)* Rainbow Trout
4	McLean Creek	Rainbow Trout Kokanee *(Oncorhynchus nerka)* (Rainbow Trout stocked in McLean Clan Lk.)
5	Matheson Creek	None identified
6	Gillies Creek	Rainbow Trout *(Oncorhynchus myskiss)* Old records: Sockeye Salmon *(Oncorhynchus nerka)* Kokanee *(Oncorhynchus nerka)*
7	Ellis Creek	Longnose Dace Rainbow Trout
8	Wolfcub Creek	Rainbow Trout
9	Atsiklak Creek	None Identified

9.2.1 Wolfcub Creek

Wolfcub Creek (Overview Map 1/Alignment Sheets 1 & 2 of 20 Appendix 1) is typical of tributary streams to the Okanagan River system which experience a short duration, snowmelt freshet event with larger peak flows, followed by a significant drop in discharge throughout the remainder of the year. A review of historical stream flow information in the region demonstrates that peak flows can be expected between April 1st and early June, subject to seasonal heating, spring rain and the snowmelt. Existing riparian vegetation on Wolfcub creek shows evidence of previous disturbance (both natural and human caused). This watercourse, exhibits two different riparian zones on the two crossings associated with the desert ponderosa pine and shrub-steppe grasslands respectively, which provide diversity in the desert habitats along the right-of-way. Wolfcub creek has a fishery in the lower reaches below the crossing near the Okanagan River.

There are two crossings of Wolfcub Creek. The one crossing is east of the Bentley site before the right-of-way crosses McKinney Road. The second crossing is northeast of the first crossing where the creek is adjacent to McKinney Road (south side). With ground access on both sides of the creek as well as a steep valley at the first site, Wolfcub Creek is expected to have the poles installed well outside of the riparian zone on the valley breaks and to have the conductors strung on the poles without a crossing of the creek by any vehicles or ground equipment. The second crossing should be easily spanned as it is in a shrub steppe vegetation community and moderately incised into the desert plateau with access on both sides of the creek. No effects are anticipated for these two crossings.

9.2.2 Atsiklak Creek

Atsiklak Creek (Overview Map 1/Alignment Sheets 2, 3, 4 & 5 of 20 Appendix 1) is typical of tributary streams to the Okanagan River system which experience a short duration, snowmelt freshet event with larger peak flows, followed by a significant drop in discharge throughout the remainder of the year. Depending on snow load in the Manuel's canyon headwaters area, the creek can have flows exceeding the normal high water mark in a given year. Atsiklak Creek does not have any fisheries resources in it.

Atsiklak Creek headwaters are in Manuel's Canyon and it is a shallow creek in both the canyon and on the flats. On Manuel's Flats there is a very narrow riparian zone (1-2m) of desert shrub and grasses. In the lower reaches of the canyon there is an excellent riparian zone with large cottonwoods with a high potential for screech owls. It is expected there will be three or four crossings of this creek. Based on initial assumptions from the field assessment, it is expected that the poles will be installed well outside of the riparian zone on the flats, and equipment will do the work from both sides. The access to Manuel's canyon for construction related activities will necessitate some limited crossing of this creek by vehicles and equipment when it is dry. Federal approvals or notifications may be required.

The effects of several trips through the canyon and across the creek could cause additional loss of protective vegetation on and near the banks of the watercourse with an increased risk of erosion and downstream sedimentation.

9.2.3 Vaseux Creek

Two crossings of Vaseux Creek are required for this project. One crossing (Overview Map 1/Alignment Sheet 6 of 20 Appendix 1) will be adjacent to the Vaseux Lake terminal station and the other over the Vaseux canyon (Overview Map 1/Alignment Sheet 7 of 20 Appendix 1) at the north end of Manuel's canyon. The crossing near the station is expected to affect some riparian vegetation and will require federal and provincial authorizations.

Vaseux Creek Crossing at the Vaseux Lake Terminal Station

The stream channel in this lower reach of Vaseux Creek descends from a narrow bedrock canyon and crosses a broad alluvial fan. This portion of the stream has been significantly impacted since the development of the area began in the early 1900's. During past flood events, the stream channel in this reach has been channelized and straightened, dikes have been constructed that limit lateral channel movement and protect properties from flooding. A concrete irrigation flume has been installed as part of the Okanagan River flood protection and water management plan initiated in the 1950's. This concrete irrigation flume was armoured with a significant amount of large rock that includes a step-pool structure to assist with fish passage. Existing riparian vegetation shows evidence of previous disturbance (both natural and human caused) and several water diversions, reservoirs and intakes exist upstream that can have an impact on discharge levels.

The combination of these channel impacts, riparian disturbance and water diversions/withdrawal have contributed significantly to the dewatering of this stream reach in most years. Stream channel dewatering is most prevalent in the area immediately above the irrigation flume (extending upstream 300 to 400 metres). Alteration of the stream channel, as a result of construction of the irrigation flume, appears to be causing the storage of bed material above the flume (channel aggradation) resulting in sub-surface stream flow in this section during periods of low discharge.

The mouth of the creek and the short section below the flume host spawning sockeye and rainbow trout. Other documented species including rainbow trout are also found upstream.

Vaseux Creek is a highly valued creek for fisheries and recreation. The planned aerial crossing for the conductors (poles will be located well outside of the riparian area) will likely require removal of cottonwood and pine in the riparian zone and a compensation plan for offsetting this activity. The detailed environmental management plan will provide more information on this activity. This crossing will require an application for a Fisheries Act Authorization which includes a fisheries impact assessment and a habitat compensation plan designed to offset riparian vegetation and stream channel impacts associated with transmission line vegetation removal.

Vaseux Creek Crossing at the Vaseux Canyon

The proposed crossing location is at a site over a deep section of incised bedrock canyon where the conductor will be elevated well above the stream which will result in no impacts to fish or riparian habitats. Although Vaseux Creek has the highest fisheries values of all the streams being crossed, no fish habitats will be disturbed for this existing crossing. The existing right-of-way has been cleared to a 40 m width. Minor additional vegetation impacts are anticipated outside of the riparian zone to facilitate the installation of 2 poles with single circuits at this location. The length of the crossing and the load of the conductors on the poles are considered to be limiting factors for single pole double circuit. The right-of-way in this location "will need to be" about 52 to 55 m wide to accommodate the load and provide the necessary safety margins for the conductors to prevent contact. The conductor crossing will be an aerial crossing using a combination of helicopters and ground equipment working from each side of the canyon.

Photo 9.3 Crossing at Vaseux Creek Canyon. View is to the Southeast (by G. Smith).

9.2.4 Irrigation Creek

The proposed crossing of Irrigation Creek (Overview Map 2/Alignment Sheet 8 of 20 Appendix 1) is over a steeply incised valley. The McIntyre Creek road parallels the creek through this valley. The existing transmission line is strung from the top of the valley on each side and it is expected that the new poles and lines would also be installed without disturbance to the creek. The creek is ephemeral though it had a small amount of flow in it at the crossing location early this summer (2007) due to the extended above normal rainfall in the region. Irrigation Creek does not support any fish and is precluded from fish migration from Vaseux Lake as it flows underground as it approaches the lake. Vegetation is predominantly a Ponderosa Pine shrub steppe community.

9.2.5 Shuttleworth Creek

The existing crossing location on Shuttleworth Creek (Overview Map 2/Alignment Sheet 11 of 20 Appendix 1) is within the lower fish bearing reaches in a portion of the relatively 'natural' undisturbed stream channel with productive fish habitat and mature riparian vegetation. In recent times, this reach of Shuttleworth Creek often dries up during the late summer low flow period. Discharge levels at the time of the assessment (see Photograph 15.0) were at somewhat higher than normal summer levels due to the abnormal precipitation. The existing right-of-way has been previously cleared of any tall riparian trees. No additional vegetation impacts are anticipated to install new taller poles on either side of the stream channel. One or two mature Ponderosa pines on the margins of the right-of-way may need to be topped to ensure protection of the new lines.

Photo 9.4 Shuttleworth Creek crossing location. View is to the east (by G. Smith)

9.2.6 McLean Creek

The crossing location on McLean Creek (Overview Map 2/Alignment Sheet 13 of 20 Appendix 1) is within the lower fish bearing reaches (but above culvert barriers that prevent Skaha Lake fish from access) in a portion of the relatively 'natural' stream channel. Resident rainbow trout populations exist throughout the stream, both from native resident populations and the stocking of headwater lakes (McLean and Derenzy Lakes). Historically, the lower reaches of McLean Creek supported populations of kokanee and sockeye salmon. In recent times, this portion of McLean Creek often dries-up during the late summer / early fall low flow period leaving no habitat available for fall spawning. In addition, a culvert barrier exists at the first road crossing above Skaha Lake that limits upstream access to < 50 metres above the lake.

The existing crossing has been previously cleared of any tall riparian trees and poles are located on the opposite side of McLean Creek Road and up on a rock bluff well above the stream channel. No additional riparian vegetation impacts are anticipated to install new poles.

9.2.7 East Shore of Skaha Lake (Matheson Creek and small unnamed tributaries)

The current FortisBC right-of-way along the eastern shore of Skaha Lakes crosses a number of small drainage ravines and two named tributaries (McLean and Matheson creeks). The small drainage ravines do not provide any fish habitat but are important to Skaha Lake fish populations for providing clean water and nutrients to the lake. Matheson Creek (Overview Map 2/Alignment Sheet 15 of 20 Appendix 1) is a relatively small and steep drainage that offers very little habitat to Skaha Lake fish populations. No evidence of fish presence was located during a review of existing information. Observations of Matheson Creek stream habitat near the confluence with Skaha Lake suggest that only a small amount of habitat is accessible to fish when surface flows are present.

Riparian vegetation along the existing right-of-way has been previously topped; functional riparian vegetation within Matheson Creek and the numerous drainage ravines will not be impacted by the new transmission system. This portion of the existing route is in close proximity to the residences of the Heritage Hills development. A small unnamed seasonal tributary with no observed fish presence flows through this development and is crossed by the proposed lines.

9.2.8 Gillies Creek

The existing crossing location on Gillies Creek (Overview Map 3/Alignment Sheet 17 of 20 Appendix 1) is within a relatively steep portion of the stream. The proposed crossing location on the existing right-of-way is in a steep incised area above obstacles preventing fish access. The lower reaches of Gillies Creek support a resident population of rainbow trout and historically kokanee and sockeye salmon may have spawned there as well. In recent times, this lower portion of the stream often dries-up during the late summer / early fall low flow period leaving no habitat available for potential fall spawning. In addition, a culvert obstruction exists at the Eastside Road crossing above Skaha Lake that is a limiting factor to upstream fish access.

The existing powerline right-of-way crossing has poles placed well back on either side of a deeply incised stream channel. A few tall Ponderosa pine trees may need to be topped at the top of the ravines (near the new tower locations), but no functional riparian vegetation will need to be disturbed. No additional riparian vegetation impacts are anticipated to install new taller poles.

Photo 9.5 Crossing of Gillies Creek. View is to the Southeast. (By G. Smith)

9.2.9 Ellis Creek

The proposed OTR crossing location on Ellis Creek (Overview Map 3/Alignment Sheets 20 of 20 Appendix 1) is along the existing right-of-way below the Ellis Creek Canyon at the Cantex aggregate operation. This portion of the stream is fish bearing and supports resident rainbow trout populations. The lower reach of Ellis Creek (below the concrete sewer line structure) supports kokanee salmon and historically sockeye salmon as well. The current crossing location is within an area of already disturbed riparian vegetation and proposed poles will be well back from the active stream channels or remnant riparian vegetation. No riparian or stream impacts are anticipated to install the new poles.

Photo 9.6 Crossing of Ellis Creek in Penticton. View is to the Northwest (by G. Smith)

Potential Project Effects

Project activities, if not effectively planned and mitigated, have the potential to cause adverse effects to any or all of the watercourses above including the fisheries and aquatic resources in a number of ways:

- Disturbance or removal of vegetation may result in erosion and sedimentation into the watercourse and changes in water temperatures. The result could be an interference with; invertebrate life cycles, the incubation of fish eggs, brooding fry and fish foraging.
- Equipment and vehicle crossings of the watercourse causing habitat alteration (i.e. bank destruction) and potential sedimentation.
- Habitat alteration and loss can affect both the quality and quantity of aquatic organisms, change water temperatures and cause additional predation.
- Equipment leaks or failures and escape of chemicals or other hazardous material into the riparian zone or the watercourse can affect nervous systems, contaminate food chains and cause mortality of fish populations.

The impacts to the fisheries resources are expected to be negligible due to the proposed low impact crossing techniques on all the creeks including the fish bearing creeks. Activities are planned to occur during the late summer and through the fall to minimize disruption and disturbance to a wide variety of terrestrial species along the proposed powerline route which will also avoid the spring spawning cycle in the watercourses.

Long term residual effects from the original construction of the right-of-way in 1963 are very low to non-existent. Although the overstory was cleared and maintained open through some creeks (i.e. Matheson) there is a very good stable understory shrub community present which provides many of the benefits of the larger trees and the pre-construction setting on either side of the right-of-way.

The construction of the Vaseux Lake Terminal Station and the two 230kV lines in 2004 and 2005 resulted in a crossing of Vaseux Creek and a requirement for a Fisheries Act Authorization. The crossing required the topping of trees in the floodplain. The authorization (for the crossing and a downstream bridge installation) was submitted and approved using the habitat compensation method, replacing topped trees with planted trees and shrubs off the right-of-way along the creek as well as the installation of habitat features. The compensation was planned to insure that the habitat is better after a 5 year period than existed before and to offset any effects from the line and bridge crossings. No cumulative or new residual effects are anticipated at this or any of the crossings. The Ellis Creek crossing is an example of a significant cumulative effect well beyond the powerline crossing arising from activities such as the adjacent gravel operation and the creeks proximity to city business, residences and other influences on its habitat. The crossings of Atsiklak Creek for construction access may have short term effects, however long term residual effects will be minimal and will be compensated by using the compensation model.

Mitigation

Construction of the right-of-way is planned for the late summer and fall through to early winter. The timing avoids the spring spawning period. Creeks with fall spawning species (i.e. Mountain whitefish and Kokanee) will have timing constraints prohibiting in stream activity and activity in the riparian zone.

Mitigation measures planned for the project to eliminate effects to riparian zones and fish habitat include standard protocols for construction equipment and vehicles:

- No fuel handling or servicing of equipment and vehicles is permitted within 100m of the watercourse except for power saws which are permitted to re-fuel up to a 15 m zone from the banks;
- No equipment is to be parked overnight within 100m of a watercourse;
- Equipment parked overnight will be tarped (diapered);
- Construction and heavy equipment will be required to each carry portable spill cleanup kits;
- Construction and heavy equipment are prohibited from entering the riparian zone unless an authorization has been obtained for the activity (ie crossing of Atsitlak Creek)

There are other mitigation measures planned to protect fisheries and aquatic resources. Although some streams are not fish bearing they are still tributaries to fish bearing waterbodies and the protection of those streams and their riparian zones is important to downstream fisheries resources. With the planned approach to access including the use of a helicopter in some areas, it is expected that equipment can access both sides of a watercourse, staying well back of the designated riparian zone except at the crossings of Atsiklak Creek. The key challenge for the project is to determine the method of stringing the feeder line across the creek in areas where the helicopter is not going to be used. In those cases, initial plans call for foot access and for line installers to hand pull a feeder line through (subject to weight and safety restrictions). It may be necessary, if there are weight or safety limitations, to carefully access the riparian zone with one construction vehicle to enable the stringing process. Depending on the final design and construction plans as well as the watercourse the sensitivities, this may be accomplished under a notification process rather than necessitating an authorization. Detailed project design and plans for installation will be part of the environmental management plan, which in turn will affect the regulatory process.

The crossing of Vaseux Creek will necessitate removal of cottonwood hazard trees and the selective topping of Ponderosa Pine by qualified arborists in the riparian zone near the Vaseux Lake Terminal Station. If there are hazard trees on the edge of the right-of-way in the riparian zone at Shuttleworth Creek (subject to design considerations) topping or removal of trees may be required. Topping may at times be done under a notification or it may require an authorization. In either case, access to the riparian zone will be foot access by arborists who will be using chain saws to accomplish their task. Arborists will be required to use biodegradable vegetable based lubricants if available. No heavy equipment will be permitted in the riparian zone to clear trees or vegetation. This should maintain the integrity of much of the riparian vegetation, particularly the shrub species. Any vegetation removal will be compensated in offset habitat improvement as per the Fisheries and Oceans Canada guidelines.

There will be a prohibition on removal or damage to shrubs and understory vegetation in the riparian zone of the watercourses. Tops from trees will be removed from the riparian zone and stacked to provide habitat features for small mammals and reptiles.

The crossings of Atsiklak Creek along the right-of-way will utilize best management practices for a stream of this nature and will incorporate considerations for the 2 year construction period and the sensitivity of the stream. Details of the crossing techniques will be refined in collaboration with the design process and the development of the environmental management plan. It is expected that a number of crossings of this creek may be required and different methods will be under consideration. Crossing techniques will be consistent with federal and provincial fisheries guidelines.

A number of the watercourse crossings, both named and unnamed are over steeply incised valleys. It is expected there will be no clearing or removal of trees in these locations. The power poles will be installed on valley terraces on each side of the creek more than 30 m from the watercourse. The power line conductors would be strung with the aid of a helicopter permitting an aerial crossing well above the trees.
With the frequency and proximity of access locations on either side of the creek crossings, there is no need for equipment to enter the watercourse or the riparian zone in this scenario. The environmental management plan will detail additional mitigation measures integrated with the final design of the right-of-way particularly with respect to pole placement and any disturbance to the riparian zone.

10.0 WILDLIFE AND TERRESTRIAL HABITAT

The region where the proposed facilities will be located, is considered to be generally very rich in wildlife diversity. The South Okanagan is also home to Canada's largest concentration of wildlife species at risk (Habitat Atlas, ed. Holm, 1998).

There are guidelines (Canadian Wildlife Service, 2004) for the assessment of species and ecological communities at risk. The ESIA has included species at risk as a significant component. The federal ranking system (COSEWIC) is described in Table 5.0. The BC Species and Ecosystems at Risk process uses a ranking system of 'Red', 'Blue', 'Yellow' Lists. The Red designation is for species identified under the Wildlife act as endangered or threatened, while Blue is for those not immediately threatened but of special concern. The Yellow designation captures a wide range of considerations such as common, uncommon, declining and increasing species.

In addition, based on a review of data as well as experience from previous projects in the valley the following species at risk are recorded historically in close proximity to the proposed project facilities.

- ***Amphibians:*** Great Basin Spadefoot (*Spea intermontana*), Tiger Salamander (*Ambystoma tigrinum)*
- ***Reptiles:*** Western Rattlesnake (*Crotalus oreganus*), Night Snake (*Hypsiglena torquata*), Western Skink (*Eumeces skiltonianus)*, Gopher Snake
- ***Mammals:*** Great Basin Pocket Mouse f(*Perognathus parvus)*, Western Harvest Mouse *Reithrodontomys megalotis*), Nuttal's Cottontail (*Sylvilagus nuttallii*), Badger (*Taxidea taxus*), California Bighorn sheep (*Ovis Canadensis californiana)*, Pallid Bat (*Antrozous pallidus*), Spotted Bat (*Euderma maculatum*),
- ***Birds:*** Lewis' Woodpecker (Melanerpes lewis), Long-billed Curlew (*Numenius americanus)*, Brewers' Sparrow (*Spizella breweri breweri*), Gray Flycatcher, Canyon Wren (*Catherpes mexicanus*), Western Screech Owl (*Megascops kennicottii macfarlanei)*, Whiteheaded woodpecker (*Picoides albolarvatus*), Sage Thrasher (*Oreoscoptes montanus*)
- ***Invertebrates:*** Behr's Hairstreak (*Satyrium behrii*), California Hairstreak (*Satyrium californica*)

Photo 10.1 Behr's hairstreak a species at risk nectaring on yarrow near the Vaseux Lake Terminal Station (by S. Morck)

An initial screening of species at risk recognized by BC and Canada in the Okanagan Shuswap Forest District is quite large with over 100 animals and plants each. The following Table is a refined list showing the wildlife potential in south central BC for the occurrence of species at risk with a federal COSEWIC Ranking in the Ponderosa pine and the bunchgrass ecosystem communities.

Table 10.1: Table of COSEWIC Listed Species in the South Okanagan (BC Ministry of Environment, 2007)

Scientific Name	English Name	COSEWIC	BC Status	Class (English)	Habitat Type
Ambystoma tigrinum	Tiger Salamander	E (Nov 2001)	Red	Amphibians	LACUSTRINE;PALUSTRINE;RIVERINE;SUBTERRANEAN;TERRESTRIAL
Antrozous pallidus	Pallid Bat	T (May 2000)	Red	Mammals	LACUSTRINE;PALUSTRINE;TERRESTRIAL
Apodemia mormo	Mormon Metalmark	E (May 2003)	Red	Insects	TERRESTRIAL
Asio flammeus	Short-eared Owl	SC (May 1994)	Blue	Birds	ESTUARINE;PALUSTRINE;TERRESTRIAL
Athene cunicularia	Burrowing Owl	E (Apr 2006)	Red	Birds	TERRESTRIAL
Centrocercus urophasianus	Greater Sage-Grouse	XT (May 2000)	Red	Birds	PALUSTRINE;TERRESTRIAL
Coluber constrictor	Racer	SC (Nov 2004)	Blue	Reptiles	PALUSTRINE;TERRESTRIAL
Cottus hubbsi	Columbia Sculpin	SC (May 2000)	Blue	Fishes	RIVERINE
Crotalus oreganus	Western Rattlesnake	T (May 2004)	Blue	Reptiles	TERRESTRIAL
Euderma maculatum	Spotted Bat	SC (May 2004)	Blue	Mammals	PALUSTRINE;SUBTERRANEAN;TERRESTRIAL
Eumeces skiltonianus	Western Skink	SC (May 2002)	Blue	Reptiles	PALUSTRINE;TERRESTRIAL
Falco peregrinus anatum	Peregrine Falcon, *anatum* subspecies	T (May 2000)	Red	Birds	ESTUARINE;TERRESTRIAL
Gonidea angulata	Rocky Mountain Ridged Mussel	SC (Nov 2003)	Red	Bivalves	LACUSTRINE;RIVERINE
Hypsiglena torquata	Night Snake	E (May 2001)	Red	Reptiles	LACUSTRINE;RIVERINE;SUBTERRANEAN;TERRESTRIAL
Icteria virens	Yellow-breasted Chat	E (Nov 2000)	Red	Birds	PALUSTRINE;TERRESTRIAL
Megascops kennicottii macfarlanei	Western Screech-Owl, *macfarlanei* subspecies	E (May 2002)	Red	Birds	PALUSTRINE;TERRESTRIAL
Melanerpes lewis	Lewis's Woodpecker	SC (Nov 2001)	Red	Birds	PALUSTRINE;TERRESTRIAL
Numenius americanus	Long-billed Curlew	SC (Nov 2002)	Blue	Birds	ESTUARINE;PALUSTRINE;TERRESTRIAL
Oreoscoptes montanus	Sage Thrasher	E (Nov 2000)	Red	Birds	PALUSTRINE;TERRESTRIAL
Otus flammeolus	Flammulated Owl	SC (Nov 2001)	Blue	Birds	TERRESTRIAL
Phrynosoma douglasii	Pigmy Short-horned Lizard	XT (May 2000)	Red	Reptiles	TERRESTRIAL
Picoides albolarvatus	White-headed Woodpecker	E (Nov 2000)	Red	Birds	TERRESTRIAL
Polites sonora	Sonora Skipper	SC (Apr 2006)	Red	Insects	PALUSTRINE;TERRESTRIAL
Reithrodontomys megalotis	Western Harvest Mouse	SC (May 1994)	Blue	Mammals	PALUSTRINE;TERRESTRIAL
Rhinichthys umatilla	Umatilla Dace	SC (May 1988)	Red	Fishes	RIVERINE
Satyrium behrii	Behr's Hairstreak	T (Nov 2000)	Red	Insects	TERRESTRIAL
Satyrium fuliginosa	Sooty Hairstreak	E (Apr 2006)	Red	Insects	TERRESTRIAL
Spea intermontana	Great Basin Spadefoot	T (Nov 2001)	Blue	Amphibians	PALUSTRINE;RIVERINE;TERRESTRIAL
Sylvilagus nuttallii	Nuttall's Cottontail	SC (Apr 2006)	Blue	Mammals	PALUSTRINE;TERRESTRIAL
Taxidea taxus	Badger	E (May 2000)	Red	Mammals	TERRESTRIAL
Tyto alba	Barn Owl	SC (Nov 2001)	Blue	Birds	PALUSTRINE;TERRESTRIAL
Danaus plexippus	Monarch	SC (Nov 2001)	Blue	Insects	TERRESTRIAL
Rana pipiens	Northern Leopard Frog	E (May 2000)	Red	Amphibians	LACUSTRINE;PALUSTRINE;RIVERINE;TERRESTRIAL

In addition to species at risk, there are a number of regionally significant species occurring throughout the area. In particular this includes ungulates such as Mule deer (*Odocoileus hemionus*), moose (*Alces alces*) and elk (*Cervus elaphus canadensis*). Some of the other regionally significant wildlife includes:

- ***Amphibians:*** Frog and toad species
- ***Mammals:*** Black bear (*Ursus americanus*), Coyote (*Canis latrans*) and Bat species
- ***Birds:*** Raptors, Waterfowl, Upland birds and a wide variety of songbirds, and other members of all bird groups as well as large birds such as the Great Blue Heron.

There are a number of seasonal sensitivities throughout the project area which require consideration of timing constraints, contingency plans and other mitigation during construction and to a lesser degree, operation of the proposed facilities. Seasonal sensitivities on this project include some of the following:

- Bird mating, nesting and rearing;
- California Bighorn Sheep late winter forage areas and spring lambing;
- Snake emergence and migration to and from hibernacula (fall and spring);
- Spadefoot breeding migration;
- Bat roosting locations for parturition, foraging and winter hibernacula; and
- Hairstreak life cycle phases.

The project transects a variety of wildlife habitats based on localized variants of the two key biogeoclimatic zones (Bunchgrass and Ponderosa Pine). The bunch grass zones tend to be located at lower elevations on plateaus/terraces in or adjacent to the valley floor. The Ponderosa Pine (*Pinus ponderosa*) zone is present in low to mid altitudes on the more mountainous areas along the route. There is some Douglas fir (*Pseudotsuga menziesii*) in the Ponderosa Pine zone along Manuel's Canyon due to the wetted nature of the valley. It is largely assumed to be an invasive species into the open Ponderosa Pine bunchgrass habitat type with the advent of sustained fire suppression practices over the last century.

Construction and Operations activities have a potential to cause impacts to wildlife and terrestrial habitat in a number of ways:

- Disturbance to or removal of vegetation communities providing cover and other habitat functions can be significant if the removal causes a disruption to a critical life cycle phase or exposes the wildlife to predation and other threats.
- Equipment and vehicle access or noise disturbs traditional migratory pathways or disrupts wildlife particularly during critical or key periods (i.e. Spadefoot migration to breeding ponds, bird nesting or lambing).
- Disturbance or damage to dens and hibernacula can disrupt a critical phase as well as cause mortality to a large group of the population on a local level.
- Direct contact with equipment and human activity can cause injury and mortality.
- Activities can increase accessibility to more remote areas by ATV's, horses and 4x4s causing erosion, additional hunting pressure and disturbance during critical life cycles.

- Certain types of equipment such as guy wires and overhead shield wires depending on terrain, habitat and species of birds in the vicinity may have a potential for bird collisions. Conductors, depending on the configuration are often a concern when the issue is avian collisions with overhead wires. Double circuiting tends to exacerbate the problem and this must be weighed against the habitat losses associated with two single circuits.

The Conservation Data Centre has records of data from a wide range of studies and inventories collected by others. The non-sensitive data, such as the occurrences of some ungulates, is accessible and was used for this assessment. Sensitive data (i.e. location of snake dens) is not available for use in a public document. It however can be used and interpreted for detailed project planning in the Environmental Management Plan. Data and knowledge of the California Bighorn Sheep population(s) throughout the area is fairly comprehensive (Demarchi, et al 2000), so field studies were not required for this wildlife group. Some data was collected though, based on observances during the field studies as appropriate. There was also wildlife data for the Vaseux Lake Terminal Station (Elements, 2003) and the associated right-of-way through the protected area. A number of studies were conducted at the Bentley site in collaboration with other projects on the Osoyoos Indian Reserve. These included invertebrate, small mammal, bird and wildlife assessments. See Section (21) for additional information on the Bentley site. The focus of field studies was on identifying the use and presence by species at risk and other regionally significant species where data gaps exist.

10.1 Oliver, RG Anderson, Vaseux

All changes to these facilities will be within the existing fenceline. No new or incremental impacts are anticipated to wildlife or wildlife habitat.

10.2 Bentley Station

10.2.1 Amphibians

Effects

There are no documented sightings of Spadefoot on or adjacent to the Bentley Terminal. Site selection timing precluded including this site in the spring 2006 assessment. There are recorded Spadefoot observations to the east (about two km) along McKinney road. As Spadefoot are largely nocturnal and spend their daytime buried in sandy areas, it is often difficult to confirm their presence or absence in a specific locale. If nearby ponds and waterbodies host Spadefoot tadpoles, there is reason to believe that Spadefoot could use a given locale for their adult life cycle. The Bentley site does not have any ponds capable of hosting tadpoles either on it or adjacent to it. With the lack of unimpeded access to a small pond or water body and the degraded nature of the site, the site has a low habitat potential for Spadefoot. With their presence in the greater area adjacent to Wolfcub Creek and high quality shrub steppe ecosystems, there remains a small a possibility that site preparation may displace Spadefoot, if present, and could result in mortality of a few individuals from the heavy equipment and earth movement. Any such result would not have a significant impact on local Spadefoot populations.

The Great Basin Spadefoot is listed a special concern species due to its rapidly shrinking habitat and reduction in temporary ponds and water that historically were available for the completion of the breeding cycle (Cannings, RJ 1999). Long term effects from the possible loss of a few individuals are not expected to influence the population measurably, however, efforts should be made to mitigate some of the effects of the project activities.

Tiger Salamander may occur in the area but have not been documented to date. The habitat on the site is not considered suitable for the adult phase and there are no ponds on site for the tadpole phase.

Photo 10.2 Spadefoot tadpoles, part of a rescue effort led by Ron Hall of the OIB and supported by FortisBC during the Nk'Mip project (by S.Morck).

Mitigation

Although resident Spadefoot are not confirmed in the Bentley site, an exclosure system is proposed to mitigate impacts either during the breeding season in the spring or later during the foraging periods in the summer. A concern is that in a non-normal wet year, the lowland area of the site may be a host site for spadefoot.

Initially a small team will regularly monitor the known ponds in the area for nocturnal breeding activity in the spring. Once it is determined that this activity (if it occurs) is near peak, a construction fence made of a heavy gauge geotextile will be erected around the perimeter of the station site. It will be inset or buried into the soil approximately 15 cm and fully enclosed to act as a barrier against Spadefoot returning to the site. Alternatively, the site could cleared and then the enclosure erected and monitored. Spadefoot and other wildlife found inside the enclosure would be relocated to the adjacent residual habitat. Either technique would significantly reduce potential impacts to Spadefoot as well as other wildlife such as small mammals and snakes.

10.2.2 Small Mammals

Effects

Observations during other field studies indicate that small mammals of note were likely to occur on the project site. The station clearing and grading will result in the loss of vegetation and soils that provide habitat for small mammals. In addition, grading could disrupt individuals on the site, potentially causing mortality.

Members of the field survey teams noted evidence that pocket mice were present on the site. A small mammal field study was completed in 2005 to determine the type and abundance of species on the Bentley terminal station site. The site had four species of small mammals at an overall density of 42.0 mice/ha. This abundance may be due to the lack of snakes on the site. The majority of captures (83%) were Deer Mice. Meadow Voles and Western Harvest Mice each accounted for 7% of captures, while Great Basin Pocket Mice accounted for 3%. There is no indication that this site is currently used as an extensive foraging area by predators, despite the high availability of prey items.

The initial impact on small mammals, of construction on the site is expected to cause displacement and some mortality. It is not known if the adjacent vineyards and residential areas provide significant small mammal habitat and populations to provide an overall context to the impact rating, although typically the voles and deer mice are found in those settings. Overall, it is not expected to have a population effect in the vicinity of the station as there is a corridor of better quality habitat along the terrace connecting to other areas of habitat with very good potential to host small mammals.

If this residual area provides a stable environment for the propagation and dispersal of deer mice as pests in particular to nearby agricultural and residential areas, the reduction of the population may provide a modest benefit. By contrast the adjacent lands may be a source of small mammals and the site is the sink or marginal habitat for some of these species, particularly those (i.e. deer mice) that are associated with adaption to anthropogenic activity, which may provide food and shelter. In this case, the loss of habitat would then be expected to have no effect on overall on the population.

The cumulative longer term effects of the conversion of this habitat to an industrial site are not considered to have an effect on the voles or deer mice which live and adapt well, and likely in greater numbers in adjacent land uses. There are two species listed as species at risk, the Western Harvest Mouse and the Great Basin Pocket Mouse. Both are abundant in their range in the US but their association with dwindling grasslands in Canada makes them rare. The Great Basin Pocket Mouse is reported as secure in the South Okanagan by the BC Conservation Data Centre (CDC) and given its low density on site and preference for high quality adjacent habitats, no long term significant effect is expected. The Western Harvest Mouse is documented as preferring the tall grass (Nagorsen, D.W., 1995) and shrub edge areas where it is generally found in higher numbers. Some of this edge habitat occurs off the station site nearby, and given the low densities on the site, no long term population effect is anticipated.

Mitigation

The two species blue listed provincially and federally as species of special concern (Western Harvest Mouse and Great Basin Pocket Mouse) occur in relatively small numbers. In combination with the Spadefoot mitigation measures, it is proposed that a construction fence be erected which will function as a barrier or exclosure to small mammal movement after plant salvage and clearing are completed. It is expected those activities will cause a significant dispersal of small mammals. Once the construction fence is installed a program of live capture of small mammals (only at risk species) on site and their relocation to adjacent higher quality habitat would be initiated. Under consideration would be the relocation of the species at risk only to promote a higher chance of individual survival in an adjacent environment.

With these steps, it is expected the final impact to small mammals will be negligible, provided a continuum of habitat will be maintained adjacent to the development, affording corridors for migration and population dispersal.

10.2.3 Chiroptera (Bats)

Effects

The South Okanagan is known to support Canada's most diverse species of bats. This includes species at risk such as Pallid bats and Spotted bats. The area also supports common Myotis species. A field inventory was completed in 2005 using audible and inaudible detection techniques to determine some of the species present and the significance of the use on the site.

The Bentley Terminal site does not have any trees or rock outcrops that would provide key habitat for bat roosting, rearing or hibernation. However, the field studies determined the site is used for foraging by bats. The initial field studies were confined to the Bentley site, so it is not known what the significance of the site is for foraging relative to the area in general. There must be day roosts in the general area, perhaps in the buildings nearby and in large trees or rock outcrop features on the river terrace above Oliver. Foraging likely occurs in a much larger area than just the station site.

Observed flight behaviour and patterns suggested the potential for pallid bats on the site or other species that glean insects on the ground. OIB data shared with the OTR team from other projects confirms the occurrence of Pallid bats near Mud Lake Mountain, north of the Bentley Terminal Station about 2 km. Audible detection and visual observation confirmed

Spotted Bats were foraging in the area. Based on the results of the field study, the site supported significant foraging activity.

The most sensitive times of year for bats are parturition, weaning, and breeding/hibernation. These phases of their life cycle correspond to late spring/early summer (early June to early July), mid-summer (late July to early August), and autumn to early spring (late August/early September to late April/early May), albeit the exact dates vary between years and species. During these times, bats may abandon their day roosts if they are subject to severe disturbance particularly if individuals or colonies are not generally accustomed to being disturbed. Construction could cause a disturbance to the use of day and night roosts of various species (i.e., rock crevices may be more protected from physical damage but sound disturbance could affect individuals or colonies occupying these structures; on the other hand, tree roosts are vulnerable to both sound and physical disturbance or damage).

An additional reconnaissance by the wildlife team around the site did not identify any structures or features that would be expected to provide day roosts or winter hibernacula in the immediate vicinity of the Bentley Terminal site. No impact is expected to bat populations with regard to the disturbance of day roost or winter hibernacula.

Bats using the area can be expected to have developed a tolerance of the sound levels associated with vineyard operations as well as the Town of Oliver throughout the day. Noise levels associated with vineyard operations may be similar in loudness and frequency, at times, to noise levels of those associated with site preparation. The site preparation equipment would only be used during the work day most likely between 7:00 am and 5:00 pm. This work period would be outside of the normal foraging times for bats, further reducing the likelihood of disturbance from sound. Disturbance from construction noise is not expected to impact the bats.
Bats are very acrobatic fliers and there are no records of collision with conductors (powerlines) or support structures. Acoustic interference with bats is not believed to be a problem because the acoustic signatures of the equipment are in the audible range, where as bats are considered to use ultrasonic sound for location and foraging.

Although the proposed Bentley Terminal Station may not physically interfere directly with flying bats, this modification of the habitat and of the landscape may affect the prey composition and abundance of various arthropod prey. A decrease in prey density, availability, or quality could cause bats to choose an alternate foraging site or to switch day or night roost locations. It is likely that the higher quality habitat along the corridor adjacent to the site provides quality foraging for the bats in the area than does the degraded areas on the site. As a result, impacts to bats are expected to be primarily due to the loss of a lower quality foraging area. The degradation of the site for foraging is considered a marginal long term effect on individuals which have to learn and adapt to an adjusted area for foraging. It is suggested that factors other than degradation of available foraging affect Pallid Bat at this site. Pallid bats are particularly sensitive to human disturbance (Chapman, K.1994) and with the close proximity to town, and the activity areas of the adjacent vineyards they are probably only occasional foragers on the site. The loss of open grasslands for is a key long term factor affecting the entire population in Canada. The loss of the site even if degraded, is a small incremental loss equivalent to about 4% the annual loss of shrub steppe grasslands which are important to this species.

Mitigation

With the loss of foraging habitat, there is a need to protect the buffer zone of undisturbed higher quality habitat along the west side of the proposed site on benchland terrace above the Town of Oliver. Native vegetation must not be removed or damaged within the buffer zone, and the overall quality of the buffer zone must not be compromised.

The final clearing and grading of the site would occur in August and September, avoiding critical cycles should they be occurring in the vicinity. Limited hand clearing of antelope brush would occur in the last weeks of June, but the main site clearing of all vegetation with heavy equipment would not start until August.

The site layout and footprint of the station will be configured to avoid the habitat foraging corridor along the terrace to the west of the station to minimize the displacement of foraging bats.

To restore the site after construction and to promote inhabitancy by bats, bat boxes are to be installed in the vicinity well away from human disturbance. Although occupancy of bat boxes is not guaranteed, they can provide satisfactory day roosts for some species permitting conservation of energy rather than flights to a more distant day roost. Not all bat species will occupy bat boxes. For example, there are few records of Pallid bats roosting in these structures. Construction plans have been made available for a Pallid bat house (designed by Greg Tatarian, Wildlife Research Associates) that has proved successful in some parts of California. Two or three of these pallid bat houses will be installed in the vicinity of the site.

10.2.4 Mustelidae (Badger)

Effects

The focus of the ESIA is primarily on badgers, although other members of the family, particularly weasels may occasionally forage in the area. Badgers are an at-risk species and as of the date of this ESIA there have been no recorded observations of badgers or badger dens by study teams on or near the station site. No impact to badgers is expected. Impact to other members of the family is expected to be negligible, as the loss of foraging habitat is small and there was no evidence of their presence on the site.

Mitigation

No mitigation is required as no impacts are anticipated.

10.2.5 Lagomorphs

Effects

To date, no lagomorph species have been observed or identified using the Bentley Terminal site.

Mitigation
No mitigation is planned for lagomorph species at this site as there are no impacts anticipated.

10.2.6 Large Mammals

Field survey teams did not observe the presence of large mammals in the area. It can be expected based on area use patterns that there is a likelihood of both Mule deer and Coyote use of this habitat, particularly the corridor along the benchland edge.

Effects
Impact to these species will be negligible as both are mobile and adaptable species living in close proximity to other anthropogenic activity. The site may temporarily cause a minor displacement in movement patterns depending on the amount of infringement on the corridor. The habitat at the site is degraded and not expected to be important to either species presence or survival in the area. No long term residual impacts are anticipated to large mammals. Helicopters are not expected to be used on the Bentley Terminal Station portion the project, so no effects are anticipated as a result.

Mitigation
No mitigation is planned for large mammals as the impacts are expected to be limited to a small amount of foraging displacement. Site boundary adjustments to the station are anticipated subject to an engineering and technical review for the EMP. Should these boundary adjustments be made, the impact to the corridor and the preferred foraging habitat will be minimal.

10.2.7 Birds

Effects

Field surveys indicated that the site had potential nesting habitat in sagebrush (BC Ministry of Environment, 2007) for Lark Sparrow and Grasshopper Sparrow, though neither species was seen or heard or found to use the site for nesting during the surveys. No other bird species were observed using the site for nesting or foraging during the surveys, though it can be expected there is some foraging. There is still a potential for nesting by these or other species during the year of construction.

Clearing of the site has the potential to displace nesting birds that may use the site. Without any occurring on the proposed site, the long term effects of removing nesting habitat are not expected to occur. However, to ensure that nesting does not initiate during the year of construction, the site will be cleared by hand prior to the nesting period by removing only the Big Sage which is known to be a host plant for nesting or sheltering of the nests of the Lark Sparrow and Grasshopper Sparrow. The site is considered to have no potential for ground nesting species (i.e. Night Hawk or Curlew). The antelope brush must remain on the site though until any Behr's hairstreak have emerged (see section 10.2.9).

Terminal site equipment and wires generally do not present a risk to birds in fight, because most foraging by local resident birds is expected to take place off the station site on the larger areas of residual natural habitat. Migratory birds will fly well above the height of the station equipment, based on the surrounding terrain as well as observations of migratory routes by the bird specialist in the region.

Based on the results of surveys to date, no measurable effects are anticipated for birds on this site during construction or longer term during operations.

Mitigation

There will be a timing activity window permitting clearing of shrubs associated with potential nesting prior to the nesting season in conjunction with the plant salvage and relocation plan. Current schedules call for hand clearing of selected shrub species (sagebrush) in April.

10.2.8 Reptiles

Field studies were conducted and existing documented data were reviewed on reptiles in the area. No hibernacula or gestation sites were identified on or near the Bentley Terminal site. There are many areas throughout the region with snake habitat. Snakes are documented in locations less than 1km away so it can be assumed that they may use the site as foraging habitat or migrate through it on occasion. High numbers of small mammals, the prey of the snakes, suggest that the site has few if any snakes foraging on it.

Effects

The establishment of a site in the area has the potential to disrupt the movement of snakes in the area and reduce available foraging habitat. Snakes, which frequent adjacent areas to the north, include at risk species such as the Western rattlesnake and the bull snake. Fields studies did not identify any snakes on the site, so it is unlikely it is a high use area. Based on the data from other sources, snakes occur within a few hundred metres of the site and can be expected to be occasional foragers or migrants through the site. The density and diversity of small mammals suggest snake predation if it occurs is low on site. Snakes will be displaced due to the project but in low numbers. No population impacts are expected and impacts to individuals could occur during clearing and grading.

Mitigation

A construction fence, designed as a barrier to snakes, will limit the potential for human and snake interaction during construction. Although snake populations appear to be low on the immediate site, there is a possibility of migration through the area as well as some foraging at times. As a result, a permanent snake fence will be integrated into the site chain link fence to ensure there are no interactions between people, snakes and equipment during operations.

10.2.9 Invertebrates

Effects

Surveys were conducted in June of 2005 and again in 2006, with an emphasis on Behr's and California hairstreak. A few adult phase Behr's hairstreak were observed nectaring within the Bentley Terminal site. California hairstreak are observed in all of the recent field studies on Fortis projects utilizing the same habitat niche and account for 10-20% of the total hairstreak numbers.

A leading local invertebrate specialist, Dr. Dennis St. John was asked to assess the site. His findings are that the site is generally of poor quality for Behr's and California Hairstreak due to its degraded nature and less than desirable microclimatic regime. He suggested that though it has some nectaring sources present, particularly yarrow, it is most likely attracting a few adults from other more productive sites in the adjacent higher quality benchlands.

Effects to this species can include mortality of individuals from shrub (antelope brush) removal when in the incubating egg, the larval or pupae stages. Behr's hairstreak relies on the antelope brush for most of its life cycle (Shepard, J.H. 2000). If disturbance is wide spread and a significant amount of antelope brush is removed during the above stages, there is a very good chance that a population or subpopulation group could be significantly impacted.

<u>Mitigation</u>

Although it had been originally proposed in the first ESIA (Elements, 2006) with the FortisBC Nk'Mip projects to capture and relocate larvae, the input since the first ESIA suggests the quality of the site is low and the adults are very likely foraging on a temporary basis from adjacent higher quality areas. Under that assumption, it would suggest that the likelihood of a larval stage on the site is small. In addition, larval capture had variable results from one year to the next, and generally only represented a small portion of the total numbers of emergent butterfly in a high density population.

An alternate system has been designed that precludes handling of the larvae or the adults. Nectar sources will be removed before the end of May from the site. Monitoring of the site will occur twice weekly to remove any new sources of nectar as well as confirm that the adults are not on site. At the end of the adult phase, the antelope brush can be safety removed with the assumption that adults nectaring off site are likely ovipositing off site as well. If for some reason adults are found on site, one team with members trained in handling adults would capture and relocate them to host sites along McKinney road which are higher quality sites and far enough away to preclude a return to the site by the relocated individual. Note, wildlife handling and relocation require permits, in this case a permit under the Federal Species at Risk Act.

With this two pronged approach, a significant reduction of impacts to this small group is expected. It should be noted that the hairstreak were handled successfully by researchers in an ongoing marked recapture study in the area, so they can be safety handled.

10.3 230kV Transmission Line(s)

10.3.1 Amphibians

Effects

There are documented observations of Spadefoot in the vicinity of the right-of-way at the crossing location of McKinney road and near the crossing locations at Wolfcub and Atsiklak Creeks as well as Manuel's flats and Manuel's Canyon. There are small wetland features north along route which did not have any species at risk species but did have Long-toed salamanders and tree frogs. Installation of poles has a very low likelihood of direct or indirect impact on Spadefoot, salamanders or other amphibians as long as pole location is flexible and can avoid the wetland habitat these species rely on. Clearing of timber along the existing right-of-way is expected to be limited to hazard trees on or adjacent to the right-of-way. Few trees are expected to be removed, and this will have no measurable effect on amphibians.

Photo 10.3 Spadefoot near the existing right –of-way (by W. Alcock).

Mitigation

Spring timing constraints for other wildlife will benefit amphibians permitting the breeding cycle to be completed before construction starts. The final design and location of poles will be undertaken to minimize disruption of wetlands too.

10.3.2 Small Mammals

Effects

Various types of small mammals were observed along both the upper and existing routes including squirrels and chipmunks. One species at risk, a Western Harvest mouse was observed on the existing right-of-way near Okanagan Falls. Impact to rodents and small mammals along the transmission line right-of-way are not considered a concern since the environmental footprint of this development will primarily be concentrated to structure locations and existing access trails. This type of activity may cause minor short term dispersal. Clearing of timber along the existing right-of-way is expected to be limited to hazard trees on or adjacent to the right-of-way. Few trees are expected to be removed unless some unidentified portions of the right-of-way were not cleared to full width. No measurable effect is expected on small mammals.

Mitigation

No additional mitigation for small mammals is required, however some clearing debris from the few hazard trees will be made into artificial cover which will benefit small mammals. As for reptiles and livestock, pole holes left unattended will be covered to prevent the inadvertent trapping and potential mortality of small mammals. Pole holes will also be regularly inspected and the animals will be removed.

10.3.3 Chiroptera (Bats)

Effects

The South Okanagan is known to support Canada's most diverse species of bats. This includes Spotted bats and Pallid bats as well as the more common Western Long-eared Myotis. Other bat species which occur in the region include the Fringed Myotis, Western Small-footed Myotis and Townsend's Big-eared bat. There is a high potential for the occurrence of some of these species along the transmission line route.

There are trees and rock outcrops that could provide critical habitat for bat roosting, rearing or hibernation. There is also a possibility that foraging could take place along the routes. Bat foraging areas typically are much larger than the right-of-way portion of any bats range.

Of key concern is the timing of construction activities. Construction has the potential to displace or disrupt significant populations of threatened or endangered species if winter hibernacula are disturbed. The proposed timing of construction of the powerline is during the hibernation period for bats. Bats that are severely disturbed during hibernation could leave the hibernacula and if unable to find a suitable alternative in a short period of time would suffer mortality.

Bats are very acrobatic fliers and there are no records of collision with conductors (powerlines) or support structures. Acoustic interference with bats is not believed to be a problem because the acoustic signatures of the construction equipment are in the audible range where as bats are considered to use ultrasonic sound for location and foraging. Inventories for wildlife have been completed along the route. To date no bat hibernacula have been identified near the route although rock outcrop features adjacent to the route through the Skaha Bluffs area were noted for potential. In areas where rock is unconsolidated, it is expected that pole holes would have to be excavated primarily with the use of small controlled blasts from explosives, which could be expected to disturb bat hibernacula within close proximity (i.e. 100m or less). This disturbance to a winter hibernacula could be significant if the hibernacula supports notable numbers, particularly of species at risk and more so if multiple hibernacula are disturbed. This type of disturbance could result in a cumulative local population impact to rare species over the longer term perhaps as part of a cycle of decline beyond recovery levels.

Mitigation

Inventories for wildlife have been completed along the route and no bat hibernacula were identified. There are features (principally rock outcrops, cliffs and caves), which may be used as hibernacula, so prior to pole hole preparations, the QEP will examine pole locations to determine if there are any suspect active hibernacula immediately adjacent to the pole locations. Should they be found, every effort would be made to relocate the poles, within the engineering constraints, to avoid the hibernacula or ensure the timing of activities minimizes the disturbance.

In addition, where poles are installed in rock, the current design calls for the use of drilled rock sets and anchors to support the structures minimizing blasting of pole holes in the rock. This would reduce the potential for disturbance where bedrock is stable. However, in areas where rock is highly fissured, cracked and considered unconsolidated, it is expected that pole holes would have to be excavated with the use of small controlled blasts from explosives. It is important that blasting and other high disturbance activities be completed prior to hibernation (i.e. before the end of September) in areas within 100m of high potential sites for winter hibernacula.

10.3.4 Mustelidae (Badger & Weasels)

Effects

The focus of the ESIA is primarily on badgers, although other members of the family, particularly weasels may occasionally forage in some location along the corridor. Badgers are an at-risk species. There was no evidence of recent or past activity by badgers. Weasels tend to be nocturnal and are seldom observed during the daylight. They can be expected in the area but are unlikely to be impacted by preparation and construction of the transmission line as it is on an existing right-of-way where the disturbance to the existing vegetation communities is expected to be low and clearing will be limited to hazard trees at the edge of the right-of-way.

Mitigation

No mitigation is required as no impacts are expected. Badgers, if in the area, are highly mobile and should active dens be discovered during the route refinement process or construction, there will be a QEP assigned to the project to address unforeseen incidents and implement additional mitigation in the field.

10.3.5 Lagomorphs

Effects

Nuttall's cottontail were observed during field studies along the right-of-way. The impacts of the right-of-way activities are expected to be minimal because:

- The ground disturbance that can impact lagomorph habitat is very localized, especially with construction access constraints; and
- There may be a minor amount of displacement during preparation and pole installation, however, there is extensive undisturbed habitat within a 20 metres of the centerline. Primarily a nocturnal species, they are expected to cross and use the habitat during periods when construction is not occurring. This species has been observed frequently using larger shrubs such as antelope brush for temporary cover on and off the right of way.
- This species showed high adaptability and tolerance of construction activities at Vaseux in 2004 and 2005, frequently using stored equipment and crates as temporary shelter. Should equipment or materials be left unattended for more overnight or even for a few days, there is a possibility of their presence, which could result in mortality or injury if care is not taken when accessing and/or moving materials and equipment.

Mitigation
No dens were identified during the wildlife inventories along the right-of-way. Should active dens be discovered during the right-of-way preparation activities, mitigation measures would be implemented. In the case of Nuttal's cottontail, our experience on other projects shows that den features can be successfully rebuilt off site and used by this species. In addition, man-made artificial dens created with clearing debris are also willingly used by this species. There will be a QEP assigned to the project to address unforeseen incidents and implement additional mitigation in the field. Wildlife features doubling as dens will be built in selected areas using logs and clearing debris from the few hazard trees that are removed from the right-of-way. Detailed plans for the project activities will also include guidelines to minimize the impact to and loss of shrubs on the right-of-way that provide temporary cover for this species.

10.3.6 Large Mammals

Effects
Mule deer and California Bighorn Sheep use is known to be high in the vicinity of the right-of-way based on abundant observations and sign. The transmission line also crosses foraging range for Moose and Elk. Black bear and Coyote were observed in the area.

California Bighorn sheep are rare in Canada and have a high value associated with their presence. Significant effort has gone into the knowledge of their biology and habitat. The population has had some dramatic shifts up and down over the last two decades. The Okanagan population is increasing but is still believed to be at a significant concern level as a major event or disease could affect the population and reverse the recent trend. Areas along or adjacent to the existing route include key habitat such as lambing areas (i.e. Manuel's canyon and the bluffs near Heritage Hills) and winter range.

In addition there are Conservation Lands along the route. The Vaseux protected areas, the Nature Trust properties and the proposed Derenzy Wildlife management area (LRMP) were established to support the goal of maintaining good quality sheep habitat.

Photo 10.4 California Bighorn Sheep observing the field study team (Photo by W. Alcock).

There will be clearing of a few hazard trees along the right-of-way. In heavily timbered areas this can cause displacement as well as microhabitat changes. However there are very few trees to be removed and this activity will occur outside of key life cycle phases. It will not measurably impact large mammals who are mobile and able to avoid short term disturbance.

Both grazing and browsing species tend to benefit from the additional foraging capacity along rights-of-ways. The existing right-of-way provides an extensive corridor edge effect of a natural vegetation community of shrubs and grasses that are beneficial to the large mammals using it now.

A significant effect may occur when construction activities cause a behaviour avoidance response or stress during critical cycles for large mammals in their key habitat. The activities could cause them to leave the habitat for less secure sites or use excess energy for avoidance. These types of impacts would typically be associated with late winter habitat use, or the spring lambing and calving season. Of particular concern are the use of heavy equipment and vehicles in close proximity to large mammals in their key habitats.

Some areas require helicopter access and the use of helicopters can also cause an avoidance response or stress during critical life cycles for large mammals. Of particular concern is the use of the helicopter in lambing and other parturition habitat as well as winter range during periods of late winter stress. The helicopter may disturb the rut/breeding period in the fall. A disturbance of this cycle could result in lower pregnancy and lower recruitment. However, it should be noted that large mammal rut periods tend to occur over two estrus cycles (4-6 weeks duration) and are frequently accompanied by activity during both the night and day reducing the effect of an occasional or even regular fly-over by a helicopter during the normal work day.

The helicopter circling, landing or taking off at low altitude can excite and cause animals to bolt increasing the stress as well as the potential to flush large mammals from secure habitat niches.

Increased public access through pristine high quality habitat areas is also a concern because it too can cause disturbance during critical periods as well as increasing hunting pressure on large mammals.

Currently access along the corridor near critical habitat is very limited on the existing right-of-way near critical habitat areas such as Vaseux Creek Canyon and Manuel’s Canyon. It is important that construction activities do not result in improved access to these areas to avoid new cumulative and residual effects of the existing right-of-way.

The existing right-of-way is a lowland route and avoids cross slope areas associated with the migration patterns of ungulate species. The route does transect sheep wintering range and care must be taken to avoid impacts to these habitats. The primary effects are displacement or disturbance during critical times in late winter or loss of habitat in winter range due to damage to vegetation. Displacement is generally a short term effect which can be mitigated easily through timing. Loss of habitat from uncontrolled construction activities however could be a long term residual effect if not effectively mitigated.

Mitigation

The following measures are planned to reduce impacts to large mammals. One measure is to implement timing constraints to protect large mammals from disturbance during critical life cycle periods. The clearing and construction timing constraints would prohibit activity on the right-of-way during the late winter stress period and the birth and initial rearing period in critical habitat areas.

The timing constraints will prohibit the use of the helicopter in lambing and parturition critical habitat as well as in critical winter range in late winter for project related work. The helicopter will also be required to fly at a minimum height of 500 feet above ground during the rut when ferrying passengers and equipment over habitat areas. Helicopter route choices will also be part of the planning process and ongoing field adjustments during construction as critical habitat can often be avoided with a minimal re-route of the flight path.

The second consideration is ensuring that measures are developed in the environmental management plan to minimize disturbance or impact to the vegetation in wintering habitat. This would include use of existing trails and access roads. It includes a prompt revegetation program on disturbed areas and the aggressive control of invasive plant species.

Photo 10.5 The existing 161 kV line through the Nature Trust property near Okanagan Falls with typical Sheep habitat (by T. McIntosh).

The third mitigation measure is to ensure there is no increased public access causing longer term impacts to large mammals. This will occur by specifying that there is to be no upgrades of existing trails. It is possible some trails may require minor grading for trucks and equipment. In those cases the trails would be returned to their former condition after construction. In some selected back country areas along the route, helicopters will be used in sensitive areas where there is no existing access. Should a section of right-of-way be determined to have potential to create improved access for off highway vehicles as a result of any construction related activity, countermeasures would be developed and implemented as required within the 2 year post construction monitoring program.

10.3.7 Birds

Effects

Field surveys provided observations of many different species of birds. Some of the observed species are at risk, such as Lewis' Woodpecker, which were observed nesting near the right-of-way. Observations along the route noted potential habitat near the right-of-way for a number of at risk species including:

Western Screech-Owl
White-headed Woodpecker
Sage Thrasher
Peregrine Falcon
Long-billed Curlew
Lewis' Woodpecker
Lark Sparrow
Brewers' Sparrow
Gray Flycatcher
Canyon Wren

Two sets of surveys were conducted along the route by three and four member teams transecting the right-of-way and the corridor adjacent to the right-of-way. One was an early spring bird survey with a focus on determining whether or not white-headed woodpecker, the screech owl or any other species at risk were present along the route. Timing of the early survey is based on finding these species using calling tapes and determining their location. This assessment did not find any evidence of either species presence along the route, however habitat potential for screech owl is very high through a riparian zone in Manuel's canyon and screech owls were observed in the riparian zone of Vaseux Creek in the early spring of 2004 about 400 m south of the proposed 230 kV crossing. The second series of surveys was conducted in early spring with an emphasis on nesting activity on or immediately adjacent to the right of way.

There are two primary types of risks to avian species associated with the operation of transmission facilities: Bird strikes/collisions and bird electrocutions. Research suggests that certain types of birds that are low fast fliers, with high body weight to wing surface ratio, are particularly at risk of collision during poor light conditions (Bradley, 2003). The data also indicates smaller diameter and less visible wires such as distribution lines or overhead shield wires may pose the most risk for avian collision. However, transmission lines tend to be higher, may span valleys or transect flight paths and can be associated with collisions in poor light conditions.. This risk of collision is very dependent on the location of the lines, the surrounding terrain, flight paths, updrafts on cliffs and other local factors. This proposed transmission line is not expected to be a concern for bird collisions because:

- The transmission line as proposed is parallel to migratory flight paths in the valley according to observations over time from the study team's bird specialist (R. Cannings);
- The right-of-way is a lowland route, mostly in the valley terraces avoiding favoured higher surrounding higher terrain;
- The few areas over ridges are not considered to be significant flyways;
- Most of the observed migratory pathways are on the opposite side of the valley (west side);
- The route is not immediately adjacent to any large wetlands or other features that tend to attract large numbers of migratory birds such as Vaseux Lake (route is about 1km from the lake and separated by interceding higher elevation terrain); and
- Flight paths of observed migratory birds tend to be well above the terrain by as much as 1000+m which is likely in part due to the height of intervening mountains.

In general, electrocutions seldom occur on transmission lines. When reading or hearing of a bird electrocution it almost always is from a distribution line or secondary service line to a home or business. (Bradley, 2003) There are several differences in scale between transmission and distribution lines that affect their involvement in bird electrocutions. One major structural difference is that distribution conductors are usually mounted on top of a cross-arm, separated by a relatively small insulator. Birds prefer these cross-arms as perching sites. When wooden cross-arms are wet, and readily conduct electric current, even birds as small as starlings have been known to reach over the insulator, touch the conductor and be electrocuted. On a transmission line, the spacing between electrical components almost always exceeds the wingspan of all but the largest BC birds likely to perch on transmission structures. Furthermore, the transmission wires are usually located below the cross arms rendering them far less accessible and hazardous to landing/perching birds. The smaller diameter overhead shield wires near the stations may pose a higher risk to collisions.

Another potential effect, on bird recruitment, can be removal of trees and shrubs during nesting season. A key benefit of using an existing right-of-way is that there will be minimal clearing including limited topping of some trees in a couple of the watercourses and removal of hazard trees on the edge of the right-of-way. This significantly reduces the potential impact to tree nesting species. There are desert species that use shrubs such as big sage or nest on the ground requiring mitigation to minimize effects.

Birds can also be impacted if activities disrupt the calling and breeding season prior to nesting.

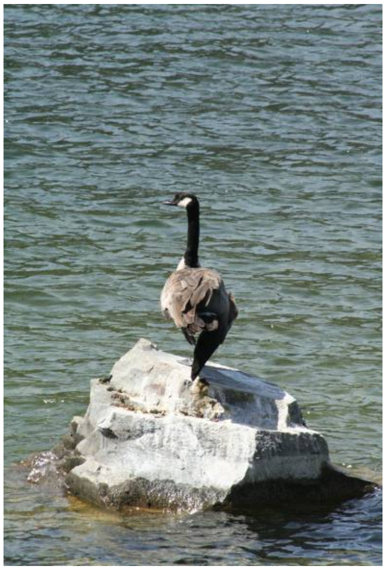


Photo 10.6 Canada goose at Vaseux Lake (by S. Morck)

Mitigation

One of the key mitigation measures with respect to impacts to birds during the calling and nesting season will be the use of a timing constraint in areas with nesting or mating habitat. Many of the species in the Okanagan are early nesters and the calling season for some species can start in early April. It is anticipated that a timing constraint from April 1 to August 14 will ensure birds are not impacted or interrupted during these two key phases of their life cycle. In addition, the project will utilize the provincial guidelines
for least risk for raptors using a permitted activity period from August 15th to January 31.
Constraints will also be applied to equipment and vehicle activities on the rights-of-way to minimize damage and destruction of shrub and open grassland nesting areas. This includes mandating the use of existing trails and access roads and will be supplemented by a prompt revegetation program on disturbed areas and the aggressive control of invasive plant species.

The transmission lines are not considered a significant risk to electrocution, so no mitigation is planned.

Overhead shield wires which will be installed on poles near the stations do not require marking as the station and transmission line locations are not in close proximity to areas where there is a high risk of bird strikes or collisions (i.e. waterfowl staging areas or in primary migratory flight paths).

10.3.8 Reptiles

Effects

Candidate dens were identified and all species of snakes known to exist in the region were observed along the right-of-way during the field studies. This includes a number of night snake locations, which are considered rare, as well as being a species at risk. Known dens have been mapped and will be included as a consideration during route refinement and pole placement in the design and environmental management planning process. Snake den location data is considered sensitive and is not included in public documents. Most of the existing route has a high potential for the occurrence of snakes and snake dens or hibernacula.

Western skinks are relatively abundant throughout the area and are also an important food source for night snakes. Skinks were observed using the rocky rubble around the existing poles as habitat. Significant numbers of skinks could be displaced or even suffer mortality during the pole removal process. The impacts of the pole removal process have the potential to affect skink populations within the corridor for a number of years as well as night snake foraging.

Photo 10.6 Alligator lizards observed during field studies (by W. Alcock).

The field assessments indicated the area through Manuel's flats may have been potential habitat for the short horned lizard in the area, but surveys failed to confirm their presence.

Depending on timing, construction activities on the right-of-way have the potential to cause some minor displacement of foraging or migrating snakes. Structure and anchor installation and counterpoise ground wire trenching also present a threat to the integrity of the hibernacula directly located where these disturbances occur. Loss of hibernacula during hibernation could have a significant impact to the local populations. Loss or impact of hibernacula during other times may have an impact depending on the snakes capability to find an alternative denning site within the vicinity.

Snake mortality is a risk if snakes come into direct contact with humans and with construction equipment. One of the impacts of right-of-way activities to snakes is expected to be disruption or displacement during migration from and to dens with a summer and fall construction period. Another impact could be any actual disturbance to a hibernacula, although this is considered unlikely as all identified dens and candidate dens will be provided with a buffer zone from activities.

Mitigation

Mitigation includes the timing of right-of-way activities with an emphasis on minimizing activity near dens during the denning and migration periods. Current plans call for right-of-way preparation and pole installation to occur in the summer and fall. This will eliminate the possibility of human and snake interaction in the spring season. There remains a possibility of snake and human interaction during the fall migration to dens.

Key mitigation measures to be implemented for snakes are:

- An additional assessment for hibernacula features in close proximity to the proposed pole locations will be undertaken by the Wildlife Biologist in consultation with the QEP during the environmental management planning process. Critical hibernacula will be avoided by moving pole locations;
- Objects providing cover around the footprint of the pole holes (i.e. construction material, logs or rocks) will be inspected and any snakes found will be relocated about 50m away; and
- Construction crews will be required to attend an orientation which will include snake conservation and appropriate responses to snake encounters.
- The planned creation of habitat piles along the right-of-way using timber residue from hazard tree removal would also benefit snakes by providing temporary dens and cover from predators as well as habitat for their prey species.
- Should pole holes be left unattended, they will be covered to prevent accidental trapping of reptiles. Pole holes should also be regularly inspected and any wildlife that may be present removed by a trained professional.
- Spring timing constraints implemented for bird nesting and sheep lambing periods overlap with the snake emergence and migration from dens providing security during that period.
- Minimize activity in the fall in undeveloped areas near snake dens. Both candidate and confirmed hibernacula have been identified near the right-of-way in a number of locations and will be part of the detailed construction logistics process when determining pole locations, installation methods and timing. Generally activity will be restricted within 150m of during key use periods of the dens.

In order to minimize the effect of pole removal on skinks and in turn on night snake foraging, the old transmission line poles will be cut off at ground level in the areas where there is utilization by skinks of the rocky rubble around the poles. Normally, decommissioning requires the entire removal of the poles or cutting them off below grade. In some cases these skink habitat areas will be on privately owned land and FortisBC will consult with the landowners to determine whether this procedure can be implemented.

Photo 10.7 Snake den near the existing right-of-way (by M. Sarell).

10.3.9 Invertebrates

Effects

Behr's hairstreak surveys were conducted during the adult emergence period. Surveys identified Behr's Hairstreak and California Hairstreak (Blue-listed) along the route in several locations.

The impact to hairstreak is expected to be limited to the loss of a few incubating eggs during construction in locations where there is disturbance or destruction of large mature antelope brush. The larval and adult phases will be completed by the time the right-of-way activities are initiated and there will be no direct impact to either of these two phases.

The Tiger Beetle is about to be listed as a species at risk and its most recent recorded sighting was in Manuel's canyon. Team members were alerted to watch for it, however no occurrences of this species were observed during the field studies.

Mitigation

Mitigation includes a timing constraint that will limit right-of-way activities to avoid disturbance during the larval and adult emergence phases.

Constraints will also be applied to equipment and vehicle activities on the rights-of-way to minimize damage and destruction of shrubs, particularly antelope brush through the hairstreak habitat areas on the southern portions of the route (south of Shuttleworth Creek. This includes mandating the use of existing trails and access roads as well as a prompt revegetation program on disturbed areas and the aggressive control of invasive plant species. The yarrow, the preferred nectaring species is a plant associated with disturbed areas and will self seed or re-grow from existing seed in the soil when disturbed. It is also a perennial and will grow back the following year providing the root system is not damaged.

10.4 Residual Access

Perhaps one of the more significant wildlife concerns with a transmission line right-of-way (i.e. pipelines and power lines) is the issue of increased public access to remote areas. Frequently, transmission lines cross backcountry or environmentally sensitive areas to avoid impacts in populated areas. The construction effects can generally be mitigated, however, the long-term impacts of uncontrolled access in an environmentally sensitive area can be significant. In the case of the preferred route, it is a very high quality wildlife habitat area and care should be taken to minimize and if possible eliminate residual access. With the spread of the use and availability of four-wheel-drive vehicles and all-terrain-vehicles (ATVs), along with intensive horseback recreation, increased public access contributes to the following effects:

- Increased erosion;
- Increase hunting pressure;
- Disturbance of wildlife during critical cycles;

- Mortality of many individuals of species not being hunted;
- Invasive plant species introduction, particularly weeds;
- Increased fire risk; and,
- Littering of garbage and refuse.

The existing right-of-way does not have residual access problems in part due to the private ownership of lands and perhaps difficult terrain consideration. However, there are areas where the current access is limited and any upgrades could pose a significant additional impact. One area is Manuel's Canyon where uncontrolled access during and after construction will be measurable, observable and may become a long term issue if access trails are upgraded to facilitate easy access. The right-of-way in many areas is habitat for snakes, bats, birds and large mammals including Sheep, Deer, Moose, Elk and Bear. Residual access combined with increasing road development, the use of ATV's (particularly 'quads') has significantly affected the ability of people to travel in previously inaccessible areas, causing erosion, additional hunting pressure and disturbance to wildlife.

Mitigation

A key commitment on this project is that there be no new access roads or trails created for construction. Areas without access should be accessed by workers on foot, with portable equipment and/or using a helicopter for access and transport of materials and equipment, including poles.

In some areas where access trails to and along the right-of-way are improved for construction equipment, there will be a decommissioning and reclamation of those trails to their previous state. Trails should not be completely removed as FortisBC requires occasional access for operations and maintenance.

Follow-up inspections for two years after construction will be conducted to determine if construction activities have created new access. If they have, more complex approaches to access control may be undertaken in consultation with landowner representatives. This could include placement of large rocks, or the installation of fences and gates. These measures are expected to eliminate increased access.

Photo 10.8 Off highway trails were noted in some areas such as the shrub steppe grasslands below near the existing right-of-way likely due to traditional use patterns or recreation (by S. Morck).

11.0 VEGETATION RESOURCES

There are two principal bio-geo-climatic zones within the planning area of the project. They are the Very Dry Hot Bunchgrass and Very Dry Hot Ponderosa Pine (Pinus Ponderosa). The two zones are dominated by the shrub steppe grassland and the Ponderosa Pine ecosystems. There are a number of sub elements to these vegetation communities along the right-of-way requiring further delineation for planning as well as a rare plant survey.

The Ponderosa Pine zone, described by Hope et al. (1991a) occurs at low elevations along the very dry valleys of BC Southern Interior Plateau. This zone occurs at elevations above the bunchgrass zone from Penticton to the US border in the Okanagan Valley. It is the warmest and driest forested zone in BC. Forests in the zone are characterized by open park-like stands and can typically have a blue bunch (Agropyron *spitacum*) wheatgrass understory as well as transition understory species from the shrub steppe bunchgrass communities. Douglas fir (*Pseudotsuga menziesii*) is common to moist sites along gullies and streams but only represents a minor component on drier sites. Black cottonwood (*Populus balsamifera*) and water birch (Betula *occidentalis*) may also occur on moist sites.

11.1 Oliver, Vaseux and RG Anderson

All changes to these facilities will be within the existing fencelines. No new or incremental impacts are anticipated to vegetation or wildlife habitat.

11.2 Bentley

Effects
Initial vegetation surveys were conducted in June of 2005. An Antelope brush grassland vegetation association dominates the proposed Bentley Terminal site. A second survey is planned for the site as part of the plant salvage and offset site restoration plan.

The central, lower area at this site is heavily disturbed by a variety of events including cattle and horse grazing (and related disturbances), fire (burned garbage and wood debris) and deposition of garbage.. One fire that was set burned northwest into the less disturbed part of the area. There is also evidence of damage from vehicles. Weeds are common across this part of the site, in particular large patches of knapweed, some Russian thistle, and extensive swards of cheatgrass, along with minor amounts of dalmation toadflax. Much of the remaining area around this central disturbed site is in relatively good condition, except for past grazing disturbances and former plowing activities on the easterly ridge. It is a typical shrub-steppe community which includes the following characteristic species:

- <u>Shrubs</u>: Antelope-brush and big sage, with some rabbit-brush (one relatively large mock orange is present).
- <u>Grasses</u>: needle-and-thread and Sandberg's bluegrass, with minor amounts of red three-awn.

- Forbs (non-grassy herbs): prickly-pear cactus, shaggy daisy, balsamroot (spotty distribution), long-leafed phlox, *Phacelia* spp., brown-eyed Susan, and species of desert parsley.
- Biological crust: mainly steppe moss, indicating the sandy soil conditions, with some pioneering species in disturbed spots.
- Weeds: some knapweed, Russian thistle, and patches of cheatgrass; one hounds-tongue plant was observed.

Photo 11.1 Prickly Pear Cactus (by T. McIntosh)

The pocket of Antelope brush on the site has been fragmented with recent developments in the vicinity, however the western portion is still thought to be an important corridor along the benchland edge overlooking Oliver. Given the highly sensitive nature of these vegetation communities, the development of the station will cause an effect on the local Antelope brush community due to the removal of the vegetation. Based on the analysis in the Dyer report, it is estimated that the removal of this plant community will be equivalent to 'a one time' loss of 2-4 % of the total annual removal of these Antelope brush communities in the South Okanagan. Most of the annual loss is due to residential and agricultural development.

Mitigation

With sensitive vegetation, minimizing activities to reduce disruption and loss of the vegetation communities is important. Vehicles and equipment will be confined to the designated access road or used within the fenced station boundary. A construction limit fence will be installed to ensure that vegetation outside of designated construction areas remains undisturbed.

Fire prevention is also important to preserving the existing vegetation associations and reducing the risk of fire to the community in the area. No burning of timber residue is permitted unless during a low fire hazard period such as the winter. Crews must have fire-fighting equipment on standby (except during winter periods when there is snow), including one Wajax/Backpack water sprayer with each crew. Shovels and grub-hoes/axes must be readily accessible and available for each crew member. A filled 500-gallon water tank or truck must also be readily available and on standby at the station during the fire hazard season.

Erosion control, re-vegetation and weed control requirements have also been included in the mitigation plans (see section 20.1).

A salvage plan will be developed to identify the plants and the best methods of salvage for the plant material from the proposed Bentley Terminal site. This effort will also include discussions with key representatives of the community to identify a host site(s) for mitigative restoration. It is recommended that an area equivalent to or larger than the size of the station (3.5ha) be considered. Receptor restoration sites in the area are expected to include acreages and residences as well as disturbed areas nearby on the reserve.

Recent attempts at salvage by Elements Network, as well as other researchers, demonstrates that mature Antelope brush precludes transplanting because of its deep tap root (i.e. 3-5m). Small seedlings and plants to about 40 cm in height are expected to be transplantable, depending on the soil type. The proposed approach is likely a combination of transplanting smaller shrubs from the site, as well as from growing greenhouse seedlings from seed collected for the purpose. With this in mind, a team will collect seed in the spring of 2008. Other species in the vegetation association are generally easier to transplant. This includes the sages, rabbitbrush, bunch grasses and many of the forbs.

11.3 230kV Transmission Line

Portions of the existing or proposed transmission lines pass through three broad vegetation zones:

1. BGxh1 (Bunchgrass Zone; Okanagan Very Dry Hot Bunchgrass Variant)
2. PPxh1 (Ponderosa Pine Zone; Okanagan Very Dry Hot Ponderosa Pine Variant)
3. IDFxh1 (Interior Douglas-Fir Zone; Okanagan Very Dry Hot Interior Douglas-Fir Variant)

Most of the southern portions of the existing transmission line are in the BGxh1 whereas the northern sections are in a mix of the BGxh1 and PPxh1. The proposed corridor passes principally through PPxh1 and IDFxh1. The following site series for each variant were encountered at some point during field work (from Haney and Iverson 2005. Field staff were walking the existing right-of-way and the terrain was often highly variable over short distances, so accurate mapping of the site series polygons beyond the right-of-way for the site series is not possible at this time.

BGxh1:

Antelope-brush – Needle and thread grass
Trembling aspen – common snowberry
Oregon grape – Saskatoon Gully
Ponderosa pine – Antelope-brush – Red three-awn
Ponderosa pine – Nootka rose – Poison ivy
Ponderosa pine – Sumac
Ponderosa pine – Bluebunch wheatgrass
Antelope-brush – Selaginella
Selaginella – Bluebunch wheatgrass rock outcrop
Saskatoon – Mock orange talus
Big sagebrush – Bluebunch wheatgrass
Bluebunch wheatgrass – Selaginella

1. PPxh1:

   Antelope-brush – Needle and thread grass
   Ponderosa pine – Antelope-brush – Red three-awn
   Trembling aspen – Common snowberry – Kentucky bluegrass
   Douglas-fir / Ponderosa pine – Snowberry – Spirea
   Ponderosa pine - Black cottonwood – Snowberry riparian
   Ponderosa pine – Bluebunch wheatgrass – Cheatgrass
   Ponderosa pine – Bluebunch wheatgrass – Idaho fescue
   Antelope-brush – Selaginella
   Selaginella – Bluebunch wheatgrass rock outcrop
   Saskatoon – Mock orange talus
   Big sagebrush – Bluebunch wheatgrass
   Bluebunch wheatgrass – Balsamroot

2. IDFxh1:

   Kentucky bluegrass – Stiff needlegrass
   Douglas-fir and ponderosa pine – Pinegrass
   Douglas-fir and ponderosa pine – Snowberry – Spirea
   Douglas-fir and ponderosa pine – Bluebunch wheatgrass - Pinegrass
   Douglas-fir and ponderosa pine – Bluebunch wheatgrass – Balsamroot
   Antelope-brush – Selaginella
   Selaginella – Bluebunch wheatgrass rock outcrop
   Saskatoon – Mock orange talus
   Bluebunch wheatgrass – Balsamroot

3. In addition, the following non-vegetated or sparsely vegetated units were also encountered (these units are common to all variants):

   Alkaline pond
   Cutbank
   Cultivated field
   Cliff
   River
   Rock outcrop
   Talus

Rare Plant Communities

The Conservation Data Centre (CDC) has derived a number of Red and Blue Listed Ecological Communities, a number of which are present along the existing corridor. The following communities that were observed during field work are Red or Blue listed by CDC or probably would be listed if considered by CDC (potential additions to the CDC list are noted with a '!'):

1. BGxh1:

   Antelope-brush – Needle and thread grass (Red Listed; Fig. 2)

Ponderosa pine – Antelope-brush – Red three-awn (Red Listed !)
Ponderosa pine – Nootka rose – Poison ivy (Red Listed !)
Ponderosa pine – Bluebunch wheatgrass (Blue Listed)
Antelope-brush – Selaginella (Red Listed !)
Big sagebrush – Bluebunch wheatgrass (Red Listed)

Photo 11.2 Antelope brush in bloom (from an Antelope brush needle and thread grass community) at Vaseux Lake Terminal Station. (By S. Morck)

2. PPxh1:

   Antelope-brush – Needle and thread grass (Red Listed; Fig. 3)
   Ponderosa pine – Antelope-brush – Red three-awn (Red Listed !)
   Ponderosa pine – Bluebunch wheatgrass – Cheatgrass (Red Listed)
   Ponderosa pine – Bluebunch wheatgrass – Idaho fescue (Blue Listed)
   Antelope-brush – Selaginella (Red Listed !)
   Big sagebrush – Bluebunch wheatgrass (Red Listed)
   Bluebunch wheatgrass – Balsamroot (Red Listed)

3. IDFxh1:

   Douglas-fir and ponderosa pine – Bluebunch wheatgrass - Pinegrass (Blue Listed)
   Douglas-fir and ponderosa pine – Bluebunch wheatgrass – Balsamroot (Blue Listed)
   Bluebunch wheatgrass – Balsamroot (Red Listed)

4. CDC also lists a plant community mainly found in more northern portions of the province in the PPxh2 variant, but was found alongside the existing transmission line east of Vaseux Lake (two Red Listed plant species listed in the next section were also found there). This community is:

   Alkali saltgrass - Nuttall's alkaligrass (Red Listed; Fig. 4)

Rare Plants

Five rare plants, four vascular plants and one moss, were observed along the existing transmission corridor during field work. All of these species were restricted to one site or a few sites in the same area, and all of the species, except for the cushion fleabane, are off to the side of the right-of-way. These species include two CDC Red Listed vascular plants, Hutchinsia (*Hutchinsia procumbens*), and Olney's bulrush (*Schoenoplectus americanus*), and two CDC Blue Listed vascular plants, cushion fleabane (*Erigeron poliospermus* var. *poliospermus*) and obscure cryptantha (*Cryptantha ambigua*). In addition to the vascular plants, two small patches of the CDC Red Listed Columbian carpet moss (*Bryoerythrophyllum columbianum*) were observed. The Columbian carpet moss is also listed as Special Concern by the Committee on the Status of Endangered Wildlife in Canada (COSEWIC; www.cosewic.gc.ca). It has been included on Schedule 1 of the Species at risk Act (www.speciesatrisk.gc.ca).

Table 11.1 Details on populations of rare plants observed during OTR field work, May 2007

Species	Elevation	Notes
Hutchinsia	-	**Red Listed** by CDC; restricted to margins of alkaline depressions; it was found adjacent to a series of alkaline ponds east of Vaseux Lake along the existing transmission line (Fig. 4); 6 plants on vegetated salt crust on shore of pond with *Distichlis spicata*, *Critesion brachyantherum*, and *Bromus tectorum*.
Olney's bulrush	-	**Red Listed** by CDC; restricted to margins of alkaline depressions; it was found adjacent to a series of alkaline ponds east of Vaseux Lake along the existing transmission line (Fig. 4); sporadic along edge of ponds with other rushes and sedges.
Columbian carpet moss	347m	**Red Listed** by CDC; restricted to shrub steppe communities as part of a mature biological crust; observed near Oliver on OIB land along the existing transmission line; with *Poa sandbergii*, *Phlox longifolia*, and *Bromus tectorum*.
Cushion fleabane (Photo11.1)	637m 666m 666m	**Blue Listed** by CDC; restricted to rocky outcrop knobs in shrub-steppe habitats; it was found in heavily livestock grazed habitats east of Vaseux Lake along the existing transmission line; WP 243: 1 plant on rocky sloped knoll with *Selaginella wallacei*, *Erigeron linearis*, *Bromus tectorum*, and *Potentilla recta*; WP 244: 1 plant on edge of rocky knoll with *Selaginella wallacei*, *Erigeron linearis*, and *Bromus tectorum*; WP 245: 12 plants in a 2 X 3m patch on rocky flat with *Selaginella wallacei*, *Erigeron linearis*, *Bromus tectorum*, and *Potentilla recta*.
Obscure cryptantha	-	**Blue Listed** by CDC; found in shrub-steppe habitats; it was found in heavily grazed habitats near Vaseux Lake along the existing transmission line; about 1000 individuals in weed community of burn, on ridge crest, sandy loam soil, with *Sporobolus cryptandrus*, *Bromus mollis*, *B. tectorum*, *Filago arvensis*, *Sisymbrium altissimum*, and *Collinsia parviflora*; CDC (2006) noted that "this species is not as rare and threatened as previously thought in south Okanagan and Similkameen valleys. It appears to tolerate over-grazed landscapes since it grows in disturbed, exposed soils. Further down-listing is plausible".

Photo 11.3

Cushion Fleabane, a rare plant observed near the right of way. (Photo by T. McIntosh)

Invasive Species

The observations of the field study participants, in particular, the botanist assert that overall, the presence of weeds along the existing right-of-way are generally low and of limited concern. There were infestations noted of Diffuse knapweed, (*Centaurea diffusea)* and Sulfur cinquefoil (*Pontentilla recta*) along the right-of-way on grazing lands near Shuttleworth Creek. Heavy grazing pressure north of Shuttleworth creek is considered an instrumental factor in the presence of the weeds and also contributes to some degree south of Shuttleworth Creek, although the area to the south was also impacted by the Okanagan Falls fire a few years ago. Other weed species occur incidentally and in small numbers along the right-of-way. In all cases where the weeds were observed, they are also present on adjacent land. It should be noted there is no evidence that suggests the presence of weeds is due to right-of-way activities. Most noxious weeds such as knapweed occur throughout the region and their presence and spread have been are largely attributed to past grazing management practices.

Effects

Impacts of powerline construction are related to the removal of vegetation on the right-of-way which may provide habitat for birds, small mammals such as squirrels as well as some bat species. Older mature trees in this project may be hazard trees adjacent to the right of way and are likely to have wildlife habitat values. Another impact of powerline construction through an area is the creation of a linear access corridor for off road vehicles and horses into areas where there was limited or no prior access. This access can contribute to increased recreational, hunting and fishing pressure, disturbance to wildlife during critical life cycle periods and erosion. On average, it is expected that the width of the existing right of way would be approximately 40 m. In areas where the powerline will be strung from one high point to another, there will be little disturbance in the valley bottom.

The modifications to the three existing stations (RG Anderson, Oliver and Vaseux) will have little impact on the vegetation communities adjacent to the facilities unless there is expansion outside the existing footprint. By contrast, the Bentley site will affect a vegetation community, causing the loss of approximately 3.5 ha of shrub steppe grassland. The effect of this loss is a reduction in habitat for bats, small mammals, deer, coyote and Behr's/California hairstreak.

Disturbance of the land can also cause the loss of topsoil due to erosion and create a site where weeds can be established. Both factors affect productivity and in the case of significant erosion, capability can also be compromised.

There is general overview knowledge and high level mapping of the vegetation communities along the transmission line route available. However, this is not in enough detail for impact assessment and protection planning.

The Okanagan Valley has had a long history of disturbance and many of its indigenous ecosystems have been greatly reduced and modified by disturbance and subsequent invasive alien plant species. Few unaltered habitats remain, especially at lower elevations in the valley, in particular in some of the areas where the existing transmission line exists. However, during field work, it was observed that the most widespread and often extensive disturbance along the OTR corridor was by livestock, particularly cattle but also, in some areas, horses. In the most disturbed areas, alien weeds dominate the landscape. However, disturbance from the earlier construction of the existing transmission line and from associated maintenance activities is minimal and localized. This should remain a main goal of future transmission line construction.

Many of the existing plant communities, especially along the existing route, have been recognized as threatened or endangered. For example, extensive portions of the existing route, especially from Oliver to Vaseux Creek, but with spotty occurrence northwards, are characterized by antelope-brush communities. Communities that contain antelope-brush are red listed or blue listed and considered globally imperiled mainly because of their limited world distribution and ongoing and substantial decreases in extent and quality, in particular as related to urbanization and agricultural development. Across its Okanagan distribution, about 2% of the antelope-brush community is presently lost each year.

According to Dyer and Lea (2003), antelope-brush plant communities support eighty-eight provincially listed Species at risk, of which seventeen are federally listed by COSEWIC. Most of the remaining antelope-brush ecosystems have been heavily disturbed and subsequently invaded by noxious, non-native weeds, in particular species of knapweed, silvery cinquefoil, and cheatgrass.

Although a number of other Red or Blue Listed plant communities were observed along the route, their areal extent is minor in comparison to the antelope-brush communities. All of these listed communities are off to the side of the right-of-way or in gullies or draws where disturbance is unlikely. Five rare plants, three Red Listed species and two Blue Listed species, were observed along the existing transmission corridor during field work. All of these species have a very limited distribution and only one, the cushion fleabane, is found in an area where construction activities will be a direct threat.

Mitigation

Mitigation measures to protect vegetation resources along the 230kV transmission lines include the implementation of a weed management plan to control invasive species. In addition to the long term development related losses of the sensitive vegetation communities in the south Okanagan, arguably invasive species are one of the most significant threats to the remaining high quality desert vegetation communities. There are a number of standard practices which will be implemented on this project to prevent infestations of invasive plant species with particular emphasis on 'noxious weeds' (See also section 20.1) and weeds that are locally a concern for these vegetation communities. They include:

- Implement a pre-emptive weed control strategy in 2008 along the right-of-way;
- Inspection of construction vehicles and equipment;
- Power washing and hand cleaning of vehicles and equipment;
- Monitoring of transition areas between infested and clean areas (may include portable wash sites along the route);
- Prompt revegetation of disturbed areas; and
- Weed inspections and control 2 times per year for 2 years after construction.

Although the timing of the botanical survey was nearly ideal, an early spring survey will be completed in a few sites in 2008 to ensure there are no early emergent rare plants. This will be in conjunction with the pole location information which will be developed in the fall of 2007. Pole location will also be vetted against the locations of the rare plants identified. Where possible, any pole locations or access trails that would impact the rare plants will be relocated in consultation with the engineering team. Should safety or design constraints preclude pole relocation, the environmental management plan would consider other alternatives including salvage and relocation of the rare plant(s) if appropriate.

Special care will be taken to avoid the alkaline flats east of Vaseux Lake (See photo below) because of the number of rare species present there. Either flagging or temporary exclusion fencing will be used. Flagging off areas with rare plants (without specifically identifying the plant within the area) will also be used to ensure that there is a zone without disturbance hosting these plants. As rare plants are likely to require a unique ecosystem and microclimate around them, it is important that the integrity of the vegetation community in the immediate vicinity (i.e. up to 30m) be maintained and protected from significant disturbance.

Photo 11.4 Alkaline Flats east of Vaseux Lake (Photo by T. McIntosh)

Residual and Cumulative Effects

The loss of the antelope brush grassland vegetation associations at the Bentley site is a concern. This impact is discussed relative to the overall changes in this ecosystem, both on the reserve and throughout the valley.

The Antelope brush ecosystem at the Bentley terminal station varies from good to very degraded or disturbed. The removal of vegetation at Bentley results in the reduction of about 1.5 ha of good quality antelope brush grassland vegetation community and about 2.0 ha of low quality habitat that has been disturbed and degraded. There are 3.5 ha of the antelope brush vegetation community in total at the Bentley site that would be removed. This removal is equivalent to only 2.5 to 5.0 per cent of the annual reduction. However, it should be noted that, unlike residential encroachment and the wine industry, this is not an annual recurring loss.

Historically and more recently, a wide range of development projects in the local area have caused the removal of a large amount of the Antelope brush ecosystem. The development of orchards and agriculture have removed vast tracts of Antelope brush grassland vegetation communities over the last 75 years, particularly those on the west side of the valley. The construction of the irrigation canal now owned by the Town of Oliver contributed to significant orchard expansion in the 1950's. The Town of Oliver remained a small town with a mining and agricultural heritage for many years. Over the last five years Oliver has been experiencing significant residential growth along with more modest commercial and business growth. It has not seen the significant resort and tourism growth that Osoyoos and communities to the north have experienced. The following table shows estimates of some examples of the reduction in the sensitive Antelope brush grassland ecosystem. Data estimates are based on publicly available information and interpretation of maps.

Table 11.2 Summary of cumulative losses of Antelope Brush

Project Name	Estimated ha of AB habitat removed in the year of the project	% Equivalent of the Average Annual Loss (134 Ha/yr) in the year of the project	Comments
Recent Developments			
Nk'Mip Vineyards	**100**	**74.6**	**Includes vineyards in the central and southern part of the reserve.**
FortisBC Vaseux Lake Terminal Station	**6.25**	**4.7**	**A project with BC Hydro to increase the power supply in the valley as a result of load shedding**
Vineyards	**100**	**74.6**	**Some vineyards are converted orchards. The orchards originally were responsible for the habitat removal.**
Oliver Area and Country Residential Expansion	**50**	**37.3**	
Vincor Winery & Warehouse	**6**	**4.5**	
Kinder Morgan (Terasen Gas) Southern Crossing Pipeline	**15**	**11.2**	**Right-of-way is in poor condition dominated by invasive weed species.**
Proposed FortisBC 63kV Transmission Line	**0.03**	**0.002**	**Area from PI 13 to Bentley** **Total along the entire line from poles is expected to be about 0.15 ha.**
Known or Probable Future Developments			
Development project near Okanagan Falls	**xx**	**xx**	**Significant loss** **Data needs to be acquired.**
Proposed FortisBC Bentley Terminal Station & Access Road	**3.5**	**2.6**	
Vincor Vineyard Expansion	**20-100ha/yr**	**14.9 to 74.6**	**Variable range depending on the approval and leasing process.**

OIB Business Park in the Northwest Quadrant	**50**	**37.3**	**Most of the proposed development is on poor and lower quality AB grasslands**
Proposed FortisBC 230 Expansion	**.15**	**1.1**	**Bentley terminal station to Penticton. Number is acreage on the reserve. Depending on routing to the north, there may be more AB habitat affected.**

There are a number of historical activities that affected the Antelope brush vegetation community in the past. It was not possible to make a confident estimate of the aerial extent of the impacts, however based on scattered data, the following activities in the Oliver region have probably contributed to more than 75% of the reduction of this valued vegetation community over the past century:

- Agriculture and orchard development over the last 75 years;
- Expansion of the town of Oliver;
- Country residential development;
- Highway 97 and the McKinney Road; and
- Ecosystem encroachment from Ponderosa Pine vegetation associations and invasive weed species

Impact
The potential residual or cumulative effects that arise from this change are:

- Relocation of wildlife to other foraging habitats for several species;
- Reduction of population numbers of several wildlife species;
- Alienation and fragmentation of traditional corridors and habitat; and
- Reduction in nesting and foraging habitat.

Mitigation
It has been proposed by the project's proponents to create an offset and re-establish the same type of vegetation communities at other locations on the reserve lands as was proposed and planned for the Nk'Mip site. The offset philosophy for an ecosystem under pressure has merit, providing that the proponents have an understanding of the habitats in question and a commitment to see it through as it is likely to take more time than the construction of the project as many project proponents typically move on to the next project. This approach in addition to firm conservation initiatives may help to assure that a minimum amount of habitat is available for a sustainable diverse ecosystem. In addition it assumes that that the short term impacts and habitat reduction are acceptable providing the offsets are successful in the near term (i.e. 2-5 years).

To directly offset the contribution of this project to potential cumulative effects above, sites will be selected that will promulgate and improve habitat in the general locale of the Bentley Terminal Station as well as on the OIB Reserve lands. Due to the larger nature of the offset required for this site, it is expected that it would be a combination of:

- Expansion of the xeriscape landscaping pilot project providing there is continued demand for it;

- Enhancements to the disturbed sections of the habitat leave areas on the Benchland adjacent to the station; and
- Restoration and enhancements of areas on reserve lands that the community wishes to keep in a natural state which will be identified and approved in consultation with the leadership of the OIB.

Details of implementation for this offset program will be refined once the project approval for the Bentley Terminal Station has been obtained from the BCUC as this application is part of another expansion project.

Photo 11.5 High quality habitat with few invasive species on the right-of-way in the Vaseux Protected area south of Vaseux Creek Canyon. View is to south in Manuel's Canyon (by T. McIntosh).

12.0 ARCHAEOLOGICAL AND HERITAGE RESOURCES

This region is rich with culturally significant archaeological sites and artifacts. Many are associated with the First Nations and pre-date the arrival of Europeans in the Penticton area around 1865. Previous assessments have identified sites in the vicinity of the proposed route, for example, there are Aboriginal pictographs adjacent to the existing FortisBC transmission line.

NOTE: 'Appendix 1 – FortisBC Okanagan Transmission Reinforcement Oliver to Penticton, B.C. Archaeological Impact Assessment Heritage Inspection Permit 2007-147' provides more detail on archaeological resources and heritage resources for the immediate area surrounding the proposed project.

The preparation of a right-of-way for the installation of a transmission line varies in the potential to impact historical and cultural resources. For rights-of-way with very little surface disturbance, except at pole locations, the potential is low. Rights-of-way with significance disturbance from clearing and access road preparation tend to have a much higher potential to impact historical and cultural resources. Installation of pole anchors and grading of access roads may involve surface disturbance too and right-of-way clearing which may impact culturally modified trees. Given this, the surface disturbance during the construction in 1963 likely did not appear to disturb historical resources on the existing right-of-way. There remains a potential for resources to still be present on undisturbed portions of the right-of-way. The amount of new clearing and surface disturbance will be minimal confined to the pole locations limiting the potential to disturb resources.

The focus of much of the assessment work has been on First Nations issues, primarily those of the Okanagan First Nations. The Okanagan were hunters, gatherers, and fishers who lived a nomadic existence in small family groups from early spring to late autumn, followed by winter residency at permanent villages in major river valleys or around lakes. The seasonal availability and abundance of food resources primarily dictated the annual cycle of subsistence activities and settlement locations. Low-elevation habitats (e.g., bottoms of river valleys and lake margins) would have been utilized for fishing, and as locations both for winter villages and base camps for hunting and gathering of plant foods in adjacent mid-elevation environments.

Photo 12.1
Pictograph site along the right-of-way (by. I. Cameron)

It is important to note that not all aspects of traditional Okanagan culture have been recorded in the anthropological and historical literature. Additional knowledge of traditional culture and life ways exists in contemporary Okanagan communities. Also, Okanagan culture underwent significant changes as a result of contact with Europeans, and some aspects of traditional culture reported in the literature may not be an accurate representation of Okanagan culture prior to European contact.

The Okanagan communities in the project area are the Penticton Indian Band and the Osoyoos Indian Band (see sketch below). The tribal council is the Okanagan Nation Alliance All three groups have expressed an interest in the project (See Section 18 for details on First Nations Interests).

The European settlement period in the south Okanagan started in 1865 with the arrival of Tom Ellis, from England, who established the community of Penticton. He planned the formulation of the new town. In 1892, a town site was laid out around the Smith Street area. The street is now called Front Street, home to many unique stores and boutiques. By 1907, Penticton had grown to the size of 600 residents, and was officially recognized by the British Columbia Government as a municipal district. The building of the Kettle Valley Railroad increased the population to around 1500 people. By 1921 the city was 4,000, but it took until 1948 for Penticton to gain City Status.

Settlement in the Oliver area was somewhat later. The first European activity in the area was gold mining, with the staking of the first claim in 1887, and the establishment of the Town of Fairview in 1890 on the benches above Oliver to the west. Folklore has it that a one armed gold prospector named Reid discovered gold in this area, and the Town of Fairview (located just outside what is now known as Oliver) became home to gold miners, ranchers and businessmen. Fairview was one of B.C.'s largest towns at the turn of the century. The gold rush died and so did Fairview, with Oliver springing up in its wake. Fairview's life was short; the post office was closed in 1926. One of the few remaining buildings from the town, the Fairview Jail, has been moved to the Oliver museum site. The original town site of Oliver was surveyed in 1921. Completed in 1923, the concrete irrigation canal (locally known as "the ditch") soon transformed this desert region into lush orchards and farms, many of which are still in existence today sharing land with the viticulture industry.

Effects

A. Transmission Line

An Archaeological Overview Assessment (Arcas 2007) and an Archaeological Impact Assessment (Heritage Inspection Permit #2007-147) has been completed by Arcas Consulting Archeologists for the project (July 2007). The assessment determined that four known archaeological sites exist within the existing and proposed route that could be adversely impacted by project activities. These sites are:

- DhQv-30: pictograph and rock shelter- High Significance
- DhQv-98: petroform site consisting of two circular rock mounds – Moderate Significance

- DiQv-24: pictograph – High Significance
- DiQv-25: pictograph – High Significance

Photo 12.2 Petroform site adjacent to the right-of-way (by I. Cameron).

Another 6 archaeological sites are within 150 metres of the existing right-of-way however they should not be impacted by project activities.

There is a low to moderate potential for the discovery of unknown archaeological and historical resources along the existing and preferred transmission line route.

The Potential Impact Rating from construction activities associated with the new powerline is High for the sites DhQv-30, DhQv-98, DiQv-24 and DiQv-25. For the remaining transmission line routes and stations the Potential Impact Rating is Low to Moderate since there have been only 10 sites identified by Arcas along the existing powerline right-of-way or within 150 metres of the right-of-way.

B. Bentley Terminal Station

An archaeological impact assessment has been completed by Arcas Consulting Archeologists for the new Bentley Terminal station site (August 2005). No archaeological resources were identified during this assessment.

There is the potential for the discovery of unknown archaeological and historical resources during the construction of the project.

Potential Impact Rating is Low for this site.

Note: Appendix 1 contains a copy of the Archaeological Impact Assessment.

Mitigation

To avoid any adverse impact to the 4 identified high value archaeological sites and to ensure that high potential areas around the sites are protected:

- FortisBC will monitor any construction activities within 50 metres by either an archaeologist or archaeologically-trained First Nations' representatives from the Penticton Indian Band or Osoyoos Indian Band;
- Construction activities will not be allowed to damage or impact any of these sites unless a site alteration permit is obtained by FortisBC;
- Sites will be flagged and cordoned off during construction;
- A notification system will be implemented in the event any resources are discovered during construction activities;
- Should any archaeological or historical resources be discovered during any construction activity, work in that vicinity will be halted and the site will be inspected by an archaeologist. Work will not resume until authorized by the archaeologist, a designated First Nations representative and the Construction Project Manager.
- A qualified archaeologist will conduct a post construction evaluation of the 4 sites to verify that construction activities did not result in adverse effects.

13.0 LAND USE

The land uses along the vicinity of the routes and adjacent to the stations are varied from park and natural areas to agriculture and residential. There are several locations where residences are located close to project facilities. The table below summarizes the residential considerations near the proposed facilities.

Table 13.1 Residential Developments near existing and proposed facilities.

Facility	Residences/Residential Community
RG Anderson	Penticton city residences are immediately adjacent neighbours
Oliver	Manufactured (Mobile) home park and the east side of the Town of Oliver.
Vaseux Lake Terminal Station	3 primary residences within 300m. Country Pines Estates and Deer Park in Gallagher Lake about 500 m
Bentley Terminal Station	A residence to the Northeast of the site is about 150m away. There is a Mobile (Manufactured) home park about 150 m west on OIB Land. The Town of Oliver is about 400m west.
230kV Transmission Line Wolfcub Creek X-ing at the McKinney Road	Country residences along the road nearby.
230kV Transmission Line from Vaseux	Country Residential about 350m south.
230kV Transmission Line Near McLean Ck	Acreages/Country Residential some within 150m
230kV Transmission Line Heritage Hills area north of Okanagan Falls	Acreages/Country Residential some within 150m
230kV Transmission Line Skaha Lake area	Acreages/Country Residential
230kV Transmission Line Penticton	City Residential
230kV Upland Alternate Route	No residences except at the Penticton terminus area.

13.1 Facility Sites: Oliver, Vaseux and RG Anderson

The Oliver Station in Oliver is located in a community where land is used as an office (by FortisBC), a golf course and a residential community.

The RG Anderson Station in the city of Penticton is located adjacent to land used as a residential community, commercial facilities and a gravel operation.

The Vaseux Lake Terminal Station near the community of Gallagher is surrounded by land used for country residential purposes, as a natural area (Nature Trust), a protected area (BC Parks), as an orchard and as a gravel extraction and processing operation.

No new impacts to land use are forecast for theses three sites. Stations and terminal stations result in the loss of use of land for other purposes but are necessary service facilities required for the community infrastructure. Occasionally sites may be decommissioned and allocated a new use, however this is unlikely for any of these sites as they are planned to be part of the continuing community infrastructure for the future.

13.2 Facility Sites: Bentley

13.2.1 Residential Areas

Effects

The Bentley Terminal site is close to residential areas, both country residential and the Town of Oliver. The nearest residences are in a mobile home park in Oliver (on the OIB reserve) 150 m west of the southwest corner of the Terminal station boundary as well as one about 150 m north of the north boundary. In addition, there are many residences within a two-km radius because of country residential development and the proximity to the Town of Oliver.

Large transmission terminal stations may be sited in both urban and country areas, depending on criteria considered for site selection. Primary long-term concerns of residents near stations are sound levels and visual impacts, which are addressed separately. Facility construction also raises concerns traffic and dust during construction. Dust can be a nuisance to residents but can also affect orchards and vineyards by coating leaves and reducing the photosynthetic capabilities of the plant.
Increased traffic is a safety concern in roads around residential areas and schools as well as at entrance locations on and off main roads and thoroughfares.

Mitigation

An ambient sound level survey has been completed and will be used in the design specifications for the terminal stations. For a project of this scope, there is a potential for considerable traffic during peak periods of construction, likely necessitating a traffic management and parking plan. In addition, dust abatement measures will be incorporated into the requirements of the key contractors working on the construction project.

13.2.2 Agriculture and Soil Capability

Effects

The site is located on residual land adjacent to vineyards on a deep soiled shrub-steppe vegetation association. This plant community shows significant disturbance, weed encroachment, die-off and some community or vineyard refuse dumping. The nearest agricultural land are vineyards abutting the east and south sides of the site. The soils on the site are suitable for forage crops, frost tolerant fruit crops and pasture (developed or native grasses). It is not suitable for a vineyard because it is in a low-lying frost pocket. The impact to agriculture is a restriction on future use, however, communication with the OIB's leadership indicates this site is not identified for future agricultural expansion, probably due to the frost pocket. The total amount of land to be removed is 3.50 ha, less than 1.0 % of the annual removal of land from agriculture in the valley.

Mitigation

No mitigation is planned with respect to agriculture and soil capability.

13.2.3 Commercial and Industrial

The Bentley site is about 150 m east of some portions of the Desert Canyon Golf Course, an OIB owned business. In addition the FortisBC Oliver offices and the Oliver station are about 250 m and 150 m west of Bentley respectively.

Effects

Generally commercial and light industrial areas are compatible with electrical stations and transmission lines. These may be high volume customers who will benefit from security of supply and prevention of overload during peak demand periods. Development of new facilities may result in a slight increase in power rates. Construction activities tend to provide contracting and financial benefits to local service and supply businesses in the community.

Overall, the facility is a benefit to commercial and industrial users.

Mitigation

No mitigation is required.

13.2.4 Mineral Resources and Mining Activity

Effects

There are no coal tenures in the area (South Okanagan). There are a number of mineral leases around the Town of Oliver. In addition, placer staking is not permitted in this area. There are no current operating mines, quarries or prospecting/development projects in this area (Ministry of Energy, Mines and Petroleum Resources).

The Bentley Terminal site and the adjacent area have very good potential for sand and gravel processing and production. The aggregate potential for this area is rated as 'primary.' This use, however, is not forecast for this site. Sand and gravel production occurs in many areas in the South Okanagan and can be readily produced throughout the region. Much of the lowlands areas of the South Okanagan are rated with primary and secondary aggregate potential. As a result, it is unlikely this source would ever be developed based on the availability in the region. No impact to sand and gravel production is expected.

Mitigation

No mitigation is required with respect to mineral resources and mining activity.

13.2.5 Recreation

Effects

The site is situated in an area where there is limited recreational use or potential use. Impact to recreation is expected to be Negligible.

Mitigation

No mitigation is required with respect to recreation.

13.2.6 Visual Resources

Effects

The site is situated in an area with modest country residential development and is adjacent to Oliver, with its high-density residential development that may place a value on the visual setting in the area. Down the slope to the west is an existing FortisBC station. The proposed Bentley Terminal site is on a benchland terrace above the manufactured home park. The steep angle of the hill rising to the site may reduce the visual impact to the closest residences because it interrupts the line of site to the station. Many residents further west in Oliver will likely see the station in their view, depending on the orientation of their residences. Station design, final placement and height of the structures and equipment on site will influence how the station is seen.

Country residents to the north of the site appear to have been built with a valley view orientation to the west and as a result have a limited view to the south. To date there have been no significant concerns about visual resources relating to the proposed Bentley Terminal station.

Initial site selection included the consideration of the effects of the project on the visual landscape relative to the other sites considered for the station. Input indicated high value visual landscape was more important two of the other locations and was a factor in site selection. The impact of the site on the visual landscape is considered long term and considered significant.

Photo 13.1 Rendering of the Bentley Terminal Station

Mitigation

Preliminary design includes arrangement of the higher voltage taller equipment further east away from the bench edge. In addition, the 63kV section of the station is proposed with compact electrical bus design which would occupy less footprint and is lower height than standard bus work. The slope at the site and the apparent need for grading or terracing may become considerations relative to site visibility and site elevations could be established that would reduce the visibility of some sections of the site if the cost of grading is not onerous.

13.2.7 Sound Levels

Effects

One area of concern is the potential for increased sound levels from the Bentley Terminal station. The nearest existing residence is 150 m west from the southwest corner of the proposed station. Larger transformers, reactors and other equipment at a station of this size can be expected to produce audible low frequency sound.

A 24-hour ambient sound level assessment has been completed and the data on the area's background sound levels will be used for design of the station. Acoustic controls will be designed and incorporated into the equipment and contractor specifications if it is determined to be required during the design phase. Based on experience in similar settings, the town and highway sounds will dominate the sound landscape during the day and the night. Daytime increases in activity from adjacent developments, agricultural operations and other business and commercial activity within two km will contribute significantly to the sound levels in the area, exceeding the station fence line levels. Uncontrolled excess sound in the environment is considered unpleasant and a nuisance to neighbours.

Mitigation

The use of heavy equipment for construction will be restricted to operation between 6:00 am and 10:00 pm Monday to Friday and 8:00 am to 10:00 pm on Saturdays and Sundays. This is similar to bylaws used by the Regional District of Okanagan Similkameen. Normal construction hours on a project of this scope would likely be 7:00 am to 5:00 pm, however, the region's high heat in the summer could require early morning starts to avoid the heat of the afternoon for safety reasons. Project delays could affect this schedule, extending hours in the morning and evening.

The station design will include acoustical considerations and controls, so that sound levels do not exceed 45dBA at the station fence-line. This will ensure that sound levels are about 40dBA or less at the nearest residences. This is expected to be below the current ambient sound levels at residences in the surrounding area. Station design includes acoustical controls. Retrofitting equipment with sound reducing systems and materials may need to be undertaken if predictions are exceeded.

A follow-up sound level assessment will be conducted after the initiation of station operation to ensure compliance with design standards.

13.2.8 Protected Areas

Effects

The proposed Bentley Terminal site is not directly adjacent to or located on federally, provincially or locally protected areas. However, it is partially within a proposed wildlife conservation corridor within the Northwest Sector land use plan for the OIB (TRUE 2005) on the west side.

Mitigation

There are no protected or conservation areas and mitigation is not required.

13.2.9 Forest Resources and Forestry Operations

Effects

There are no forest resources or forestry operations at or near the site. There will be no impacts to forest resources or operations.

Mitigation

Mitigation is not required.

13.2.10 Terrain Conditions

Effects

The Bentley Terminal site has been chosen after site visits and geotechnical assessments which have confirmed the suitability of the site. The adjacent slopes to the west of the proposed site appear stable and show no evidence of recent mass movement or slumping. Erosion potential at the site is considered low, due to the shallow gradient and the trapping effect of the depressional area. There is still a small risk of erosion from a sudden or unusual rainfall event during construction, carrying soil and sediment from the site to adjacent habitat.

There is a modest slope down and across the site from North to South which may necessitate significant grading and back-sloping beyond the station footprint. This has the potential to significantly impact additional vegetation resources as well as the wildlife utilizing the habitat. The impact due to terrain conditions is expected to be moderate subject to detailed survey and design considerations.

Mitigation

A construction fence will be erected using a geotextile capable of trapping and retaining eroding sediments and of slowing water speed across bare ground to reduce the potential for erosion sediments escaping onto adjoining property.

A site survey will be completed during the design and EMP phase to determine the extent of grading and back-sloping required. If the amount of grading is significant, measures such as terracing or using tiers in the station design will be considered relative to viewscapes and the need to minimize the footprint in sensitive adjacent land.

The final site will be graded to a very shallow slope for drainage then packed and graveled and packed again with a layer of pit run topped with crushed washed gravel which is very erosion resistant.

13.3 230 kV Transmission Line

13.3.1 Residential Areas

Effects

The 230kV transmission line would traverse the lowland grasslands and low-elevation highland of the Okanagan Valley in the OIB reserve lands in close proximity to many residences on the existing right-of-way.

Table 13.2 Residential development along the transmission line corridor

Facility Section	Residences/Residential Community
230kV Transmission Line Wolfcub Creek X-ing at the McKinney Road	Country residences along the road some within 150m.
230kV Transmission Line from Vaseux	Country Residential about 350m south.
230kV Transmission Line Near McLean Ck	Acreages/Country Residential some within 150m
230kV Transmission Line Heritage Hills area north of Okanagan Falls	Acreages/Country Residential some within 150m
230kV Transmission Line Skaha Lake area	Acreages/Country Residential
230kV Transmission Line Penticton	City Residential

New transmission lines are frequently sited in rural and back country areas to reduce the visual impacts to residents if suitably balanced with environmental, safety, engineering and operational considerations. Long term concerns from residents near transmission lines are sound levels, impacts to agricultural operations and the effect on the visual resources. This facility is however an upgrade to an existing corridor, and initial analysis shows that it is environmentally preferable to use an existing corridor through the residential areas for reasons outlined in the discussion on route selection.

Mitigation

The route selection process for this project included consideration of proximity to residences based on community input. The initial route proposed during community consultation was the existing corridor located in proximity to a number of residences. Subsequent revisions have identified a potential route further east through the low elevation ponderosa pine mountainous area east of Okanagan Falls and Skaha Lake which is set back from the residences. A more detailed discussion of route selection is contained in Section 5.0.

13.3.2 Agriculture and Soil Capability

Effects

The existing right-of-way crosses land or is adjacent to land with agricultural production or potential. The land along the route has the potential depending on soils and microclimatic regimes for a range of agricultural activities that include grazing and production of forage crops, orchards and vineyards. Much of the focus in recent years, in the South Okanagan, has been on the development of vineyards. Along the existing route some of the shrub-steppe grasslands and orchards offer the right soils, aspect and micro climate for grape production.

Between Oliver and Vaseux, the transmission line would cross sections of the OIB on Manuel's Flats and the lower section of Manuel's canyon which are largely used for uncontrolled grazing by horses. The Manuel's flats area exhibits good potential for more intense agricultural development including vineyards. The area if proposed would have to go through the designation vote process and includes the challenges of managing the presence of traditional plants and habitat used by species at risk. Poles currently have a very small footprint through this area, occupying a- total combined area roughly equivalent to a house and could still co-exist with more intense agriculture.

The Vaseux Protected Area and the Canadian Wildlife Service (CWS) lands preclude agricultural development. North of the CWS lands to Shuttleworth Creek, there are private lands used largely for grazing. Some parts were recently logged and enhanced with pasture production grasses. The McLean Creek area has forage production and developed pasture. The area northeast of Okanagan Falls traverses areas with both vineyards and orchards.

From the Heritage Hills area northeast of Okanagan Falls to Penticton much of the right-of-way is in a natural state and some sections would have modest agricultural potential, primarily for pasture. Level to moderate sloping terraces could be developed into vineyard or orchard where the soils are suitable. Based on current patterns though, land that is suitable for agriculture in this section is more likely to become residential.

As poles will be removed and new poles installed, there will be no net change in the amount of agricultural land affected once the land has be restored from the small amount of construction related disturbance anticipated. There will be a short term (1-2 years) impact from construction activities which is expected to be a small temporary loss of agricultural vegetation until restoration is successful. There is also a risk of soil rutting and mixing if construction activities occur during extended rainfall periods on sensitive soils.

Some areas of the project may have invasive plant species encroaching on disturbed areas, which is generally a short term impact when appropriate control measures are implemented.

Pole installation and removal in agricultural areas with crops such as vineyards, orchards and forage crops will have a broader footprint due to the disturbance from equipment and vehicles along the right-of-way. This is a temporary disturbance and standard practices include compensation for crop damage or loss.

Construction activities affecting the traditional timing and location of calving areas in pastures can also be a concern if cattle are displaced from those areas without a suitable alternative location available.

Photo 13.2 Existing Right-of-way transects agricultural land Southeast of Okanagan Falls

Mitigation

Transmission lines generally co-exist with agricultural operations. On an existing right-of-way compensation was originally provided to landowners for the easement rights and other considerations at the time of the acquisition. Generally no other compensation is required for additional construction except for damages.

There will be timing constraints on the project requiring summer and fall construction which will avoid any impact to traditional spring calving. The timing of access may also permit removal of field crops prior to disturbance, reducing the loss of production for one season. Where the crops cannot be removed prior to construction access, compensation is provided to the landowners. Compensation also considers factors for longer term production (vineyards and orchards) requiring replanting and more than one season of loss. In some cases there may be a need for temporary livestock fencing to isolate the right-of-way during construction. This is determined on a case by case basis in consultation with the landowner.

There are a number of standard practices which will be implemented on this project to prevent infestations of invasive plant species with particular emphasis on 'noxious weeds' (See also section 20.1):

- Inspection of construction vehicles and equipment;
- Power washing and hand cleaning of vehicles and equipment;
- Monitoring of transition between infested and clean areas;
- Prompt revegetation of disturbed areas; and
- Weed inspections and control 1 or 2 times per year for 2 years after construction.

The QEP monitoring construction will have the responsibility in consultation with the construction manager to monitor activities causing soil mixing and rutting and where appropriate, implement field mitigation measures. These measures typically include a temporary hiatus or deceleration of activities until the risk of rutting and mixing is over.

13.3.3 Mineral Resources and Mining Activity

Assessment

There are no coal tenures in the area (South Okanagan). There are a number of mineral leases around the Town of Oliver and the Town of Osoyoos. In addition, placer staking is not permitted in this area. There are no current operating mines, quarries or prospecting/development projects in this area (Ministry of Energy, Mines and Petroleum Resources).

The lowlands crossed by the transmission line have very good potential for sand and gravel processing and production. The aggregate potential for lowlands along the route is rated as primary and secondary, while the potential on the low-elevation highlands is rated as secondary and tertiary.

Sand and gravel production occurs in many areas in the South Okanagan and can be readily produced throughout the region. Much of the lowlands areas of the South Okanagan are rated with primary and secondary aggregate potential. As a result, lowland sources along the transmission route are unlikely to be developed, based on the availability in the region and the close proximity of those sources to infrastructure and users. No impact to sand and gravel production is expected.

Mitigation

No mitigation is required with respect to mineral resources and mining activity.

13.3.4 Recreation

Effects

The route is located through areas which vary in recreational use and potential use. The south end of the route across Manuel's Flats has been observed to be used by community members for off highway vehicle recreation. The Vaseux Protected Areas and the CWS lands are largely used by people on foot access to view wildlife and the natural habitat of these conservation areas. In addition to the aforementioned locations, recreational use along or adjacent to the existing route includes hiking and wildlife viewing along Skaha Lake as well as rock climbing in the Skaha Bluffs area which has been proposed as a provincial protected area. There has been no recent action by provincial agencies in designation of this area even though it was a recommendation in the Land and Resource Management Plan (Okanagan-Shuswap LRMP Process Team, 2001) for the area. Even if it should be designated, existing rights and tenure are generally recognized and maintained by BC Parks for this type of protected area. Recreational use on and adjacent to the existing right-of-way co-exists well and no impact is expected other than a temporary nuisance factor or restrictions on right-of-way access for safety purposes during construction.

Mitigation

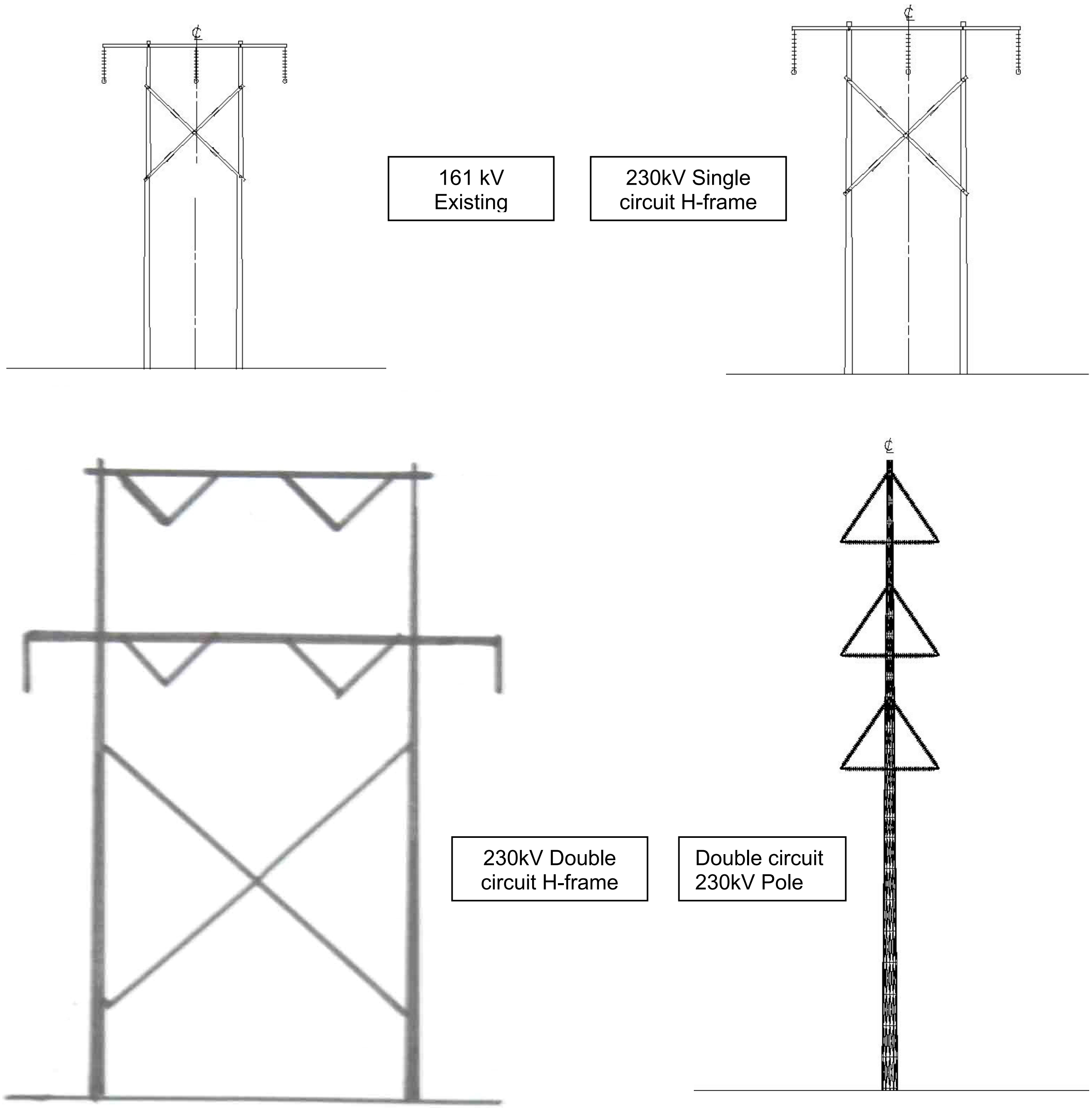
Route selection and refinement have adjusted the right-of-way, so mitigation is not required with respect to recreation other than restrictions on access where safety issues must be effectively managed.

13.3.5 Visual Resources

Effects

Residents often express concern about the impact of transmission lines on the visual landscape. Most people think of transmission lines as the larger 230kV and 500kV lines installed on large steel lattice structures. By contrast, FortisBC proposes a 230kV transmission line of single poles with either a double circuit on one pole or two single circuits running in parallel on two poles or on H-frames. Double circuit poles are anticipated to be about 13m taller than single circuit H-frames which are about 2m taller than the existing poles. Conductors (electrical wires) will be slightly larger in diameter then the existing overhead lines.

Figure 13.1 Different pole configurations under consideration for the OTR project



FortisBC initiated two series of public open houses for consultation purposes that were held in Oliver, Okanagan Falls and Penticton. The first open houses presented in March of 2007 showed the existing right-of-way as part of the initial project proposal. Many people in the area around Okanagan Falls, especially the community of Heritage Hills expressed concern about the intrusion of the proposed new transmission lines into the visual landscape. Most of those expressing concern had built residences in recent years in the proximity of the existing transmission line.

As a result of the input, FortisBC responded by asking the project team to look at an alternative route that was technically and environmentally feasible and avoided the area in question. After an initial review, the team proposed an alternate section from Shuttleworth Creek to Penticton located upslope to the east of the existing right-of-way. This alternative was presented and discussed at the second set of open houses in May of 2007. Subsequent analysis of the routes has determined though that the existing corridor is preferred for environmental, technical, engineering, operations and maintenance perspectives.

A single-pole double circuit combination was presented at the open houses in May. A number of the residents expressed concern about the increased height (13m) of this option over the existing pole and conductor system that was in place. This single-pole system has an increased intrusion factor in the viewscape of residents adjacent to the right-of-way on the east side in the Heritage Hills area.

As a result of this input about the incremental increase being a concern, the project team considered additional pole configurations to determine if there is a possible alternative that may reduce the increased pole height through the area of concern.

One option would be the installation of two single-circuit, H-frame systems. The height related impact to the viewscape with this model would be almost the same as the existing system (subject to final placement of the poles) which residents have built along side. There would be a minor increase in the diameter of the conductor wires and only 2m increase in the overall height, but an 11m increase in right-of-way width is needed. There would also be two sets of H-frame structures where there is currently one now.

A second option was the use of two single-circuit, compact single-steel pole systems with the conductors vertically arranged on the poles. This would result in two single pole structures that could just fit within the existing right of way and be about 7m taller than the existing structures. However due to the configuration, the span or distance between structures is about halved resulting in about double the number of structures along the right of way.

A third option was also developed which focused on lower construction costs using a double circuit H-frame configuration. While this configuration reduced construction costs its structure heights are comparable to the single-pole double circuit configuration at the 30m height range. The structures would be located at the same sites as the existing and the single-pole double circuit design but the structures are visually wider.

The preferred option of using the existing right-of-way for either one or two circuits is considered to have a moderate impact on the visual landscape for residents generally on the east side of and in close proximity to the right of way.

Mitigation

The engineering design team recommends single-pole double-circuit structures with a flat galvanized finish and non-glare finished conductors to mitigate visual impact, as proposed at the second public open houses. These structures would be sited where there are existing structures in place now.

The options that were considered and set aside included a two single circuit H-frame system and a two compact single-pole system. Although the 2 single circuit H-Frame system is only 2 m taller than the existing system, it required expanding the right-of-way an additional 11m in a developed area and also needed two sets of structures at each existing structure location where there is only one now. Based on overall public concerns this was not expected to be an acceptable option.

The second option of two compact single pole structures, doubles the number of structure locations along the right of way, although it somewhat mitigated the height visual impact concern. This was also not considered an acceptable option based on anticipated public concerns.

The third option of double circuit H-frame construction is less costly but it is considered more intrusive than the single-pole double circuit option. However unlike option 1 or 2 it does not need additional right of way and maintains existing structure locations. This option was developed further as Alternative # 1B in the CPCN application.

13.3.6 Sound Levels

Effects

Transmission lines occasionally emit low levels of audible sounds. These are noticeable when in very close proximity to the lines, during weather events such as snow, fog and hoar frost. The larger 230-kV and 500-kV lines are more likely to emit these sounds, sometimes described as a buzzing or a humming sound.

There will be noticeable temporary sound level changes during construction, from the helicopter, line trucks, drill trucks and blasting. Clearing of the hazard trees will have sounds from a helicopter and from small equipment, particularly chain saws. The sound levels during construction will be generally similar to daytime sounds from farm equipment, construction equipment and other vehicles and activities depending on residents' proximity to the project and other sources of sound.

Mitigation

The use of the helicopter and heavy equipment for construction will be restricted to operation between 7:00 am and 10:00 pm Monday to Friday and 8:00 am to 10:00 pm on Saturdays and Sundays in areas within 400 m of a rural residence. Normal construction activities on a project of this scope would likely be 7:00 am to 4:00 or 5:00 pm. It is expected that most of the construction activities will take place in the late summer fall and winter in 2008 and 2009 for a 2010 in service date.

No mitigation is considered feasible for the sound levels from the 230kV line.

13.3.7 Protected Areas

Effects

The 230kV transmission lines from Vaseux to the interconnect in Manuel's canyon to the east, as well as the existing transmission line east of Vaseux Lake Park, and in Manuel's Canyon north of the Osoyoos Indian Reserve traverse the Vaseux Protected Area. This is a wildland park system largely established as a habitat area for California Bighorn Sheep. There are no recreation areas, campgrounds or developed access roads to this protected area.

There is a candidate park called the Skaha Bluffs adjacent to the right-of-way near Penticton. This area has been proposed as a park for the purpose of recreation. This area is used for its unique rock climbing features.

The Canadian Wildlife Service owns land north of Vaseux Creek which is transected by the current right-of-way. The area has been designated as a National Wildlife Area with emphasis on Sheep Habitat and the natural desert setting.

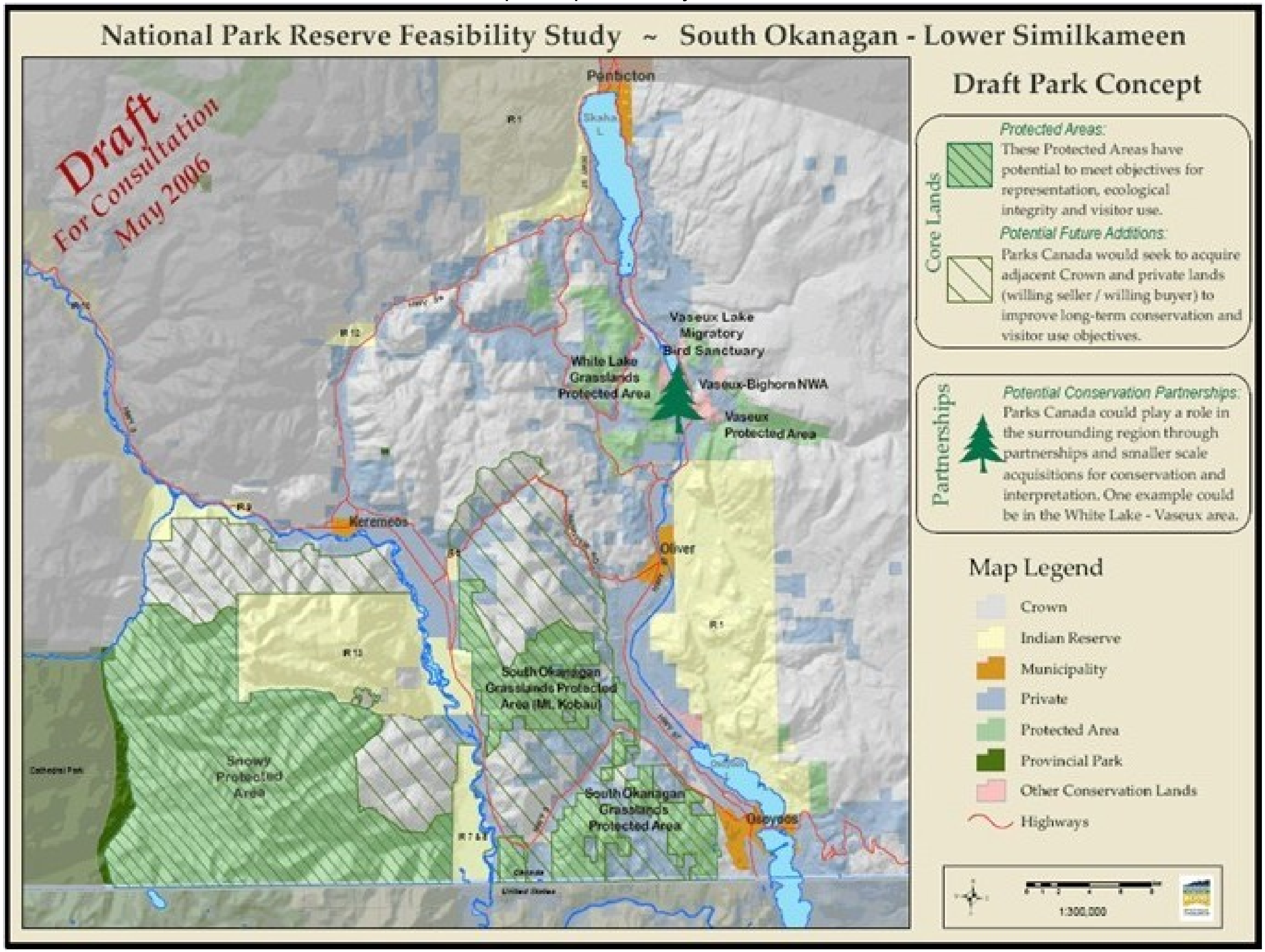
Approximately 2 years ago, the Federal Government announced the establishment of a feasibility study to assess the need and location for a new national park(s) in the South Okanagan with a primary goal of protection of the endangered grasslands communities and their multitude of species at risk. Initial considerations included some of the provincial parks in the project area (i.e. Vaseux Protected Area) as candidate areas for the establishment of the new national parks. A subsequent public consultation process has refined the concept in more detail. At this point it appears that there are no National Park areas under consideration in the planning vicinity of the OTR project.

Construction on the existing rights-of-way through protected areas and conservation areas can affect the vegetation and in turn the habitat. Removal of large trees on the edge of the right-of-way will result in a reduction of wildlife trees and nesting/roosting habitat. Rights-of-way through protected wildland recreation areas may be affected if there are residual access increases for off road vehicles and horses. Overall the field assessments have determined that the pre-existing (prior to the establishment of the conservation area) right-of-way is well integrated into the protected area or conservation area with good quality habitat and wildlife use.

Disturbance of the land can also cause erosion and create an exposed site where weeds can become established. Both factors affect the quality of a protected area's residual vegetation community and the associated habitat.

Construction timing and activities can also interfere with conservation operations (i.e. sites where there is camping and recreation) and can disturb wildlife by interfering with foraging, migration or critical life cycle phases.

Figure 13.2 Draft National Park Discussion Concept: Map Courtesy of Parks Canada



Mitigation

The construction of the powerline from Vaseux Lake Terminal Station to the interconnect location in Manuel's Canyon will be with foot access and helicopter, thus eliminating any impacts from construction equipment and vehicles.

Construction through the Vaseux Protected Areas, CWS National Wildlife Area, The Nature Trust lands and the Skaha Bluffs area will be done with conventional equipment subject to terrain constraints. Measures to minimize the impact to the habitat of construction activities include:

- There will be no new access roads or trails created for construction;
- Areas without access should be accessed by workers on foot, with portable equipment and/or using a helicopter for access and transport of materials and equipment, including poles;
- There will be prompt revegetation of disturbed areas after construction in the best germination period (i.e. late fall/early winter or early spring in February or March) to take advantage of season precipitation patterns;
- All vehicles and equipment will stay on existing access trails. Off trail access to a pole location will be coordinated by the QEP and flagged to minimize disturbance to sensitive vegetation;
- Weeds will be monitored and controlled on a regular basis, likely 2 times per year.

Wildlife trees which are hazard trees on the edge of the right-of-way will be topped by an arborist to maximize maintenance of the wildlife value of the tree.

In some areas where access trails to and along the right-of-way are improved for passage of construction equipment, there will be decommissioning and reclamation of those trails to their previous state. Trails should not be completely removed as FortisBC requires occasional access for operations and maintenance.

There are a number of standard practices which will be implemented on this project to prevent infestations of invasive plant species with particular emphasis on 'noxious weeds' (See also section 20.1):

- Inspection of construction vehicles and equipment;
- Power washing and hand cleaning of vehicles and equipment;
- Monitoring of transition between infested and clean areas;
- Prompt revegetation of disturbed areas; and
- Weed inspections and control 1 or 2 times per year for 2 years after construction which would be extended subject to the scope of the impact.

Timing constraints through these areas have been established to protect wildlife in the late winter and in the spring. Construction will also avoid the calling and nesting season for birds.

13.3.8 Forest Resources and Forestry Operations

Effects

The existing right-of-way, subject to final design, has the potential for the removal of some hazard trees along the edge of the right-of-way where it was not cleared to the full width. However, the amount of merchantable timber involved is very low, it is scattered, there is limited access to it, and it is open grown with excess branching such that value is minimal for commercial use and it is not worth mobilizing harvesting equipment.

Mitigation

No mitigation is planned as no meaningful or measurable impact is expected.

13.3.9 Terrain Conditions

Effects

The right-of-way crosses a variety of terrain, including the undulating benchland of the South Okanagan lowlands and the more rugged terrain of the adjoining highlands. There is no evidence along the corridor of any mass movements or head scarps, which are the result slumping on slopes creating exposed soil faces, that are good indicators of slope instability.

Trees will be only be removed from the edge of the right-of-way, on sections where there are poles and lines that could be impacted by falling trees. The undergrowth of small trees shrubs, grasses and forbs will be left intact to prevent erosion. The excavated material around the pole holes could be susceptible to erosion until re-vegetated.

A key concern for the operation of a powerline across rugged terrain and potentially erodable areas is the impact of increased public access. In order to limit access to the right-of-way, no new access roads will be constructed. Line trucks and drill trucks will access the right-of-way only on existing access roads, as well as on trails in other parts of the right-of-way and in two or three selected locations in the highlands, to facilitate stringing of power lines.

Terrain impacts are anticipated to be low for this project.

Mitigation

The continuing right-of-way design should ensure, where possible, that the powerline spans steep incised valleys (such as Vaseux Creek at the Vaseux Canyon) in order to avoid creating new access routes. Helicopter access through this portion of the right-of-way will significantly reduce erosion potential during construction and also during operation. To further limit access to the right-of-way, no new access roads will be constructed. Drill trucks and line trucks that install poles and string power lines will access the right-of-way only on existing access roads, and via trails on other parts of the right-of-way.

If poles are located on significant slopes, where exposed excess material from the hole is potentially erodable, the soils will be seeded with a native grass mix and covered by an erosion control blanket. The blanket is made from wood fibre and can be described as similar to a gauze material that holds soils in place until they are re-vegetated. The blanket eventually rots away, providing valuable organics and nutrients to the soil.

All disturbed areas along the right-of-way will be reclaimed and restored with native vegetation species at the completion of the construction. Seeding will be timed to take advantage of the expected wet ground conditions that will promote effective establishment of vegetation either in the late fall or in the early spring.

14.0 NAVIGATION

Watercourse crossings such as the one on Vaseux Creek Canyon spans across valleys which may require navigation markers for aircraft. The height of the transmission line structures in most cases (i.e. other than at the two stated exceptions) are similar to large trees and will not require markers along the route.

The timing and the type of construction of powerlines across watercourses and waterbodies has the potential to interfere with navigation on the water by boats and other users. In some cases, the power line crossing of a watercourse such as Vaseux Creek will require an authorization from Navigable Waters under the Navigable Waters Act. Although field assessments and historical observations indicate that Vaseux Creek is not used for transportation, it remains a small possibility through interpretation that passage could occur with a watercraft. No effect is expected on transportation on any of the creeks, including those requiring the authorization. The line will be strung above the watercourse.

Powerline construction and operation where there are large spans across valleys well above tree height pose a risk to aircraft in flight. Tall structures on facility sites and on the right-of-way can also be a hazard to aircraft. Two small airports (Penticton and Oliver) are situated relatively close to the OTR project. The Penticton airport is about 4 kilometers to the west of the OTR and aircraft flying in and out of the airport should not be adversely effected by the powerline. The much smaller Oliver airport is about 2 kilometres to the southwest of the new Bentley station site. The existing powerlines connecting into the adjacent Oliver station do not have any aircraft warning markers and no markers are planned. The transportation routes around the airports are not expected to be directly affected by the 230kV poles and conductors. The engineering design team will assess the hazard relative to guidelines when design is near completion and pole and station structure heights are known.

The 3rd line crossing Vaseux Creek is expected to trigger an application for authorization to remove overstory timber within 30m of the creek as an approval was required for the 2 x 230kV lines from Vaseux in 2004/2005. The application for a Federal Fisheries Act Authorization will trigger a CEAA review by Fisheries and Oceans Canada that will circulate to several agencies including the Navigable Waters Protection Division of Transport Canada. It is possible that a separate application may be required for an NWPA (Navigable Waters Protection Act) authorization on this watercourse depending on direction received from the agency during the detailed design phase. If an NWPA approval is required, this is a separate process from the Federal Fisheries Act authorization process.

Mitigation

New construction at the Bentley site is not likely to have poles or equipment that exceeds the height of the existing powerline in that area. The new Bentley station will install high visibility markers on new structures if required by Transport Canada.

Specific and detailed water course navigation plans will be developed, if required, and included in the Environmental Management Plan once the final route has been determined and when detailed design and engineering plans are in place in areas involving watercourse crossings.

Powerline crossings of numbered roads owned and controlled by the province or the regional district will require approvals from the road authorities in each level of government. Activities at road crossings will be controlled for safety purposes.

15.0 TRANSPORTATION AND UTILITIES

The primary highway in the Okanagan valley is Highway No. 97 which runs along the length of the valley parallel to the proposed OTR route, although for the most part it is well to the west of the OTR. A railway line, long since abandoned, used to run adjacent to the highway (Black latticed line on the adjacent figure 15.1).

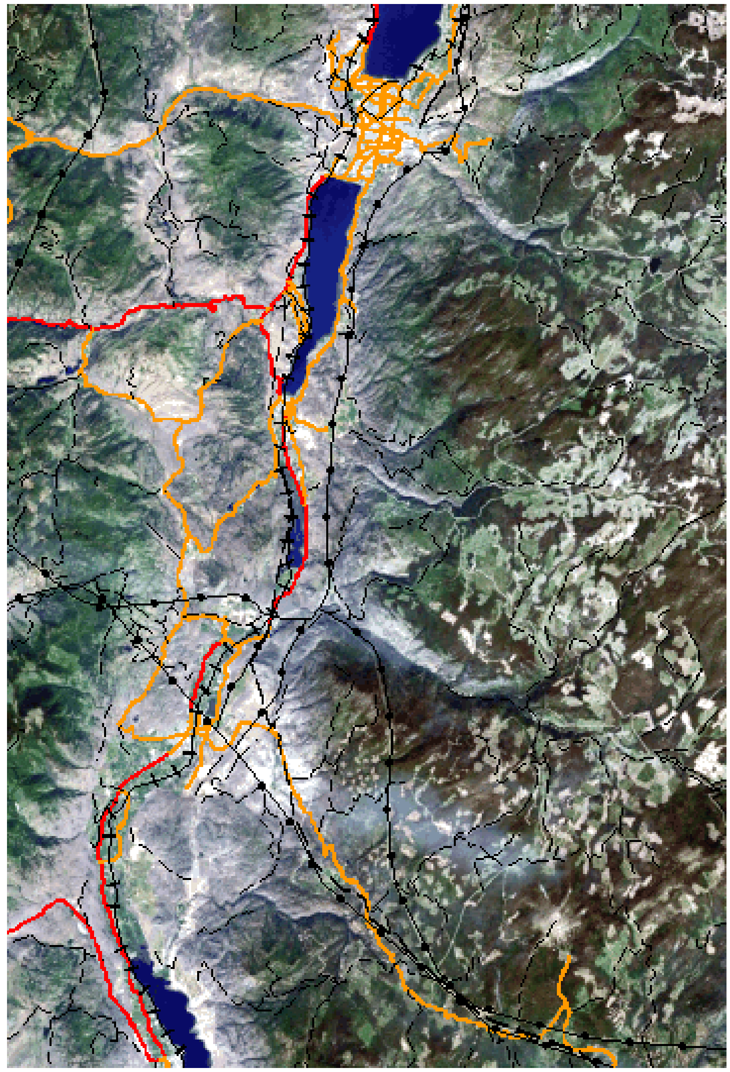


Figure 15.1 Overview of transportation and utilities in the study area. The red lines are primary highways & the orange lines are other roads.

Terasen Gas has a medium diameter gas transmission pipeline that cuts across the OTR route from the east, a few kilometers northeast of the Bentley site, then heading north primarily along the west side of the valley.

BC Transmission Corporation operates a 500 kV transmission line which crosses the OTR from east to west at the Vaseux Terminal Station. Power is also downloaded from the BC Hydro transmission line to FortisBC at Vaseux.

Effects

It is common planning practice to have transportation facilities and utilities share a common geographic ‘corridor’, in order to minimize the physical imprint and disturbance to the natural environment. The only existing transportation or utility corridor that could be utilized in the ‘corridor’ concept model is the existing FortisBC transmission line that connects Oliver to Penticton. The OTR will be utilizing the original right-of-way wherever possible.

- No direct impact is foreseen on the airports, gas pipeline or abandoned railway line.
- A modest increase in vehicle traffic along portions of Highway 97 may occur during the construction of the OTR. Construction related traffic is estimated to have a negligible impact on highway traffic (i.e. less than 1% increase)

- Secondary highways, roads and existing trails in the vicinity of the OTR may experience temporary and short term increase in construction related traffic.

Powerline crossings of numbered roads owned and controlled by the province or the regional district may result in short term temporary closures and traffic control during construction, expected to be a minor nuisance to the public using those roads.

Mitigation

Once the engineering design and scheduling has been completed, detailed mitigation measures for Transportation and Utilities, if needed, will be included in the Environmental Management Plan and approvals obtained from provincial and regional district agencies.

16.0 CONTAMINATED SITES POTENTIAL

Within the project area, there are three existing stations (Oliver Station, Vaseux Lake Terminal Station, and RG Anderson Station) and a proposed new Bentley Terminal Station on a site that has not had previous industrial development. In addition, the 230kV transmission line will cross and likely have structure installed on the former station site known as the original Bentley site.

The project area was assessed for contamination potential by both physical examination of the terminal stations and consultation with FortisBC Operations and Environment personnel following industry 'best practice' assessment methodology, similar to the format identified in CSA Z768-99 standard for conducting a Phase 1 Environmental Assessment. The results of the assessment for contaminant potential indicated there would be little value, if any, to conduct a detailed and likely costly Phase 1 Environmental Assessment for the project area.

Although no records or visual evidence of spills exists at any of the existing stations or the proposed new Bentley station, there is the possibility that spills of transformers oils, fuels and other liquids may have occurred at these sites some considerable time in the past.

Inadequate waste management systems during construction as well as operations can cause pollution and contamination. Sewage, solid wastes and special wastes from hazardous materials all pose a contamination threat if not properly stored and used.

Materials used during construction and operations such as fuel, lubricating oil, solvents and transformers also pose a threat of contamination if improperly operated, stored or used.

Should additional information or evidence be produced that indicates that pre-existing contamination issues exist in the project area, more detailed assessments will be considered to address any concerns. Contaminated sites assessments will be conducted in accordance with both industry standards (i.e. CSA environmental assessment standards) and provincial regulatory guidelines and requirements.

16.1 Oliver Station

Effects

The project involves changes and upgrades to the existing Oliver Station on the OIB Reserve in the east side of the Town of Oliver. FortisBC records, as well as previous testing at several comparable FortisBC stations, provides indication that PCBs were not likely used in the operations at any given time in the past. Other possible contamination would likely be limited to any unknown spills of transformer oil (mineral based) or the burial of construction debris.

Mitigation

In the event that soil contamination is discovered during construction activities at the station, an assessment of the environmental conditions will be undertaken and if necessary, contaminated soil will be excavated, treated and disposed of according to provincial standards.

16.2 New Bentley Station

Effects

The proposed new Bentley station is on land without a history of prior industrial or commercial development. The natural habitat at the site is rated as degraded and generally of poor quality due to a number of other anthropogenic related uses such as grazing and off road driving. There is no apparent evidence of contamination at this site, and it is therefore assumed that there is no contamination and no further assessment is required.

An environmental inspection of the existing station was undertaken in May of 2007. There was no indication of any significant soil contamination, although there were small amounts of garbage (i.e. waste debris such as pop cans, plastic and wood) scattered about the site.

Mitigation

In the event that soil contamination is discovered during construction activities at the station, an assessment of the environmental conditions will be undertaken and if necessary, contaminated soil will be excavated, treated and disposed of according to provincial standards.

16.3 Bentley-Original (Oliver)

Effects

The project involves installation of new 230kV transmission line poles on a site that was formerly a FortisBC station known as Bentley. It was decommissioned a number of years ago. Although the station infrastructure had been completely removed, there are no existing records to indicate whether there was any contamination of the soils at this location nor whether any contaminants that might have been present had been removed or remediated.

FortisBC records, as well as previous testing at several comparable FortisBC stations, provides indication that PCBs were not likely used in the operations at any given time in the past. Other possible contamination would likely be limited to any unknown spills of transformer oil (mineral based), the burial of construction debris or some residue from soil sterilants. Contamination at the site is considered unlikely.

Photo 16.1: Old Bentley Site near McKinney Road east of Oliver (by S. Morck).

Mitigation

In the event that soil contamination is discovered during construction activities at the station, an assessment of the environmental conditions will be undertaken and if necessary, contaminated soil will be excavated, treated and disposed of according to provincial standards.

16.4 Vaseux Lake Terminal Station

Effects

The project involves the some equipment changes and modifications within the Vaseux Lake Station which is a recently constructed station that went into operation in November of 2005. Because this facility is a new station built on previously undeveloped land, it is highly unlikely that any contamination issues would be present at this particular site. The site was constructed without contamination and the operating parameters and spill control systems ensure there should be no contamination of this site. Therefore this site should be excluded from a contamination review or further assessment for the project.

Mitigation

No mitigation is required.

16.5 RG Anderson (Penticton)

Effects

The project involves the tie in to the existing RG Anderson Terminal Station located in the east side of Penticton. The station was originally constructed in 1963. There are no records of any spills or other environment related problems at this facility.

FortisBC records, as well as previous testing at several comparable FortisBC stations, provides indication that PCBs were not likely used in the operations at any given time in the past. Other possible contamination would likely be limited to any unknown spills of transformer oil (mineral based) or the burial of construction debris.

An environmental inspection of the existing station was completed in May, 2007. There was no indication of any significant amount of oils stains on the ground surrounding transformers and other equipment. Consultation with FortisBC operations personnel did not reveal any past contamination issues with this station. Impacts from contamination are not expected unless a subsurface issue is discovered which was not apparent during the inspection.

Mitigation

No mitigation is planned other than monitoring during construction. In the event that soil contamination is discovered during construction activities at the station, an assessment of the environmental conditions will be undertaken and if necessary, contaminated soil will be excavated, treated and disposed of according to provincial standards.

16.6 Existing Right-of-Way

Effects

There is no reason to expect soil contamination along the existing FortisBC powerline right-of-way between Bentley and RG Anderson. A review of treated wood poles in the environment (Morck, 2002) showed that contamination of soil around treated wood poles generally is not significant. As a result, treated wood chemicals are not expected to be a concern on this right-of-way.

FortisBC does not have any records of any spills or incidents along the existing right-of-way. Existing transformers contain only mineral based oils.

Mitigation

No mitigation is required.

16.7 Decommissioning

Should the OTR project be approved, decommissioning will be required for some equipment at RG Anderson and Oliver as well as the poles and conductors on the existing transmission line.

The sites have had an inspection and it is determined that there are no contaminants of concern at either station so equipment may be removed. If there is need for significant excavation to remove old equipment, it will be inspected regularly by the QEP for any evidence of contamination.

The decommissioning of the poles and conductors on the existing right-of-way requires care and planning to protect environmental resources. As the right-of-way has matured, both wildlife habitat and vegetation resources are integrated into the operation of the existing system. This includes the presence of at risk vegetation communities and the habitat of at risk wildlife. These habitats should be protected. For example skinks are using the unconsolidated rubble around the poles in many areas as their habitat, likely as a residence. In these areas, the poles should be carefully cut off at ground level and lifted away, preserving the habitat. In other areas where there are sensitive vegetation communities, poles should also be cut off no more than a few centimeters (cm) below grade to minimize the disturbance. A large pole that is completely removed usually results in more disturbance to the area around the pole as it breaks free of the ground and causes disturbance beyond the pole hole. A detailed decommissioning protocol will be included in the environmental management plan.

Most of the old transmission poles are expected to have been butt treated with a wood preservative. Poles can be disposed of by placing in a landfill, sale to local landowners who have expressed an interest, donation to a non-profit group or used as fuel in a cogeneration plant. Fortis has a release form for poles sold or donated to ensure the new pole owner understands the structural limitations on the use of the recycled poles. Residual contamination from leaching of the treatment product is not expected to be significant (Morck, 2002) so there should be no regulatory or environmental concern with leaving the butt behind or in the soil in the case of the complete pole removal. A general guideline for pole removal is included in Appendix 3.

17.0 SOCIAL CONSIDERATIONS

Social assessments consider project components with respect to potential effects within the community. Potential impacts are considered in light of any applicable local or regional land use plans, employment and business opportunities. The environmental assessment takes account of general patterns of human occupancy (Residential assessment) and resource use (Forestry and Mineral Resources) in the study area and the impact of those activities which are strongly linked to the Social patterns.

The South Okanagan experienced significant population growth in the 1990's as well as the last few years. This population growth is forecast to continue and is a large factor in the need for the expansion and improved reliability of power in the valley. The increased population as well as significant growth in tourism, commercial and services sectors, light industrial, and the agri-industry, particularly viticulture, are all contributing to the increased demand for utility services including electrical power.

Table 17.1
Population Projections for the Okanagan Similkameen to year 2031

	YEAR					
AGE	**2005**	**2010**	**2015**	**2020**	**2025**	**2031**
0 – 14	10,929	10,744	11,670	12,888	13,076	12,526
15 – 24	10,365	9,514	8,607	7,848	8,298	9,715
25 – 34	7,844	10,018	10,904	10,102	9,178	8,422
35 – 44	9,803	8,832	10,339	12,809	13,670	12,627
45 – 54	12,463	12,640	11,459	10,781	12,351	15,106
55 – 64	10,551	12,377	13,837	14,161	13,096	12,652
65+	20,530	21,841	23,856	26,387	29,139	31,476
Total	**82,485**	**85,966**	**90,672**	**94,976**	**98,808**	**102,524**

Source: BC Stats, Population Section, May 2005

A number of social issues tend to be associated with this scale and scope of project. The issues include local hire and opportunities, utilization of local services, aboriginal employment and services as well as concerns about noise, dust and other factors.

Through the public consultation process as well as research and experience with past projects in the valley, the following Table summarizes key Socio- Economic issues:

Table 17.2 Key Social Issues

Project Activities and Physical Works	Key Issue	Relevance
Powerline and Station Construction	Number of landowners and residents directly affected	People potentially inconvenienced by construction activity near their residence.
Powerline and Station Construction	Access to contracts and jobs by local residents	The distribution of a portion of the economic benefits of the project to people most directly affected.
Powerline and Station Construction	Increased traffic on local roads	Potential for damage to local roads, perceived increases in traffic, risk around schools and dust abatement.
Operation of Transmission Line	Visual Landscape changes	Perception of impact to the viewscape of residents near the transmission line.
Construction and Operation of the Stations and Transmission Line	Increased sound levels	Sound levels increase and affect quality of life whether temporary or permanent in the environment.
Operations	Residential Electrical Rates	Concern about the impact the new facilities will have on the rates paid for power. Advocacy representatives tend to intervene on applications.
Operation of Transmission Line	Property Value	Perception that the existing transmission line if replaced will reduce property value.
Operation of Transmission Line	EMF	Perception of health effects from electric and magnetic fields as well as concern about more EMF in the environment.

17.1 Facility Sites: Oliver, Vaseux and RG Anderson and Bentley

Business development and expansion in Penticton, Oliver, Osoyoos and communities immediately nearby continue to place a significant increased demand on distribution power. Power requirements are driven by residential, commercial, light industrial and agricultural expansion and growth in these communities in the Summerland - Osoyoos corridor. Part of the Bentley Terminal Station will include electrical equipment to provide power for the newly constructed 63 kV transmission line and the Nk’Mip station supplying increased power demands in East Osoyoos.

Top Employers in the Greater Penticton Region

Employer	Employees
Penticton Regional Hospital	900
School District #67	888
Excell Agent Services	600
City of Penticton	325
Canada Revenue Agency	305
Valley First Credit Union	290
Moduline Industries	280

Apex Resorts	276
Penticton Lakeside Resort & Casino	240
Greyback Construction	200
Safeway	200
Community Resource Centre	190
Argo Road Maintenance	165
Weyerhaeuser Canada	165
Save On Foods	160
Wal-Mart	155
The Bay	135
Peerless Limited	130
Cantex Engineering	125
Zellers	120
Penticton Home Support	103
McDonald's	100
Penticton Retirement Centre	100
Peter Brothers Paving	100

The South Okanagan is forecast to have increased residential and tourism units. For example demand in Penticton is for multifamily units, primarily condominiums and over 1500 units are currently proposed for South Penticton alone. In outlying areas as an example, Oliver and area have approximately 1500 residential and tourism units proposed for the next few years. This is a very significant growth increase relative to the historic rate of development even over the last few years. This creates infrastructure demands and some of the developments would be on the margins of the urban area, potentially impacting residual desert habitat where it still exists. The country residential growth and the wine industry in the South Okanagan have expanded significantly in recent years. This expansion has resulted in significant pressure on residual lands with natural vegetation and habitat including endangered vegetation communities such as the antelope brush needle and thread grass ecosystem.

Assessment of Bentley

The proposed Bentley Terminal site is located on OIB reserve land that had its land value determined by a professional third party assessor. This determines property value for compensation over a 99-year lease on the site. The compensation provides significant income to the OIB. Leasing income provides the band with financial resources to improve infrastructure, community programs and education. It also helps business ventures on behalf of the community.

Statistical data show, for all persons with earnings, the OIB average was approximately 50% of the provincial average (Statistics Canada, 2001). The project planning for this station has already provided aboriginal and other community members with employment opportunities in the environmental and archaeological assessment process. Further opportunities are expected to be realized with construction related jobs, reclamation and construction environmental monitoring. In addition, contractors will be encouraged to use local services and local labour on the project. If community businesses, such as Oliver

Readi-Mix, are able to cost-effectively supply material and services for the project, there will be further benefits to the OIB community.

A project of this scope has a finite period of construction and requires a significant number of skilled and unskilled labourers, perhaps peaking at 50 employees during key phases. A construction project of this scope has modest local benefits to the hospitality sector, which include hotels, restaurants and the automotive service and supply businesses.

Station operation is expected to be supported within the work plans of the existing staff of FortisBC. This ensures that there will be no strain on community facilities and services (i.e. schools, housing, etc) and the impact of the new facility will be negligible on infrastructure.

There is an older draft community plan prepared for the Osoyoos Indian Band which, according to Olson & Olson (2004), was never ratified. The Olson and Olson report of 2004 provides recommendations for developing a new community planning process. They suggest that, given the importance of the land and water in the region, community economic development needs to be sustainable. But it must also consider environmental values in the planning process.

This project has social benefits, particularly for the Osoyoos Indian Band. In addition, power is required for the increasing population, commercial and agricultural needs in the South Okanagan, by the OIB and in the surrounding area. As noted in other sections, it does, however, have some associated environmental impacts, which are being reduced or eliminated through mitigation measures.

Mitigation

A goal to foster employment opportunities for OIB and PIB community members on the project has been implemented with participation in the archaeological and environmental studies. It is expected both communities will participate where they have skills and services in the construction activities. On other projects in the area, FortisBC has implemented a plan to engage aboriginal business and labour and is considering a similar approach for this project. No other mitigation has been planned to date.

Assessment of Oliver, Vaseux and RG Anderson

The upgrades and additions to these facilities will also impact the larger service and supply communities in the valley, particularly Oliver, Okanagan Falls and Penticton. A project of this scope has a finite period of construction and requires a significant number of skilled and unskilled labourers. It is expected that the labour force may perhaps peak at 30 employees during key construction phases at RG Anderson, a similar number at Vaseux and somewhat less at Oliver. A construction project of this scope has modest local benefits to the hospitality sector, which include hotels, restaurants and the automotive service and supply businesses.

New staff are not needed for operations. This work will be conducted by the existing staff of FortisBC. There will be no impact on community facilities, infrastructure and services (i.e. schools, housing).

Mitigation

A plan has been implemented to foster employment opportunities for OIB and PIB community members on the project. No other mitigation has been planned to date.

Assessment 230 kV Transmission Line

The transmission line will also benefit the larger service and supply communities in the valley, particularly Oliver, Okanagan Falls and Penticton. A project of this scope has a finite period of construction and requires a significant number of skilled and unskilled labourers. It is expected that the labour force may perhaps peak at 80 to 100 employees during key phases of the transmission line construction. A construction project of this scope also provides local benefits to the hospitality sector, which include hotels, restaurants and the automotive service and supply businesses. Much of the skilled labour for a project of this scope on the electrical side is expected to come from other areas such as the lower mainland.

A transmission line of this scope does not require new staff at FortisBC for operations. This ensures that there will be affect on community facilities, infrastructure and services (i.e. schools, housing).

Infrastructure Growth Inducement

The presence of the stations and transmission system components does not cause an expansion in business and an increased power demand. Business expansion plans are built on revenue potential and power is assumed in those plans to be a fixed cost. Growth in electrical power infrastructure is driven by demand. People decide what they want and expect the power to be there when they need it.

Distribution lines from the stations will strategically connect to the existing distribution systems, feeding the south Okanagan communities they are in. This project gives capacity to the area and will eventually be part of the expansion of distribution lines, providing service to the increasing population and meeting demands in new service areas currently without distribution lines. Notable is the City of Penticton’s marketing information to businesses which includes a statement about dependable low cost power supplies which suggests it may be a location decision criteria of business.

Impact
For this consideration (growth inducement), there is no cumulative effect.

Mitigation
No mitigation is required.

18.0 PUBLIC HEALTH AND SAFETY

Public Health effects related to electrical facilities are largely limited to concerns about potential, but to date, unsubstantiated health effects from the low levels of magnetic fields associated with transmission facilities. Electric fields tend to be more of a safety concern (i.e. induced current).There is also at times a concern with the nuisance and intrusion of additional sound levels that could emanate from an electrical facility if unabated. Spills as well as improper storage and handling of wastes, hazardous materials and chemicals also pose a threat to the health of humans and wildlife, and plans are included in the general guidelines for management of hazardous materials and waste (See Section 20).

18.1 Electric and Magnetic Fields (EMF)

Assessment

Generally, the public health concern with electrical facilities is about the magnetic force field component of EMF around electrical equipment and the potential for adverse human health effects. The poles used for the line will be too low for other uses except for communication and fiber optic cables. There will be no cell phone or microwave transmitters associated with these facilities. During the public open houses, some residents living adjacent to the right-of-way expressed a concern with magnetic fields. FortisBC had staff on hand to discuss the issue and the field changes associated with the transmission line upgrade.

Considerable effort has gone into determining the potential effects of EMF exposures to workers and to the general public. The effects of higher dosages on people have been evaluated by the World Health Organization which has issued a number of technical papers on EMF and discussed polices to address public concern. The BCUC regulates EMF exposures in the context of electrical utilities in British Columbia.

The World Health Organization in its recent publication, “Extremely Low Frequency Fields Environmental Health Criteria Monograph No.238” states the following about Acute and Chronic exposure and effects:

Acute Effects (WHO, 2007)

Acute biological effects have been established for exposure to ELF electric and magnetic fields in the frequency range up to 100kHz that may have adverse consequences on health. International Guidelines exist that have addressed this issue. Compliance with these guidelines provides adequate protection for acute effects.

Chronic Effects (WHO, 2007)

Scientific evidence suggesting that everyday chronic low-intensity (above 0.3–0.4 μT) power-frequency magnetic field exposure poses a health risk is based on epidemiological studies demonstrating a consistent pattern of increased risk for childhood leukemia. Uncertainties in the hazard assessment include the role that control selection bias and exposure misclassification might have on the observed relationship between magnetic fields and childhood leukemia. In addition, virtually all of the laboratory evidence and the mechanistic evidence fail to support a relationship between low-level ELF magnetic fields and changes in biological function or disease status. Thus, on balance, the evidence is not strong enough to be considered causal,
but sufficiently strong to remain a concern.

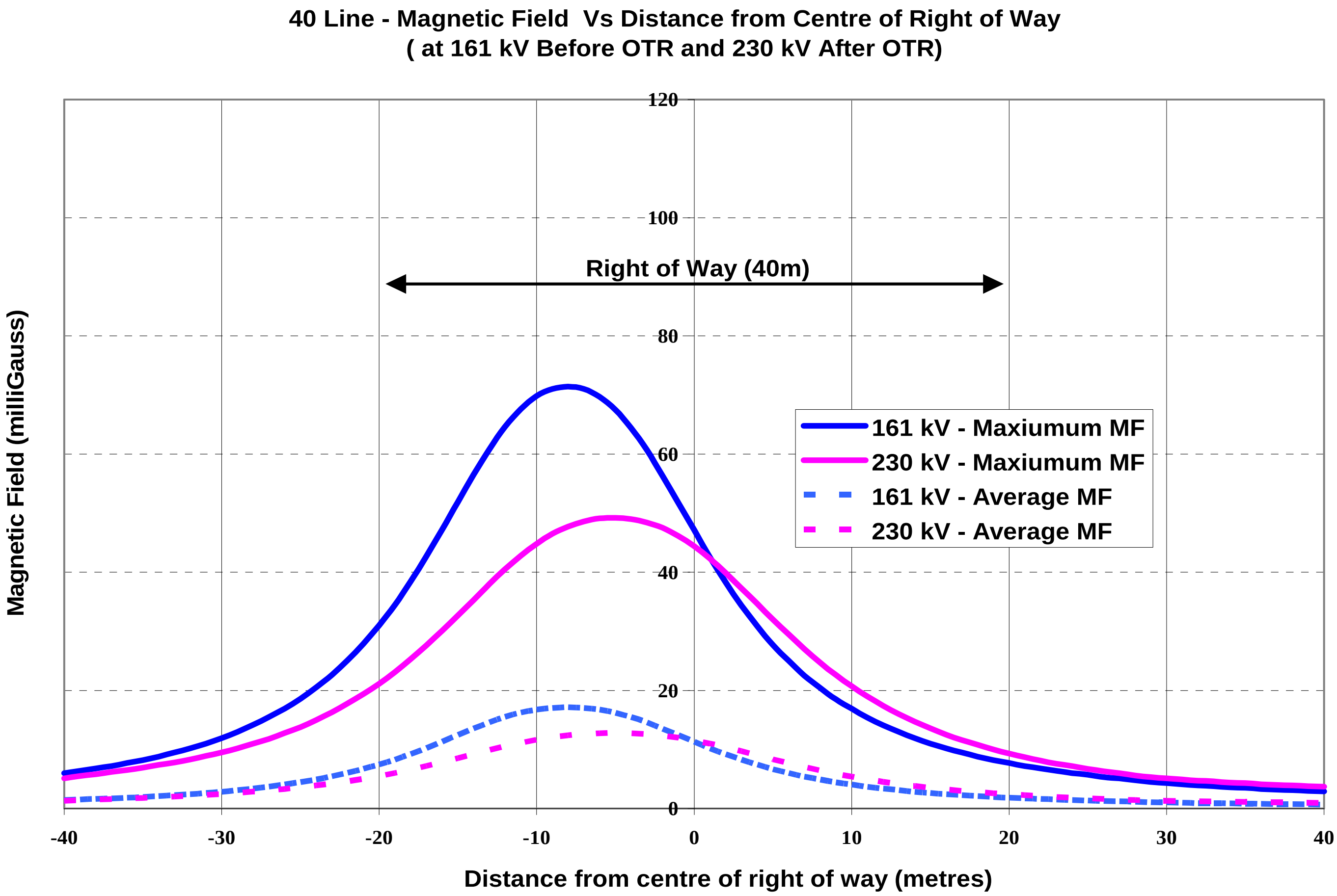
Although a causal relationship between magnetic field exposure and childhood leukemia has not been established, the possible public health impact has been calculated assuming causality in order to provide a potentially useful input into policy. However, these calculations are highly dependent on the exposure distributions and other assumptions, and are therefore very imprecise. Assuming that the association is causal, the number of cases of childhood leukemia worldwide that might be attributable to exposure can be estimated to range from 100 to 2400 cases per year. However, this represents 0.2 to 4.9% of the total annual incidence of leukemia cases, estimated to be 49 000 worldwide in 2000. Thus, in a global context, the impact on
public health, if any, would be limited and uncertain.

A number of other diseases have been investigated for possible association with ELF magnetic field exposure. These include cancers in both children and adults, depression, suicide, reproductive dysfunction, developmental disorders, immunological modifications and neurological disease. The scientific evidence supporting a linkage between ELF magnetic fields and any of these diseases is much weaker than for childhood leukemia and in some cases (for example, for cardiovascular disease or breast cancer) the evidence is sufficient to give confidence that magnetic fields do not cause the disease.

Assessment Calculations

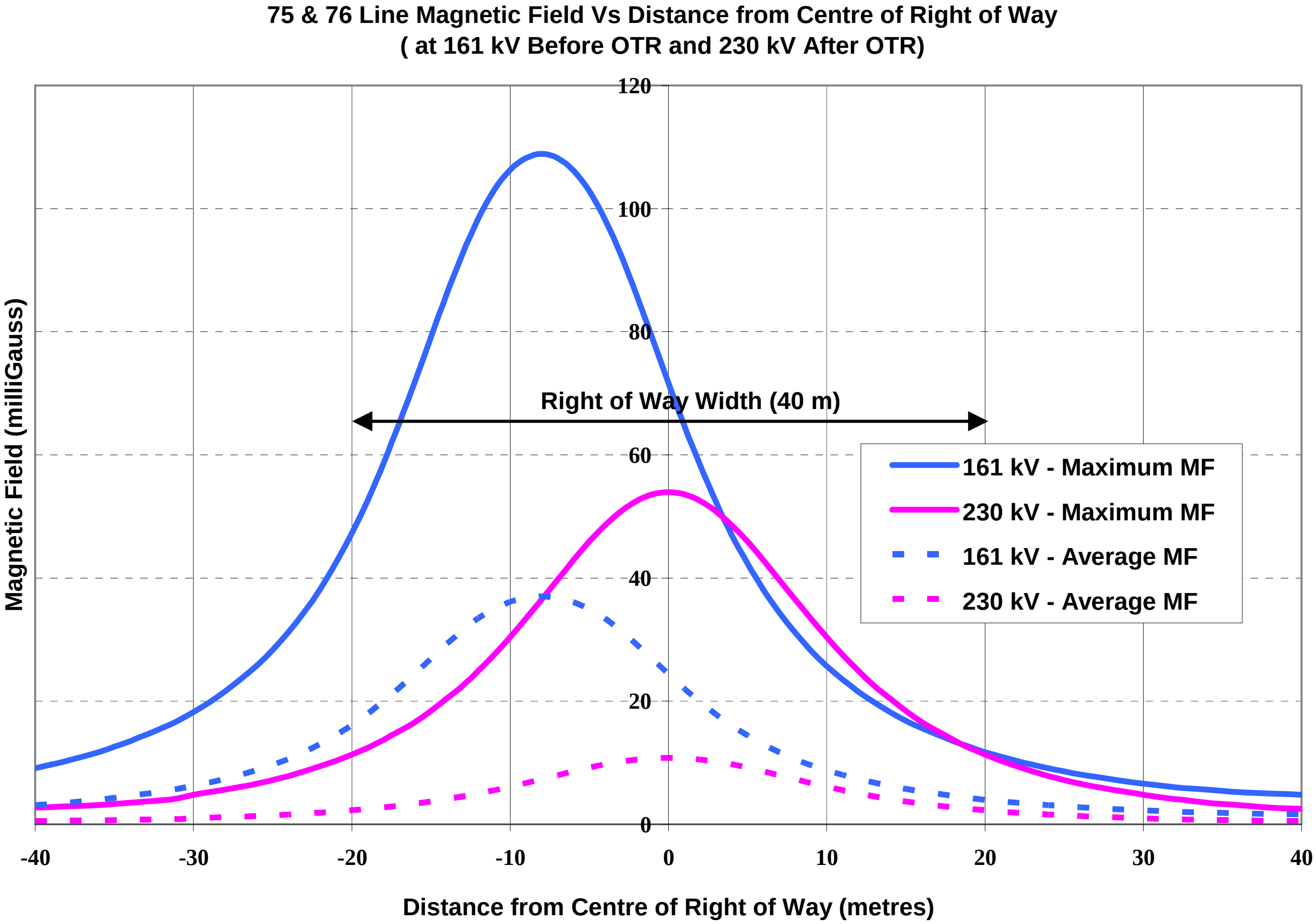
Magnetic fields have been calculated for both the existing 161kV line as well as the proposed 230 kV in the double circuit configuration and the single circuit configuration. The magnetic field profiles for the proposed 230kV transmission lines have been calculated for the expected operating conditions. This analysis indicates these designs will reduce the magnetic fields below those levels which currently exist at the edge of the right-of-way.

Figure 18.1 Comparison of the magnetic fields in the vicinity of the existing 161 kV transmission line and the proposed 230kV single circuit configuration.



40 Line - Magnetic Field Vs Distance from Centre of Right of Way
(at 161 kV Before OTR and 230 kV After OTR)
Right of Way (40m)
Magnetic Field (milliGauss)
Distance from centre of right of way (metres)
161 kV - Maxiumum MF
230 kV - Maxiumum MF
161 kV - Average MF
230 kV - Average MF
120
100
80
60
40
20
0
-40
-30
-20
-10
0
10
20
30
40

Figure 18.2 Comparison of the magnetic fields vs Distance from Centre of the Right-of-Way of the existing 161 kV transmission line and the proposed 230kV double circuit configuration.



Both comparisons of proposed line to the existing line magnetic fields show that the proposed line will reduce magnetic fields in terms of maximum levels with little change at the edge of the right-of-way (at about the -20 and the 20 m location).

The Electric Field (EF) calculations for the Project are also well below ICNIRP's reference levels for public exposure. The new lines would differ little from those of the existing transmission lines despite the increased operating voltage because of the proposed line structure heights and location within the right of way. The EF is related to the operating voltage of the transmission line and does not vary as much as the MF which is proportional to the line loads. Table 18.1 summarizes the calculated EF before and after construction of the lines

Table 18.1 Electric Field (EF), kV/m

Configuration	Maximum EF on Right of Way	EF at edge of Right of Way
Existing 40 and 76 Lines at 161 kV	1.70	1.05
40 Line at 230 kV	2.15	1.30
75 and 76 Lines at 230 kV	1.64	0.20

TABLE 18.2 Maximum reference levels for electric and magnetic field 50 Hz exposures from the International Commission on Non-Ionizing Radiation Protection (ICNRP). Higher levels may be permitted if basic restrictions on current densities are not exceeded.

Applies to	Duration	Electric Field	Magnetic Field
Occupation	Whole working day	10 kV/m	5,000 mG
General Public	Up to 24 hours per day	5 kV/m	1,000 mG

Note: 1 kV = 1,000 V and 1,000 mG = 1 G

Mitigation

Given that there are such low field levels associated with the project, no mitigation is necessary with respect to Health Canada guidelines. Moreover, the exposure of residents adjacent to the right-of-way is well below the ICNRP reference levels for public exposure.

18.2 Sound Levels

Assessment

The background sound levels have been completed for the Bentley, Oliver, Vaseux and the RG Anderson sites. Vaseux is currently undergoing modifications in response to concerns about changes to the sound levels at the adjacent landowner's home.

Increased background noise is a concern as it affects quality of life and has the potential to cause disruption and stress on receptors. Very high sound levels over time also have the potential to cause physiological damage to the auditory system. Electrical transmission and distribution facilities do not have equipment and sources of sound that pose a risk for physiological damage to the auditory system but can under some circumstances increase ambient sound levels with discrete frequencies that are annoying. Transmission lines do create a lower frequency buzz, noticeable within the right-of-way and is considered a nuisance. Station equipment, particularly transformers and reactors can also emit sound levels that are a concern particularly in rural areas and country residential areas if not adequately attenuated.

Mitigation

The Vaseux station is undergoing modifications to control the sound levels from the two existing 230kV transformers. The project design team will incorporate acoustical control on any new sources proposed for Vaseux to ensure it does not add to the sound levels emanating from the facility.

The Bentley Station is near the edge of town and background levels at the site will be influenced by diurnal activity patterns and sound from the town. The background levels in town at the nearest residences were not directly tested as the nearest country residence is the same distance away from the site but further from town and will have lower background levels. The sound level assessment indicates that there are relatively low levels at the nearest country residence in the early morning (36dBA). This residence is north of the site and overlooks the golf course. Its sound levels are within the normal range for this setting. Equipment will be designed with considerations for acoustic controls to ensure there is not a significant audible sound frequency added to the background levels. A design to address changes for the levels at the country residence to the north of the site will also ensure that the levels at the town residences are effectively managed.

There is no cost effective mitigation available or planned for the transmission lines.

19.0 FIRST NATIONS INTERESTS

The Okanagan Aboriginal communities in the South Okanagan have an interest in this project. There are three groups with traditional ties to the region of the project; the Osoyoos Indian Band (OIB), the Penticton Indian Band (PIB) and the tribal council, the Okanagan Nation Alliance (ONA). The Okanagan Nation Alliance also includes the West Bank First Nation, Upper Nicola Indian Band, the Upper Similkameen Indian Band, the Lower Similkameen Indian Band and the Okanagan Indian Band. Any or all of these bands could potentially seek involvement and consultation during the project planning and construction. Figure 4.0 shows a map of the overall area of interest and influence of the Okanagan people in BC and the state of Washington.

To date, consultations about the project have focused on the PIB and the OIB who provide direction on additional consultation with sister organizations and other Okanagan First Nation communities where they indicate it is warranted. During consultations, the communities expressed interest in the archaeological and environmental studies as they indicated that the existing route does cross areas of traditional interest. Historically, members of these communities, hunted, fished and gathered plants throughout the project area and have left their legacy in pictographs and other archaeological features. There have been no known claims of compensation for the existing route. However both communities are participating in the field studies and it is expected they will participate in providing labour and selected services where they have the capacity for the project. Chief Clarence Louie and the leadership of the OIB are on record as having a strong interest in “capacity” building in their people. One of the goals of engaging community member participation in the planning and field studies is to mentor members to give them capacity and knowledge in the archaeological and environmental management areas. The capacity building from an environmental standpoint is important considering the OIB lands currently hold the majority of high quality endangered shrub steppe grasslands now under pressure for development through the South Okanagan.

There are no claims of right or title by either community along the existing route off the reserve lands. A portion of the route from the Bentley Terminal Station to the Vaseux Protected Area as well as the Bentley station and the existing Oliver station are on the reserve lands of the OIB. The OIB community held a designation vote for the Bentley site lease in 2005. Although the vote passed, there is a significant portion of the community with an interest in the project, wanting to ensure that there is care and consideration from an archaeological, traditional use and environmental perspective with the project elements.

Figure 19.1 A map of the Okanagan Traditional Territory and the reserve lands.
Map courtesy of the Okanagan Nation Alliance.

Osoyoos Indian Band

The Osoyoos Indian Band is a partner in the project as they have a commercial arrangement with FortisBC to provide a lease for the Bentley Terminal Station as well as about 10km of 230kV transmission line right-of-way. In addition, FortisBC has built a strong business alliance, working closely with the Osoyoos Indian Band in the environmental planning, assessment and construction of the Nk'Mip Substation and Transmission Line on the Osoyoos Indian Reserve. A key feature of the alliance has been the capacity building and engagement of OIB community members and businesses in various phases of these projects.

This community is also very interested in conservation of species at risk and their habitat on their land as well as environmental stewardship. They have an interest in both the Okanagan River System and Vaseux Creek from a traditional use perspective, particularly with their historical use of the salmon fishery as one of their past main food sources. In association with that activity as well as hunting and gathering, the areas along the Okanagan River System exhibits features such as pit houses, food preparation pits, and encampment remnants of their traditional movement patterns. Rock shelters potentially used for shelter during fishing for salmon were identified during the Vaseux Archeological Impact Assessments. In addition, there are pictographs in Manuel's canyon (off the reserve) likely done by their ancestral community members that need to be protected. The OIB wishes to ensure that impacts to their heritage resources are avoided as well as ensure that the project is completed with protection of environmental resources to minimize any residual effects from the project.

Penticton Indian Band

The Penticton Indian Band has reserve land well to the west of the right-of-way on the west side of the valley. However the area in and around Penticton is part of their asserted traditional territory. The PIB have also reported in correspondence to FortisBC that they have filed a timber claim in the upland areas east of the existing right-of-way between Okanagan Falls and Penticton.

They have supplied community members to project teams during field studies and are expected to participate in construction monitoring when their key areas of interest are under construction. They have an interest in the Okanagan River System and Skaha Lake salmon fishery conservation, traditional hunting lands and use of the lands throughout the valley. Similar to the OIB, this community's project interest from a traditional use perspective is with their historical use of the salmon fishery as one of their past main food sources. In association with that activity as well as hunting and gathering, the areas along the Okanagan River System exhibits features such as pit houses, food preparation pits, and encampment remnants of their traditional movement patterns. The PIB wishes to ensure that impacts to their heritage resources are avoided as well as ensure that the project is completed with protection of environmental resources to minimize any residual effects from the project.

The PIB assigned members to participate in the archaeological assessment as well many of the environmental field studies. They will continue to be involved throughout the project planning process by FortisBC and engaged in meaningful participation by contractors focused on capacity building in the community.

Okanagan Nation Alliance

The tribal council has been supporting and directly involved in the management of the salmon fishery in the Okanagan River system and has recently partnered with the Colville Nation from Washington in the enhancement of the salmon fishery. Not only are they interested in the river and Skaha Lake, they have also participated in studies in the Vaseux Creek watershed, from the perspective of restoring the upstream fishery above the irrigation canal crossing, currently a significant barrier to salmon movement. Elders are reported to remember history and some personal experience in salmon fishing in the canyon in the early part of the 20th century before the Columbia and Okanagan system were as controlled as they are today. Like their member communities, the ONA wishes to ensure that impacts to the heritage resources are avoided as well as plans and construction measures are implemented to ensure that the project is completed with protection of environmental resources to minimize any residual effects from the project.

Photo 19.1 Bitter root in bloom, a traditional plant still harvested in the Manuel's Flats area on the OIB (by S. Morck).

20.0 GENERAL ENVIRONMENTAL PROTECTION MEASURES APPLYING TO ALL THE PROJECT COMPONENTS

20.1 Control of Invasive Species

FortisBC plans to develop and implement an Integrated Invasive Plant Management Strategy as a key part of the Environmental Management plan. The right-of-way has been surveyed for weeds and rare plants during the field assessment and further delineation is not required at this time. The existing collected data will be collated and used as part of the management plan and the need for pre-emptive weed control prior to construction will be assessed and where necessary implemented in consultation with the South Okanagan Similkameen Invasive Plant Society. Construction will be monitored by a Qualified Environmental Professional (QEP) who will implement many of the following construction and post construction measures.

Photo 20.1 Patch of Cheatgrass (Downy Brome) along the right-of-way (by T. McIntosh)

To prevent infestations of invasive plants entering the site or the right-of-way ***all*** equipment and vehicles must be power-washed and cleaned prior to site entry. Vehicles and equipment must be inspected and must obtain entry approval before being allowed on the site or the right-of-way. Vehicles and equipment must be cleaned of mud and plant debris if operating in an area where there are weeds, or prior to moving to a section where there are no weeds. With widespread alteration to the landscape, there are invariably weed seeds already in **most** terrestrial soils that will germinate after a disturbance, and they may not have any association with (but are often blamed on) dirty equipment, vehicles, etc.

Weed control will be initiated under the direction of the QEP during construction and will continue after construction under the direction of FortisBC. Herbicide use will comply with all legislative requirements, including limitations on distances to the creeks as well as transport and storage. The OIB does not support the use of herbicides for right-of-way management at this time.

A landscape fabric or weed barrier will be installed under rock on the toe and berm of the Bentley Terminal Station outside of the permanent fence-line. This will significantly reduce weed infestations in an area that traditionally is subject to invasion. This zone will be part of the semi-annual inspections and control programs.

Operations require that FortisBC continue weed control with regular inspections during the annual growing seasons and to control weed with appropriate techniques.

An important aspect of weed control is ensuring that re-vegetation is implemented immediately/quickly after completion of right-of-way construction activities. This helps reduce areas of bare ground that may be sites for weed invasion. All disturbed areas are to be re-seeded in the same year, during the first preferred seeding period. This may be the late fall, before snow, or early spring when there is still moisture in the soil. Seed mixes for the right-of-way (subject to availability) are expected to use native species and where appropriate non-invasive agronomic species to match the vegetation community and the current land use.

From an operations perspective, it is recommended that there be twice-yearly inspections by qualified company personnel, or their weed control service providers, who can implement control measures as needed for the first two to three years after construction, and thereafter as needed. In some areas of the project, weed control and monitoring may be required for up to 5 years after construction is completed.

20.2 Waste Management

Temporary facilities will be provided to collect wastes during the construction of the facility and to prevent site contamination from any waste material. All waste materials will be removed from the site during construction. If waste materials are temporarily stored onsite, they must be contained, labeled and located within the fenced station boundaries.

Sewage

Portable toilets and washrooms will be provided by the owner or the contractor during construction. They will be situated well away from environmentally sensitive areas and will be secured to prevent them from overturning. A permanent washroom will be constructed within the control room of the Bentley Terminal station that will be connected to a septic field.

Solid Waste

Solid wastes will be temporarily stored in a secure area and must be disposed of on a routine basis throughout the construction process.

Hazardous Waste

The construction of these facilities is not expected to generate significant volumes of hazardous wastes. Any such wastes must be collected, handled, stored and disposed of according to provincial regulations.

20.3 Storage and Spill Prevention

Large projects with heavy equipment and the support systems for heavy equipment have the potential risk of spills. Storage of fuel and lubricants and spill prevention measures are required and include:

- All oil and fuel storage must have secondary containment.
- Fuels cannot be stored and equipment cannot be refueled within 100 metres of a creek.
- All chemicals must be transported and stored in accordance with the Transportation of Dangerous Goods Regulations and the Workplace Hazardous Materials Information System.
- All machinery and equipment must be inspected for leaks prior to access onto the site.
- The contractor must provide adequate spill prevention and cleanup equipment and supplies sufficient to handle any possible on-site incident.
- The contractor must comply with all applicable provincial regulations for the use and storage of fuels and chemicals on this project.
- Any quantity of a spill of fuel or chemicals will be considered a reportable incident and must be cleaned up immediately and reported to the QEP.

Equipment and Materials

- All equipment and materials must be stored on FortisBC lease sites (for the station and terminal station) within the fenced limit of the station or on the access road that is immediately adjacent to the station.
- Equipment must not be temporarily stored on top of any sensitive vegetation and only in locations approved by the QEP.
- Equipment will not be temporarily stored along any portion of the right-of-way without the authorization of the QEP and only in exceptional circumstances and where there will be no measurable impact to the environment.
- All large fuel powered equipment and large vehicles will be tarped (diapered) overnight or when not operating for the day.

20.4 Dust Abatement

If the contractor's construction activities have the potential to generate significant amounts of dust, measures will be implemented to suppress and control the generation of dust using water or a non toxic dust suppressant.

20.5 Fire Prevention

Smoking restrictions will be in effect for contractors and their employees. Designated smoking areas and breaks will be established, with suitable ashtrays made available. Smoking will not be permitted outside of designated areas and times.

Burning of timber residue will be permitted only during the winter (and only when the fire hazard is low for extended periods). Construction crews must have fire-fighting equipment on standby (except during winter periods when there is snow):

- One Wajax/Backpack water sprayer must be available to each crew. Shovels and grub-hoe/axes must be readily accessible and available for each crew member,
- A filled and mobile 500-gallon water tank or truck must be on standby at the Station or Terminal station and at a suitable staging location near the middle of the transmission line.

The contractor shall have an Emergency Preparedness Plan in place prior to start of work.

20.6 General Environmental Guidelines

Appendix 3 includes a set of general environmental guidelines in procedural format developed for FortisBC activities.

20.7 Monitoring, Measurement and Follow-up

Given the sensitive nature of the ecosystem at the terminal stations sites, and the need to expand the knowledge base with respect to certain key issue areas, a monitoring and measuring program will be developed in the environmental management plan. The program will be designed to facilitate and improve management decisions and mitigation planning for:

- Assessment of the actual impact versus the predicted impacts of the ESIA;
- Species-at-risk biology, habitat management and habitat improvement for those species potentially impacted;
- Antelope brush needle-and-thread grass vegetation community relocation, enhancement and re-establishment;
- Species at risk measurable impacts and changes; and
- Invasive species/weed control.

A QEP will be assigned to monitor the projects on a daily basis and assist in field adjustments where necessary. The QEP will have access to professional biologists and archaeologists to help interpret and manage issues as well as monitors from the OIB and PIB where warranted (i.e. at the archaeological sites) during key phases of construction. Typically there are field adjustments to detailed environmental management plans as well as unforeseen events requiring modification and adjustment in the field. Monitoring and reporting of the impacts, construction activities and the effectiveness of mitigation measures on a regular basis during construction is a key expectation of the QEP and the field biologists.

21.0 SUMMARY AND RECOMMENDATIONS

The proposed FortisBC OTR project provides benefits to local communities for employment and services as well as future reliable power. There are a few notable impacts from the projects.

- Loss of an Antelope brush vegetation associations at the Bentley station;
- Potential fragmentation of wildlife corridors around the Bentley Terminal Station;
- Removal of the large hazard trees with wildlife potential along the edge of the right-of-way;
- Temporary effects on the existing natural vegetation on access trails along the right-of-way from construction vehicles and equipment;
- Reduction in foraging habitat for snakes and small mammals at the Bentley site;
- Riparian zone impacts at Vaseux Creek due to topping of selected trees at the crossing adjacent to the Vaseux Station;
- Riparian impacts due to culvert installation for crossing Atsiklak Creek; and
- Potential changes to public access in the existing corridor through the project area.

The Bentley site will result in the removal of a total of 3.5 hectares of an Antelope brush vegetation community which is under severe pressure in BC. Over recent years the overall removal rate has been 90 ha/year, increasing in 2004 and 2005 to about 200 ha annually. Most of this loss is due to recurring withdrawal of the land for residential and agricultural purposes. This station loss accounts on a total one time basis for about 4% of the yearly (excluding 2004 and 2005) average.

As a company committed to protection of the environment, FortisBC has initiated plans for restoration of other areas on the Reserve lands to offset this habitat change. This plan will include the salvage and relocation of transplantable vegetation from the two station sites. Based on the experience of others, it may take approximately five years to re-establish a desert shrub grassland community with ongoing support and management.

In addition, to the above offset mitigation measure, other measures have been developed and FortisBC is committed to implementing them. More detailed site specific measures integrated with the design process will be prepared in the environmental management plan.

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APPENDIX 1: ARCHAEOLOGICAL IMPACT ASSESSMENT

FORTISBC
OKANAGAN TRANSMISSION REINFORCEMENT
OLIVER TO PENTICTON, B.C.
ARCHAEOLOGICAL IMPACT ASSESSMENT

Heritage Inspection Permit #2007-147

ARCAS
CONSULTING ARCHEOLOGISTS

FORTISBC
OKANAGAN TRANMISSION REINFORCEMENT
OLIVER TO PENTICTON, B.C.
ARCHAEOLOGICAL IMPACT ASSESSMENT

Conducted under:

Heritage Inspection Permit #2007-147

Prepared for:

FORTISBC
1266 Commercial Way
Penticton, BC
V2A 3H5

Prepared by:

Geordie Howe and Ian Cameron

ARCAS CONSULTING ARCHEOLOGISTS LTD.

55A Fawcett Road
Coquitlam, B.C.
V3K 6V2
T: 604-526-2456 F: 604-526-2438
E-mail: ghowe@arcas.net

(Arcas Project No. 07527)

July 2007

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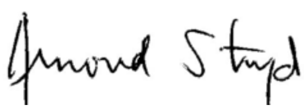

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Affiliation

CREDITS

PROJECT MANAGEMENT	D. Geordie Howe, B.A., RPCA
FIELD DIRECTOR	D. Geordie Howe
CREW LEADERS	D.Geordie Howe
	Ian Cameron, M.Sc.
FIELD ARCHAEOLOGISTS	Ewan Anderson, B.A., RPCA
	Arran Ferguson, B.A.
	Dean Gallagher (Osoyoos Indian Band)
	Ryan Gallagher (Osoyoos Indian Band)
	Robert George (Penticton Indian Band)
	Richard Hill (Penticton Indian Band)
	Charles Kruger (Penticton Indian Band)
REPORT AUTHORS	D. Geordie Howe and Ian Cameron
REPORTING ASSISTANCE	Ginelle Taylor, B.A.
	Jessica Ruskin, B.A.
REPORT EDITOR	Richard Brolly, B.A., RPCA
REPORT DRAFTING	Robert MacNevin, B.A.
	Ann O'Sullivan, B.A.

Unless otherwise specified, all personnel are affiliated with Arcas

MANAGEMENT SUMMARY

This report summarizes the results of an Archaeological Impact Assessment (AIA) of the FortisBC Okanagan Transmission Reinforcement Project (OTR) within the Okanagan Valley, located between Oliver and Penticton, B.C. FortisBC is proposing to upgrade the existing Okanagan 161kV Transmission line for approximately 29 km from Oliver to Penticton (Figure 1) with a 230 kV system. Currently, an alternative route, the Alternative Upland Corridor, has been included in the selection process and was also evaluated as part of the archaeological review. This archaeological assessment was undertaken by Arcas Consulting Archaeologists Ltd. (Arcas) at the request of BC Hydro, the EPC Contractor. The AIA was carried out under Heritage Investigation Permit #2007-147 issued by the Archaeology Branch.

The project development locations are in the vicinity of the areas of responsibility of the Penticton Indian Band and the Osoyoos Indian Band, members of the Okanagan Nation Alliance. This AIA is concerned with identifying previously recorded archaeological sites and assessing the archaeological potential of lands within the development areas. It does not address potential impacts to traditional use sites by proposed developments and is not intended to document First Nations interest in the land. The study was conducted without prejudice to First Nations treaty negotiations, aboriginal rights or aboriginal title.

Four protected archaeological sites (DhQv-30, DhQv-98, DiQv-24 and DiQv-25), were identified within the existing OTR right-of-way. No archaeological sites were identified in the proposed Alternative Upland Corridor. No cultural heritage sites were identified within both development areas.

No construction should have any direct impact on these sites; however, any proposed land alterations, such as clearing, grubbing, and excavation for the OTR, or any other surface and subsurface alteration within the boundaries of these protected archaeological sites could have indirect impacts on these sites. Specific recommendations are provided below.

(1) Any development activities within 50 m of the archaeological sites (DhQv-30, DhQv-98, DiQv-24 and DiQv-25) should be monitored by an archaeologist or archaeologically-trained First Nations' representatives from the Penticton Indian Band and Osoyoos Indian Band to ensure the sites are not impacted by indirect effects of OTR construction.

(2) A post-development evaluation of the four sites should be undertaken by a qualified archaeologist familiar with this assessment for a before and after comparison.

ACKNOWLEDGEMENTS

Arcas would like to thank FortisBC for the opportunity to conduct the archaeological assessment discussed in this permit report. In particular, we would like to acknowledge the assistance and support of Steve Morck (Elements Network) for his assistance during all stages of this project.

We would also like to thank Dean Gallagher and Ryan Gallagher of the Osoyoos Indian Band along with Robert George, Richard Hill, and Charles Kruger of the Penticton Indian Band for their assistance during the fieldwork phase of the archaeological impact assessment. We would like to thank Eric Stoof of Eclipse Helicopters Ltd for his expertise and assistance with access to the proposed Alternate Upland Corridor.

In addition, we would like to thank Dave Hutchcroft, Archaeologist at the Archaeology Branch, Ministry of Tourism, Sport and the Arts in Victoria, for reviewing the Heritage Inspection Permit application and the archaeological impact assessment report.

The professional opinions expressed in this report are those of Arcas, and not necessarily those of any individuals, groups, or institutions involved in the study. Arcas Consulting Archeologists is solely responsible for the content of this report, including any errors, omissions, or shortcomings.

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1.0 INTRODUCTION

FortisBC is proposing to upgrade approximately 29 km of the existing Okanagan 161kV Transmission line from Oliver to Penticton (Figure 1). The transmission line was originally built in 1963 and no archaeological studies were undertaken for that development. The proposed project is scheduled for construction between 2008 and 2010. The project will commence at the Bentley Terminal Station at the south end of the line and proceed north to the RG Anderson Terminal in Penticton and will include a branch line to the Vaseux Lake Terminal Station. An Alternative Upland Route is included in the proposed transmission reinforcement project.

One of the objectives of the Environmental Management Plan for the Okanagan Transmission Reinforcement Project is the identification and protection of heritage and cultural resources along the existing and proposed alternative transmission line corridors. In order to determine if any archaeological sites could be impacted by the proposed transmission line, FortisBC retained Mr. Steve Morck, of Elements Networks, to coordinate heritage and cultural studies for the proposed project. Mr. Morck contracted Arcas Consulting Archeologists (Arcas) to undertake the necessary archaeological studies for FortisBC.

The first stage for the heritage and cultural studies involved completion of an archaeological overview assessment (AOA) of the proposed development (Arcas Consulting Archaeologists 2007). The purpose of the AOA was to identify and assess known archaeological sites within the study area, identify and assess archaeological resource potential or sensitivity within the proposed study area, and identify the need and appropriate scope of further archaeological field studies. Based on the results of the AOA, recommendations were made for an archaeological impact assessment of lands assessed as having moderate or high archaeological potential. The AOA recommended an archaeological impact assessment for the existing and proposed transmission line corridors (Arcas Consulting Archaeologists 2007).

The subject of this report is an archaeological impact assessment as defined in the *British Columbia Archaeological Impact Assessment Guidelines* (Archaeology Branch 1998) and was undertaken in accordance with these guidelines. The archaeological impact assessment (AIA) was carried out under Heritage Investigation Permit #2007-147 issued by the Archaeology Branch pursuant to Section 14 of the *Heritage Conservation Act* (RSBC 1996, Chap. 187).

The First Nations' communities with asserted interest in the study area are the Osoyoos Indian Band and the Penticton Indian Band, members of the Okanagan Nation Alliance.

1.1 Objectives

The objectives of the AIA are to:

(1) Identify and evaluate the significance of any archaeological sites located within the proposed transmission line corridors;

(2) Identify and evaluate possible impacts by the transmission line development on protected archaeological sites; and

(3) Recommend appropriate impact management measures where necessary.

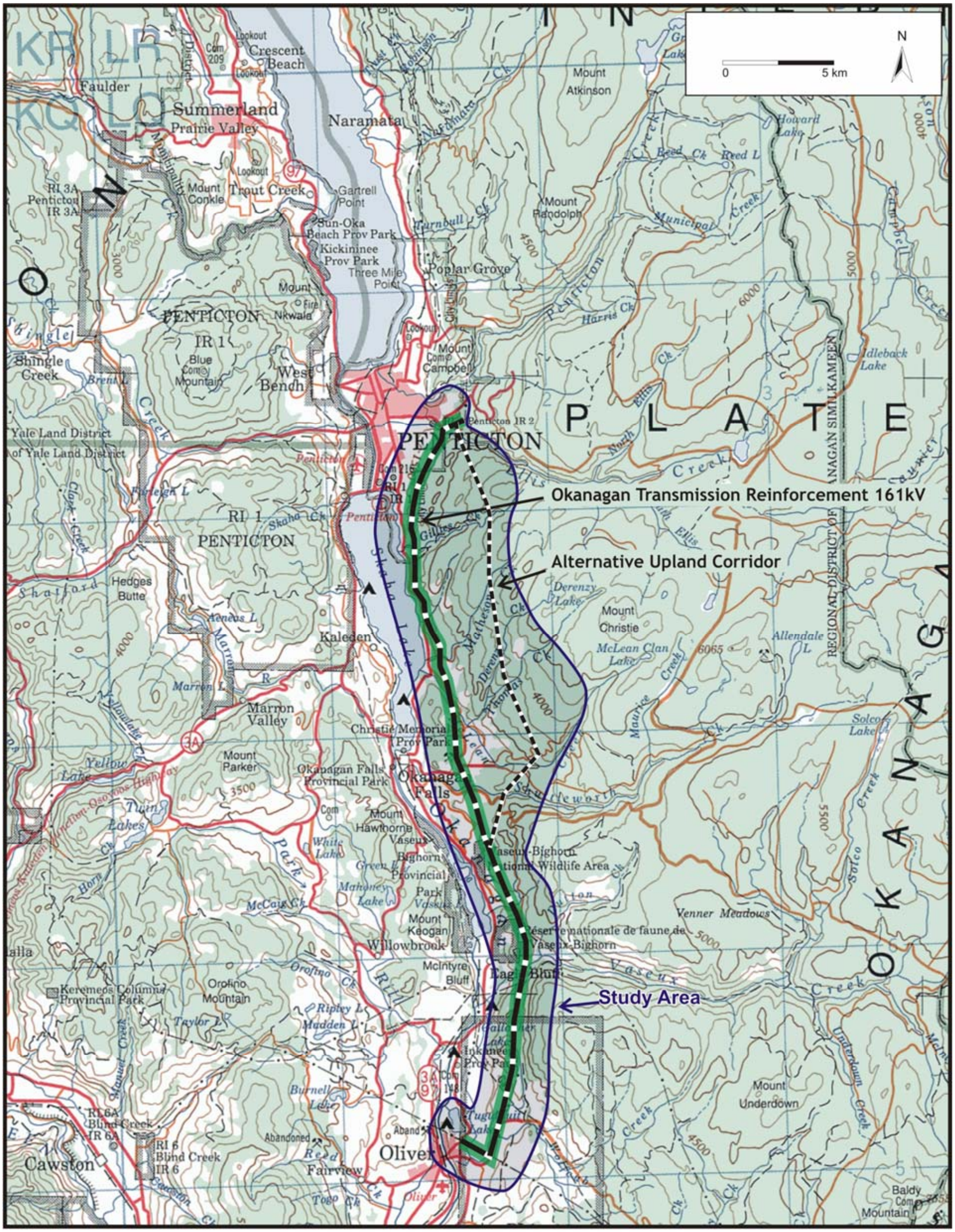

Figure 1. Location of the FortisBC Okanagan Transmission Reinforcement Project (1:250,000; NTS 82E).

This study is concerned with potential impacts to archaeological remains caused by the proposed transmission line development project. It does not address potential impacts to traditional use sites by this development. It is not the intent of this report to document the interests of the Osoyoos Indian Band or the Penticton Indian Band in the lands of this locality. The study was conducted without prejudice to First Nations' treaty negotiations, Aboriginal rights, or Aboriginal title.

1.2 Archaeological Sites

An archaeological site is a location that contains physical evidence of past human activity, and which can be studied by archaeological methods of investigation, including site survey, excavation, and data analysis (Archaeology Branch 1998). In British Columbia, most archaeological sites are attributable to pre-Contact settlement and land use by First Nations' people, though locations of Euro-Canadian or Asian-Canadian settlement pre-dating 1940 are recorded as historic archaeological sites in some circumstances. Records of archaeological sites in B.C. are maintained by the Archaeological Site Inventory Section (Archaeology Branch).

Archaeological sites are numbered according to the Borden Site Designation Scheme used throughout Canada (Borden 1952). This scheme is based on the maps of the National Topographic System and uses latitude and longitude to pinpoint the location of a site. The four alternating upper and lower case letters (e.g., DhQv) designate a unique block measuring 10 minutes of latitude by 10 minutes of longitude. Sites are numbered sequentially within a block, based (usually) on their date of discovery; therefore, DhQv-30 would be the thirtieth site recorded in block "DhQv".

Archaeological Site Types

Archaeological sites are defined according to the types of **archaeological remains** (i.e., artifacts and features) present, and according to the types of traditional activities suspected to have taken place at the site. A particular site can be comprised of one or more of these types of archaeological remains, and generally speaking, it is expected that larger sites will be more complex than smaller ones.

Typical archaeological remains found in the Okanagan Valley include housepits, subsistence features, artifact scatters, burial places, petroforms, rock art, culturally modified trees, trails, and historic remains, each of which is described below:

- **Housepits** are circular to sub-rectangular depressions (rarely, square), in this region usually between about 4 m and 10 m in diameter (or along its longest axis). These features are the remains of semi-subterranean pithouses or matlodges. Housepits frequently occur in small village clusters, often in association with smaller pits used for food preparation and storage, butchered animal bones, and artifacts. Housepits are typically found in environmental settings with good solar exposure, protection from winter winds, and proximity to potable water, though secluded locations were sometimes selected for defensive reasons.

- **Subsistence features** are usually present at locations traditionally used to harvest and process traditional resources, but are often associated with village sites as well. Cache or storage pits are the most common type of subsistence feature, and appear as circular surface depressions between 1 m and 3 m in diameter, frequently in closely-spaced clusters and often in proximity to housepits. Cooking features are another characteristic subsistence feature in this region; they may appear as small, charcoal-filled depressions, or level platforms covered with black carbon-stained soil, but are generally larger than cache pits (Lepofsky and Peacock 2004).

- **Artifact scatters** are the most common archaeological remains in the Okanagan Valley, and are comprised of clusters of (usually) stone artifacts, including expedient or formed tools and the waste products of tool manufacture (debitage). Most artifact scatters represent transitory use of the landscape, and are often associated with the exploitation of particular resources. Recurrently occupied sites may include other kinds of archaeological remains, such as butchered animal bones and fire-altered rocks, as well as charcoal-stained soils.

- **Burial places** are locations where First Nations' people interred their dead. They are commonly found near winter villages, but occur generally throughout the landscape for individuals who died when away from their villages. In this region, burial places are most often found in sandy hills overlooking lakes or other waterways.

- **Petroforms** are to deliberate constructs of stones (e.g, walled enclosures, cairns, stone-lined pits), which might either be associated with subsistence activities like hunting blinds or berry-drying, or ceremonial activities such as puberty rituals.

- **Rock art** sites are locations where First Nations' people painted designs (pictographs) in red ochre, often in places of particular spiritual power used for vision-questing. Rock art sites in this region are usually found on prominent bedrock outcrops along lakes or rivers, as well as along traditional trails (Corner 1968, Nankivell and Wyse 2003).

- **Culturally modified trees** (CMTs) are trees which have been intentionally altered by First Nations' people as part of their traditional use of forest resources. Although a number of species were traditionally used by Aboriginal people on the Interior Plateau, cambium-stripped lodgepole pine and ponderosa pine are the most common CMT type (Lepofsky and Peacock 2004). A cambium-stripped or bark-stripped CMT is a tree from which a section of bark has been removed, resulting in a lenticular bark scar (Archaeology Branch 2001). Nearly all CMTs will occur in proximity to a major watercourse on well-drained, level ground or hillsides with less than 50º of slope, and in old-growth forest stands containing mature pine trees.

- **Trails** represent traditional routes used by Aboriginal people, either for subsistence pursuits or for long-distance trade and communication with neighbouring First Nations. Many traditional trails became historically known routes during the fur trade period, and used later still for contemporary roads. In the Okanagan, rock art sites are frequently associated with traditional trails, and CMTs are commonly found within a short distance of traditional and more recent trails.

- **Historic remains** denote artifacts, structures, and other features usually associated with Euro-Canadian or Asian-Canadian settlement and land use. In the Oliver to Penticton project locality, they are most likely to be associated with late-19th and early-20th century homesteading, ranching, and orchard-growing.

1.3 Protection of Archaeological Sites

Archaeological sites are protected by the *Heritage Conservation Act (HCA)*, which is administered by the Archaeology Branch. Archaeological sites are protected whether located on public or private lands. Archaeological sites are protected if they have been designated as "Provincial Heritage Sites" in accordance with Section 9 of the *HCA*, or through automatic protection pursuant to Section 13 by virtue of particular historic or archaeological values.

Sites automatically protected by Section 13 include:

- archaeological sites occupied or used before A.D. 1846;
- aboriginal rock art;
- burial places;
- heritage ship and aircraft wrecks; and archaeological sites of unknown age, with a reasonable possibility of having been occupied or used before A.D. 1846.

Protected archaeological sites may not be altered or disturbed in any manner without a permit issued under Sections 12 or 14 of the *HCA*. Archaeological sites of aboriginal origin not automatically protected by the *HCA* may be subject to legal interpretations of the *Delgamuukw* vs. British Columbia (1997) decision regarding the fiduciary responsibilities of provincial governments for protecting cultural heritage resources.

2.0 PROJECT BACKGROUND

BC Hydro is the Engineering-Procurement-Construction contractor for the proposed FortisBC Inc. Okanagan Transmission Reinforcement (OTR) project. The project has been proposed in response to significant electrical load demand in the Okanagan Valley as a result of increased population and residential demand, as well as industrial and agricultural demand for additional electrical power. The expansions were identified in the Fortis planning forecasts in 1998/99.

The OTR project has several project components which together with other projects, such as the Vaseux Lake Terminal Station, are expected to supply the load for the next 20 years, based on Fortis planning and load forecasting criteria accepted by the British Columbia Utilities Commission. Once completed, this system expansion in the South Okanagan should supply an increasing load without significant additional transmission infrastructure during this period.

Initially, alternative transmission build-ups were considered, which included a significant upgrade to the existing transmission corridor from the Kootenay Valley to Osoyoos and north to Penticton in some combination with continuing to purchase supplemental power from BC Hydro in the North Okanagan. BC Hydro did not have the power available for sale as they had to meet growing demand in their service area. The transmission build up option from the Kootenays was also rejected due to cost, engineering and environmental considerations. The preferred alternative was the development of the Vaseux Terminal Station in partnership with BC Hydro along with the expansion of the transmission system in the South Okanagan. The Vaseux project was subsequently approved and constructed, setting in motion the development of these proposed projects. The principal aspects of the currently proposed OTR project include the:

- Upgrades within an existing 1.00 ha (2.40 acre) substation (RG Anderson) in Penticton;
- Upgrades within an existing 7.00 ha (17.00 acre) substation (Vaseux Lake Terminal Station) east of Vaseux Lake;
- Construction of a new 3.50 ha (8.66 acre) Bentley terminal station, near the town of Oliver (Arcas Consulting Archaeologists 2005b);
- Partial upgrade to an existing substation (Oliver), located in Oliver west of the proposed Bentley Station;
- Decommissioning of the existing 161kV system and installation of two 230kV Transmission Lines - one between Bentley and Vaseux and one between Vaseux and Penticton on existing or new rights-of-way (this study); and
- The installation of a third 230kV transmission line from Vaseux Lake Terminal Station to feed power north to RG Anderson in Penticton (this study).

The proposed facilities are expected to be built between 2008 and 2010 subject to regulatory approvals.

The first component of this study consisted of an AIA of the existing 161kV system and two proposed 230 kV transmission lines. The corridor width for this component is 40 m, which includes the existing line corridor. The second component consisted of an AIA of a third 230 kV transmission line through "green field" lands with a corridor width of 40 m.

2.1 FortisBC OTR Project Existing Route

The existing route extends from Oliver Station north to RG Anderson Terminal Station in Penticton across variable terrain and varying levels of disturbance. Terrain ranged from fairly flat and level to steep and rugged. The route was disturbed in areas by agriculture and residential construction as well as wild fire, road construction and gravel extraction. The route is summarized in Table 1.

Table 1. FortisBC OTR Project Existing Route Summary Information

Section	Length (km)	Route Description	Proposed Alterations
1 Oliver Station to Camp McKinney Road (existing tower L40A to L40J) Osoyoos IR 1	1.300	from east side of Oliver Station corridor crosses irrigation canal, ascends steep slope to bench above Oliver Station; atop bench ascends gentle slope to southeast, crossing antelope bush and sagebrush vegetation; access roads to vineyards parallel corridor; east of Tower L40I corridor descends steep slope, crosses Wolfcub Creek to reach McKinney Road; major disturbance from existing transmission line corridor, vineyard development and road construction	corridor expansion; clearing, grubbing; upgrade access road, line construction, tower installation; portion of corridor parallels south side of proposed Bentley Station development property (see Arcas 2005b)
2 existing tower L40J (east side Camp McKinney Road) to tower L40-7 (north of Camp McKinney Road)	1.655	existing corridor proceeds northeast from junction with another transmission line; ascends gentle slope across open shrub steppe; crosses deeply incised draw for Wolfcub Creek; crosses small creek immediately S of Camp McKinney Road; crosses several roads leading to residences on Osoyoos IR 1	corridor expansion; clearing, grubbing; line construction, tower installation
3 tower L40-7 (north of Camp McKinney Road) to northward to tower L40-16	2.125	existing corridor proceeds northeast from tower L40-7; traverses open shrub steppe; crosses shallow drainage course (dry) of Atsiklak Creek; crosses BC Gas pipeline, leaves Osoyoos IR 1 into Crown land; ascends steep hill overlooking Atsiklak Creek canyon	corridor expansion; clearing, grubbing; line construction, tower installation
4 tower L40-16 to tower L76-36 (Vaseux Canyon –south side)	4.370	existing corridor descends steep slope broken by vertical cliffs to reach base of Atsiklak Creek canyon, proceeds north from tower L40-17 following talus slopes along west base of canyon; canyon very narrow and steep sided to tower L40-22; then canyon widens and existing corridor proceeds north to crest of vertical canyon of Vaseux Creek, within Crown Land; junction with Vaseux Lake Terminal Station transmission line south 250 m south of Vaseux Creek canyon; disturbance from existing transmission line corridor and access road construction	corridor expansion (timber harvesting, clearing, grubbing), site access, line construction; pole installation

Table 1. FortisBC OTR Project Existing Route Summary Information

Section	Length (km)	Route Description	Proposed Alterations
5 tower L76-36 (Vaseux Canyon –south side) to McIntrye Creek Forest Service Road (Irrigation Creek)	3.385	existing corridor proceeds north, crosses vertical canyon of Vaseux Creek, ascends open ponderosa pine – bunchgrass slope with bedrock exposures, from crest of slope route traverses rolling open ponderosa pine-bunchgrass terrain; crosses irrigation ditch; from tower L76-44 corridor traverses moderate to steep side slope until tower L76-46 where route opens into open grassland on bench above Irrigation Creek; steep descent to McIntyre Creek Forest Service Road and Irrigation Creek; route bounded by private property; disturbance from existing transmission line corridor and access road construction	corridor expansion (timber harvesting, clearing, grubbing), line construction; pole installation; no impacts to Vaseux Creek as creek will be spanned
6 McIntrye Creek Forest Service Road (Irrigation Creek) to tower L76-57 (junction with proposed alternate upland route)	3.060	existing corridor proceeds north, crosses Irrigation Creek, ascends open bunchgrass slope with scattered trees, bedrock exposures and vertical cliffs to reach crest of slope at tower L76-49; route traverses rolling open ponderosa pine-bunchgrass terrain with bedrock exposures; at tower L76-54 route descends steep slope broken by cliffs; then traverses moderate to steep side slope with western exposure; route then descends steep rocky slope with cliffs to reach tower L76-57; southern portion of section bounded by private property; some disturbance from existing transmission line corridor and access road construction	corridor expansion (timber harvesting, clearing, grubbing), line construction; pole installation; no impacts to Irrigation Creek as creek will be spanned
7 tower L76-57 (junction with proposed alternate upland route) to Okanagan Falls Forest Service Road	2.505	existing corridor proceeds north, descends open ponderosa pine – bunchgrass slope, then crosses ponderosa pine – bunchgrass rolling terrain with bedrock exposures; route crosses small road and prominent cliff face 70 m south of tower L76-59, then open antelope bush and sagebrush steppe to Okanagan Falls FSR; route bounded by Crown Land or Nature Trust of BC lands; some disturbance from existing transmission line corridor and access road construction	corridor expansion (timber harvesting, clearing, grubbing), line construction; pole installation
8 Okanagan Falls Forest Service Road to McLean Creek Road (tower L76-71)	1.390	existing corridor proceeds north, route descends short steep slope to Shuttleworth Creek crossing – bounded by alluvial fan; then ascends short steep bank; corridor crosses over farm and residential structures, agricultural fields and Allendale Road; route bounded by private property; major disturbance from existing transmission line corridor, agricultural and residential development, and road construction	corridor expansion, line construction; pole installation

Table 1. FortisBC OTR Project Existing Route Summary Information

Section	Length (km)	Route Description	Proposed Alterations
9 McLean Creek Road (tower L76-71) to McLean Creek Road (south of tower L76-81)	2.420	existing corridor proceeds north, crossing private property then ascends steep rocky slope to tower L76-72; traverses rolling terrain of ponderosa pine – bunchgrass, crossing two alkali ponds until tower L76-75; route descends short steep slope crossing level open area immediately east of earthen dam; route ascends steep rocky slope to tower L76-76 before descending and traversing moderate to steep side slope; corridor crosses McLean Creek before reaching McLean Creek Road; route bounded by Crown Land, Nature Trust Of BC lands and private property; disturbance from existing transmission line corridor	corridor expansion, line construction; pole installation
10 McLean Creek Road (south of tower L76-81) to Matheson Creek	2.345	existing corridor proceeds north, crossing private property then ascends steep rocky slope to tower L76-83; descends, crossing horse pasture and vineyard; crosses over farm buildings and a private drive; ascends open grassland, crossing deeply incised drainage channel, rolling grassland, over another drainage channel to tower L76-88; route descends moderate side slope, crossing another vineyard before reaching forested slope south of Matheson Creek; route bounded by private property; disturbance from existing transmission line corridor and agricultural and residential development	corridor expansion, line construction; pole installation
11 Matheson Creek to Sunnybrook Drive	1.920	existing corridor proceeds north crossing Matheson Creek (dense shrubs), crosses Parsons Road, crosses vineyard, crosses Matheson Road, traverses a small section of sagebrush-covered moderate side slope, then vineyards; adjacent to residential lots within a new subdivision (under construction) to reach Sunnybrook Drive; route bounded by private property; disturbance from existing transmission line corridor and agricultural and residential development	corridor expansion, line construction; pole installation
12 Sunnybrook Drive to Gillies Creek	3.150	existing corridor proceeds north, adjacent to residential lots on Sunnybrook Drive; traverses open rolling terrain covered by ponderosa pine and bunchgrass; bedrock exposures and rock bluffs present along route; closest approach to Skaha Lake (100 m); descends steep slope to Gillies Creek; route bounded by private property at southern end of section, Nature Trust of BC Lands, with private property and Crown Land in northern portion of section; disturbance from existing transmission line corridor with some disturbance from residential development at southern end of section	corridor expansion, line construction; pole installation

Table 1. FortisBC OTR Project Existing Route Summary Information			
Section	**Length (km)**	**Route Description**	**Proposed Alterations**
13 Gillies Creek to tower L76-130 (junction with proposed alternate upland route)	5.400	existing corridor proceeds north; traverses open rolling terrain covered by ponderosa pine and bunchgrass; bedrock exposures and rock bluffs present along route; route traverses canyon at Skaha Bluffs Rock Climbing locality, route bounded by private property, disturbance from existing transmission line corridor with some disturbance from residential development at southern end of section	corridor expansion, line construction; pole installation
14 tower L76-130 (junction with proposed alternate upland route) to RG Anderson Terminal Station	0.635	existing corridor proceeds north; descends moderate slope to alluvial fan of Ellis Creek crossing; route ascends steep slope and traverses open rolling terrain covered by ponderosa pine and bunchgrass to Carmi Avenue and RG Anderson Terminal Station; route bounded by private property (gravel pit) south of Ellis Creek; disturbance from existing transmission line corridor, forestry access roads; gravel extraction activities	corridor expansion, line construction; pole installation; no alterations to Ellis Creek as it will be spanned
15 Vaseux Lake Terminal Station to junction with Oliver – Penticton transmission line	1.410	from terminal route proceeds northeast, traversing flat alluvial plain, crossing Vaseux Creek, then ascends steep slope to reach narrow terrace before ascending very steep rocky slope to reach crest of slope near Tower L76-32; descends rocky slope to reach Oliver – Penticton transmission line; disturbance from existing transmission line corridor	corridor expansion (timber harvesting, clearing, grubbing), line construction; pole installation; no impacts to Vaseaux Creek as creek will be spanned

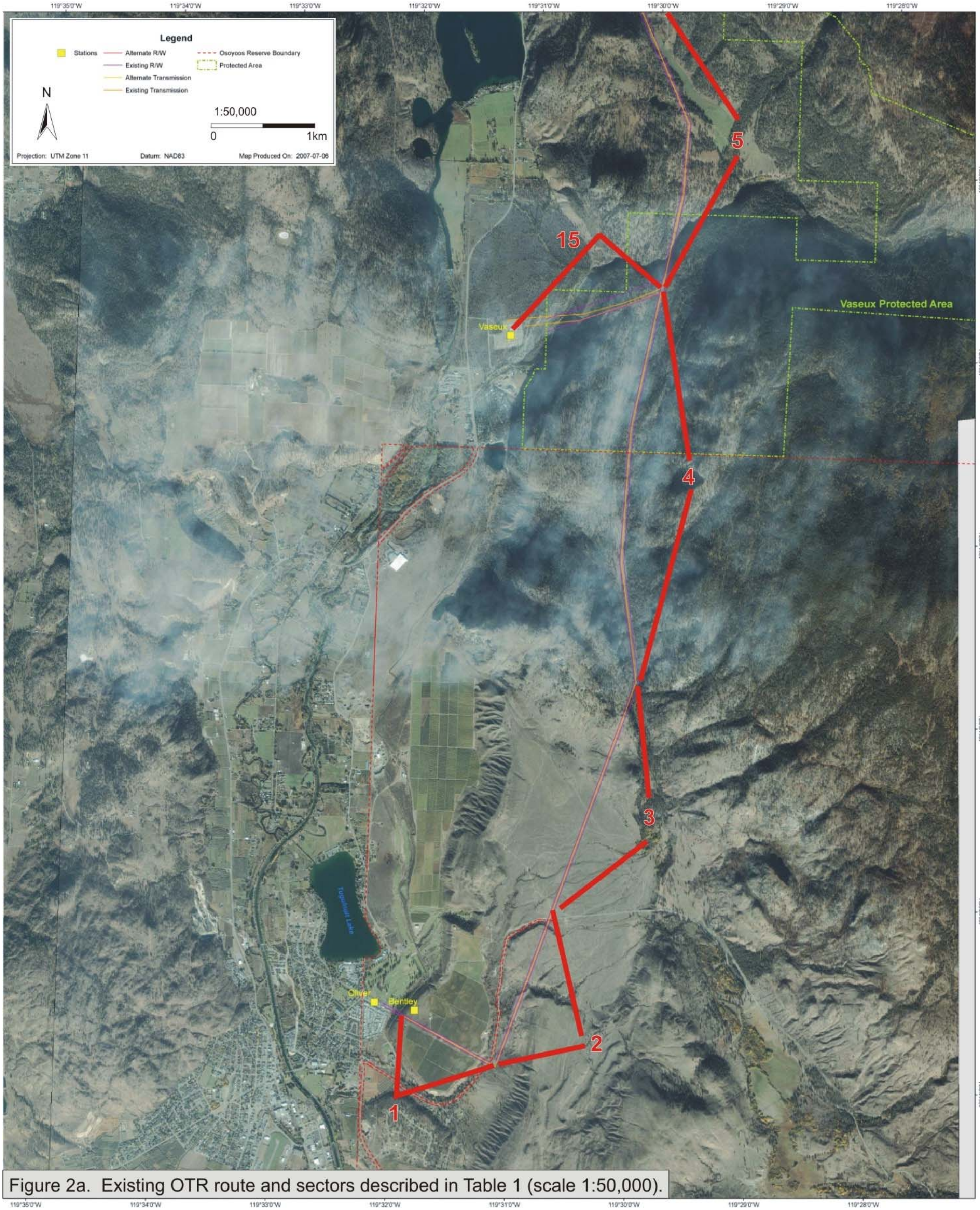

Figure 2a. Existing OTR route and sectors described in Table 1 (scale 1:50,000).

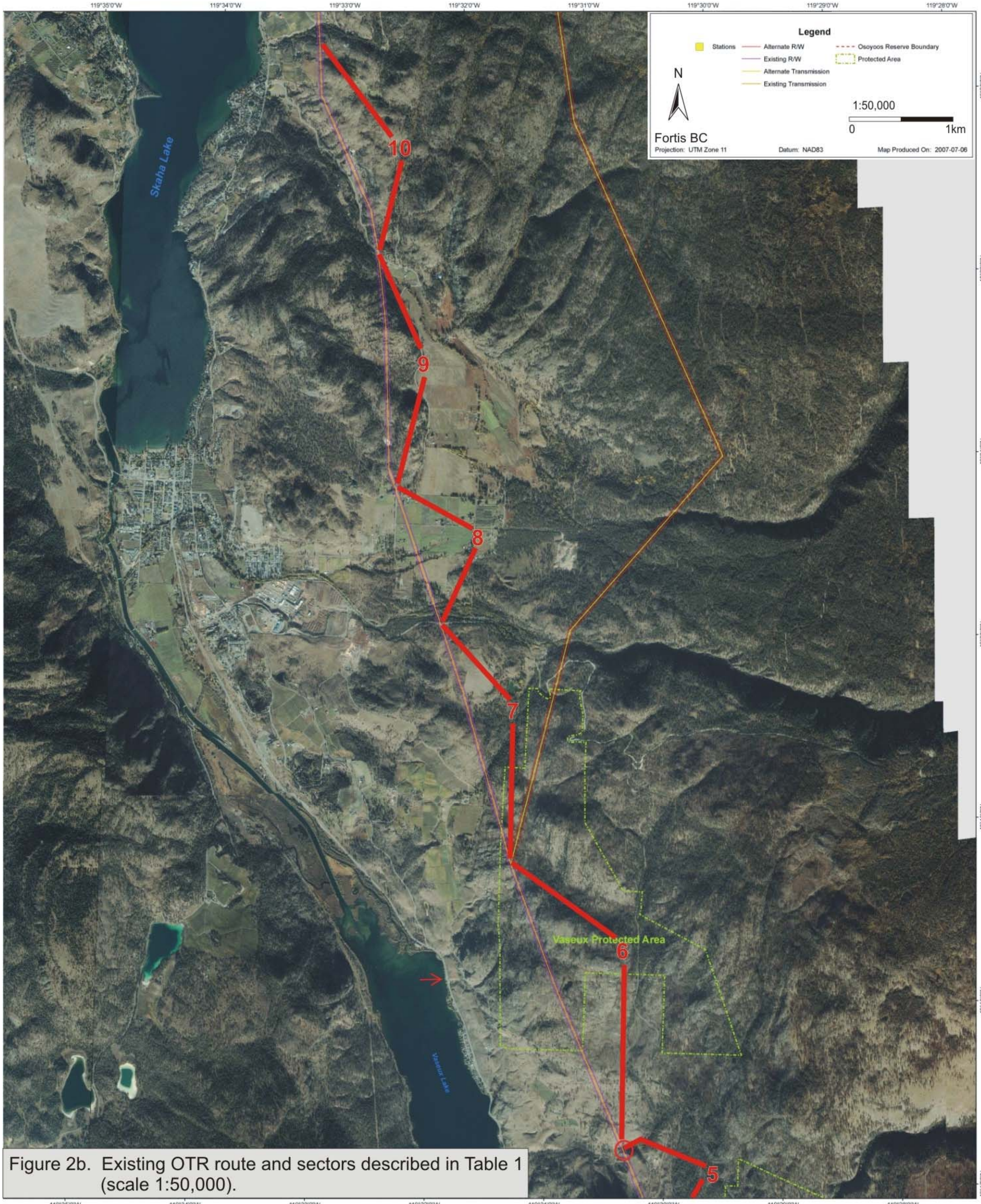

Figure 2b. Existing OTR route and sectors described in Table 1 (scale 1:50,000).

Figure 2c. Existing OTR route and sectors described in Table 1 (scale 1:50,000).

2.2 FortisBC OTR Project Proposed Alternative Upland Corridor

The proposed upland route was surveyed from Station 31 on the existing OTR route, north to R.G. Anderson Terminal Station in Penticton. The Alternative Upland Corridor is east of the existing route at a higher elevation (≈ 700-1000 m asl.). The route consisted of predominantly broken, rugged terrain with some areas of disturbance by road construction, wild fire and selective logging. The route is summarized in Table 2.

Table 2. FortisBC OTR Project Proposed Alternative Upland Corridor Summary Information

Section	Length (km)	Route Description	Proposed Alterations
A from Stn 31 (11U N 5465095 E 316637) at junction with existing powerline to Shuttleworth Creek	2.2	evidence of wild fire throughout area; crosses Shuttleworth Creek; lands south and north of Shuttleworth Creek have been disturbed by diversion of creek for irrigation	establishment of corridor (timber harvesting, clearing, grubbing), line construction; pole installation
B from Shuttleworth Creek to McLean Creek Forest Service Road	1.0	moderately disturbed; route ascends moderate to steep forested slope; locations along proposed corridor have been subject to timber harvesting	establishment of corridor (timber harvesting, clearing, grubbing), line construction; pole installation
C from McLean Creek Forest Service Road to Crown Land (UTM 11U N 5456997 E 331513), about 2.9 km N of Stn 57	6.89	route crosses McLean Creek, Thomas Creek, Derenzy Creek, Matheson Creek and Tress Creek Canyon; no disturbance evident throughout majority of route, several forest service roads cross route in several locations	establishment of corridor (timber harvesting, clearing, grubbing), line construction; pole installation
D from Crown Land (UTM 11U N 5456997 E 331513), about 2.9 km N of Stn 57 to Stn 89	9.38	route crosses Gillies Creek, localized disturbance by wild fire and logging activities (near Stn 72) and by gas pipeline access road (near Stn 86-89)	establishment of corridor (timber harvesting, clearing, grubbing), line construction; pole installation

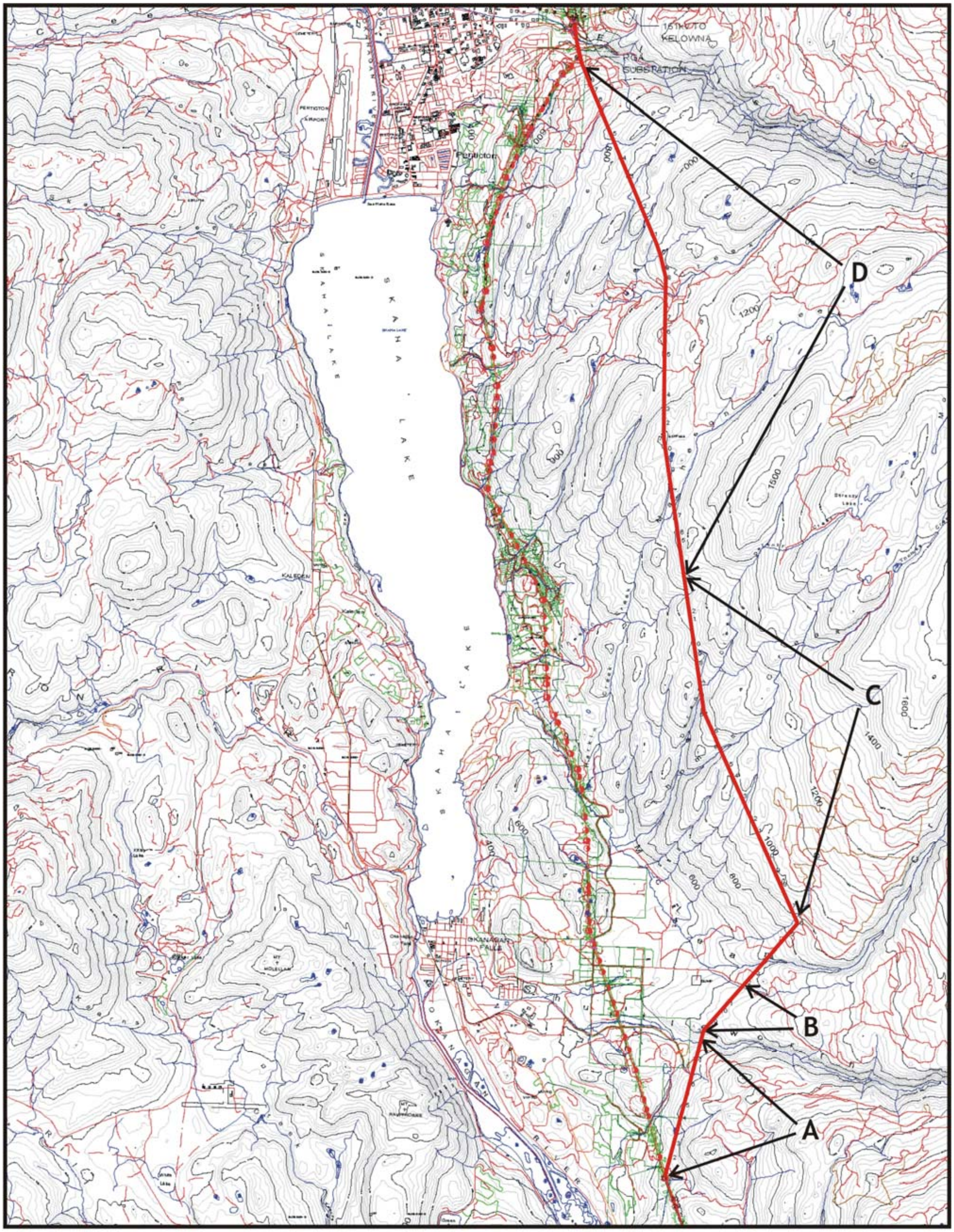

Figure 3. Proposed Alternative Upland Corridor and sections described in Table 2.

3.0 Biophysical Setting

The Okanagan Transmission Reinforcement corridor study area is located within five biogeoclimatic subzone variants, depending on elevation and aspect. The lower elevations of the transmission line fall within the Okanagan Variant of the Very Dry Hot Bunchgrass subzone (BGxh1). At slightly higher elevations, the transmission line crosses the Okanagan Variant of the Very Dry Hot Ponderosa Pine (PPxh1) subzone and traverses a section of the Grassland Phase of the PPxhla subzone. The Alternative Upland Corridor passes through the BGxh1 subzone. Higher elevations are in the PPxh1 subzone, and the Okanagan Very Dry Hot Interior Douglas-fir (IDFxh1) subzone and the highest elevations are in the Kettle Variant of the Dry Mild Interior Douglas-fir (IDFdm1) subzone, as defined by the Ministry of Forests Research Branch (1985) and Hope *et al*. (1991).

The study area is situated within three ecosections: the southern and lower elevation portions lie within the Southern Okanagan Basin ecosection, the northern lower elevation section is within the Northern Okanagan Basin ecosection, and the upper elevations of the alternatives are within the Northern Okanagan Highland ecosection of the Thompson – Okanagan Plateau Ecoregion according to the Ecoregion Classification System (Wildlife Branch, B.C. Environment) used to classify British Columbia's terrestrial ecosystems (DeMarchi 1996, DeMarchi *et al*. 1990).

Where not disturbed or altered by modern land use, vegetation on the lower slopes is dominated by grasslands with an open canopy of ponderosa pine, Douglas-fir and scattered trembling aspen. The higher slopes where not affected by wild fire are covered with ponderosa pine and sub-alpine fir.

The project area has a moderate capacity for mule deer. Bear, beaver, small carnivores, and small furbearers are also present in the study area. Bighorn sheep are present in the surrounding hills. The local lakes support resident and migratory waterfowl, which may have been more abundant in the past when wetlands were more extensive. Native food plants such as balsamroot, and spring beauty, saskatoon berries are available in the area.

4.0 CULTURAL BACKGROUND

4.1 First Nations

It is important to note that not all aspects of traditional First Nations' cultures are recorded in the anthropological and ethnohistoric literature. Additional knowledge of traditional culture and lifeways still exists in many contemporary First Nations' communities. Furthermore, aboriginal societies underwent significant changes as a result of their contact with Europeans, and some cultural aspects reported in the literature may not accurately reflect that culture prior to contact.

The southern Okanagan Valley was traditionally inhabited by groups of First Nations' people speaking the Okanagan language. They represent one of the Interior Plateau peoples who inhabited British Columbia prior to European contact, and whose culture was characterized by a semi-sedentary, predominantly egalitarian, lifestyle dependent upon fishing, plant gathering, and hunting for subsistence (Ray 1939). Religious beliefs included observance of the guardian spirit quest, shamanism, and spiritualism. The most recent scholarly summary of Okanagan traditional culture was published by Kennedy and Bouchard (1998); Teit (1930) and Spier (1938) represent important early ethnographies of the Okanagan people.

Members of the Osoyoos or Inkameep Indian Band (*nk'mip* in their own language) living in the Oliver/Osoyoos area and members of the Penticton Indian Band, living adjacent to the City of Penticton, speak the Northern Okanagan dialect of Okanagan-Colville, which describes the language its own speakers refer to as *nsy'lxcχn*, meaning "people's speech" (Kennedy and Bouchard 1998). Okanagan-Colville is one of the several languages comprising the Interior Salish Division of the Salishan language family (*syilx* to its speakers). Approximately three-quarters of Okanagan-Colville territory is within British Columbia; the rest is in Washington.

Traditionally, the Okanagan people were hunters, gatherers, and fishers who lived, from early spring to late autumn, a nomadic existence in small family groups followed by winter residency at permanent villages in major river valleys or around lakes. The annual cycle of subsistence activities and settlement locations was dictated primarily by the seasonal availability and abundance of food resources. Low-elevation habitats (e.g., river valleys and lake margins) would have been utilized for fishing, and as locations both for winter villages and base camps for hunting and gathering of plant foods in adjacent higher-elevation environments.

The Okanagan hunted several species of animals as part of their seasonal round. Large game predominantly included wapiti and deer, but black bears, bighorn sheep, and mountain goats would have been hunted when and where available. Smaller mammals such as rabbits, beaver, ground squirrel, marmot, and porcupine were hunted as opportunity afforded, occasionally as food supplements but more often for their fur. Birds that were hunted included upland species like grouse and waterfowl such as swans, ducks, and geese. Turtles have a sporadic distribution in the Osoyoos Lake locality, but would have been utilized wherever found.

Fishing was an extremely important activity in rivers, streams, and lakes. Species utilized included anadromous salmonids (e.g., salmon and steelhead), kokanee (land-locked sockeye salmon), resident rainbow trout and char, suckers, and pikeminnows. A major salmon fishery existed in the Okanagan River. This fishery was concentrated at Okanagan Falls but extended downriver for several kilometers (Bouchard 1966-1991; Kennedy 1971-1991). According to Lerman (1952-1954), salmon were caught using dip nets around McIntyre Bluff. Fish weirs and traps were also used in some sections of the Okanagan River – Lerman (1952-1954) reported that there were "four fish traps [located] from Oliver to the north."

It is likely that the same methods of fishing used in the Okanagan River around Oroville (another important salmon fishery) were also utilized in the river north of Osoyoos Lake to Okanagan Falls. Besides the weirs and dip nets mentioned above, these methods included the use of leisters, harpoons, gaff hooks, and gill nets (Lerman 1952-1954; Kennedy 1971-1991; Bouchard and Kennedy 1984).

Many plant resources were utilized by Interior Plateau First Nations. The most important food plants were yellowbells, balsamroot, bitterroot, "wild carrot" or biscuitroot (*Lomatium* spp.), chokecherry, saskatoon berry, and soapberry; most of these species are still locally abundant in the southern Okanagan today, together with numerous other, less-favoured varieties of food and medicinal plants. Sagebrush, antelope-bush, and pine trees were utilized for timber and firewood. Cottonwood trees in riparian settings were used for making dugout canoes. Other plants, such as rushes and tall grasses, were necessary for manufacture of woven artifacts, and a diverse assortment of additional species were exploited for medicinal purposes.

Traditional utilization of the three most common economically-important plants identified in this locality is summarized below, from an ethnobotany of the Okanagan-Colville people (Kuhnlein and Turner 1991, Lepofsky and Peacock 2004, Turner 1997, 1998, Turner *et al*. 1980):

- Yellowbell (*Fritillaria pudica*) is called ģ*á7temń* in the Okanagan language. The small bulbs were occasionally eaten raw and were said to be starchy and taste like sweet potatoes. The Southern Okanagan people steam-cooked the bulbs in pits, then dried them on mats for two weeks (Turner *et al*. 1980).
- "Indian celery" (*Lomatium* spp.) is called *kw'exwkw'áxw*. The flowers and upper leaves of these plants were dried and used to flavour meats, stews, and salads. They were usually picked in June and can be dried for later use. The leaves and roots were laid over the top of food in a cooking basket to give the food a parsley flavour, but were seldom eaten by themselves because their flavour was too strong. An infusion of Indian celery in water was drunk for colds and sore throats (Turner *et al*. 1980).
- Bitterroot (*Lewisia rediviva*) is known as *sp'itl'm* to the Okanagan. The roots of this important food plant were gathered in April and May, just before the plants were in full bloom; April is named "*sp'itl'mtn*" after this plant in Northern Okanagan. One source reported that the best plants grow in moist ground, not too sandy, usually among rocks. Plants growing in some locations, such as the Penticton Indian Reserve, are especially bitter and were not regarded as edible. The roots were pried out of the ground with a digging stick, the tops were broken off, and the outer covering stripped off. The top part of the peeled root is split open and a small orange-red structure called the "heart" is removed. The peeled roots are washed and laid on mats or grass for two or three days to dry. One authority reported that the roots were packed into large, tule baskets. Turner, Bouchard, and Kennedy's Okanagan consultants reported that bitterroots are generally stored in sacks, and cannot be stored in the ground, though one ethnographer was told that after they were dried they were sometimes stored in pits lined with pine needles. The fresh or dried roots are usually cooked by steaming or boiling, or by pit-cooking for about half an hour. They were seldom eaten dried, and are sometimes cooked with other foods such as *Lomatium*, gooseberries, or saskatoon berries. As well as its use as a staple plant resource, bitterroot also had several medicinal applications (Turner *et al*. 1980).

Okanagan material culture was distinguished by tools of wood, bone, and antler, and chipped and ground stone. "Fabric" artifacts, such as basketry, tule rush mats, and birch bark containers were also characteristic. The bow and arrow was the primary hunting weapon in late pre-Contact times; earlier, spears or shorter darts hurled with an atlatl (or throwing stick) were used.

The traditional winter dwelling in pre-Contact times (that is, prior to contact with European societies) was the distinctive semi-subterranean pithouse, which after abandonment and natural infilling, leave sub-rectangular to circular depressions familiar to many residents of the Okanagan Valley. Small village clusters of pithouses were often located near main waterways or fishing stations; on the Osoyoos IR#1, a number of villages are situated in sheltered settings along tributary streams well back from the lake. During other seasons of the year, the Okanagan resided in temporary pole-and-tule mat structures called matlodges. Matlodges would usually have been found on lake shores, on the banks of rivers, or associated with seasonal base camps. In the later pre-Contact period, matlodges began to replace pithouses as the favoured winter dwelling in this area. Other constructed features used in the day-to-day life of Okanagan people included hearths, storage pits, and food-steaming ovens.

At least two traditional villages are known that would have been occupied by the ancestors of the modern Osoyoos Indian Band: (1) *nk'mip* ['end of the lake'] was located on Inkaneep Creek near the head of Osoyoos Lake, and (2) *s♣úyu♣s* ['gathered together; meeting place'] was on the west shore of the lake near the narrows at Osoyoos (Kennedy and Bouchard 1998). The aboriginal roots of both modern place-names can be discerned in these names.

4.2. First Nation Use of the Study Locality

Open, mid-elevation to high-elevation environments like those crossed by the existing and proposed transmission line corridors were most commonly used in the spring and fall. In the early spring (April-May), when deer, balsamroot, and spring beauty were abundant, these lands may have been a preferred destination, with small family groups establishing basecamps for a few days to a week. Since the areas were not far from the winter villages, women could have collected plant resources during day trips in June and July and men could have hunted deer during the winter. Late fall basecamps have been established there, as the hunters followed the deer down out of the mountains. Since some traditional trails passed through such environments, it seems likely that short term transit camps were made by families, and same-sex hunting and gathering groups. These short term camps would have been occupied between mid-May and November.

4.3 Summary of Previous Archaeological Research in the Southern Okanagan Valley

The first site survey that included this part of the Okanagan was carried out by Warren Caldwell (University of Washington), who recorded several sites in 1952 (Caldwell 1954). Additional sites were recorded by Garland Grabert (University of Washington) in the late 1960s, but primarily in the northern Okanagan Valley and Spallumcheen Valley (Grabert 1968, 1974). In 1972, archaeologist Gerry Roberts began a site inventory on IR#1 for the Osoyoos Indian Band (Roberts 1973).

Large-scale surveys for archaeological sites were undertaken in the southern Okanagan Valley in 1975 by James Baker (Okanagan College) and Stan Copp (Simon Fraser University) in 1974 and 1975 (Baker 1975; Copp 1974, 1976). Several seasons of site survey around Okanagan Lake were also carried out by archaeologists employed by the provincial Archaeological Sites Advisory Board (Lawhead and McAleese 1976; Rousseau and Wales

1977). In the early 1980s, research conducted by Mike Rousseau (1984) in the Westbank locality focused on site inventory and test excavations.

Throughout the 1960s, avocational archaeologist John Corner (1968) conducted an inventory of pictographs of the Southern Interior, including several sites on the Osoyoos IR#1; Corner's pioneering work on rock art has been taken up in recent years by Nankivell and Wyse (2003).

Since the mid-1970s, most archaeological sites in the southern Okanagan have been discovered by development-specific impact assessment studies and several research projects (e.g., Arcas Consulting Archeologists 1993, 1997, 1998a, 1998b, 1999, 2000, 2001, 2004a, 2004b, 2004c, 2004d, 2005a, 2005b, 2006; Baker 1975, Copp 1974, 1976, 1979, 1986, 1996, 1007, 2006, Kutenai West Heritage Consulting Ltd. 1998, Points West Heritage Consultants 1993, 1994, 1995a, 1995b, Rousseau and Howe 1978, Rousseau 1979). Among numerous projects in the region are included: (1) impact assessments of highway construction projects; (2) impact assessments for BC Hydro high-voltage transmission lines; (3) assessments of residential and commercial developments at Osoyoos, Richter Pass, Oliver, McIntyre Bluff, and Okanagan Falls; (5) impact assessments for various forestry developments within the Penticton Forest District; (6) an impact assessment for a proposed natural gas pipeline across southern B.C.; and (7) impact assessment and field reconnaissance surveys for proposed vineyard and other developments on the Osoyoos IR#1.

Relatively few site excavations have been carried out by archaeologists in the Okanagan Valley, compared with more-thoroughly studied areas in the Thompson/Fraser Plateau to the northwest and the Columbia Plateau to the south. The following archaeological investigations have been carried out in the southern Okanagan area: (1) excavations at several sites on Osoyoos IR#1 in 1973 and 1974 (Roberts 1975; Roberts and Bird 1975); (2) excavations at the McCall Site (DhQv-48) near Vaseaux Lake in 1975 and 1976 (Copp 1979); (3) test excavations at the Tugulnuit Lake Site (DhQv-6) in 1978 (Rousseau 1983); (4) salvage of a disturbed human burial at DgQu-4 (Copp 1986), (5) salvage of disturbed human remains at DgQv-86 in 1990 (Oliver 1990), and, Points West Heritage Consultants (1995b) at Okanagan Falls. Of these projects, the most substantive results have been obtained from Copp's McCall Site investigations and Robert's excavations on the Osoyoos IR#1 (see below). Based on these excavations and others in neighbouring regions, archaeologists have determined that this region has been occupied by First Nations' people for at least the past 8000 years, and perhaps considerably longer than that.

As mentioned above, archaeologist Gerry Roberts conducted two seasons of excavations on the southern part of the Osoyoos IR#1 in 1973 and 1974 (Roberts 1975). None of the five sites investigated (DgQu-2, 12, 14, 16, 17) are within the proposed development area. Excavations of housepit or matlodge features were the primary focus of Robert's investigations at DgQu-12, 16, and 17, while buried cultural deposits were excavated at DgQu-2 and 14 (Roberts 1975).

General syntheses on archaeology in the interior plateau region of central British Columbia include Chatters and Pokotylo (1998), Fladmark (1982), Prentiss and Kuijt (2004), Pokotylo and Mitchell (1998), Rousseau (2004), and Wright (1995a, 1995b, 1999). Excavations of numerous prehistoric sites throughout the Plateau have provided a fairly reliable understanding of regional prehistory, as summarized in the following text and in Table 3.

Table 3. Archaeological periods of the Southern Interior region.

Culture Type	Dates[1]	Cultural Characteristics (selected)
Early	10,000 - 7000 BP	- associated with warmer/drier environmental conditions - subsistence pattern characterized by a reliance on hunting and a broad foraging spectrum with increasingly-efficient exploitation of small animals and plants - often associated with mid-elevation Holocene grassland environments - low-elevation valley settings away from rivers and lakes would have been extremely arid, and some modern game species may have been absent, though bison and perhaps pronghorn antelope were present (predominantly to the SE) - no evidence for social ranking - no evidence of permanent villages or habitation structures
Middle	7000 - 3500 BP	- coincides with onset of cooler, moister conditions. - correlated with the 6800 BP ashfall from Mt. Mazama (Westgate *et al.* 1970) - subsistence was still based primarily on hunting game animals and gathering plant foods, although salmonid populations available in some watersheds, freshwater mussels are more important in sites of this age than at later times (Prentiss and Kuijt 2004). Lochnore Phase represents a riverine-adapted society able to exploit stablized salmon populations - no evidence for ranked social organization no evidence for presence of resource storage - a <u>few</u> permanent houses known (e.g., South Thompson River valley) - a few burial places known, but rare
Late	3500 - 200 BP	- Plateau Pithouse Tradition represents a more sedentary way of life focused on resource mass-harvesting and systematic food storage - subsistence activities identical to those recorded by ethnographers - semi-subterranean pithouse in general use as winter residence - matlodges may begin to replace pithouses in latest pre-Contact times - permanent villages present, some of large size - artifacts identical or similar to those used by ethnographic communities - long-range trading networks present - achieved status widespread; localized evidence for ascribed status - burial places within pithouse floors (Shuswap Horizon), prominent landscape features, talus slopes (winter interments), occasionally within cairns or cists
Historic (Ethnographic) Period	About 200 years BP to present	- abandonment of traditional house styles and artifact types occurs quickly - adoption of European house styles and tools - subsistence activities become oriented to European cash economies

[1] Following archaeological convention, dates are expressed as radiocarbon years BP (Before Present), where present equals AD 1950.

4.3.1 Early Prehistoric Period (11,000-7000 BP)

The initial peopling of the Southern Interior of B.C. probably commenced between about 11,000 and 10,000 BP (Rousseau 2004), by ancient First Nations' people moving into the region from the Columbia Plateau and Great Basin to the south. These migrations appear to have involved peoples belonging to five different archaeological traditions: (1) the Western Fluted Point Tradition, (2) the Intermontane Stemmed Point Tradition, (3) the Plano Tradition, (4) the Early Coast Microblade Complex and (5) the Old Cordilleran Tradition (Stryd and Rousseau 1996).

During the Early Prehistoric Period, initial cool and wet postglacial conditions were quickly replaced by hot and dry conditions (the Hypsithermal or "Climatic Optimum"). During this period, a reliance on hunting and a subsistence pattern characterized by an ever-broadening foraging spectrum is inferred, involving more intensive and more efficient exploitation of small animals and plants (Stryd and Rousseau 1996), though the earliest inhabitants of the region may have been able to exploit relict Pleistocene mega-fauna, including extinct forms of bison. The earliest manifestations of this occupation may have been associated with mid- and high-elevation grasslands, away from the inhospitable glacial lakes that filled the valley bottoms.

As glacial lakes drained between 9000 and 8000 BP, valleys would have become more attractive as sources of potable water during the xeric climatic regime of the Hypsithermal. Settings away from rivers and lakes would have been extremely arid and perhaps devoid of many game species. Sites of this age will almost always be found in deeply-buried contexts, often associated with thick deposits of aeolian sediments.

Dated sites earlier than about 7000 BP are very rare in the Southern Interior of B.C., but examples are known from: (1) a campsite (dated 7530 BP) buried by the Drynoch Slide south of Spences Bridge (Rousseau 2004), (2) a human skeleton (dated 8240 BP) from Gore Creek west of Chase (Cybulski *et al*. 1981), (3) another encampment (dated 8400 BP) at the Landels Site on Oregon Jack Creek near Ashcroft (Stryd and Rousseau 1996; Rousseau 2004), and (4) a campsite at Stirling Creek (dated 7400 BP) in the Similkameen River valley near Hedley (Copp 2006).

A small number of distinctive Early Prehistoric artifacts, primarily projectile points (which would have been used to arm spears or atlatl darts), have been discovered in various parts of the Okanagan Valley. Generally speaking, artifacts that appear to be attributable to the Western Fluted Point and Plano traditions have only been found in the Shuswap region beyond the Okanagan Valley. Early Stemmed Point Tradition and Old Cordilleran tradition artifacts are most common to the south, but have been found throughout the Southern Interior (Copp 2006). Early artifact assemblages with microblades are characteristic of sites in the Cascade Mountains, and have recently been identified in the Similkameen River valley (Copp 2006), as well as at a still-undocumented site on the Osoyoos IR#1 (Arcas Consulting Archeologists 1999).

4.3.2 Middle Prehistoric Period (7000-3500 BP)

The Middle Prehistoric Period in the Interior Plateau coincides with the end of the Hypsithermal and onset of cooler, moister conditions. Subsistence was based primarily on hunting game animals and gathering plant foods, although robust salmonid populations were available to aboriginal fishers in some watersheds.

At the beginning of this period, the distinctive ungulate-hunting Nesikep Tradition culture emerged, once thought to be unique to the Fraser-Thompson drainage (Stryd and Rousseau 1996), but recently observed in the Similkameen Valley as well (Copp 2006). Its origins doubtless lie in the mix of early regional traditions, but appears to have affinities to archaeological remains from the Columbia Plateau of Washington and Idaho (e.g., Andrefsky 2004; Salo 1985). Where sites of this age have been identified, they are usually configured to the higher terraces of existing rivers, but sites have also been found in mid-elevation settings beyond the study area (Rousseau 2004). The latter part of the Nesikep Tradition is called the Lehman Phase, dated ca. 6000/5000 to 4400 BP; Lehman Phase sites are normally associated with existing rivers in valley bottoms, and existing watercourses and lakes in mid-elevation and upland settings (Stryd and Rousseau 1996).

A new archaeological culture, called the Lochnore Phase, appears in the Fraser-Thompson drainage about 5500 BP and persists until 4000/3500 BP (Stryd and Rousseau 1996). The appearance of this tradition signals the arrival of riverine-adapted, Salishan-speaking peoples from the Northwest Coast, presumably to exploit the salmon which became more abundant in the main rivers of the region with the onset of post-Hypsithermal climatic and hydrological conditions. The Lehman Phase people of the Nesikep Tradition and the Lochnore Phase people seem to have co-existed and maintained separate cultural identities for at least several hundred years. By ca. 4400 BP, the fishing-oriented, Salish-speaking, Lochnore Phase people had absorbed (perhaps both culturally and genetically) the indigenous, hunting-oriented, Lehman Phase people, thereby bringing to an end the Nesikep Tradition (Stryd and Rousseau 1996).

The Middle Prehistoric occupation of the Okanagan and Similkameen River valleys is not as well understood as the Thompson-Shuswap region, because fewer sites of this age are known. However, its proximity to the adjacent Columbia Plateau of Washington suggests obvious similarities with the cultural sequence developed for that region (Grabert 1968; Salo 1985; Andrefsky 2004; Copp 2006). In the Okanagan Valley, Grabert proposed the Okanagan (10,000-6000 BP) and Indian Dan (ca. 6000-3000 BP) Phases, which he believed evolved as local expressions of the Old Cordilleran Tradition (Grabert 1968; 1974; Stryd and Rousseau 1996). Recent work in the Similkameen Valley has produced a local cultural sequence, including demonstrable Middle Prehistoric cultural materials (Copp 2006).

Dated Lehman or Lochnore Phase sites are known from Monte Creek (Wilson 1991; I.R. Wilson Consultants 1992) and Adams Lake (Bailey *et al.* 1993) northwest of the Okanagan, and on Shuswap Lake (Rousseau *et al.* 1991). However, most radiocarbon-dated Lochnore and Lehman Phase components and/or sites are located well to the northwest of the Okanagan.

Neither Lehman nor Lochnore Phase cultural materials are presently known from the Okanagan Valley (*cf.*, Stryd and Rousseau 1996), but have been reported from the Similkameen Valley (Copp 2006). Large numbers of leaf-shaped projectile points (or bifacial knives) have been collected at many places within the Okanagan, some of them in environmental contexts that could suggest attribution to Middle Prehistoric sites. This interval is well-expressed along the middle Columbia River near its confluence with the Okanogan River in Washington (Grabert 1968; Salo 1985), but is also known in the study area from some undated components in sites excavated by Garland Grabert (Stryd and Rousseau 1996).

4.3.3 Late Prehistoric Period (3500-200 BP)

The end of the Lochnore Phase (and Middle Prehistoric Period) and establishment of the succeeding Plateau Pithouse Tradition (Late Prehistoric Period) is somewhat clouded by recent discoveries, but occurred about 3500 BP (Rousseau 2004). The Plateau Pithouse Tradition represents a more sedentary way of life focused on intense salmon exploitation and storage, supplemented as required by other resources, and on use of the semi-subterranean pithouse as a winter residence (Stryd and Rousseau 1996; Rousseau 2004).

The Late Prehistoric Period on the Canadian Plateau has been divided into three successive cultural horizons, each with its own artifact styles, technological attributes, and settlement characteristics (Richards and Rousseau 1987; Rousseau 2004; *cf.*, Pokotylo and Mitchell 1998; Copp 2006). The three horizons are the Shuswap Horizon (3500-2400 BP), Plateau Horizon (2400-1200 BP), and Kamloops Horizon (1200-200 BP).

All three horizons of the Late Prehistoric Period, as well as early historic remains, are commonly represented in cultural materials recovered from archaeological excavations in the Thompson-Shuswap region and further west in the Thompson-Fraser basin (Richards and Rousseau 1987; Rousseau 2004). Richards and Rousseau (1987; also Rousseau 2004) have asserted that this cultural sequence is equally applicable to the Okanagan and Similkameen River valleys, but archaeological assemblages in this region appear to exhibit more similarities to the Columbia Plateau sequence of central Washington (Copp 1979; Salo 1985; Andrefsky 2004). Grabert's research in the Okanagan Valley (1968, 1974), on both sides of the International Boundary, resulted in development of a cultural sequence beginning with the Okanagan and Indian Dan Phases as previously mentioned, and in the Late Prehistoric Period including the Chiliwist (3000-850 BP) and the Cassimer Bar (850 BP-Contact) Phases. Subsequent excavations near Vaseaux Lake led Copp (1979) to refine the Chiliwist Phase into three subphases (I: 3000-2350 BP; II: 2350-950 BP; III: 950 BP-Contact), of which the last subphase appears to represent an occupational hiatus in the southern Okanagan Valley (Copp 1979; Pokotylo and Mitchell 1998).

4.3.4 Archaeological Site Investigations in the vicinity of the OTR Project

Only three archaeological projects have included locations that are crossed by the route of the OTR project. These projects were archaeological site inventories (Copp 1974, Baker 1975) or archaeological impact assessments for specific development projects (Rousseau 1979). These studies resulted in the identification of 12 archaeological sites in the general area of the proposed transmission line. Their distribution and frequency is not believed to be representative of the archaeological resources in the area as a whole.

No archaeological site excavations have been reported from the study area. However, archaeological excavations at numerous sites elsewhere in the Okanagan and Interior Plateau have produced a chronology of First Nations prehistory in the region that spans at least 8000 years.

4.3.5 Archaeological Resources within the OTR study area

At the time this archaeological impact assessment was undertaken, 37 archaeological sites were identified within or adjacent to the proposed FortisBC Okanagan Transmission Reinforcement 230kV corridor (Arcas Consulting Archaeologists 2007). These sites are listed in Table 4. However, of these sites only ten sites were identified from within the existing 161kV corridor or within 150 m of the corridor. No archaeological sites were reported in proximity to the proposed alternative upland route. Table 4 provides summary information regarding archaeological sites within the OTR study area prior to the AIA.

Table 4. OTR study area: identified archaeological sites (Arcas 2007).

Archaeological Site Inventory Number	Archaeological Remains Present	Site Area	Setting	Distance to Transmission Line	Year Recorded	Recorders
DiQv-16	pictograph	unknown	on large cliff 8 m above road	no conflict	1968, 1974, 1977, 2002	Bishop, Wally Corner, John Cornford, Jacqueline Wyse, David Keddie, Grant Lundy, Doris Nankivell, Simon Hutchcroft, Dave
DiQv-26	rock shelter	8 m^2	in a gully that runs into Giles Creek	in direct conflict	1974, 2002	Copp, Stan Wyse, David Personnel, Nankivell, Simon
DiQv-18	pictograph	unknown	rocky bluff	20 m	1940, 1974, 2002	Wyse, David Nankivell, Simon Keddie, Grant
DiQv-19	cultural material (lithic scatter)	unknown	on shore of Skaha Lake near mouth of Oliver creek	No conflict	1974	Atkinson, R.N. Keddie, Grant Harris, Joe
DiQv-25	pictograph	4000 m^2	rocky bluff	Unknown	1974, 2002	Copp, Stan Julian, R. Wyse, David Nankivell, Simon Schleier, Friederike Meugens, G.
DiQv-24	pictograph	1075 m^2	bluffs above Skaha Lake	unknown	1974, 2002	Copp, Stan Julian, R. Wyse, David Nankivell, Simon Schleier, Friederike Meugens, G.
DiQv-21	pictograph	unknown	rock bluff east of Skaha Lake	unknown	1974	Harris, Joe Keddie, Grant Harris, Pat
DiQv-22	pictograph	unknown	adjacent to Skaha	unknown	1974	Harris, Joe Keddie, Grant Harris, Pat

Table 4. OTR study area: identified archaeological sites (Arcas 2007).

Archaeological Site Inventory Number	Archaeological Remains Present	Site Area	Setting	Distance to Transmission Line	Year Recorded	Recorders
			lake			
DiQv-23	cultural depression/ pictograph	5 m^2	terrace on east side of Skaha Lake	unknown	1974, 1979	Copp, Stan Rousseau, Mike Howe, Geordie
DiQv-20	pictograph	unknown	between massive bed rock outcrops, on steep slope above Skaha Lake	unknown	1974	Harris, Joe Keddie, Grant Harris, Pat
DhQv-41	rock shelter	20 m^2	On north side of canyon mouth	no conflict	1974	Copp, Stan
DhQv-64	lithic scatter	20,000 m^2	disturbed terrace	less than 50 m	1975	Baker, James Lawhead, Stephen
DiQv-44	cultural depression, rock shelter	25 m^2	500 m from Skaha Lake near small drainage	no conflict	1989, 1990	Brolly, Richard
DiQv-43	cultural depression, rock shelter and a petroform	340 m^2	between bedrock outcrops on east side of Skaha Lake	unknown	1989, 1990	Brolly, Richard
DiQv-27	lithic scatter	unknown	east side of Skaha Lake	no conflict	1974, 1998	Barlee, Neville L.(Bill) Bussey, Jean Prager, Gabriella Matheson, Angus Copp, Stan
DiQv-15	possible cultural depressions and lithics	unknown	on east side of Skaha Lake	no conflict	1974, 1998	Bussey, Jean Prager, Gabriella Keddie, Grant Gibson, Dr.

Table 4. OTR study area: identified archaeological sites (Arcas 2007).

Archaeological Site Inventory Number	Archaeological Remains Present	Site Area	Setting	Distance to Transmission Line	Year Recorded	Recorders
						John
DiQv-14	possible cultural depression, lithic scatter	unknown	on ridge on east side of Skaha Lake	no conflict	1974, 1978	Bussey, Jean Prager, Gabriella Keddie, Grant Gibson, Dr. John
DiQv-34	lithic scatter	5000 m^2	on terrace between two alkaline lakes	no conflict	1975	Baker, James McAleese, Kevin
DiQv-31	cultural depression and cache pit	225 m^2	n/a	500 m	1975	Baker, James McAleese, Kevin
DhQv-70	historic cabin	30 m^2	small sheltered terrace	200 m	1975	Baker, James Lawhead, Stephen
DhQv-44	stone fish drying racks	unknown	unknown	no conflict	1974	Copp, Stan
DhQv-66	34 cache pits	45,000 m^2	on terrace beside road	direct conflict	1975	Baker, James Rousseau, Mike McAleese, Kevin
DhQv-65	3 house pits and 7cache pits	22,500 m^2	on gentle slope near junction of two creeks	100 m	1975	Baker, James McAleese, Kevin
DhQv-97	pictograph	n/a	adjacent to stream	no conflict	n/a	n/a
DhQu-5	pictograph	unknown	on a granite cliff	no conflict	1968, 1969, 1974, 2002	Corner, John Harris, Joe Wyse, David Nankivell, Simon Keddie, Grant
DhQu-6	pictograph	unknown	east of Vaseaux Lake	no conflict	1968, 1969, 1974, 2002	Corner, John Harris, Joe Wyse, David Nankivell, Simon Keddie, Grant
DhQu-7	rock shelter	30 m^2	on canyon walls above	direct conflict	1974	Copp, Stan

Table 4. OTR study area: identified archaeological sites (Arcas 2007).

Archaeological Site Inventory Number	Archaeological Remains Present	Site Area	Setting	Distance to Transmission Line	Year Recorded	Recorders
			canyon mouth			
DhQv-23	pictograph, cultural material, rock shelter and pictographs	unknown	mouth of Vaseaux Creek Canyon	unknown	1974	Copp, Stan Meugens, G. Klein, R. Julian, R.
DhQv-81	cultural depressions	48 m^2	on alluvial fan	unknown	1993, 2003, 2004	Brolly, Richard Lackowicz, Robert McQuattie, Andy Rousseau, Mike Stelkia, Robert Richards, Tom
DhQv-46	cultural depression, sweat lodge and cultural material	unknown	bank of the Okanagan River	unknown	1974	Copp, Stan
DhQv-47	lithics and fishing station	15,000 m^2	west bank of the Okanagan River	unknown	1974, 1975, 1976	Copp, Stan Simonsen, Bjorn Roberts, G.W. (Gerry)
DhQv-58	cache pit and fishing weir	75 m^2	river	unknown	1974, 1975, 1976, 1987	Brolly, Richard Copp, Stan Whitbread, Ian Roberts, G.W. (Gerry) Simonsen, Bjorn Foster, Jack
DhQv-59	cultural depression, house pit and cache pit	1 m^2	west of Okanagan River below McIntyre Bluff	unknown	1975, 1976	Brolly, Richard Simonsen, Bjorn Roberts, G.W. (Gerry)
DhQv-63	lithic scatter	unknown	west of Okanagan River below McIntyre Bluff	Unknown	1975	Roberts, G.W. (Gerry) Charlton, Art
DhQv-60	cultural	0.7 m^2	west of	unknown	1975,	Brolly,

Table 4. OTR study area: identified archaeological sites (Arcas 2007).

Archaeological Site Inventory Number	Archaeological Remains Present	Site Area	Setting	Distance to Transmission Line	Year Recorded	Recorders
	depression/cache pit		Okanagan River, south of McIntyre Bluff		1976	Richard Simonsen, Bjorn Roberts, G.W. (Gerry)
DhQv-30	pictograph and rock shelter	20 m	on bolder outcrop	direct conflict	1974	Copp, G. Copp, Stan Dennis, G. Squakin, R. Meugens, G. Schleier, Friederike Julian, R.
DhQv-31	pictograph	750 m^2	on rock cliff	150 m	1974	Copp, Stan Squakin, R. Meugens, G. Dennis, Casey
Archaeological sites are listed from their position in the corridor starting at the north end to the south.						

Of the 37 identified archaeological sites in the study area, 11 sites are pictographs on rock outcrops and large boulders suitable for use as a habitation site and/or spiritual/ceremonial locations are present throughout the study area. Three rock shelter sites have been identified. Seven archaeological sites interpreted as habitation sites, containing circular depressions consisting of cache pits and/or housepits, have also been identified in the study area. Sites related to fishing include DhQv-47 which consists of lithics associated with a fishing station, DhQv-58 which is a cache pit in association with a fishing weir, and DhQv-44 which consists of stone fish drying racks. One site (DhQv-70) consists of an historic cabin.

Five sites consist of cultural material (lithics) on the surface. For the most part, artifacts identified at these sites include stone flakes, or debitage, the by-product of traditional stone tool manufacture. A variety of cryptocrystalline cherts and chalcedonies are commonly encountered lithic raw materials in the southern Okanagan valley, though black basalt (dacite) is also present.

Lastly, many traditional cultural properties may exist in the OTR study area but are not in the Provincial Heritage Register because: (1) conventional archaeological remains such as surficial features and artifacts are infrequently associated with these sites; and (2) information pertaining to these sites is customarily regarded as confidential by First Nations' communities.

4.4 Historic Background: 1811 – Present

The first Europeans to enter the Osoyoos – Oliver area were associated with the fur trade under the leadership of David Stuart in 1811 (Fraser 1952; Harris et al. 1989). The exploration of the region led to the establishment of Fort Okanagan in 1811-1812. By the mid-1850s Europeans started exploring the interior of British Columbia in search of gold. By the 1860s, the development of various travel routes, from the coast to the interior facilitated European expansion in the area.

By the mid-1850s, American prospectors were exploring the Interior of British Columbia (including Rock Creek east of the Okanagan Valley) in search of gold. In order to counteract the negative influences on First Nations' communities by an influx of European and American settlers, a Mission was established at Kelowna by Father Pandosy in 1859. By the 1860s, the development of various travel routes from the Coast to the Interior facilitated European expansion in the Okanagan Valley, and a customs house was established at Osoyoos by John Carmichael Haynes, the earliest European settler of this area. Early Euro-Canadian settlers of the Okanagan focussed on ranching and grain-farming, in response to which grist mills were established at Keremeos and Kelowna by the early 1870s (Buckland 1979).

After the 1870s, an influx of moderately wealthy English immigrants lead to the establishment of thriving tobacco plantations and orchards, which dominated the landscape of the Okanagan Valley until the years after World War 2 (Koroscil 2003). Increased industrial activity, and the need to get local products (livestock, fruit and vegetables, tobacco, and more recently lumber and minerals) to market, along with increased homesteading activities, furthered the development of regional centres like Penticton, Kelowna, and Vernon. Continued population growth in the Okanagan Valley, particularly after World War 2, has resulted in the intensive and extensive development of these cities and smaller communities like Okanagan Fall, Oliver, and Osoyoos.

Only a few historical Euro-canadian sites have been recorded as archaeological sites in the study area. Among them are included late-19th century ranch buildings, residences, and the late-19th to early-20th century ghost town of Fairview near Oliver. However, archaeologists have not consistently recorded historical heritage sites, and so the inventory of this type of site in the study area must be considered to be very incomplete.

5.0 ARCHAEOLOGICAL IMPACT ASSESSMENT PROCEDURES

5.1 AIA Components

The archaeological impact assessment involved:

- review of the archaeological, ethnographic, and historical literature pertaining to the project locality and the southern Okanagan region in general, in particular the AOA conducted by Arcas Consulting Archaeologists (2007);
- a review of biophysical and topographic information pertaining to the study area in order to assess past land use for the study area;
- a review of information about previously recorded archaeological sites within the study area;
- communications with First Nations individuals and organizations with knowledge of archaeological, and historic resources at, or near, the study area;
- archaeological field survey and impact assessment of the proposed development corridors; and
- preparation of a report on the results of the impact assessment.

5.2 Background Research

5.2.1 Document Review

This aspect of the research consisted of an in-office review of published and unpublished ethnographic, historical and archaeological literature for the OTR locality and surrounding area. Documents from the Arcas library and the Archaeology Branch in Victoria were examined. A review of the AOA scoping document (Arcas Consulting Archaeologists 2007) was undertaken as well as technical information relating to the FortisBC Okanagan Transmission Reinforcement project. The literature review was undertaken to provide general information on prehistoric archaeology and traditional First Nations' land use and settlement in the study area. Information from ethnographic reports was used to assess the potential for historic and prehistoric sites in the study area. An examination of contemporary, historic, and prehistoric environmental conditions (biophysical and topographic information) was used to assess the local variety and abundance of natural resources used in the traditional Native economy. Historic non-Native land use in the study area was determined from published local histories.

Information about recorded archaeological sites in the vicinity of the proposed development was obtained in a search of the Provincial Heritage Registry using the Remote Access to Archaeological Data (RAAD) online application, maintained by the Ministry of Tourism, Sport and the Arts. Topographic and modern land use information was obtained from maps and orthophotos provided by FortisBC (1:5,000 scale), RAAD and the Arcas library.

5.2.2 Archaeological Overview Assessment Results and Recommendations

Arcas Consulting Archeologists (2007) undertook an AOA for the FortisBC Okanagan Transmission Reinforcement Project. The results of the archaeological overview assessment can be summarized as follows:

- 37 documented archaeological sites were identified within or adjacent to the proposed OTR corridor during the AOA;
- 10 known sites were identified from locations within the existing 161kV corridor and up to 150 m from the corridor; due to a lack of orthophoto coverage and specific site location information, additional archaeological sites within 500 m of the corridor could not be accurately plotted;
- the potential for unidentified archaeological sites within the existing corridor varies from low to high;
- the potential for unidentified archaeological sites within the Alternative Upland route of the proposed transmission line corridor varies from low to high;

Based upon the results of the AOA it was recommended that an AIA be undertaken prior to construction of the proposed FortisBC Okanagan Transmission Reinforcement Project.

5.3 Communication with First Nations

First Nations' communication for this study involved contacting the Penticton Indian Band and the Osoyoos Indian Band. Steve Morck (Elements Network) provided liaison for Arcas, as relationships between FortisBC and the two Bands regarding the OTR project had already been established. Morck also arranged for assistants from the two Bands for the field survey component of the AIA.

5.4 Archaeological Field Survey and Impact Assessment

From May 28 to June 2, 2007, field survey was conducted by D. Geordie Howe, Ian Cameron, Ewan Anderson, and Arran Ferguson (Arcas), Dean Gallagher and Ryan Gallagher (Osoyoos Indian Band), and Robert George, Richard Hill, and Charles Kruger (Penticton Indian Band).

The field survey involved a pedestrian survey for the existing OTR corridor and for the proposed alternate upland route. Neither of the two transmission line corridors had been flagged in the field at the time of the AIA. The entire 37.07 km of existing OTR corridor and 19.474 km of the proposed Alternative Upland corridor was surveyed via pedestrian traverse or helicopter (Figure 3). The proposed existing OTR corridor expansion and the proposed Alternative Upland corridor were not flagged and locational information during the AIA was established utilizing orthophoto development plans and GPS coordinates.

The existing 40 m wide OTR corridor was systematically surveyed. Approximately 89% of the existing corridor was examined by pedestrian survey. Those sections of the transmission line corridor where private property restrictions denied access were not directly surveyed. However, these sections were examined from adjacent locations that provided adequate visual coverage to ascertain the in-field archaeological potential. The Vaseux Creek Canyon, from the southern cliff edge (north of tower L76-36) to the northern cliff edge (south of tower L76-37) was not examined. Archaeological site DhQv-7 (pictograph), is situated at the base of the canyon, some vertical distance from the canyon edge and will not be directly or indirectly impacted by the proposed development (Section 4-5 of Table 2).

The proposed Alternative Upland Corridor was examined by systematic coverage for a survey width of 40 m. Approximately 65% of the proposed Alternative Upland Corridor was examined by pedestrian survey. The remaining lands were surveyed via helicopter, which provided adequate visual coverage to ascertain in-field archaeological potential.

Based upon the survey coverage, 100% of the locations assessed as having moderate and high archaeological potential and a large percentage of low potential locations within the existing and proposed development corridors were traversed. Approximately 164 hectares of the existing development corridor and 50 hectares of the proposed Alternative Upland Corridor were covered via pedestrian survey (Figure 2). Crew members were spaced 5 to 10 m apart for a survey width of 50 m for the existing OTR corridor and 5 to 10 m apart for a survey width of 40 m for the proposed Alternative Upland Corridor. The survey width was narrower in the proposed Alternative Upland Corridor as the terrain was more rugged which constrained the area accessible for inspection. Surface visibility ranged from poor to excellent within the majority of the existing corridor (Figure 4). The surface exposure in the proposed Alternative Upland Corridor ranged from forested areas with poor ground exposure to large areas of excellent visibility and exposed bedrock.

The ground surface and natural exposures (root throws and cutbanks) were examined for artifacts, anthropogenic sediments, butchered animal bones, fire-altered rock, charcoal, and other evidence of past human activity. Bedrock outcrops, isolated boulders, and cliff faces were examined for rock art, consisting of either pictographs (rock paintings) or rockshelter/caves. The survey also involved the inspection of standing and fallen trees for cultural modification, that is, modification resulting from traditional use by First Nations people.

Subsurface shovel testing was undertaken at only one location within the proposed Alternative Upland Corridor. Three shovel tests were placed on a small platform under a slight rock overhang, overlooking a poorly drained area. The subsurface tests were dug to a non-cultural stratum, and measured approximately 30 x 30 cm with varying depths. This location was deemed to have moderate archaeological potential. No cultural remains were found in the shovel tests and they revealed shallow soil development. No subsurface tests were excavated for the existing OTR corridor or the remainder of the Alternative Upland Corridor, due to the excellent ground exposure and/or lack of sediment accumulation.

Figure 4. View southwest towards Stn 31 where Existing OTR Route meets south end of proposed Alternative Upland Corridor.

5.5 Reporting

Information about the archaeological sites observed during the field survey was recorded on B.C. Archaeological Site Inventory Forms, as required by the conditions of Permit 2007-147. Completed site forms were submitted to the Archaeological Site Inventory section (Archaeology Branch) for registration. Temporary numbers that had been assigned to sites in the field were replaced with permanent Borden site numbers assigned by Archaeology Branch staff.

This document represents the final report for work completed under Heritage Inspection Permit 2007-147, in compliance with Permit conditions required by the Archaeology Branch. The report is produced in a format specified in the provincial *Guidelines* (Archaeology Branch 1998), as well as the *Standards for Electronic Submission of Permit Reports* (Archaeology Branch 2004).

Per the terms of Heritage Inspection Permit 2007-147, one bound copy and one PDF version (PDF is an acronym for "Portable Document Format") of the report will be sent to the Permitting and Assessment Section, Archaeology Branch, Ministry of Tourism, Sport and the Arts. Additional copies will be sent to the Osoyoos Indian Band and the Penticton Indian Band and FortisBC.

Original fieldnotes and photographs documenting this project remain on file at the Arcas Consulting Archeologists office in Coquitlam, B.C.

6.0 ARCHAEOLOGICAL IMPACT ASSESSMENT RESULTS

Four protected archaeological sites (DhQv-30, DhQv-98, DiQv-24, and DiQv-25), were identified within the existing corridor. No archaeological sites were identified within the proposed Alternative Upland Route. No cultural heritage sites were identified within the two development corridors. Individual results for each development corridor are presented in Tables 5 and 6 below.

6.1 Existing Route Oliver to Penticton

The existing Oliver to Penticton route is 37.07 km in length. The pedestrian survey covered 31.81 km or 88.5% of the route. The remaining portion of the existing corridor (4.26 km or 11.5%) was not covered by the pedestrian survey due to private property access restrictions. These lands were either under cultivation (hay fields or vineyard) or they were residential and/or agricultural properties containing barns and out buildings. The total land area covered by the AIA of the existing OTR was 164 hectares.

The following sites are noted according to their respective survey sections in Table 5. DhQv-30 is a pictograph and rock shelter located just west of the OTR right-of-way (Figures 5, 6, 15 & 18). The rock shelter is a possible habitation feature. The AIA summary for this site is within Section 4 of Table 5. DhQv-98 is a petroform site consisting of two mounds of rocks with cultural depressions at their centres (Figures 7, 8, 16 & 19). They may represent isolation huts or ceremonial features. DhQv-98 is located within the OTR right-of-way and noted in Section 2 of Table 5. DiQv-24 and DiQv-25 are pictograph sites located within the OTR right-of-way (Figures 9, 10, 11, 12 & 17) and are noted in Section 12 of Table 5.

Several sites that were plotted near or in the OTR right-of-way, and could not be relocated in the field include DhQv-31 (Section 4), DhQv-66 (Section 6), DiQv-18 (Section 13), DiQv-20, DiQv-21, and DiQv-22 (Section 12). DiQv-18, DiQv-21 and DiQv-22 have geo-referenced coordinates that do not correspond with their site maps, which indicate that they are not near the OTR right-of-way. DiQv-23 (Section 12) and DiQv-26 (Section 13) were observed outside of the OTR right-of-way, and again their coordinates do not correspond with their site maps.

Table 5. Existing Route AIA Summary Results

Section	Archaeological Potential Field Assessment	In-field Route Description	AIA Actions & AIA Coverage	AIA Results
1 Oliver Station to Camp McKinney Road (existing tower L40A to L40J) Osoyoos IR 1	Low	disturbance from transmission line corridor, vineyard development and road construction; Wolfcub Creek is dry and lacks suitable landforms for archaeological sites; excellent ground exposure and cutbanks provide subsurface exposures; no potable water on reminder of	Pedestrian Survey – 100% Coverage: 6.5 ha No subsurface testing – excellent ground exposure The potential for buried archaeological sites is low	No archaeological or cultural heritage resources observed

Table 5. Existing Route AIA Summary Results

Section	Archaeological Potential Field Assessment	In-field Route Description	AIA Actions & AIA Coverage	AIA Results
		section		
2 existing tower L40J (east side Camp McKinney Road) to tower L40-7 (north of Camp McKinney Road)	Low - Moderate	disturbance from previous transmission line corridor, residential development and road construction; Wolfcub Creek is dry and lacks suitable landforms for archaeological sites – excellent ground exposure and cutbanks provide subsurface exposures; unnamed creek near Camp McKinney Road contains water – excellent ground exposure and cutbanks provide subsurface exposures	Pedestrian Survey – 100% Coverage: 8.23 ha No subsurface testing – excellent ground exposure The potential for buried archaeological sites is low	Archaeological site – **DhQv-98** identified No cultural heritage resources observed
3 tower L40-7 (north of Camp McKinney Road) to northward to tower L40-16	Low	Minor disturbance from transmission line corridor, road and pipeline construction; Atsiklak Creek is dry, identified by riparian vegetation and lacks suitable landforms for archaeological sites; no portable water on reminder of section; hilltop section and ridge above Atsiklak Creek Canyon provides excellent views	Pedestrian Survey – 100% Coverage: 10.63 ha No subsurface testing – excellent ground exposure The potential for buried archaeological sites is low	No archaeological or cultural heritage resources observed
4 tower L40-16 to tower L76-36 (Vaseux Canyon – south side)	Low for archaeological sites other than pictographs High for pictographs and rockshelters	disturbance from transmission line corridor and access road construction; cliffs and boulders provide excellent potential for pictographs and rockshelters; no potable water	Pedestrian Survey – 100% Coverage: 21.85 ha No subsurface testing – excellent ground exposure or precluded by bedrock exposure or talus slopes The potential for buried archaeological sites is low	Archaeological site **DhQv-30** relocated and rerecorded; DhQv-31 off development corridor – not relocated No cultural heritage resources observed.
5	Low for	disturbance from	Pedestrian Survey –	No archaeological or

Table 5. Existing Route AIA Summary Results

Section	Archaeological Potential Field Assessment	In-field Route Description	AIA Actions & AIA Coverage	AIA Results
tower L76-36 (Vaseux Canyon – south side) to McIntrye Creek Forest Service Road (Irrigation Creek)	archaeological sites other than pictographs High for pictographs and rockshelters within southern portion of section	transmission line corridor and road construction; cliffs and boulders provide excellent potential for pictographs and rockshelters; no portable water except for a dugout for irrigation west of route – drainage feature dry	100% Coverage: 16.93 ha No subsurface testing – excellent ground exposure or precluded by bedrock exposure The potential for buried archaeological sites is low	cultural heritage resources observed
6 McIntrye Creek Forest Service Road (Irrigation Creek) to tower L76-57 (junction with proposed alternate upland route)	Low for archaeological sites other than pictographs High for pictographs	disturbance from transmission line corridor, access road construction, agricultural activities; cliffs and boulders provide excellent potential for pictographs and rockshelters; McIntrye Creek – margins impacted by McIntrye Creek FSR and agricultural activities; excellent ground exposure and cutbanks provided subsurface exposures; no potable water on reminder of section	Pedestrian Survey – 100% Coverage: 15.3 ha No subsurface testing – excellent ground exposure or precluded by bedrock exposure The potential for buried archaeological sites is low	Archaeological site DhQv-66 originally plotted on corridor; no evidence of site observed in surveyed corridor; location of DhQv-66 not verified outside of corridor as situated on private property No cultural heritage resources observed.
7 tower L76-57 (junction with proposed alternate upland route) to Okanagan Falls Forest Service Road	Low for archaeological sites other than pictographs High for pictographs	Some disturbance from transmission line corridor; cliffs and boulders provide excellent potential for pictographs; no potable water in section	Pedestrian Survey – 100% Coverage: 12.53 ha No subsurface testing – excellent ground exposure or precluded by bedrock exposure The potential for buried archaeological sites is low	No archaeological or cultural heritage resources observed
8 Okanagan Falls Forest Service Road to McLean Creek Road	Low for archaeological sites	disturbance from transmission line corridor, Okanagan Falls FSR, agricultural and residential development, Allendale Road, McLean Creek Road and several access roads; alluvial fan	Pedestrian Survey – 26% Coverage: 1.8 ha (complete coverage precluded due to private property access issues)	No archaeological or cultural heritage resources observed

Table 5. Existing Route AIA Summary Results

Section	Archaeological Potential Field Assessment	In-field Route Description	AIA Actions & AIA Coverage	AIA Results
(tower L76-71)		on both sides of Shuttleworth Creek; except for Shuttleworth Creek there is no potable water in this section	Visual assessment – 74% No subsurface testing – excellent ground exposure The potential for buried archaeological sites is low	
9 McLean Creek Road (tower L76-71) to McLean Creek Road (south of tower L76-81)	Low for archaeological sites	Some disturbance from transmission line corridor, agricultural development, McLean Creek Road; McLean Creek - excellent ground exposure and cutbanks provided subsurface exposures; two alkali ponds, no potable water in this section	Pedestrian Survey – 100% Coverage: 12.1 ha No subsurface testing – excellent ground exposure or precluded by bedrock exposure The potential for buried archaeological sites is low	No archaeological or cultural heritage resources observed
10 McLean Creek Road (south of tower L76-81) to Matheson Creek	Low for archaeological sites	disturbance from transmission line corridor, McLean Creek Road, agricultural and residential development and several access roads; Matheson Creek - excellent ground exposure and cutbanks provided subsurface exposures; except for Matheson Creek there is no potable water in this section	Pedestrian Survey – 73.3% Coverage: 8.6 ha (complete coverage precluded due to private property access issues) Visual assessment – 26.7% No subsurface testing – excellent ground exposure The potential for buried archaeological sites is low	No archaeological or cultural heritage resources observed
11 Matheson Creek to Sunnybrook Drive	Low for archaeological sites other than pictographs High for pictographs	disturbance from transmission line corridor, Parsons Road, Heritage Boulevard, Sunnybrook Drive, agricultural and residential development and several access roads; there is no potable water in this section	Pedestrian Survey – 52.6% Coverage: 5.1 ha (complete coverage precluded due to private property access issues) Visual assessment – 47.4% No subsurface testing – excellent ground	No archaeological or cultural heritage resources observed

Table 5. Existing Route AIA Summary Results

Section	Archaeological Potential Field Assessment	In-field Route Description	AIA Actions & AIA Coverage	AIA Results
			exposure The potential for buried archaeological sites is low	
12 Sunnybrook Drive to Gillies Creek	Low for archaeological sites other than pictographs High for pictographs	Disturbance from transmission line corridor, residential development off Sunnybrook Drive and several access roads; there is no potable water in this section until Gillies Creek - excellent ground exposure and cutbanks provided subsurface exposures	Pedestrian Survey – 84.1% Coverage: 13.25 ha (complete coverage precluded due to private property access issues) Visual assessment – 15.9% No subsurface testing – excellent ground exposure The potential for buried archaeological sites is low	Archaeological sites **DiQv-24** and **DiQv-25** relocated and rerecorded; DiQv-20, DiQv-21, DiQv-22, and DiQv-23 off development corridor – not relocated, site information on BC Site Inventory forms appears erroneous No cultural heritage resources observed
13 Gillies Creek to tower L76-130 (junction with proposed alternate upland route)	Low for archaeological sites other than pictographs High for pictographs	Minor disturbance from transmission line corridor, agricultural development and development of Skaha Bluff Rock Climbing Area; several access roads; excluding Gillies Creek there is no potable water in this section - excellent ground exposure	Pedestrian Survey – 100% Coverage: 27 ha) No subsurface testing – excellent ground exposure The potential for buried archaeological sites is low	Archaeological sites DiQv-18 and DiQv-26 incorrectly plotted adjacent to and within the OTR corridor; DiQv-26 observed by Arcas crew off of Valleyview Drive approximately 900 m NW of plotted location - site form information updated; DiQv-18 also misplotted but not revisited No cultural heritage resources observed
14 tower L76-130 (junction with proposed alternate upland	Low for archaeological sites other than pictographs Moderate for pictographs	disturbance from transmission line corridor, Carmi Avenue, various utility lines, forestry access roads and gravel extraction quarry; margins of Ellis Creek badly disturbed; margins impacted by historic	Pedestrian Survey – 48% Coverage: 1.5 ha (complete coverage precluded due to private property gravel extraction access issues)	No archaeological or cultural heritage resources observed

Table 5. Existing Route AIA Summary Results

Section	Archaeological Potential Field Assessment	In-field Route Description	AIA Actions & AIA Coverage	AIA Results
route) to RG Anderson Terminal Station		development activities	Visual assessment – 52% No subsurface testing – excellent ground exposure The potential for buried archaeological sites is low	
15 Vaseux Lake Terminal Station to junction with Oliver – Penticton transmission line	Low	disturbance from transmission line corridor; steep slope; no potable water except for Vaseux Creek situated near Vaseux Station	Pedestrian Survey – 39% Coverage: 2.2 ha Visual assessment – 61% No subsurface testing – excellent ground exposure or precluded by bedrock exposure The potential for buried archaeological sites is low	No archaeological or cultural heritage resources observed

Figure 5. DhQv-30: detail of pictograph panel.

Figure 6. DhQv-30: view NW at pictograph panel with D. Gallagher.

Figure7. View south to petroform at DhQv-98.

Figure 8. View northwest of petroforms and general setting at DhQv-98.

Figure 9. DiQv-24: detail of pictograph panel.

Figure 10. DiQv-24: R. Gallagher and I. Cameron re-recording pictograph panel.

Figure 11. DiQv-25: detail of pictograph panel.

Figure 12. DiQv-25: View east at pictograph panel with I. Cameron and R. Gallagher.

6.2 Alternative Upland Corridor

The proposed Alternative Upland Corridor is 19.474 km in length and the pedestrian survey covered 12.58 km or 64.6% of the route. The remaining portion of the existing corridor (6.89 km or 35.4%) was not subject to pedestrian survey but was surveyed by helicopter and deemed to have low archaeological potential. The total area covered by the AIA for the Alternative Upland Corridor was 50 hectares. No archaeological sites were identified during the survey of the Alternative Upland Corridor.

Table 6. Proposed Alternative Upland Corridor AIA Summary Results

Section	Archaeological Potential Field Assessment	In-field Terrain Description	AIA Actions & AIA Coverage	AIA Results
A Stn 31 to Shuttleworth Creek	Low to Moderate for archaeological sites	Route runs NNE through rolling hills with gentle to steep slopes exhibiting general western aspect. Ponderosa pine forest with prickly rose, antelope brush and balsamroot. Evidence of wild fire from Stn 34 to Stn 31. Terrain around Shuttleworth Creek disturbed by diversion of creek for irrigation	Pedestrian Survey – 100 % One area of moderate potential was shovel tested – a rock overhang with thin veneer of soil	No archaeological or cultural heritage resources observed. The potential for buried archaeological sites is low
B Shuttleworth Creek to McLean Creek Forest Service Road	Low for archaeological sites	Route runs NE through rolling hills with gentle to steep slopes exhibiting a general western aspect. Ponderosa pine and subalpine fir forest with mock orange, antelope brush and sagebrush. Evidence of selective logging throughout and associated road/skid trails	Pedestrian Survey – 100 % No subsurface testing. Thin forest veneer atop bedrock exposures; good ground exposures; windfalls; lack of potable water	No archaeological or cultural heritage resources observed. The potential for buried archaeological sites is low
C McLean Creek Forest Service Road to Crown Land, about 2.9 km N of Stn 57	Low for archaeological sites	Route runs NNW through rolling hills to bluffs and steep canyons with general western aspect. Ponderosa pine and subalpine fir forest. Disturbed in some areas by selective logging and associated road/skid trails	Helicopter survey – 100 %	No archaeological or cultural heritage resources observed. The potential for buried archaeological sites is low

Table 6. Proposed Alternative Upland Corridor AIA Summary Results

Section	Archaeological Potential Field Assessment	In-field Terrain Description	AIA Actions & AIA Coverage	AIA Results
D Crown Land, about 2.9 km N of Stn 57 to Stn 89	Low for archaeological sites	Route runs NNW through rolling hills to steep-sided canyons with general western aspect. Ponderosa pine and subalpine fir forest with some Douglas fir, willow and juniper	Pedestrian Survey – 100 % No subsurface testing. Thin forest veneer atop bedrock exposures; good ground exposures; windfalls; lack of potable water	No archaeological or cultural heritage resources observed. The potential for buried archaeological sites is low

Figure 13. View west of Alternative Upland Corridor, illustrating typical terrain approximately 600 m north of Stn 71.

Figure 14. View west from near Thomas Creek towards typical terrain of proposed Alternative Upland Corridor.

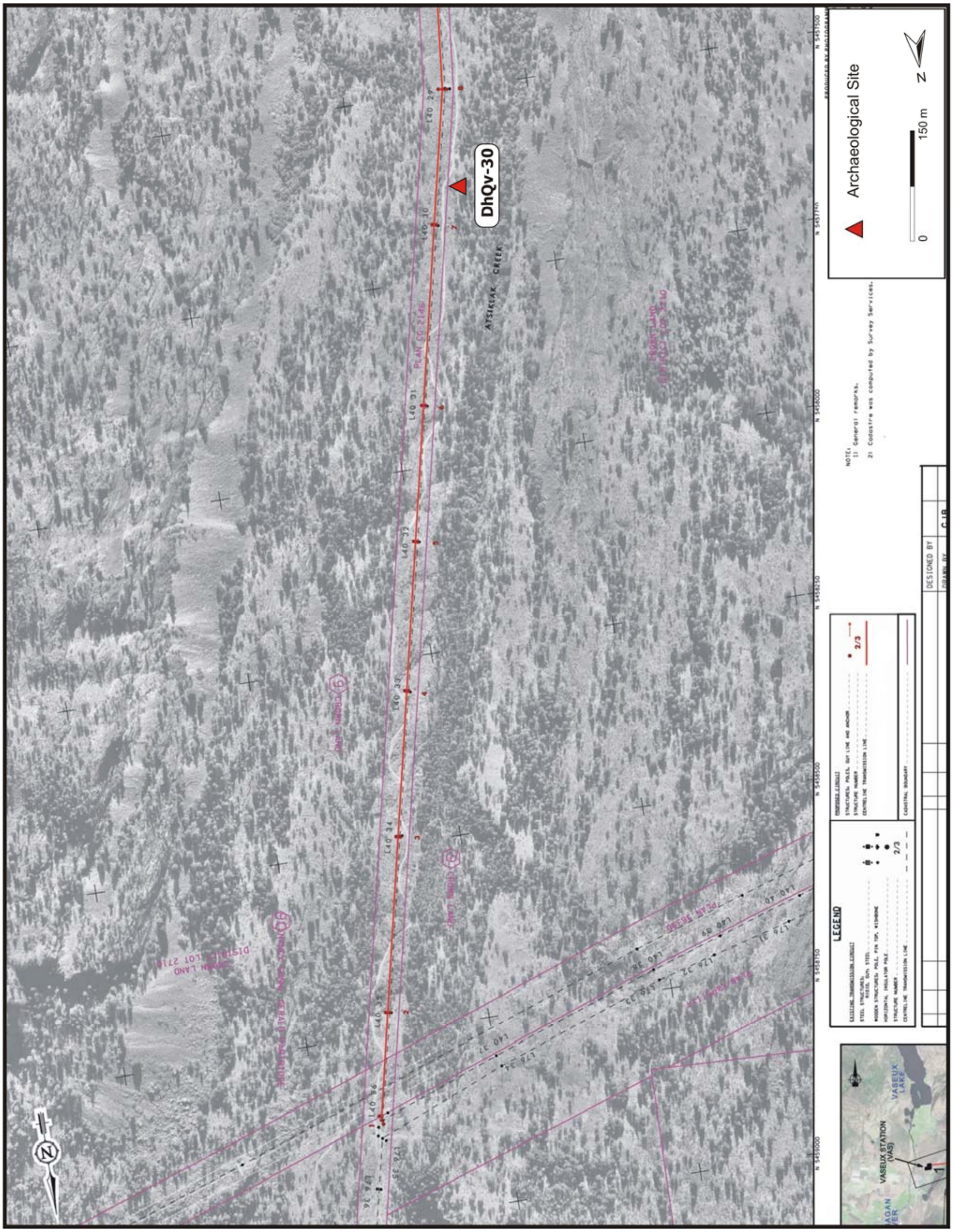

Figure 15. Location of archaeological site DhQv-30 on existing OTR route (1:7,500; FortisBC).

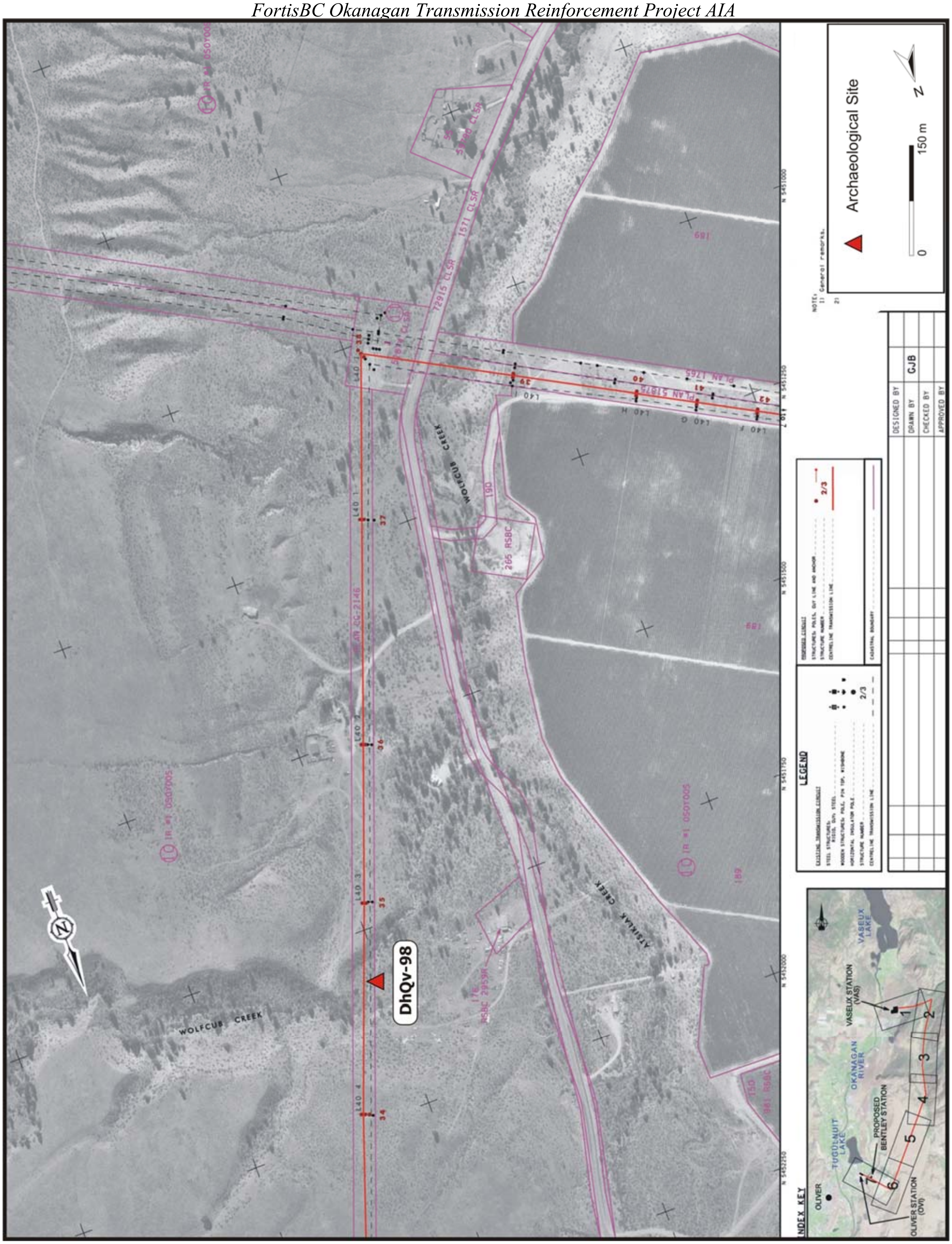

Figure 16. Location of archaeological site DhQy-98 on existing OTR route (1:7,500; FortisBC).

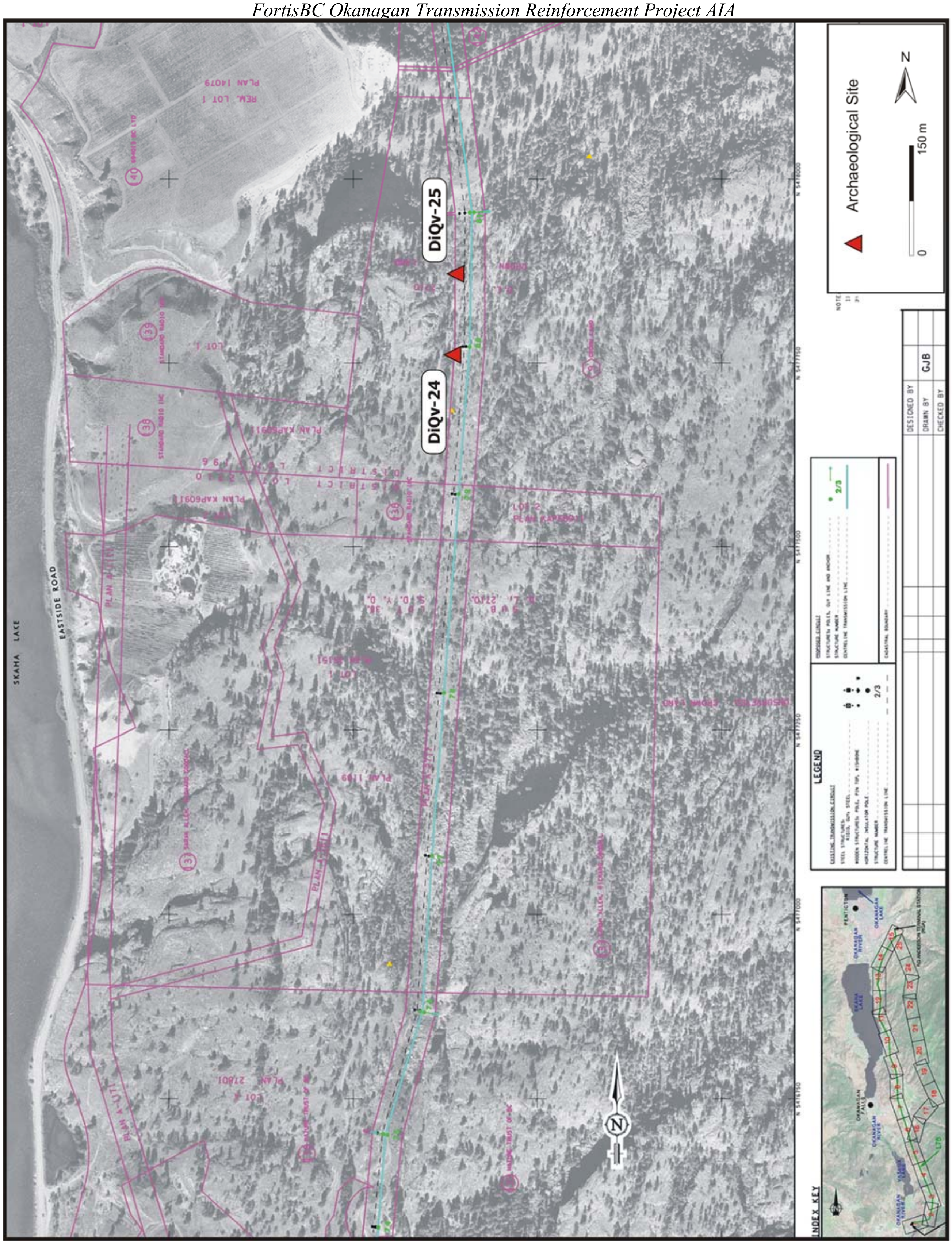

Figure 17. Location of archaeological sites DiQv-24 and DiQv-25 on existing OTR route (1:7,500; FortisBC).

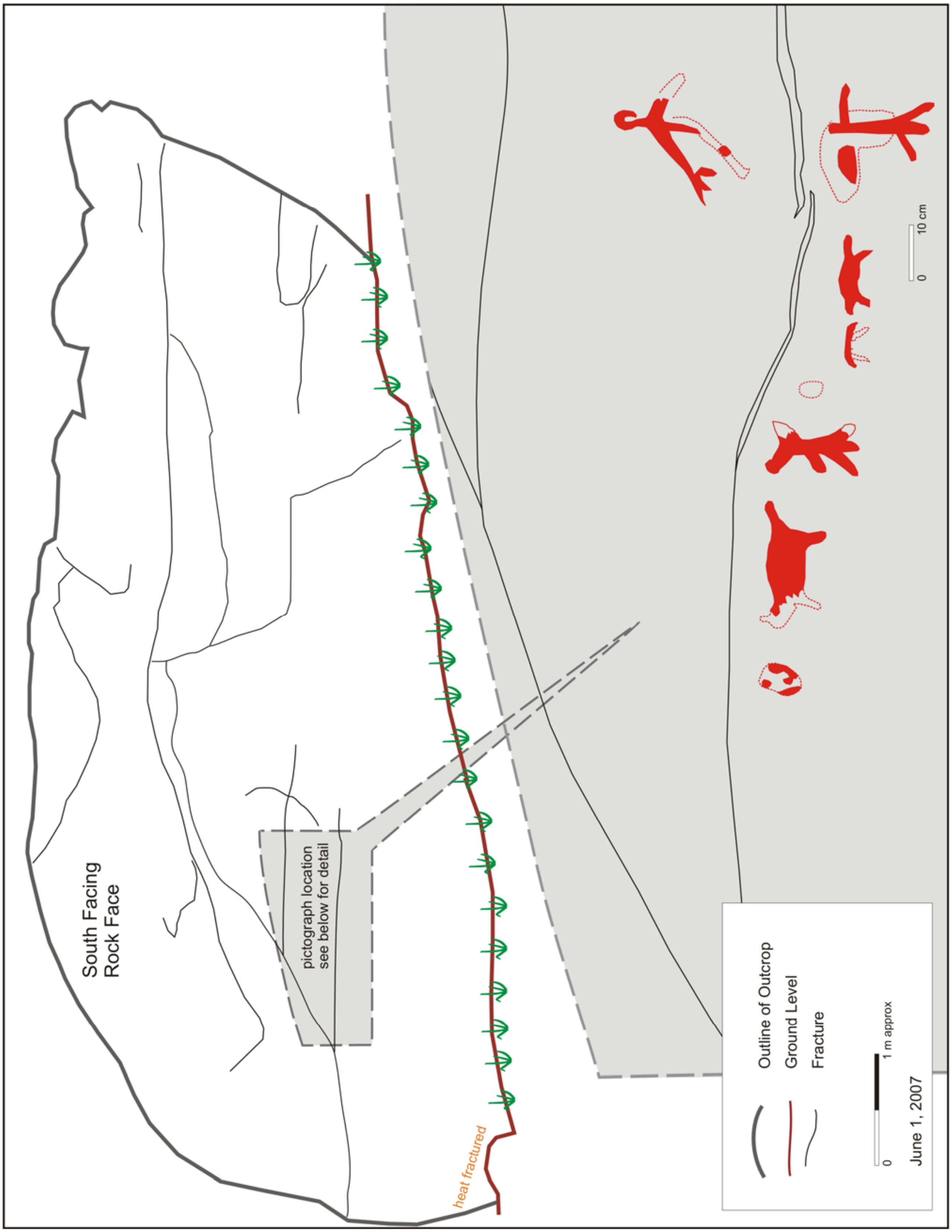

Figure 18. Pictograph at DhQv-30 (1:50 approx. with detail at 1:10).

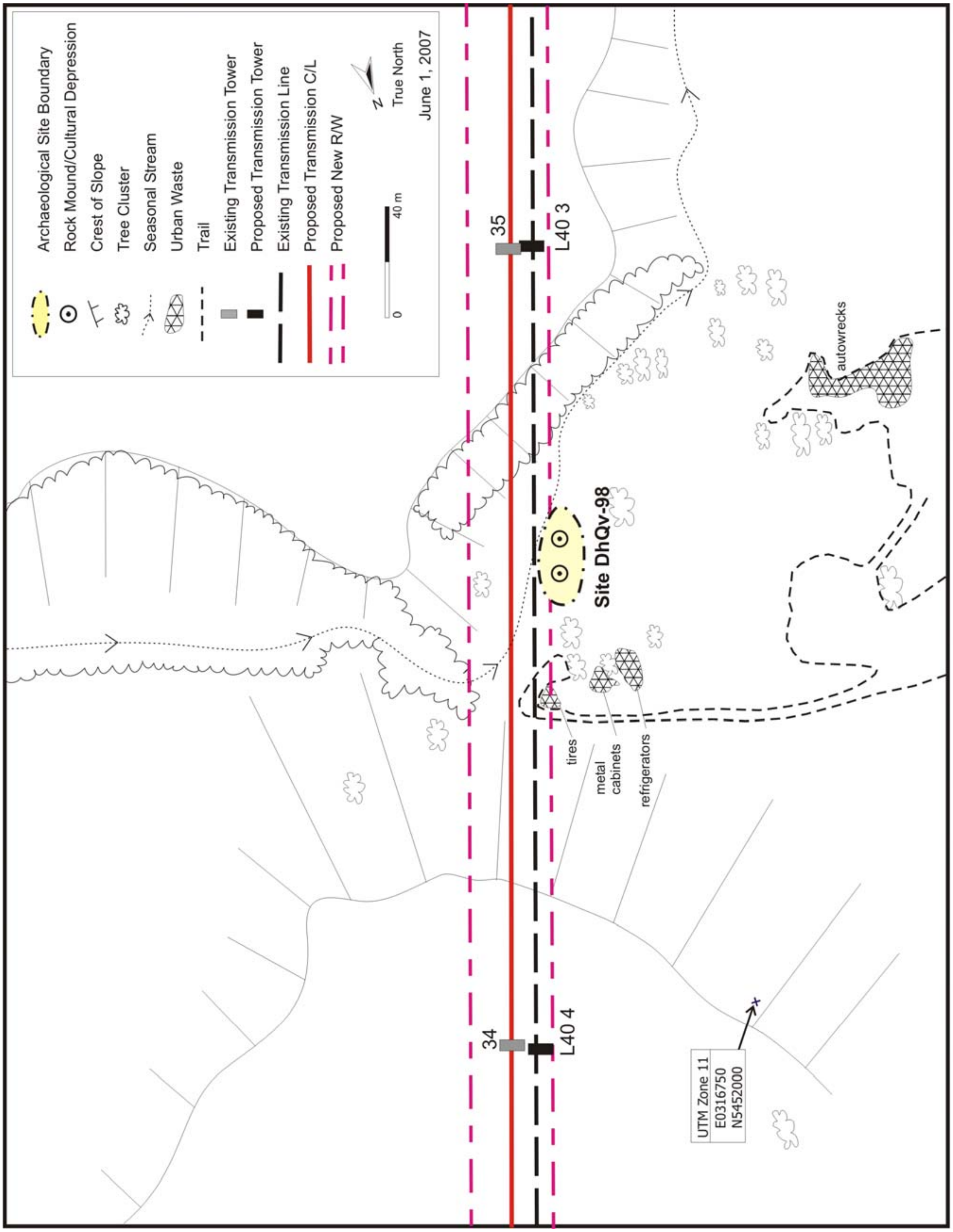

Figure 19. Archaeological site DhQv-98 (1:2,000).

7.0 SIGNIFICANCE EVALUATION

7.1 Existing Transmission Line Right-Of-Way

For the protected site, identified during the field survey that conflict with the proposed development project, the scientific, historic (where applicable), and public significance was assessed using criteria specified in the *British Columbia Archaeological Impact Assessment Guidelines* (Archaeology Branch 1998:58-60). The criteria are evaluated, and a rating determined for each kind of significance (Table 7). Scientific significance is evaluated in terms of the potential for an archaeological site to provide evidence that would substantively enhance understanding of culture history, culture processes, and other aspects of local and regional pre-history. This evaluation was based on the results of the field observations described above. These results were reviewed in terms of what is known about the scientific value of similar kinds of sites in the region.

Historic significance was evaluated based on the association of a site with the historic settlement and occupation of the region, as well as particular events or individuals. Public significance was evaluated in terms of the potential for an archaeological site to serve in an interpretative, educational, or recreational capacity. Economic significance concerns the potential financial benefits which could be derived from public use of an archaeological site as an educational or recreational facility. Economic significance of archaeological sites is evaluated in special cases where the nature of the site suggests that potential economic benefits are possible. In these cases, it was anticipated that an evaluation of economic significance was not warranted.

In addition to evaluating the scientific, historic, public significance, and economic significance, an evaluation of ethnic significance for the sites will be requested from the Penticton Indian Band and Osoyoos Indian Band. Ethnic significance refers to the traditional, social, or religious importance of a site to a particular ethnic community. Ethnic significance is most appropriately evaluated by the particular group or community with ethnic ties to the archaeological site.

7.2 Ethnic Significance Remarks

The protected archaeological sites identified during this assessment are located in the areas of responsibility of the Penticton Indian Band and Osoyoos Indian Band. Neither of these groups has yet specifically evaluated the ethnic significance of these sites. However, discussions with representatives of the Penticton Indian Band and Osoyoos Indian Band indicate that they are concerned about the integrity and preservation of archaeological remains and state that all archaeological sites within their respective territories have **high** ethnic significance. Representatives of the Penticton Indian Band and Osoyoos Indian Band may choose to independently prepare and submit ethnic evaluation statements to the Archaeology Branch upon review of this report.

7.3 Historic Significance

Archaeological sites DhQv-30, DhQv-98, DiQv-24 and DiQv-25 do not contain any evidence that link the archaeological materials or their locations to any historical events or figures, and therefore they are considered to have **low** historic significance.

7.4 Public Significance

DiQv-24 and DiQv-25 are in an area regularly used for recreation and are fairly accessible to the public. Due to their potential for interpretation and recreational development, these sites are deemed to have moderate public significance. DhQv-30 and DhQv-98 are in remote locations that are not easily accessible. Public significance is assessed as **low** for these two sites, due to limited potential for interpretive or recreational development.

7.5 Scientific Significance

DhQv-30

DhQv-30 is a pictograph and rock shelter. Though there is only a thin layer of soil above bedrock, there may be some potential for finding evidence of habitation at this site. The site is located within the existing transmission line right-of-way. The site could possibly have intact deposits and the pictograph contributes to the cultural landscape of the region. Due to the relative rarity of such sites, DhQv-30 is therefore considered to have high scientific significance.

DhQv-98

DhQv-98 is a petroform site consisting of two circular rock mounds with cultural depressions at their centre. The site is located within the existing transmission line right-of-way. The function of the cultural depressions is unknown. The site could possibly have intact deposits and due to the rarity of such sites and its potential to add to archaeological studies, DhQv-98 is considered to have moderate to high scientific significance.

DiQv-24

DiQv-24 is a pictograph consisting of one panel within the existing transmission line right-of-way. This site does not have subsurface stratigraphy or associated artifacts. The pigment in the pictograph could possibly be dated (via the AMS radiocarbon technique) though this would destroy a fraction of the pictograph. The pictograph contributes to the overall cultural landscape of the region, and is therefore considered to have high scientific significance.

DiQv-25

DiQv-25 is a pictograph site consisting of two panels within the existing transmission line right-of-way. This site does not have subsurface stratigraphy or associated artifacts the pictograph could possibly be dated (via the AMS radiocarbon technique) though this would destroy a fraction of the pictograph. The pictograph contributes to the overall cultural landscape of the region, and is therefore considered to have high scientific significance.

Table 7. Evaluation of Significance of Archaeological Sites within OTR right-of-way

Site #	Ethnic Significance	Historic Significance	Public Significance	Economic Significance	Scientific Significance	Overall Significance
DhQv-30	High	Low	Low	Low	High	High

DhQv-98	High	Low	Low	Low	Moderate to High	Moderate
DiQv-24	High	Low	Moderate	Moderate	High	High
DiQv-25	High	Low	Moderate	Moderate	High	High

8.0 IMPACT ASSESSMENT

Impacts to archaeological sites are defined as “the net change between the integrity of an archaeological site with and without the proposed development” (Archaeology Branch 1998:14). Adverse impacts may result in: (1) destruction or alteration of all or part of a site; (2) isolation of a site from its natural setting; or (3) introduction of out-of-character physical, chemical, or visual elements to an archaeological site and its setting. Direct impacts to a site are those that can be directly attributed to the terrain-modifying aspects of a development project. Indirect impacts result from processes induced by development activities, but not directly attributable to them (e.g., loss of access to cultural deposits).

The construction of the OTR should not result in any direct impacts to the archaeological sites within the right-of-way, as the construction method utilizes a helicopter to minimize ground disturbance. However, indirect impacts due to ancillary activities occurring/associated with the OTR construction could affect the sites.

8.1 DhQv-30

The site is in the existing transmission line right-of-way and appears to be in a location used for recreational purposes. The site is open to vandalism but no noticeable harm has come to the site since it was first recorded by archaeologists. The upgrades to the existing transmission line could impact the site indirectly through increased potential for vandalism and inadvertent impacts during line construction.

8.2 DhQv-98

The site is in the existing transmission line right-of-way. The upgrades to the existing transmission line could impact the site indirectly through increased potential for vandalism and inadvertent impacts during line construction.

8.3 DhQv-24

The site is in the existing transmission line right-of-way and is in an area used for recreational purposes. Walking trails are in close proximity and there is evidence that people have attempted to imitate the pictographs using modern paint and materials on loose broken rock in proximity to the existing rock art. The site is open to vandalism but no noticeable harm has come to the site since it was first recorded by archaeologists. One small spall has broken off the pictograph causing some damage but this may be due to natural causes. The upgrades to the existing transmission line could impact the site indirectly through increased potential for vandalism and inadvertent impacts during line construction.

8.4 DiQv-25

The site is in the existing transmission line right-of-way and is in an area used for recreational purposes. Walking trails are in close proximity and evidence that people have attempted to imitate the pictographs was observed. The site is open to vandalism but no noticeable harm has come to the site since first recorded by archaeologists. The upgrades to the existing transmission line could impact the site indirectly increased potential for vandalism and inadvertent impacts during line construction.

9.0 IMPACT MANAGEMENT RECOMMENDATIONS

9.1 Impact Management Background

There are three principle strategies available to manage impacts to archaeological sites resulting from development projects in British Columbia, as described in the Archaeological Permitting and Assessment Section, Archaeology Branch, Ministry of Tourism, Sport and the Arts Resource Management *Guidelines* (Archaeology Branch 1998). Generally, site conservation through **avoidance** is the most cost-effective strategy for significant sites or portions of sites threatened with destruction. Site protection by project redesign is the most commonly invoked version of this option, but naturally presents constraints on developments. **Mitigation** in the form of systematic data recovery (i.e., archaeological salvage excavation) is usually recommended for vulnerable significant sites or portions of sites that cannot be protected by other mitigative strategies. Archaeological **monitoring** is another type of mitigation, often recommended for construction within less-significant sites or portions of sites; to ensure that appropriate **emergency impact management** actions are carried out if unanticipated, significant archaeological remains are encountered. It may be recommended for portions of the site, which cannot be protected by other mitigative strategies *and* were either not excavated as part of a data recovery project or were not regarded as having significance high enough to justify systematic data recovery. Lastly, **compensation** refers to direct monetary payments being made by a proponent to finance the costs of systematic data recovery or other archaeological investigations in locations not affected by a particular development.

9.2 Recommendations

The archaeological impact assessment concluded that proposed transmission line developments in proximity to archaeological sites DhQv-30, DhQv-98, DiQv-24 and DiQv-25 could result in adverse indirect impacts to the archaeological sites. Specific recommendations are provided below.

1.0 Archaeological sites will be clearly marked on the Environmental Management Plan Maps and documents as sensitive areas requiring protection.

2.0 Archaeological sites will be flagged off on a 50 m perimeter for protection and monitoring during construction activities. Flagging will be removed upon completion of construction.

3.0 Final pole placement and access plans must either be validated by the archaeologist and/or by the environmental project manager to ensure that plans avoid the identified resource features.

4.0 Any development activities within 50 m of the archaeological sites (DhQv-30, DhQv-98, DiQv-24 and DiQv-25) will be monitored by an archaeologist or archaeologically-trained First Nations' representatives from the Penticton Indian Band or Osoyoos Indian Band. Monitoring will ensure the sites are not impacted by OTR construction.

5.0 The qualified environmental professional (QEP) responsible for environmental monitoring will have authority to stop work activities should a cultural resource feature be uncovered or impacted during construction. Work will be stopped until a qualified archaeologist has conducted an assessment and if required, prepared a mitigation strategy in consultation with the project manager.

6.0 A post-construction evaluation of the four sites should be undertaken by a qualified archaeologist familiar with this assessment, to verify that construction activities did not result in adverse project effects.

10.0 CONCLUSION AND FINAL REMARKS

Readers of this report should be aware that even the most thorough investigation may fail to reveal all archaeological remains, including protected sites under the BC *Heritage Conservation Act*, that may exist within the transmission line corridors. All users of this report should be aware that: (1) archaeological remains in BC are protected from disturbance, intentional or inadvertent, by the *Heritage Conservation Act*; (2) in the event that archaeological remains are encountered, all ground disturbance in the immediate vicinity must be suspended at once; (3) it is the individual's responsibility to inform FortisBC & the Archaeology Branch, of the location and type of archaeological remains and the nature of the disturbance as soon as possible; and (4) the *Heritage Conservation Act* allows for heavy fines and imprisonment for failing to comply with these requirements.

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1999 Late Plateau Culture. In *A History of the Native People of Canada, Volume II (1,000 B.C. – A.D. 500.)*, pp. 849-894. Mercury Series, Archaeological Survey of Canada Paper 152, Canadian Museum of Civilization, Hull, Quebec.

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ARCAS
CONSULTING ARCHEOLOGISTS LTD.

Arcas Head Office
55A Fawcett Road
Coquitlam, B.C., V3K 6V2
Tel: 604-526-2456
Fax: 604-526-2438
arcas@arcas.net
www.arcas.net

ARCHAEOLOGICAL IMPACT ASSESSMENT REPORT

RESULTS SUMMARY

Development: Bentley Terminal Station	**Arcas Project #:** 05512
Management Summary: No protected archaeological sites were identified during the assessment of the Bentley Terminal Station development location.	
Protected Sites Recorded: 0	**Unprotected Sites Recorded:** 0

DEVELOPMENT INFORMATION

FortisBC: Proposed Bentley Terminal Station – Nk'Mip Transmission Line Project		**TRIM Digital Map:** 82E.013	
Location UTM (NAD 83): 11U E315800	N5451386	**Geographic:** N 49° 11' 15"	W 119° 31' 41"
Proponent: FortisBC (Bob Gibney, T. 250-770-4622, F. 250-493-5869, email: Bob.Gibney@fortisbc.com), ELEMENTS Network – Environmental Coordination (Steve Morck, ELEMENTS Network, T: 403-547-2049, email: skmorck@telus.net)			
First Nations: Osoyoos Indian Band, Chief Clarence Louie T. 250-498-3444, F. 250-498-6577, chief@oib.ca; and Steve Bryson, Lands & Taxation, T. 498-3444, F. 250-498-6577, email: lands_tax@oib.ca.			
Project Description: Construction and installation of the proposed Bentley Terminal Station at the northern point of termination for the Nk' Mip Transmission Line.			
Total Area (ha): 3.24 ha		**Development Schedule:** 2005 - 2006	

FIELD SURVEY

Methods: The field component consisted of a pedestrian survey of the entire subject property for the purposes of establishing landscape integrity, evaluating archaeological potential, identifying archaeological sites, and assessing potential impacts to sites. Survey traverses were used to achieve maximum coverage of moderate potential lands and low-potential lands within the property. As shown on Figure 2, ten east – west traverses ensured that all lands within the development property were surveyed. Parts of all ten traverses run through low- and moderate-potential settings. Traverse #1 served as the primary baseline for the field survey, from which the other traverses where established parallel to Traverse #1. The Point of Commencement (POC) for Traverse #1 was a survey pin at the southeast corner of the property (east end of traverse). The baseline for each traverse was 30 m north of the last traverse.

Heritage Inspection Permit: n/a – Osoyoos Indian Reserve No. 1 **Arcas Project:** 05512 **Report Author:** D. Geordie Howe, RPCA **Report Reviewer:** Richard P. Brolly, RPCA **Report Date:** 9 August 2005	

FIELD SURVEY Continued

For each traverse, the survey crew (three persons) were spaced at 5 – 10 m intervals providing a survey traverse width of 20 – 30 m, depending upon vegetation and obstructions encountered during the survey. The crew-leader established the baseline (using the development ortho-photo, GPS, and compass and chain). At the point of termination for each traverse, the crew surveyed 30 m to the north along either the east or west boundaries of the development property, established the next traverse baseline and surveyed to the end of that traverse.

Along each survey traverse, the crew searched for archaeological evidence in the form of features (e.g., cooking features, cachepits, stone-lined depressions, petroforms, artifact scatters etc.). On an ongoing basis, the crew-leader appraised relative archaeological potential along the traverse. Within the subject property, surface exposures were plentiful and widespread. However, subsurface testing (with shovels) was utilized where necessary to identify buried cultural materials, particularly in settings with significant sediment accumulation. If any archaeological sites had been identified, the tests would also be utilized to establish the horizontal and vertical parameters of archaeological sites, and evaluate their integrity and significance. The number and location of subsurface tests was determined in the field by the archaeologists. Subsurface tests were excavated at 5 m to 10 m intervals in a setting with good accumulations of fine-textured sediments at the location within the development assessed has having the highest potential for archaeological sites. The subsurface tests were dug below the surface to an approximate depth of 50 cm below surface, and typically measured about 50 cm x 50 cm in area. Backdirt from each test were screened through 6 mm mesh. Information of the subsurface tests was recorded in fieldnotes and flagged. Site disturbance from testing was kept to a minimum, and all shovel tests were backfilled upon completion.

The shovel tests described above should be sufficient to establish the significance of any cultural deposits that would have been encountered. However, more detailed information may have been required to make this determination, and would have been achieved through the excavation of evaluative tests. Evaluative tests would be 100 cm^2 in area, excavated in 5 cm or 10 cm arbitrary levels (or by natural stratigraphic layers if feasible), with all matrix screened through 6 mm mesh for the recovery of artifacts, identifiable faunal remains, as well as materials for possible radiocarbon dating. Stratigraphic profiles would be prepared for each evaluative test unit. All recovered cultural materials would be collected for post-field analysis, and the evaluative test pits backfilled upon completion.

If human remains had been identified during the present assessment, testing in the vicinity would have halted, and representatives of the Osoyoos Indian Band would have been notified, as well as the clients.

Information about stratigraphic data, survey coverage, assessed archaeological potential, and fieldwork proceedings were recorded in fieldnotes. Contextual views of the subject property were photographed with a digital camera, and survey traverses mapped by GPS and chain and compass. Geo-referenced coordinates were acquired for pertinent points within the landscape, including survey traverse points of commencement and termination and subsurface test locations, using a hand-held GPS receiver. Any archaeological remains identified during the field survey would have been fully recorded and registered in the Provincial Heritage Register using BC Archaeological Site Inventory Forms.

Crew: D. Geordie Howe (Arcas), Quentin Baptiste and Russell Zubeck (Osoyoos Indian Band)	
Survey Date: 25 – 26 July 2005	**Ground Inspection:** 100%
Subsurface Test Placement: judgmental	**Total Number of Subsurface Tests:** 20

DEVELOPMENT BACKGROUND

General Location: Interior Plateau, south-central BC, southern Okanagan Valley, 1.8 km northeast of the town of Oliver and 0.8 km southeast of Tugulnuit Lake on Osoyoos Indian Reserve #1 (Figure 1).

Elevation (asl): 340 – 360 m	**Biogeoclimatic Setting:** PPxh
Indian Reserve: Osoyoos IR #1	**Map Reference:** 82 E/04 (NTS), 82E.013 (BCGS)

Vegetation Cover: Knapweed, golden rod, grasses, yarrow, oyster plan, arrow-leaf balsamroot, *Opunti*, rabbit bush, antelope brush, and several isolated birch trees. Portions of the development location have been extensively altered due to previous land use including land-clearing, road and transmission line construction activities.

Land Altering Activities: establishment of terminal (clearing, grubbing), site leveling, terminal construction; pole installation, road construction

Pre-field Potential Assessment:
An in-office map review by Arcas (*FortisBC Nk'Mip138kV Transmission Line – Archaeological Overview Assessment)* for this development utilized TRIM-based orthophotos available via RAAD (Remote Access to Archaeological Data: http://srmapps.gov.bc.ca/apps/raad/),a 1:50,000 topographic map and a 1:500-scale development plan to assess the archaeological potential using the following criteria: (1) local topography, (2) forest cover, and (3) aquatic features including Wolfcub Creek and Tugulnuit Lake. One archaeological site has been identified in the vicinity of the Bentley Terminal Station: DhQv-010, a small lithic scatter, recorded by Caldwell in 1952 is located approximately 450 m south of the proposed development property in a similar setting to the development property.

The in-office review concluded that there was moderate potential for archaeological sites within the proposed boundaries of the development, due to the proximity of Tugulnuit Lake, the benchland and benchland terrace-edge setting and the presence of previously recorded archaeological sites in the vicinity of the development.

RESULTS

Development Location Description: The proposed Bentley Terminal Station is situated a bench overlooking the town of Oliver (Photo 1). The southern boundary of the development property is delineated by the existing FortisBC transmission line (Photo 2) with the crest of the terrace edge forming the western boundary of the property. The eastern boundary consists of the fence line for the Vincor vineyards (Photo 3).

Land with the highest elevation within the Bentley Terminal Station development property is situated within the northwest corner of the proposed development property. The terrain slopes gently downslope from the northwest corner to the southeast, south and southwest. A large bowl feature forms the southeast portion of the property (Photo 2).

The proposed Bentley Terminal Station development location has been previously impacted by small-scale land clearing activities in the past related to antelope brush clearing and some recent motor vehicle traffic on the land (see Photo 4). These activities appear to have only slightly altered the landscape integrity of the development property. No potable water or evidence of earlier water features including paleo-water courses was observed in the development property.

In-Field Archaeological Potential: The lack of potable water and previous disturbance to the Bentley Terminal Station development property indicates that the development location has low archaeological potential for surface and buried archaeological sites.

Survey Results: The entire Bentley Terminal Station development property was examined (Photo 5). The boundaries of the development were identified during the field survey though several survey pins and flagging located along the margins of the property. An area encompassing the proposed Bentley Terminal Station and the recommended (revised) development site boundary were surveyed in addition to some land immediately outside the western and northern boundaries. All locations in the field were established by using GPS and the proposed Bentley Terminal Station development plan ortho-photo. Surface exposure ranged from good to excellent and depended upon the amount of previous disturbance and/or vegetation cover.

Twenty subsurface tests were excavated along the benchland terrace-edge setting at the northwest corner of the property after completion of the survey (Photo 6). The subsurface tests were placed along the edge of the terrace-edge as this portion was the highest in elevation for the development property and provided a good view northwest to Tugulnuit Lake (Figure 2).

No archaeological remains were identified within the Bentley Terminal Station development area. No evidence for housepits, cache pits, mat lodge depressions, petroforms, rockart, and surface and buried lithic scatters were identified. Based on the survey results, the potential for finding as-yet unidentified archaeological sites is very low. Figure 2 indicates the area covered by the field survey and location of the 20 subsurface tests.

Photo 1. View SW across Bentley Terminal Station development property towards the town of Oliver.

Photo 2. View across SE portion of Bentley Terminal Station towards the FortisBC transmission line.

Photo 3. View NNW along east boundary of Bentley Terminal Station and Vincor vineyards.

Photo 4. View NW at recent surface disturbance along Traverse #5.

Photo 5. View N towards crew surveying Traverse #2 with typical vegetation for the Bentley Terminal Station.

Photo 6. Looking N at Russell Zupeck excavating ST #4 with Quentin Bapiste at ST #3 in background.

IMPACT ASSESSMENT

No direct or indirect impacts to archaeological sites are expected as a result of proposed Bentley Terminal Station development project.

RECOMMENDATIONS

No archaeological sites were found during the AIA of the **Bentley Terminal Station** development location, and the potential for finding unidentified archaeological sites is considered to be low. It is therefore recommended that no further archaeological studies be required for this development, provided that the boundaries of the development area are not extended significantly beyond the lands covered by the archaeological assessment.

However, in the event that unanticipated archaeological sites are encountered during construction and terrain-altering activities in the vicinity of the find-location must stop and the proponent promptly inform the Osoyoos Indian Band and FortisBC about the particulars of the archaeological discoveries.

NOTE

This report has been prepared using the applicable Archaeology & Registry Services Branch Interim Permit Reporting Procedures (issued 23 March 2004).

Archaeological sites (physical evidence of past human activity) in British Columbia are protected and managed by the following provincial legislation:

- *Heritage Conservation Act:* Archaeological sites are protected and managed by this *Act,* which states that an archaeological site is automatically protected and requires management if it: (1) predates AD 1846, (2) is of indeterminate origin and may predate AD 1846, (3) is rock art or a burial place of archaeological/ historic significance, (4) is a heritage ship or aircraft wreck, or (5) has been designated as a Provincial Heritage site.

Protected archaeological sites may not be altered or disturbed in any manner without a permit issued under Sections 12 or 14 of the *Heritage Conservation Act.* Archaeological sites of Aboriginal origin not automatically protected by the *HCA* may also be subject to legal interpretations of the *Delgamuukw vs. British Columbia* (1997) decision regarding the fiduciary responsibility of provincial governments for preserving heritage resources.

Users of the report should be aware that even the most thorough investigation may fail to reveal all archaeological remains, including sites protected under the *Heritage Conservation Act*, that may exist within a development location. All users of this report should be aware that: (1) archaeological remains in BC may be protected from disturbance, intentional or inadvertent; (2) in the event that archaeological remains are encountered, all ground disturbance in the immediate vicinity must be suspended at once; (3) it is the proponent's responsibility to inform the Archaeology & Registry Services Branch, as soon as possible, of the location of the archaeological remains and the nature of the disturbance; and (4) the *HCA* prescribes heavy fines and imprisonment for failing to comply with these requirements.

This report is concerned with potential impacts to archaeological sites by the proposed Bentley Terminal Station development. It does not address potential impacts to traditional use activities and sites by this development. As such, this report does not comprehensively document all First Nations' interest in the land. The study was conducted without prejudice to First Nations' treaty negotiations, Aboriginal rights, or Aboriginal title.

BCAPCA MEMBER STATEMENT

As a member of the BC Association of Professional Consulting Archaeologists (BCAPCA), it is my opinion that this report and the work upon which it is based were completed in accordance with the requirements of Heritage Inspection Permits issued by the BC Ministry of Sustainable Resource Management (Archaeology and Registry Services Branch).

9 August 2005

D. Geordie Howe, RPCA

Date

55A Fawcett Road, Coquitlam, B.C., V3K 6V2

T 604-526-2456, F 604-526-2438, ghowe@arcas.net

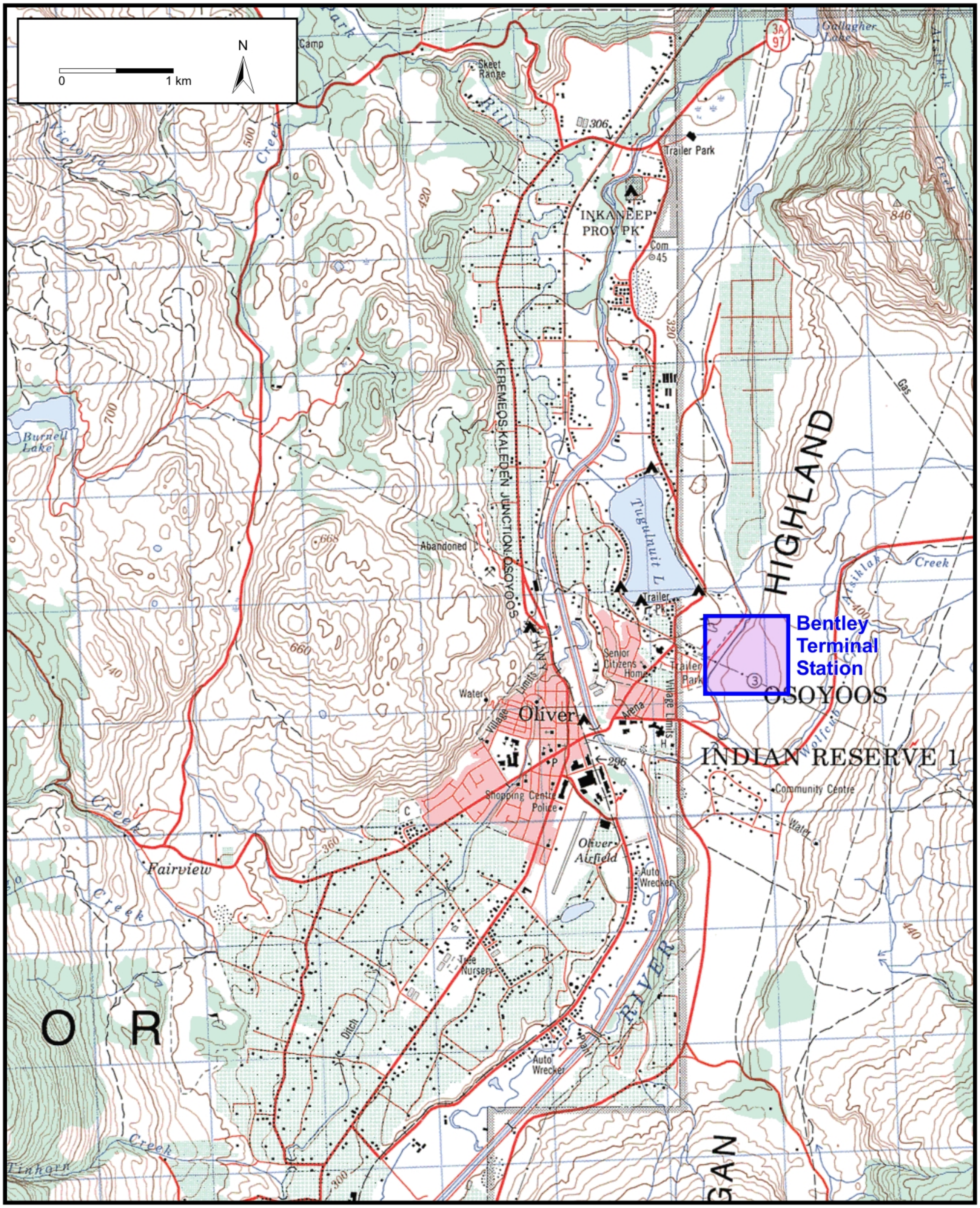


Figure 1. Proposed Bentley Terminal Station development property near Oliver, B.C. (1:50,000; NTS 82 E/4).

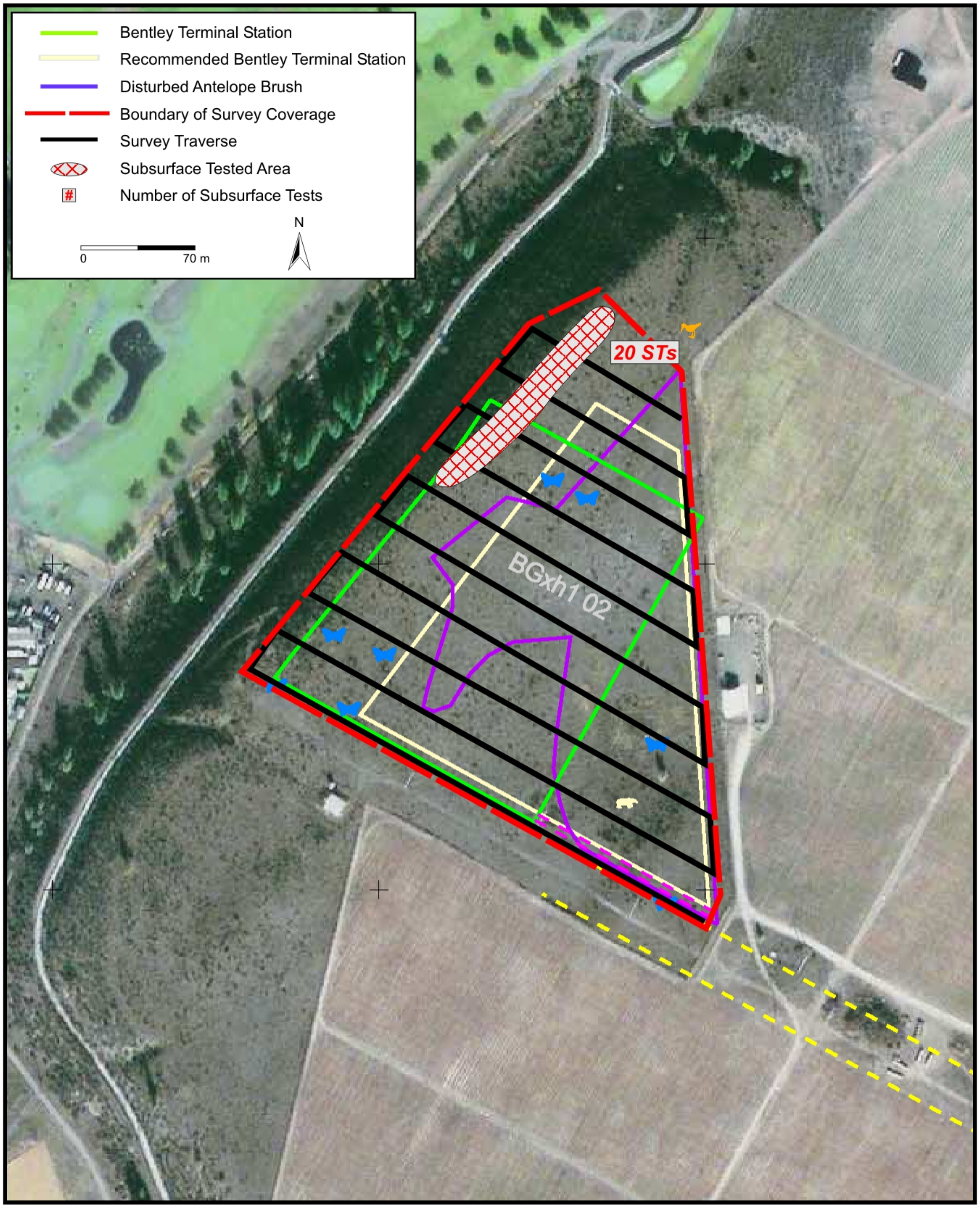
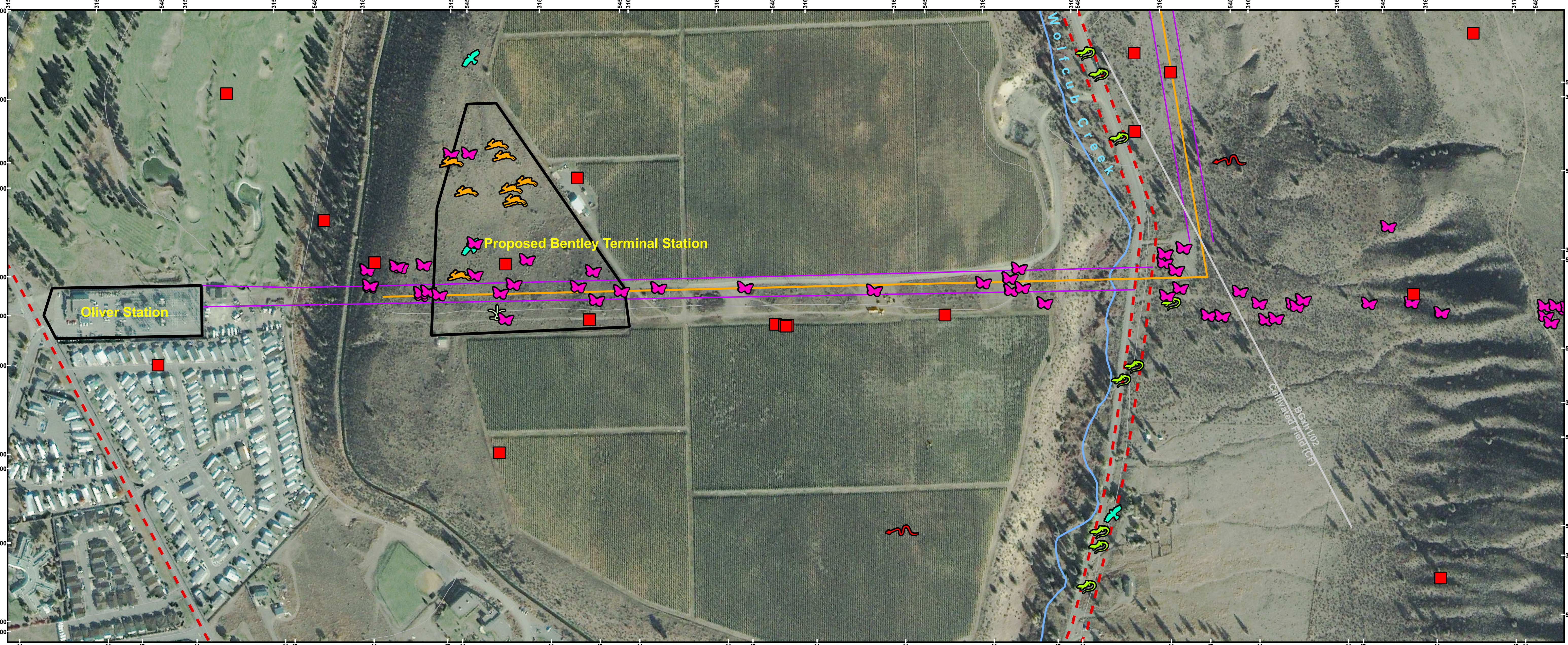


Figure 2. Archaeological survey traverses and location of subsurface testing (1:3,500).

APPENDIX 2: ALIGNMENT SHEETS

1:5000 Alignment Sheets (Maps)



Issues

Behr's and California Hairstreak foraging habitat
Bentley site is degraded antelope brush needle and thread grass
Land use: Residential West and North, Vineyards east and south
Potential for nesting birds
SAR: Western Harvest Mouse, Great Basin Pocket Mouse
Pallid Bat, Spotted Bat,
Potential for snakes and spadefoot
Crossing of Wolfcub Creek
Conservation corridor on the west side of the Bentley site

Mitigation Plans

Potential Behr's hairstreak relocation in June with removal (hand clearing) of antelope brush during adult emergence.
Plant salvage and relocation in March and April to offset areas. Remove nectaring sources from within site.
Equipment requires assessment and if necessary design for acoustical controls
Remove sagebrush in March or April to deter grassland desert nesting species on Bentley site
Once clearing is completed, erect a construction limit fence, monitor and relocate wildlife
Wolfcub Creek Crossing: no vehicles or equipment within 30 m of creek. Avoid disturbance to riparian zone.
Damage or disturbance of antelope brush on right of way prohibited, transplant yarrow from pole holes.
Stay on existing access trails.
Maintain conservation corridor as high value wildlife habitat design station to maximize corridor
Heavy equipment use restricted to 7:am to 10:00pm

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

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Meters
100 0 100 200 300 400 500
Feet

FortisBC Proposed Okanagan Transmission Reinforcement Project

ELEMENTS
GISsolutions inc.
GIS Mapping and Analysis
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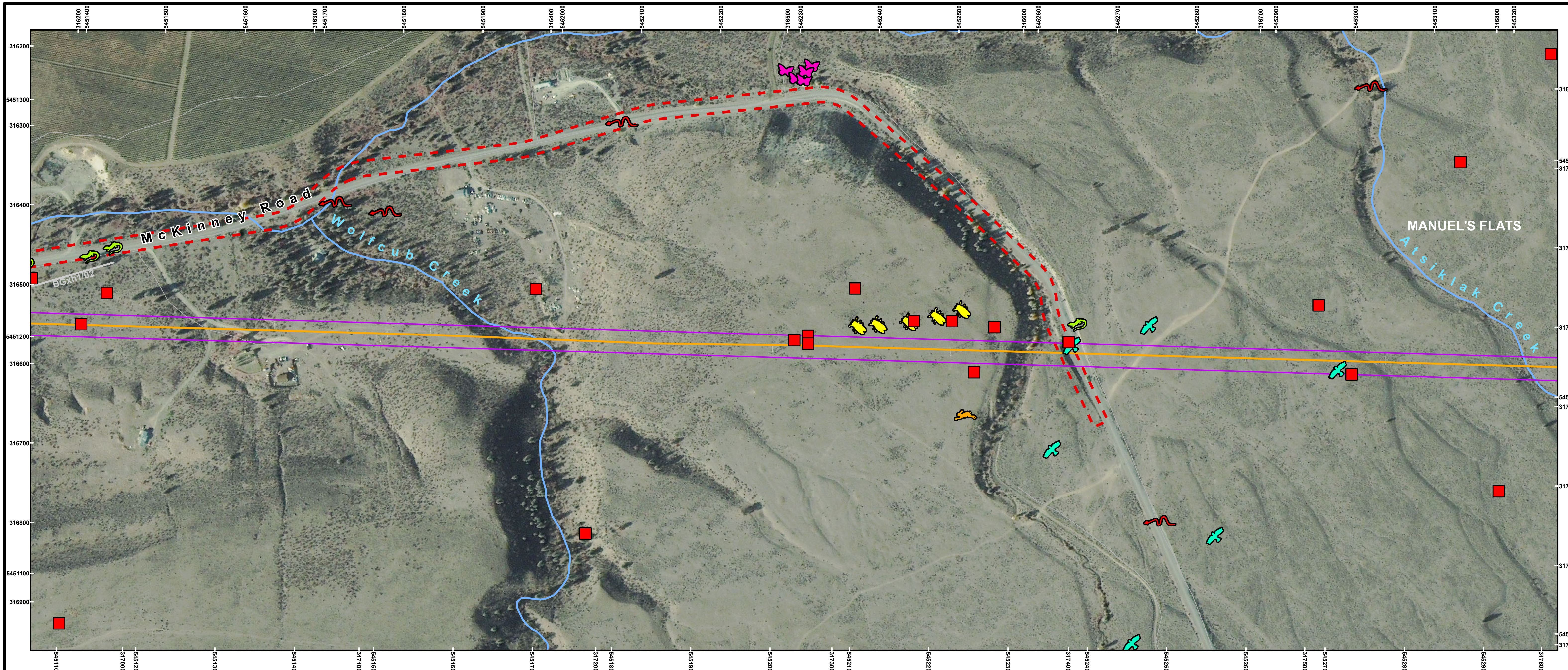
Created: Nov. 14, 2007	Drafted By: AMF	Author: GIS Solutions Inc.	Version: 2.3



Issues	Mitigation Plans
Behr's and California Hairstreak foraging habitat Land use: Residential adjacent to right-of way, Currently grazing with potential for Vineyards, country residential or golf course. Potential for nesting birds SAR: Long billed curlew (nesting), snakes and spadefoot Crossing of Wolfcub Creek at McKinney Road Bitter root in the area is still harvested as a traditional plant	Stay on existing access trails. Ensure access is with existing trails on the right-of-way. No new access to be created on or off the right-of-way without prior authorization from the OIB and the QEP. Transplant salvageable shrub steppe key species vegetation from pole holes as well as any traditional plants to adjacent areas under the coordination of the QEP. Ensure timing of activities near residences occur in normal hours (7am to 10pm) to avoid disturbance. Timing constraint to avoid curlew nesting, snake spring migration and spadefoot breeding (Aril 1 to July 31). Wolfcub Creek Crossing: no vehicles or equipment within 30 m of creek. Avoid disturbance to riparian zone. Cover pole holes securely to avoid incidents with livestock. Inspect daily and remove trapped wildlife.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

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Meters
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Scale: 1:5,000 | Map 2 of 20
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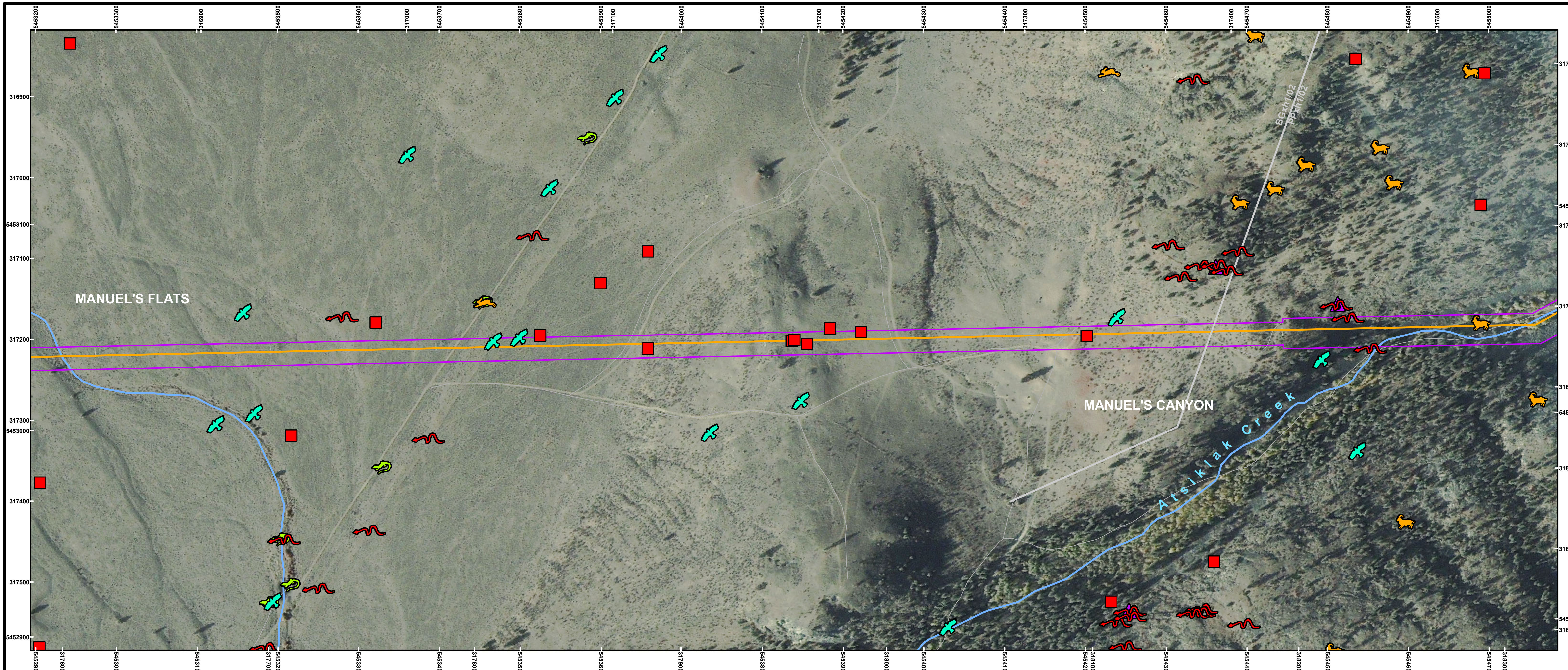

Issues	Mitigation Plans
Land use: Currently grazing with potential for vineyards, country residential or golf course on the desert flat land. Potential for nesting birds on desert and in Manuel's canyon including potential Screech Owl habitat along Atsiklak Creek SAR: Snakes, Sheep and spadefoot 2 Crossings of Atsitlak Creek: One desert and one in the cottonwood Riparian zone in Manuel's canyon	Cover pole holes securely to prevent accidents with livestock. Inspect daily for trapped SAR. Timing constraint to avoid curlew nesting, snake spring migration and spadefoot breeding (Aril 1 to July 31). Atsitlak Creek Crossing: Vehicles and equipment permitted only on the access trail and on the designated crossing within the riparian zone. Avoid disturbance to the riparian zone outside of the creek crossing location. Stay on existing access trails. Spring timing constraint for Sheep lambing in the canyon (March 15 to May 31) will also protect snakes and spadefoot Atsitlak Creek crossings: Federal and Provincial Authorization required . Design of crossing and compensation plans to be refined in the EMP.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

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Meters
100 0 100 200 300 400 500
Feet

FortisBC Proposed Okanagan Transmission Reinforcement Project

ELEMENTS
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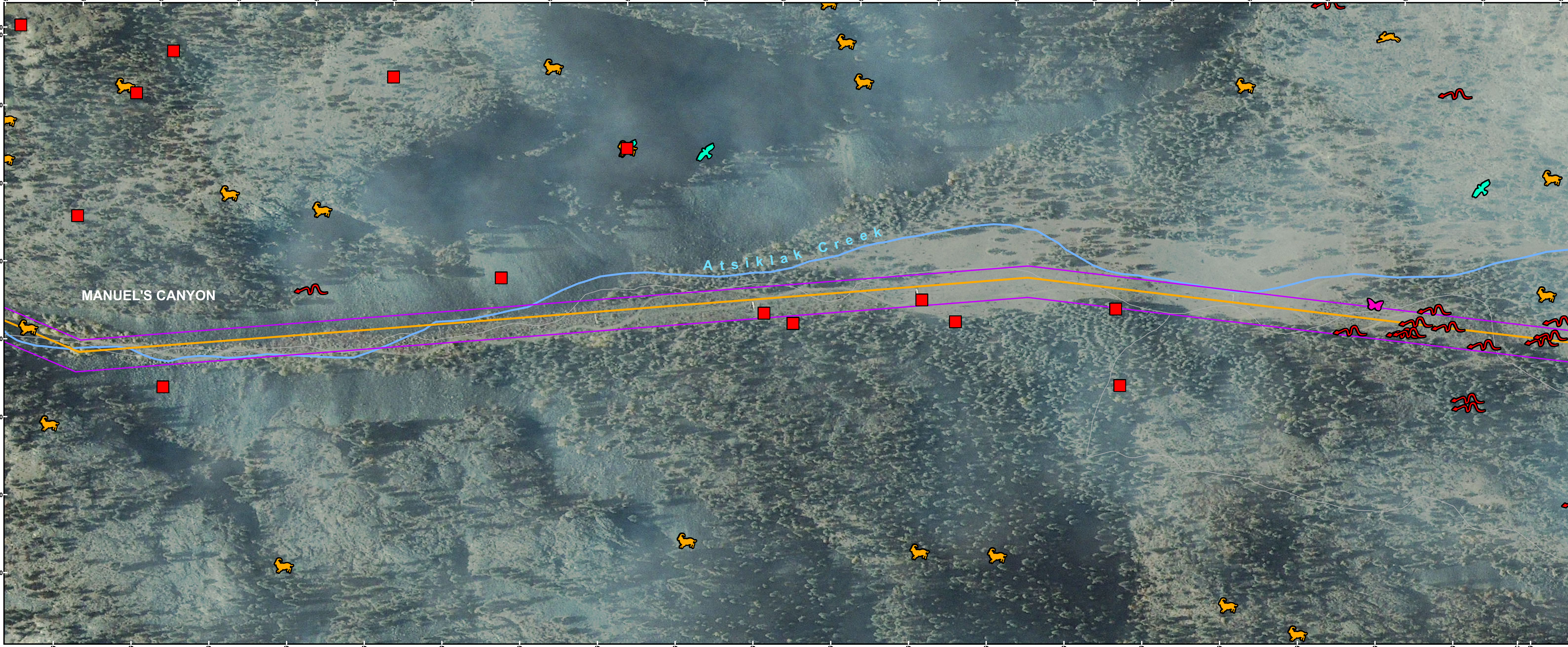
Author: GIS Solutions Inc.
Version: 2.3



Issues	Mitigation Plans
Land use: Currently limited to grazing in the valley bottom. Potential for nesting in Manuel's canyon includes high potential Screech Owl habitat in cottonwood along Atsiklak Creek near south end of the canyon SAR: Snakes, Skinks, and Sheep Sheep lambing in the canyon. Raptors likely nesting in the canyon 2 Crossings of Atsitlak Creek: In the cottonwood riparian zone in Manuel's canyon Spring fed tributary to Atsiklak Creek occurs in the valley.	Cover pole holes securely to prevent accidents with livestock. Inspect daily for trapped SAR. Timing constraint to avoid bird nesting and snake spring migration (March 15 to August 14). Atsitlak Creek Crossing: Vehicles and equipment permitted only on the access trail and on the designated crossing within the riparian zone. Avoid disturbance to the riparian zone outside of the creek crossing location. Stay on existing access trails. Hazard trees to be removed by hand clearing. Spring timing constraint for Sheep lambing in the canyon (March 15 to June 25) will also protect snakes. Atsitlak Creek crossings: Federal and Provincial Authorization required . Design of crossing and compensation plans to be refined in the EMP. Avoid activity in undeveloped areas within 150m of snake dens during key phases of the denning periods.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

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25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

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ELEMENTS
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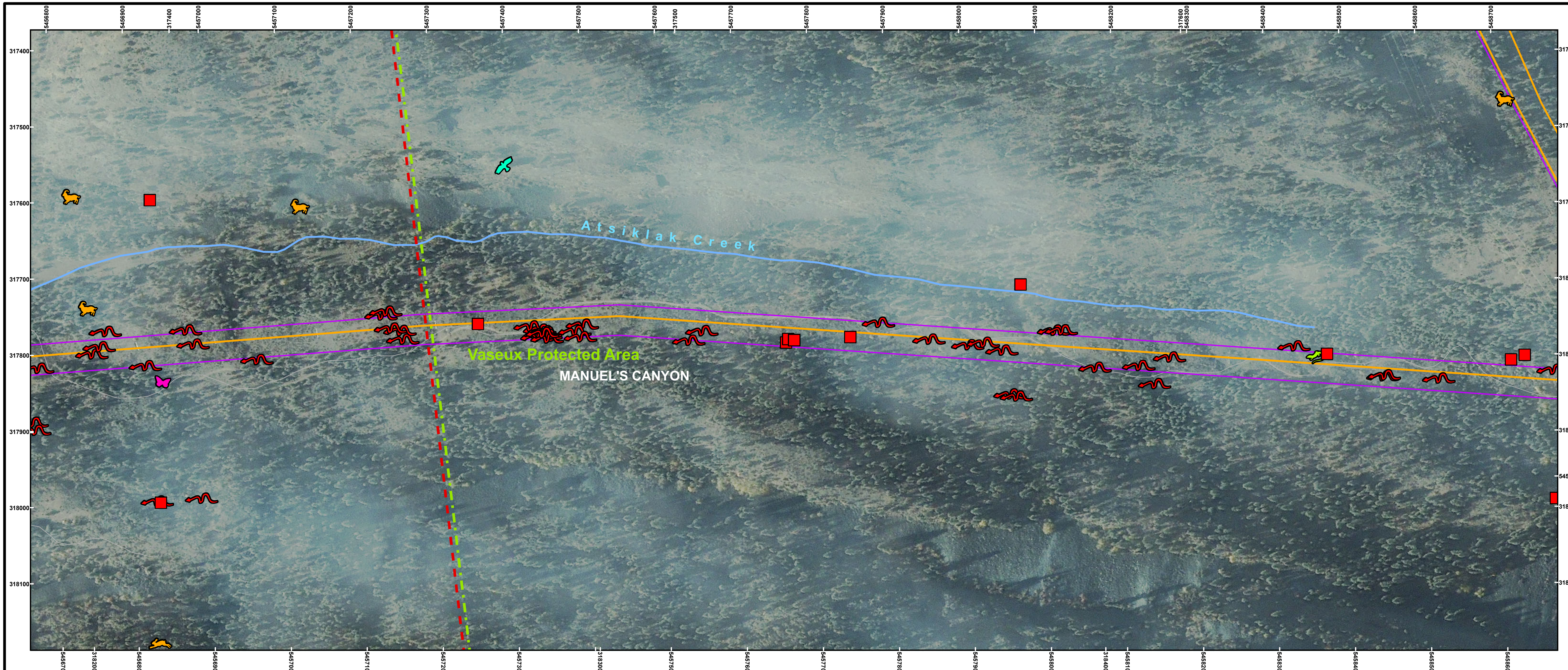

Issues	Mitigation Plans
Land use: Currently limited grazing in the valley bottom only on the OIB lands. Most of area is in the Vaseux Protected Area. SAR: Snakes, Skinks, and Sheep Sheep lambing, snake hibernacula, potential raptor nesting 1 Crossing of the spring fed tributary to Atsitlak Creek with soft ground. Excellent vegetation community in the protected area without invasive species. Invasive species on the OIB reserve. Archaeological site (Pictographs)	Cover pole holes securely to prevent accidents with livestock or trapping of SAR snakes, skinks and small mammals. Inspect daily for trapped wildlife. Timing constraint to avoid bird nesting and snake spring migration (April 1st to August 14th). Atsitlak Creek tributary Crossing: Vehicles and equipment permitted only on the access trail and on the designated crossing within the riparian zone. Avoid disturbance to the riparian zone outside of the creek crossing location. Spring fed tributary requires crossing system to prevent damage to soft ground and adjacent vegetation Stay on existing access trails. Hazard trees to be removed by hand clearing. Spring timing constraint for Sheep lambing in the canyon (March 15 to June 25) will also protect snakes. Archaeological site to be flagged and monitored during construction. Control point for weed inspection and cleaning at the entrance to the Vaseux Protected area. Minimal disturbance through Protected area. Use existing access trails, no upgrades to trail except on the soft ground area in the vicinity of the headwater.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

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Meters
100 0 100 200 300 400 500
Feet

FortisBC Proposed Okanagan Transmission Reinforcement Project

ELEMENTS
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FORTISBC

Scale: 1:5,000 | Map 5 of 20

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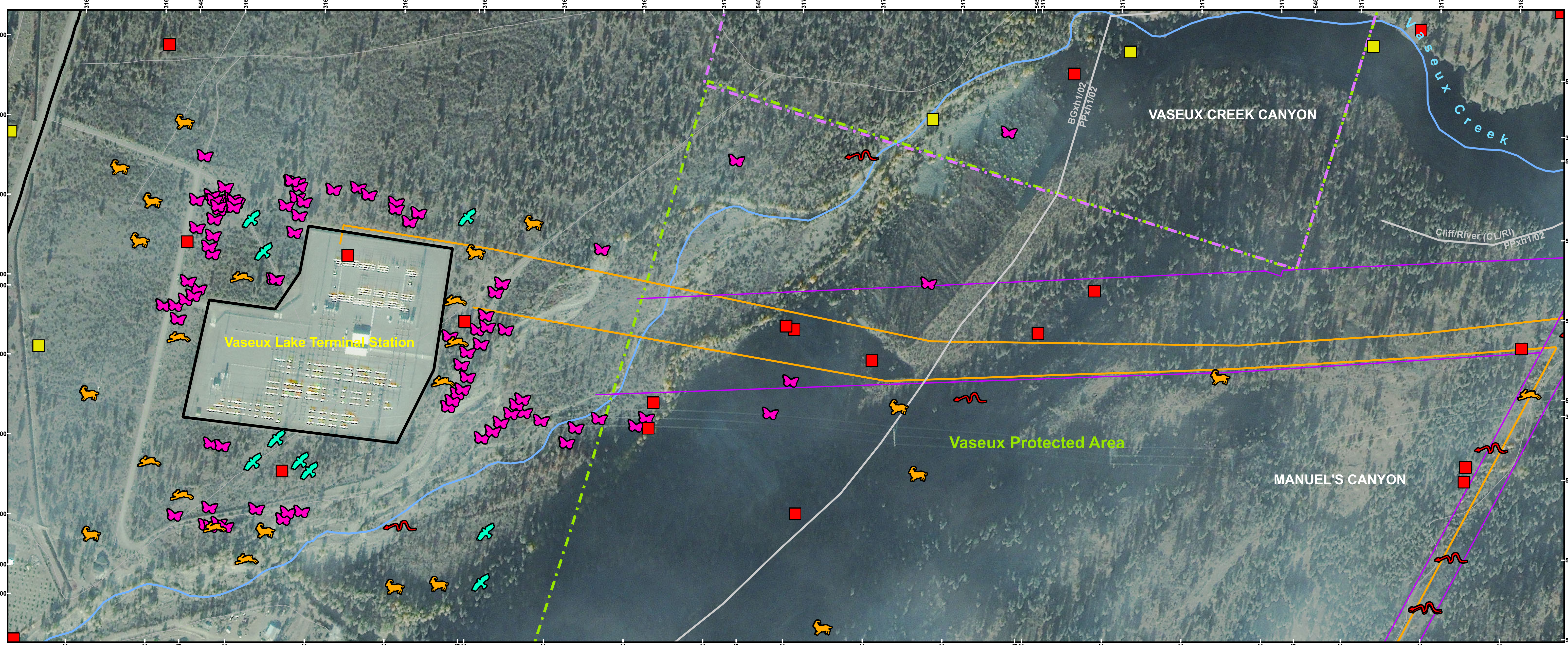

Issues	Mitigation Plans
Land use: Vaseux Protected Area, TNT conservation area, Adjacent lands include gravel extraction, orchard and residential. SAR: Snakes, Lewis's Wood pecker, Nuttal's Cottontail and Sheep. Mule Deer, Black Bear, variety of birds. Crossing of Vaseux Creek. Requires federal and provincial authorizations. Areas with excellent vegetation community areas around station but with invasive species (knapweed, toadflax and cheatgrass). Archaeological site shelter/cave on valley terrace.	Cover pole holes securely to prevent trapping of SAR snakes and small mammals. Inspect daily for trapped SAR. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14). Vaseux Crossing: Foot access for topping & removal of trees. Heli access for installation and stringing of poles and conductors. Avoid disturbance to the riparian zone outside of the creek crossing location. Crossing will require habitat offset compensation. Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Spring timing constraint for Sheep lambing on the mountain face about 200 m south and in the canyon (March 15 to June 25) will also protect snakes. Archaeological site to be flagged and monitored during construction. Implement weed control protocols for equipment installing poles at the station.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

FortisBC Proposed Okanagan Transmission Reinforcement Project

ELEMENTS
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Scale: 1:5,000
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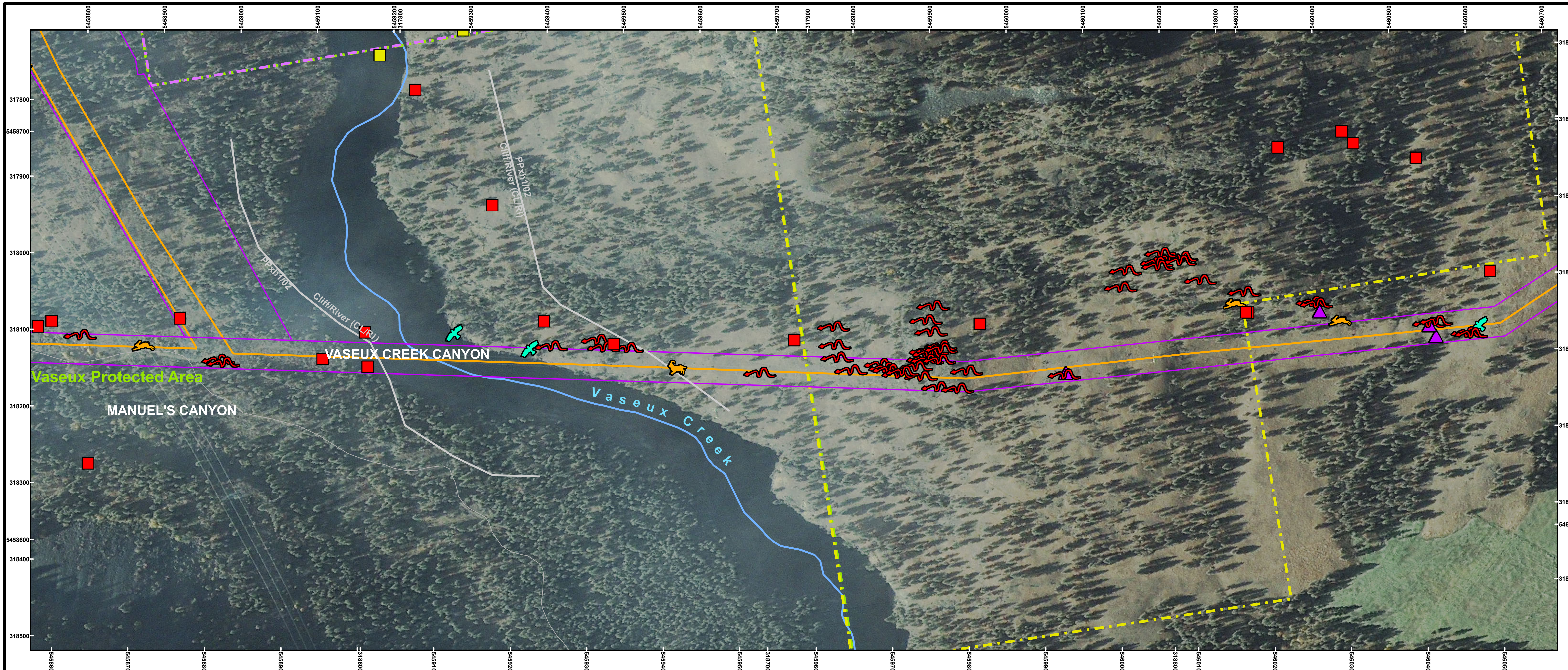
Created: Nov. 14, 2007
Drafted By: AMF
Author: GIS Solutions Inc.
Version: 2.3



Issues	Mitigation Plans
Land use: Vaseux Protected Area, CWS National Wildlife area, Adjacent lands include pasture and forage. SAR: Snakes, Skinks, and Sheep. Mule Deer, Black Bear, variety of birds including eagles and swifts. Crossing of Vaseux Creek over Vaseux Canyon. May require 2 poles and r-o-w widening to accommodate line sag and sway. Includes examples of sensitive shrub steppe vegetation communities without invasive species.	Cover pole holes securely to prevent trapping of SAR snakes and small mammals. Inspect daily and remove trapped wildlife. Conduct rock drilling for poles (if technically feasible) Avoid activity in undeveloped areas within 150m of snake dens. No new access trails permitted. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 15th). Vaseux Crossing: Foot access for topping & removal of trees at canyon edge on the edge of the right-of-way. Heli access for installation and stringing of poles and conductors. Aerial crossing is well above a steep incised canyon. No vehicle or equipment access in the canyon. Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Spring timing constraint for Sheep lambing in the canyon (March 15 to June 25th) will also protect snakes. Permits required on CWS land for soil and vegetation alteration.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

FortisBC Proposed Okanagan Transmission Reinforcement Project

ELEMENTS
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Author: GIS Solutions Inc.
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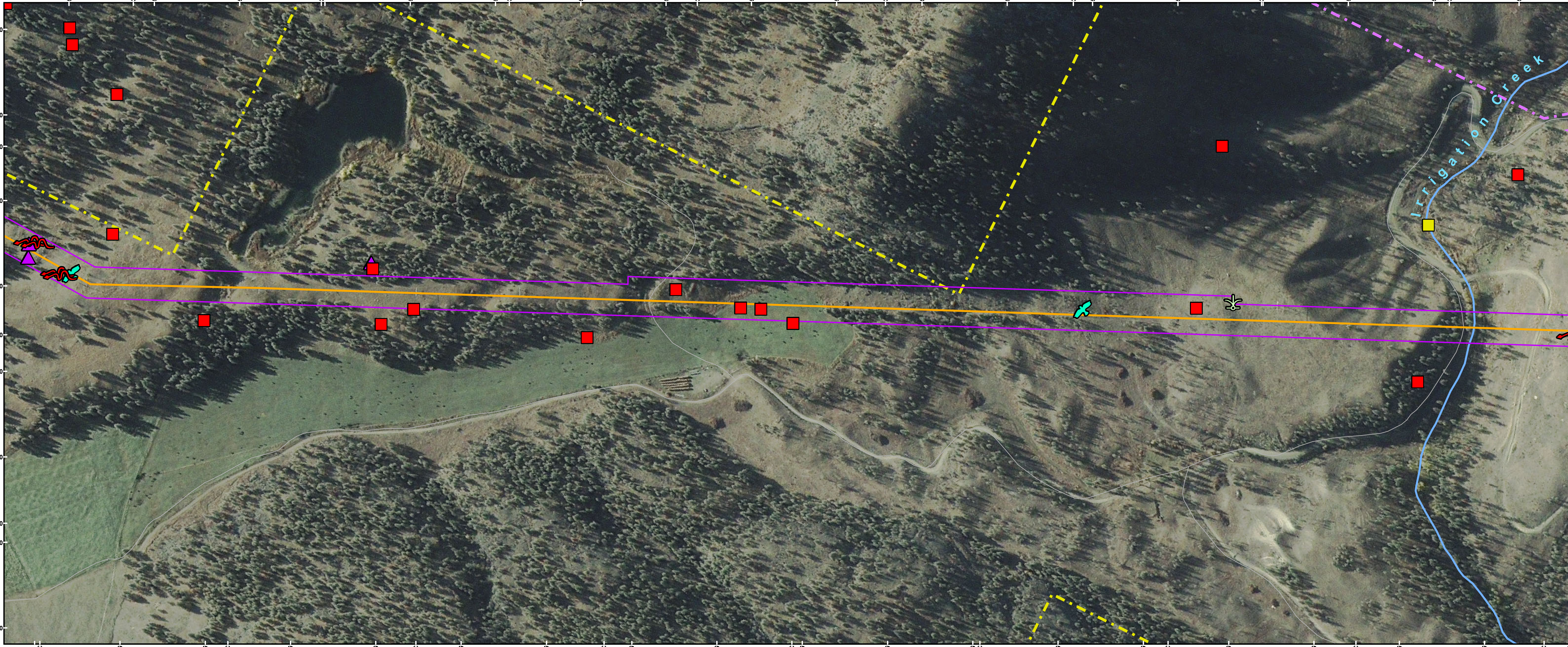

Issues	Mitigation Plans
Land use: Private land for timber, developed pasture and forage. Adjacent to the CWS National Wildlife area. SAR: Snakes, Skinks, and Sheep. Mule Deer, Black Bear, variety of birds including eagles. Crossing of Irrigation Creek (ephemeral & not fishery). Wetland adjacent to the right-of-way is a man made pond but may have rare plants Vegetation community includes agronomic pasture and some native grassland without invasive species.	Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14th). Irrigation Creek Crossing: Foot access in the riparian zone near the McIntyre Road. Avoid wetland habitat and associated vegetation community. Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. No topping of trees expected over Irrigation Creek. Cover pole holes securely to prevent trapping of SAR snakes and small mammals. Inspect daily for trapped SAR. Landowner requires notification of all activities. Access is limited to the right-of-way only. Conduct spring assessment for rare plants on the right-of-way. Mandatory access restriction by landowner to right-of-way only. Implement weed management program for vehicles, equipment and follow-up monitoring.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23
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N

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

FortisBC Proposed Okanagan Transmission Reinforcement Project

ELEMENTS
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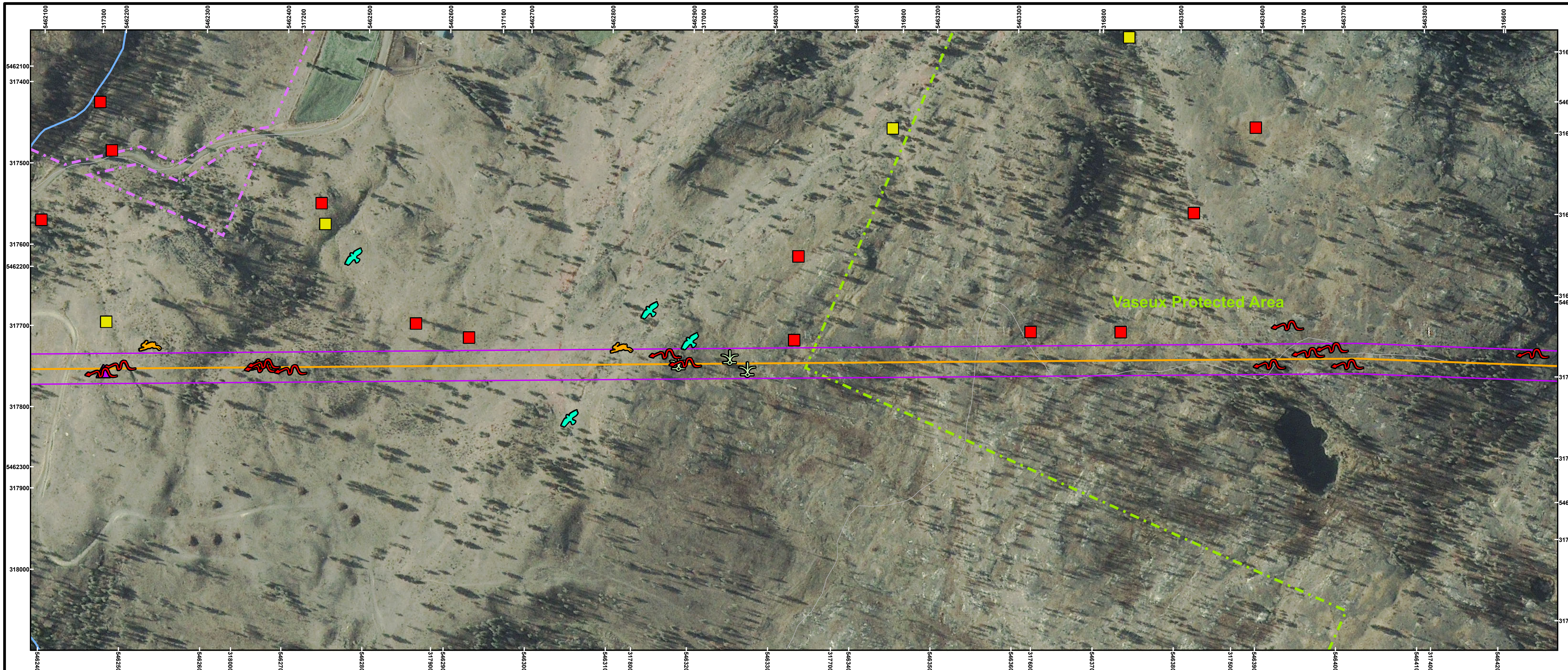

Issues	Mitigation Plans
Land use: Private land for timber and developed pasture. Vaseux Protected Area (North) SAR: Snakes, Skinks, and Sheep. Mule Deer, Black Bear, variety of birds. Wetland adjacent to the right-of-way, potential for rare plants. Invasive species watch	Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14). Avoid wetland habitat and associated vegetation community. Conduct spring reassessment of right-of-way near the wetland for rare plants. Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent trapping of snakes and small mammals and other wildlife. Inspect daily for trapped wildlife. Landowner requires notification of all activities. No access except along the right-of-way on the private land. Stay on access existing trails in the Vaseux Protected Area. Implement weed management program for vehicles, equipment and follow-up monitoring. Ensure equipment is clean and free of weeds moving between the private land and the protected area.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

FortisBC Proposed Okanagan Transmission Reinforcement Project

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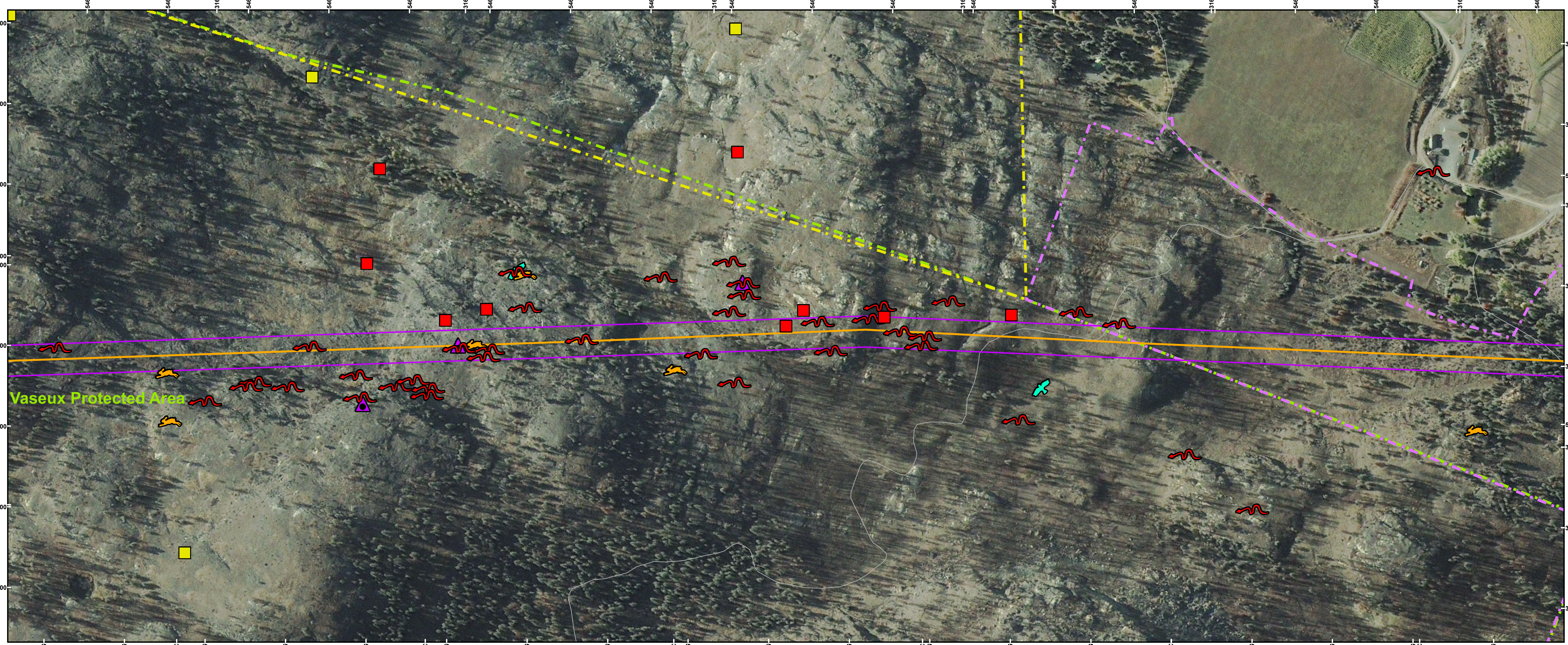

Issues	Mitigation Plans
Land use: Vaseux Protected Area (North), The Nature Trust (Brock Property) Conservation Lands. Adjacent property to nature trust includes forage production and vineyards. SAR: Snakes, Skinks, Nuttal's Cottontail and Sheep. Mule Deer, Black Bear, variety of birds. Invasive Species Control	Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14). Sheep Winter Range: Timing constraint from March 1 to April 15. Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent trapping of reptiles, small mammals. Inspect daily for trapped wildlife. Stay on access existing trails in the conservation areas. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall). Avoid activity in undeveloped areas within 150m of any snake dens.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

FortisBC Proposed Okanagan Transmission Reinforcement Project

ELEMENTS
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Scale: 1:5,000
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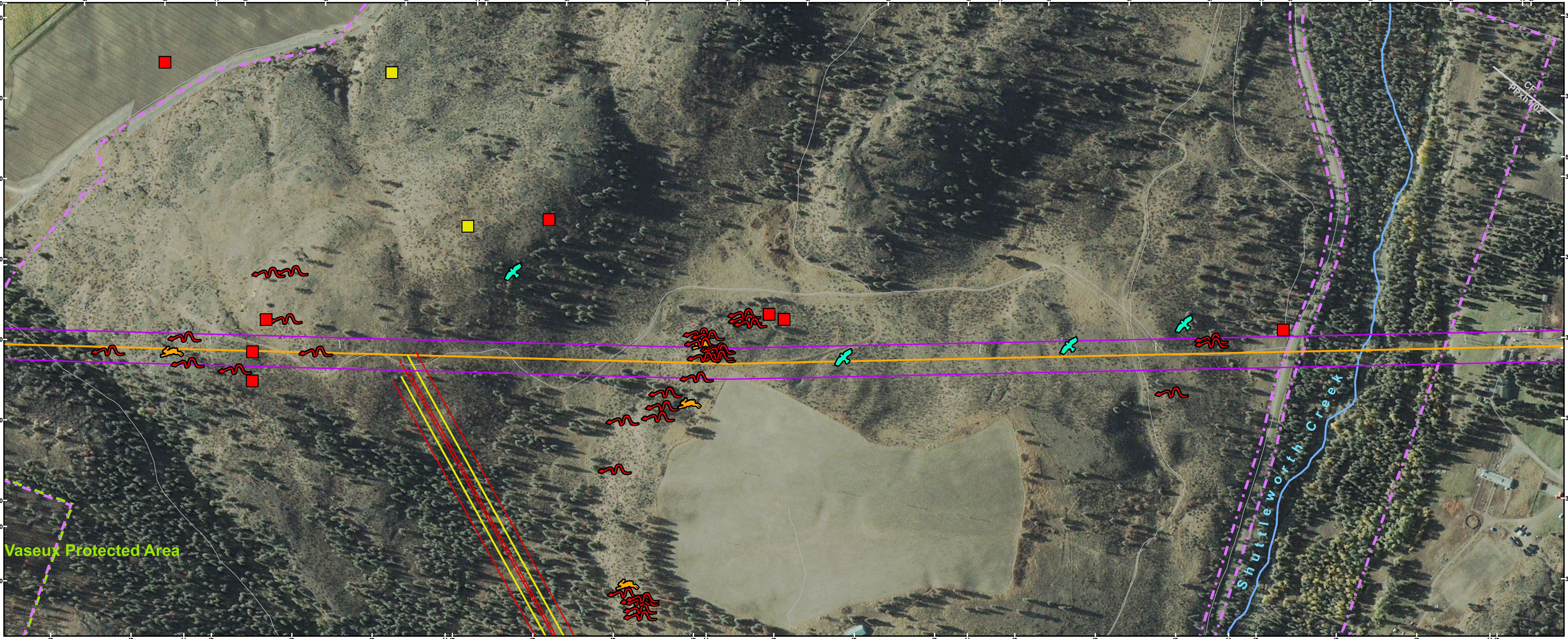

Issues	Mitigation Plans
Land use: The Nature Trust (Brock Property)-conservation lands, Transition to Agricultural land with developed pasture and forage crops north of Shuttleworth Creek SAR: Snakes, Skinks, Nuttal's Cottontail and Sheep. Mule Deer, Black Bear, variety of birds. Invasive Species Control Shuttleworth Creek Crossing Riparian Zone 50 m each side	Shuttleworth Creek: Foot access for topping of trees unless otherwise permitted under federal and provincial authorization. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14th). Sheep Winter Range: Avoid activity during the timing constraint from March 1 to April 15. Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent trapping of reptiles and small mammals. Inspect daily for trapped wildlife. Stay on access existing trails in the conservation areas. No new access trails unless approved by the construction officer and the QEP with the support of the landowner. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall).

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

Meters: 25 0 25 50 75 100 125 150
Feet: 100 0 100 200 300 400 500

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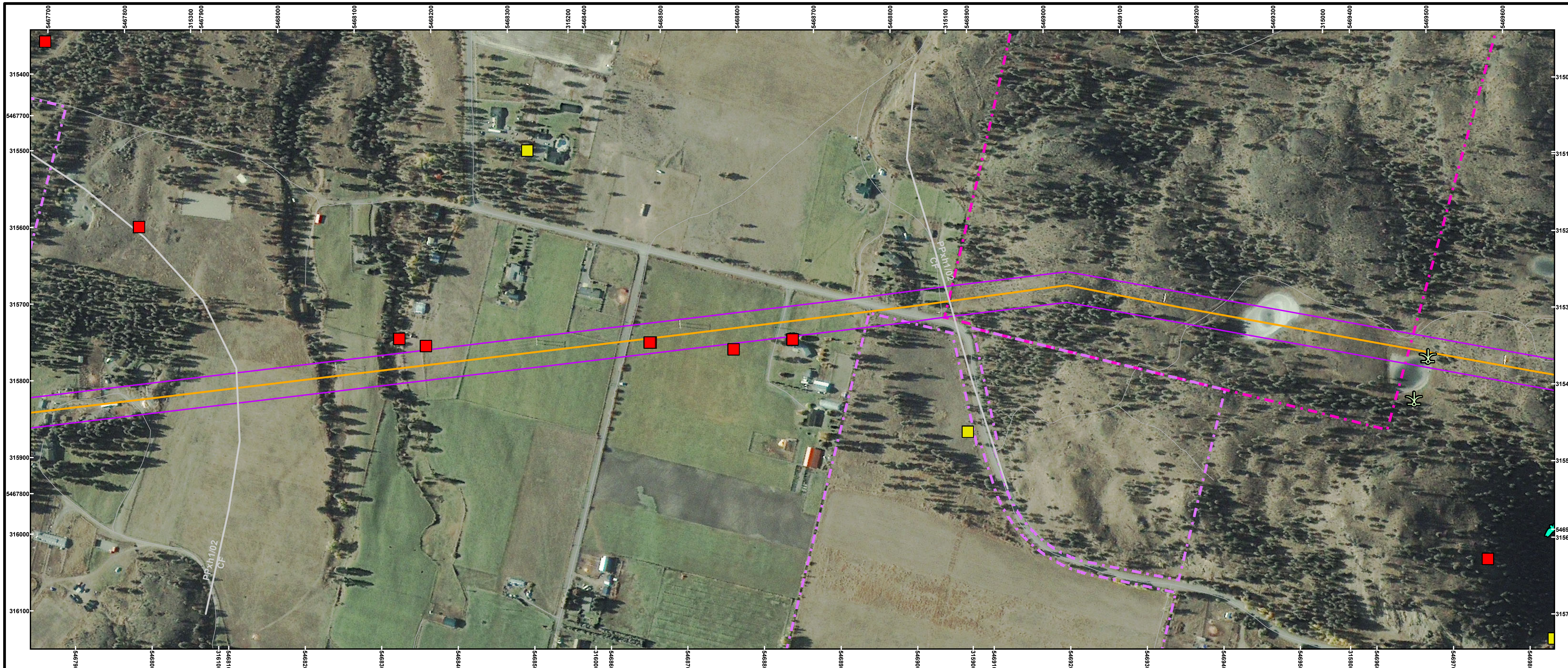

Issues	Mitigation Plans
Land use: Agricultural land with developed pasture and forage crops Rural Residences in close proximity, TNT lease Mule Deer & variety of birds. Transient sheep use on upper elevation. Potential for raptor nesting. Invasive Species Control Alkaline Wetlands with sensitive plants and vegetative communities	Heavy equipment use restricted to the times from 7:00 am to 10:00 pm only. Implement dust control measures. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14). Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent incidents with livestock. Inspect daily for trapped wildlife. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall). Wetlands and adjacent vegetation to be fenced to avoid impact . Requires spring survey in conjunction with pole placement and construction access to determine presence of rare plants. Vehicles and equipment to access from each side. No pole installation in or adjacent to wetland. Access restricted to existing trails.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

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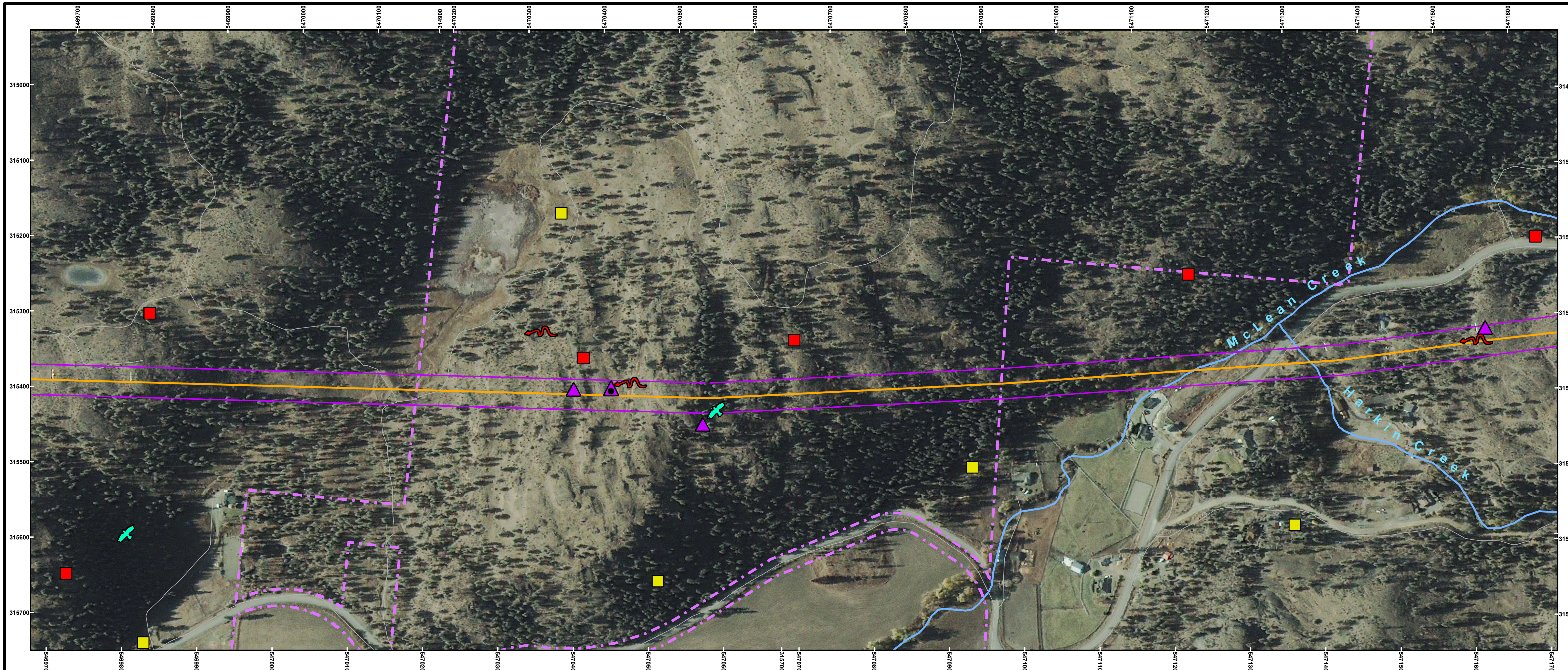

Issues	Mitigation Plans
Land use: Agricultural land with native pasture and TNT land. Crosses McLean Creek road with developed pasture and residences. Crossing of McLean Creek and Harkin Creek SAR: Sheep and snakes Mule Deer & variety of birds. Potential for raptor nesting. Invasive Species Control Alkaline Wetland off R-o-W with adjacent sensitive vegetation near right-of-way	No equipment in the riparian zone of McLean Creek or Harkin Creek. Foot access for topping of trees where needed. Heavy equipment use from 7:00 am to 10:00 pm only. Implement dust control measures as needed. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14th). Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent incidents with livestock. Inspect daily for trapped wildlife. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall). Wetlands and adjacent vegetation to be fenced to avoid impact . Requires spring survey in conjunction with pole placement and construction access to determine presence of rare plants. Vehicles and equipment to access from each side. No pole installation in or adjacent to wetland. Access restricted to existing trails.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

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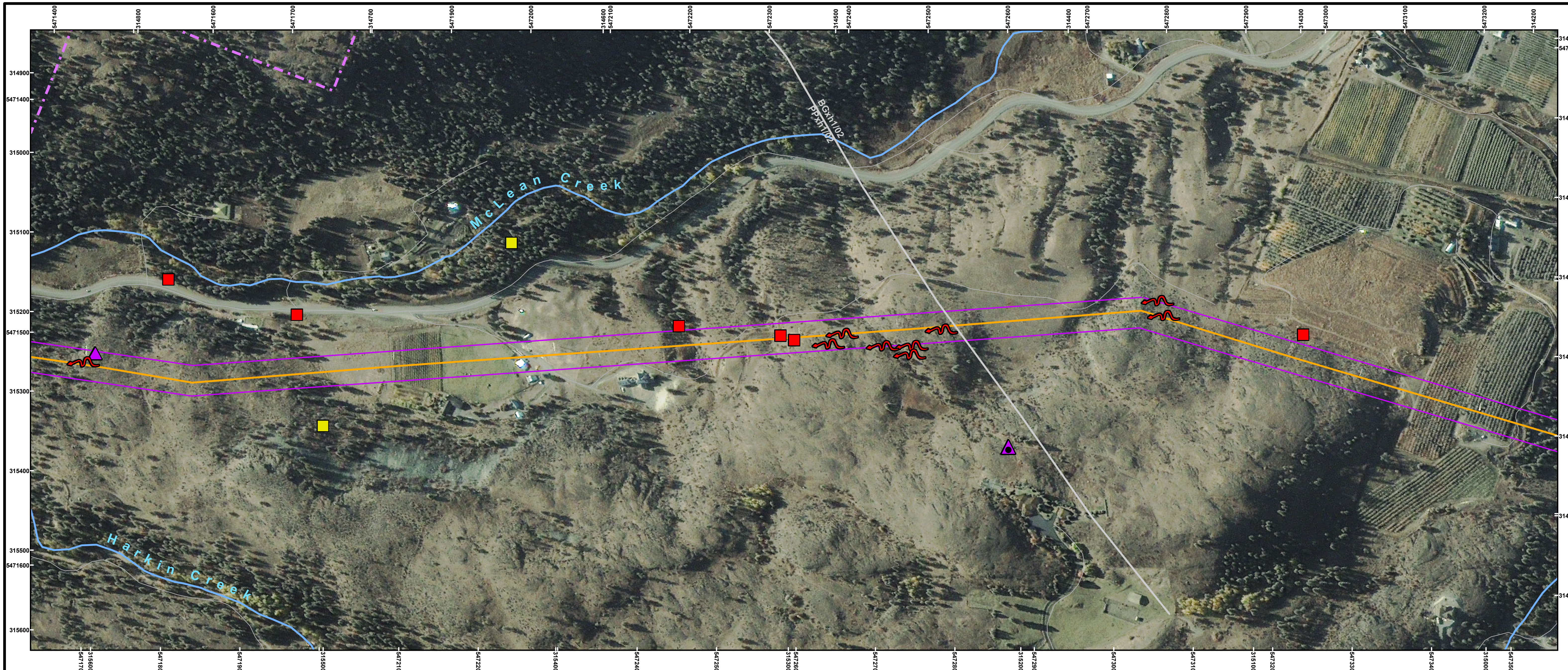

Issues	Mitigation Plans
Land use: Agricultural land with native and developed pasture. Adjacent to and crosses vineyards. Rural Residences SAR: Sheep and snakes Mule Deer & variety of birds. Invasive Species Control	Vineyard access to be planned with landowner to minimize disturbance. Heavy equipment use from 7:00 am to 10:00 pm only. Implement dust control measures as needed. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14). Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent incidents with livestock. Inspect daily for trapped wildlife. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall). Access restricted to existing trails unless approved by the construction manager and the QEP as well as landowner approval.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

Meters: 25 0 25 50 75 100 125 150
Feet: 100 0 100 200 300 400 500

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Issues	Mitigation Plans
Land use: Agricultural land with vineyards and orchards. Country Residential subdivision Mule Deer & variety of birds.Invasive Species Control Aesthetics Matheson Creek crossing	Vineyard access to be planned with landowner to minimize disturbance. Heavy equipment use from 7:00 am to 10:00 pm only. Implement dust control measures as needed. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14th). Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent incidents with livestock. Inspect daily for trapped wildlife. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall). Matheson Creek: Foot access only for topping of selected hazard trees. No vehicles or construction equipment permitted in the riparian zone. Single pole design with galvanized non glare finish to minimize visual intrusion over other pole configurations (H-frame)

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

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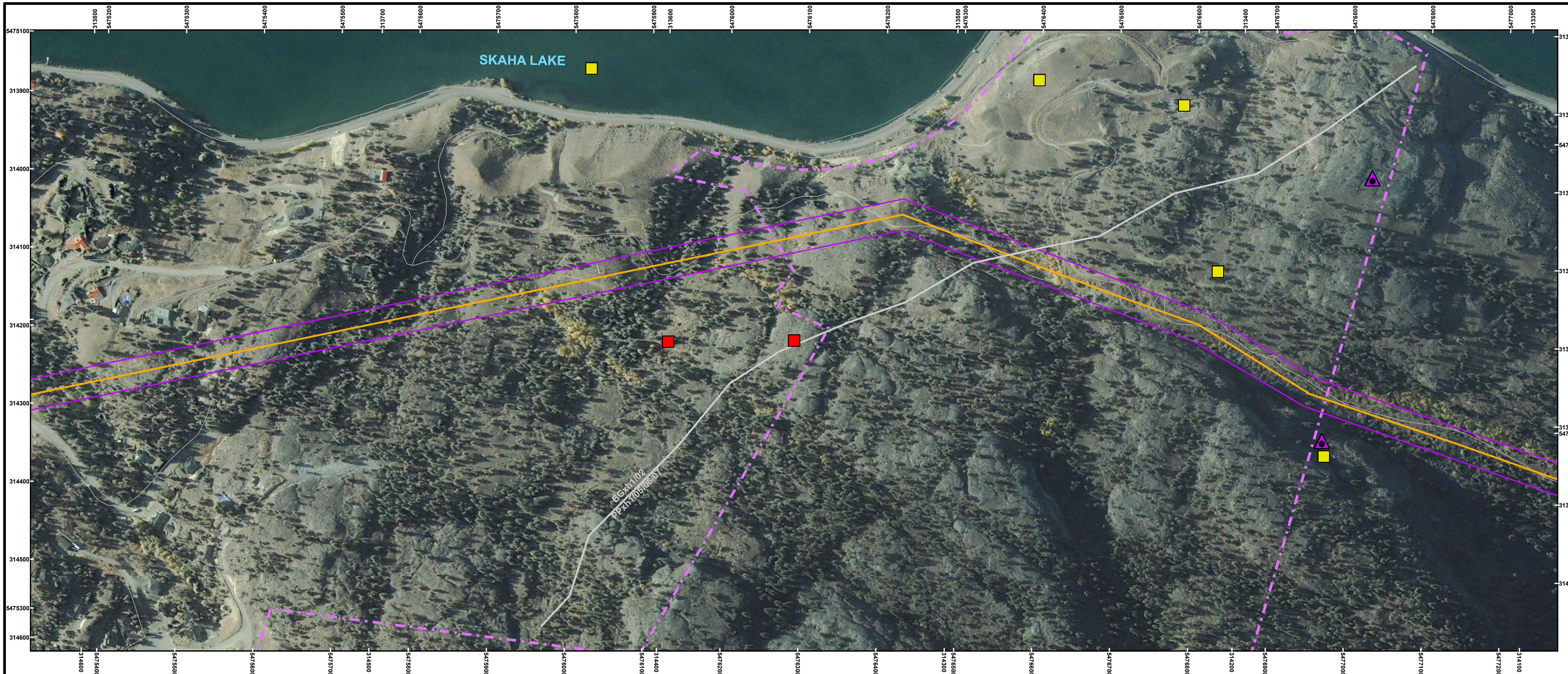

Issues	Mitigation Plans
Land use: Agricultural land with pasture. Nature Trust . Country Residential subdivision Sheep, Mule Deer & variety of birds. Potential Raptor nesting near right-of-way Invasive Species Control Aesthetics Sheep lambing area	Heavy equipment use from 7:00 am to 10:00 pm only. Implement dust control measures as needed. Timing constraint for Sheep Lambing; March 15 to June 25. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14). Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent incidents with livestock. Inspect daily for trapped wildlife. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall). Single pole design with galvanized non glare finish to minimize visual intrusion over other pole configurations (H-frame)

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

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ELEMENTS
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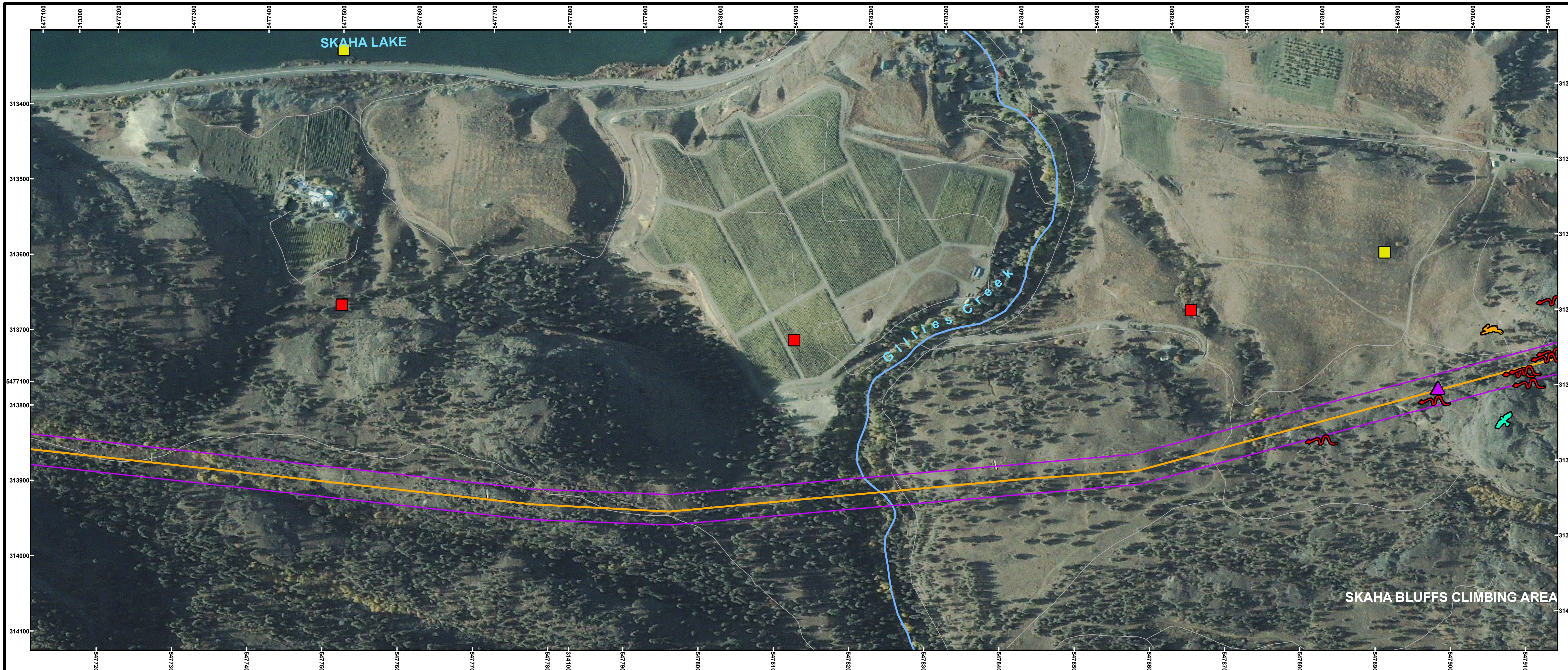

Issues	Mitigation Plans
Land use: Agricultural land with pasture. Nature Trust . Sheep, Mule Deer & variety of birds. Invasive Species Control Sheep Lambing area Gillies Creek Crossing	No heavy equipment in riparian zone of Gillies Creek. Foot access only for topping of hazard trees. Heavy equipment use from 7:00 am to 10:00 pm only. Implement dust control measures as needed. Timing constraint for Sheep Lambing; March 15 to June 25. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14). Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent incidents with wildlife. Inspect daily for trapped wildlife. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall). Access restricted to existing trails unless otherwise approved by construction office and QEP with the landowner.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

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ELEMENTS

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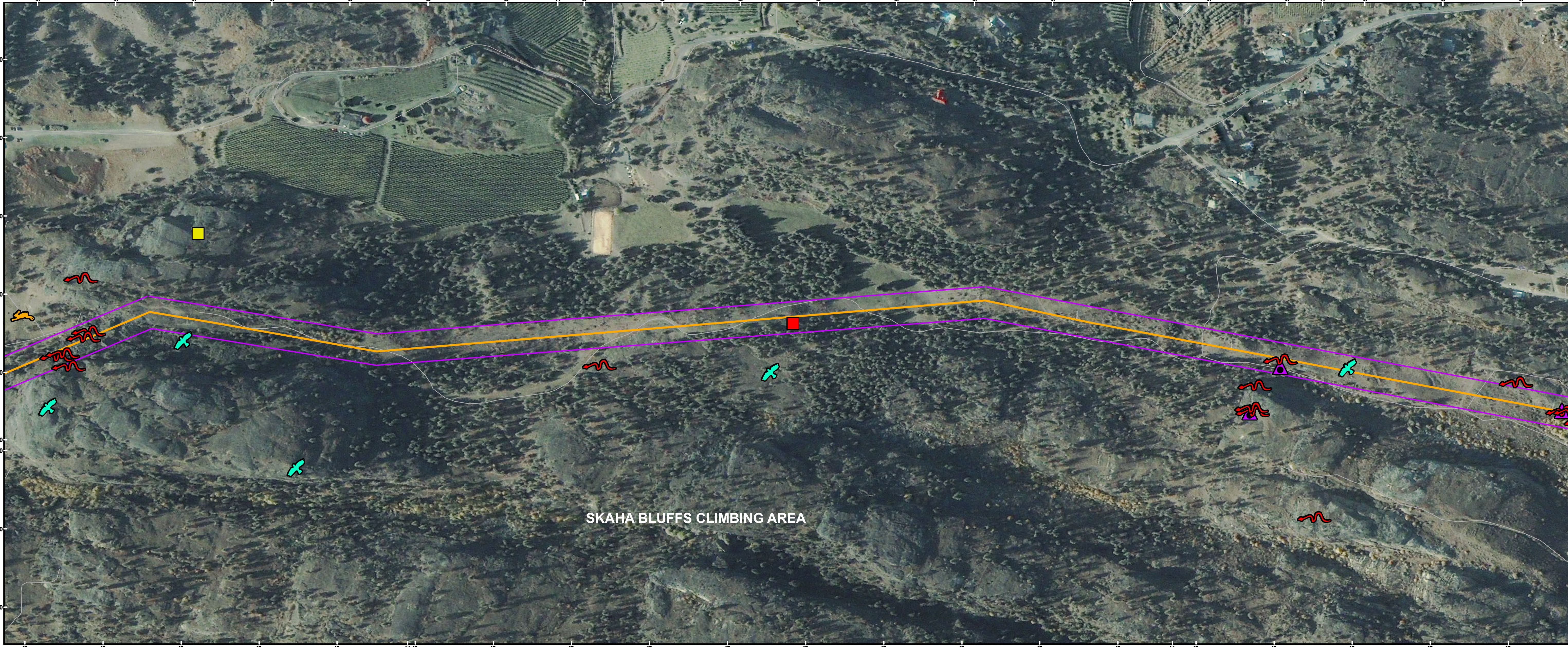

Issues	Mitigation Plans
Land use: Agricultural land with pasture. Recreation- adjacent to Skaha Bluffs Sheep, Mule Deer, snakes & variety of birds. Confirmed denning area near right-of-way Invasive Species Control	Skaha Bluffs recreational access across R-o-W. Implement Safety access control. Heavy equipment use from 7:00 am to 10:00 pm only. Implement dust control measures as needed. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14). Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent incidents with wildlife. Inspect daily for trapped wildlife. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall). No activity in undeveloped areas within 150m of a denning feature.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

Meters
25 0 25 50 75 100 125 150
Feet
100 0 100 200 300 400 500

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ELEMENTS
GISsolutions inc. GIS Mapping and Analysis
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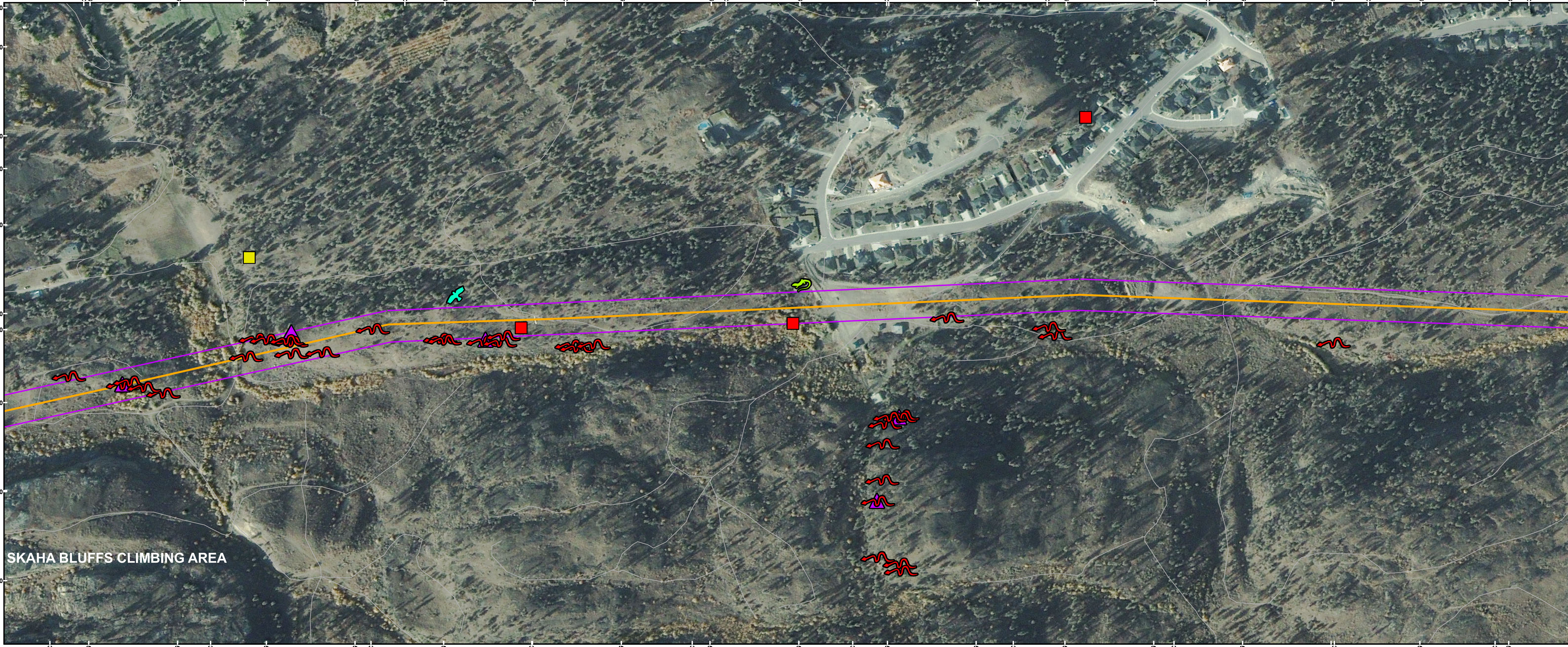
Author: GIS Solutions Inc.
Version: 2.3



Issues	Mitigation Plans
Land use: Crown land. Recreation, hiking. Adjacent to subdivision in Penticton Sheep, Mule Deer, Moose, snakes including dens, Invasive Species Control Aesthetics	Skaha Bluffs recreational access across R-o-W. Implement Safety access control. Heavy equipment use from 7:00 am to 10:00 pm only. Implement dust control measures as needed. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14). Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent incidents with wildlife. Inspect daily for trapped wildlife. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall). No activity in undeveloped areas within 150m of a denning feature. Single pole design with non glare galvanized finish. Access restricted to existing trails unless otherwise approved by construction office and QEP with the landowner.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23

N

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

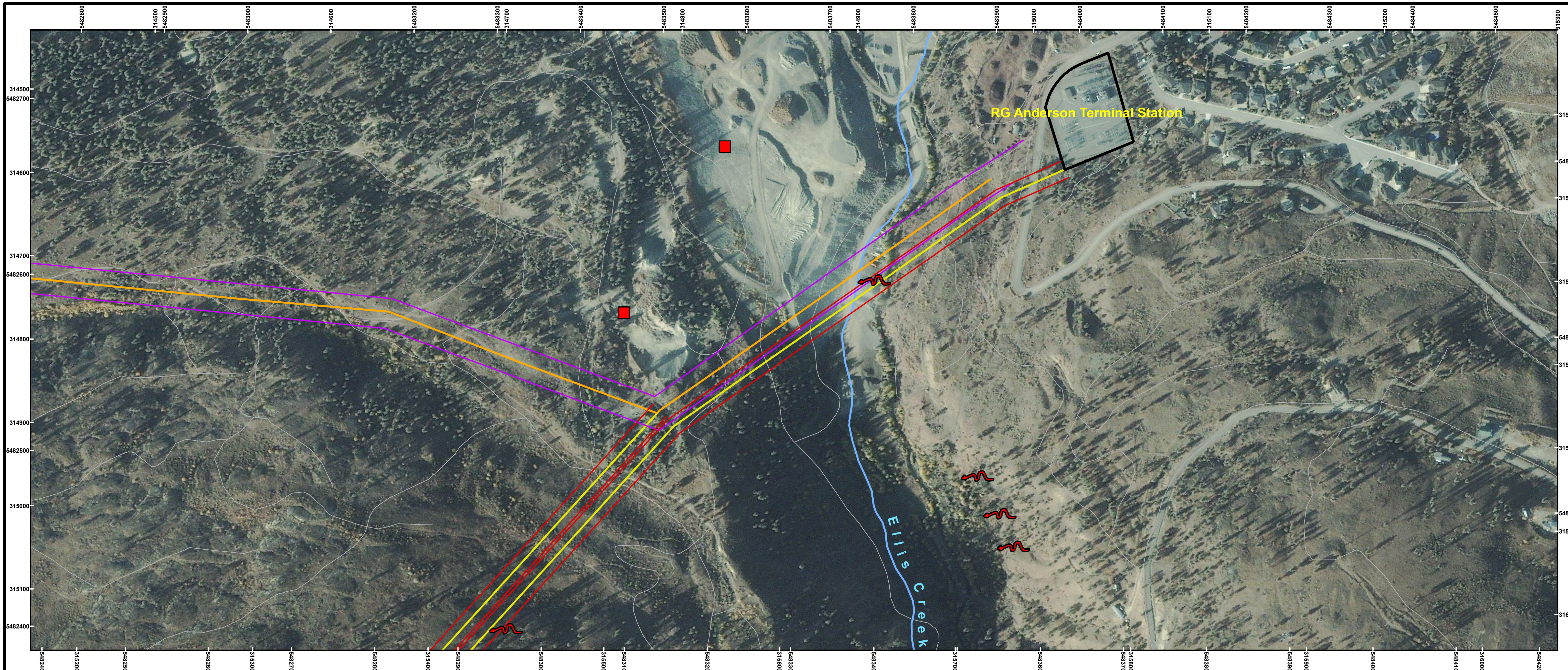
FortisBC Proposed Okanagan Transmission Reinforcement Project

ELEMENTS

GISsolutions inc.
GIS Mapping and Analysis

FORTISBC

Created: Nov. 14, 2007	Drafted By: AMF	Author: GIS Solutions Inc.	Version: 2.3
		Scale: 1:5,000	Map 19 of 20



Issues	Mitigation Plans
Land use: Crown land. Recreation, hiking. Gravel extraction & processing Adjacent to subdivision in Penticton Sheep, Mule Deer, Moose, snakes, Invasive Species Control Ellis Creek Crossing Aesthetics	No vehicles or construction equipment in Ellis Creek Riparian zone. Access control and traffic plan in coordination with residential and gravel operation Skaha Bluffs recreational access across R-o-W. Implement Safety access control. Heavy equipment use from 7:00 am to 10:00 pm only. Implement dust control measures as needed. Timing constraint to avoid bird nesting and snake spring migration (April 1 to August 14). Hazard trees and limited clearing along the edge of the r-o-w using hand clearing. Cover pole holes securely to prevent incidents with wildlife. Inspect daily for trapped wildlife. Ensure equipment is clean and free of weeds moving between parcels of land. Implement weed control follow-up monitoring and control after construction. Ensure disturbed areas are reclaimed and re-vegetated during the first suitable germination period (i.e. spring or fall). Single pole design with non glare galvanized finish. Maintain existing vegetation barrier on east and north sides of RG Anderson Terminal Station.

Amphibian
Arthropod - Butterfly
Arthropod - Other
Bird
Large Mammal
Small Mammal
Reptile
Plant
CDC Endangered Species/Ecology
CDC At Risk Species/Ecology
Candidate Den
Confirmed Den
Vegetation Boundary
Alternate Transmission
Existing Transmission
Alternate R/W
Existing R/W
Stream
Highway 97
Minor Roads
Existing Station
Osoyoos Reserve Boundary
CWS Conservation Area
TNT Conservation Area - Fee Simple
TNT Conservation Area - Lease
Park/Protected Area

Projection: UTM Zone 11
Datum: NAD83

Imagery:
1m Nominal Resolution
Acquired 2006 - 10 - 23
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N

25 0 25 50 75 100 125 150
Meters
100 0 100 200 300 400 500
Feet

FortisBC Proposed Okanagan Transmission Reinforcement Project

ELEMENTS

GISsolutions inc.
GIS Mapping and Analysis

FORTISBC

Scale: 1:5,000
Map 20 of 20
Created: Nov. 14, 2007
Drafted By: AMF
Author: GIS Solutions Inc.
Version: 2.3

APPENDIX 3: GENERAL GUIDELINES

A Field Guide of Standard Environmental Procedures
Revised August 2007

GENERAL ENVIRONMENTAL GUIDELINES

LIST OF ENVIRONMENTAL GUIDELINES

1. SITE ACCESS (CROWN AND PRIVATE LANDS)
2. SITE ACCESS (INDIAN RESERVES)
3. WEED CONTROL
4. VEGETATION MANAGEMENT AND CONTROL
5. POLE REMOVAL AND REPLACEMENT
6. WILDLIFE AND SPECIES AT RISK
7. ACCESS OR WORK AROUND AQUATIC AREAS
8. WASTE MANAGEMENT
9. EMERGENCY RESPONSE: SPILL OR FIRE
10. ARCHAEOLOGICAL AND CULTURAL RESOURCES

SITE ACCESS (CROWN AND PRIVATE LANDS)

Title: Site Access (Crown and Private Lands)
Category: Environment
Number: ENV 07-01

BACKGROUND

The following guideline provides basic environmental and cultural protection information when accessing and performing work on Company facilities that are located on crown or private lands.

APPLICATION

All employees or contractors accessing Company facilities on Crown and Private Lands by means of a vehicle must be familiar with and follow the procedures documented in this Environmental Guideline unless otherwise directed by the Project Manager or Environment Department.

PROCESS

STEP ONE - Notifications

- Ensure that the landowner has given permission for access that is required by employees or contractors.
- Note any special requests or conditions identified by the landowner. Should there be any ‘issues’ contact Bob Gibney, Manager Municipal Relations (Phone: 250-770-4622).
- If streams or rivers need to be crossed, check with the FortisBC Environment Department or their designated environmental contractor to see if a regulatory approval is required. Note: In most cases it will be.

STEP TWO - Preparation

- Only existing access roads and trails can be utilized. In the event that new access or work areas are required, contact the FortisBC Environment Department.
- Vehicles must be clean and free of mud or soil that could possibly contain noxious weeds such as knapweed.
- Check to ensure that vehicles are equipped with adequate spill control equipment to handle and prevent leaks from vehicles or equipment.
- During the fire season, check to ensure that fire fighting equipment (i.e. portable water sprayer and shovel) is carried with vehicles.

STEP THREE - Access In (to site)

- Stay on designated trails and roads.
- Avoid generating dust (i.e. travel slowly).
- Avoid rutting of trails in soft and wet conditions (i.e. avoid spinning of tires).
- Avoid all close contact with wildlife.
- Ensure all gates are left closed.

STEP FOUR – Construction or Maintenance Work

- Stay on the company right of way unless approval to operate on other lands has been previously obtained.
- Minimize contact and impact to plants and vegetation. In sensitive areas, where appropriate, consider use of foot access, hand clearing and digging and low impact construction that may include helicopter use.
- Avoid all contact with wildlife.
- All waste generated must be collected and returned to a FortisBC facility for disposal.
- Use spill prevention and containment equipment when handling damaged transformers. In the event that transformer oil or any other hazardous substance has been released onto the ground, contact the FortisBC Environment Department for site specific cleanup and remediation instructions. The FortisBC Environment Department is responsible for reporting any spills or environmental and cultural damage that may have occurred as the result of the construction or operation of the FortisBC facility or any work performed by FortisBC personnel or their contractors.
- Portable toilets may be required unless there are existing washroom facilities which can be utilized.
- Do not cut down any trees or alter the existing natural landscape unless prior authorization is obtained from the FortisBC Environment Department.
- Minimize noise near landowners and sensitive wildlife areas.
- If working during a fire hazard season, ensure equipment and crews have adequate fire fighting equipment. This generally includes a hand tool for each crew member, Wajax bags and a supply of water in a remote setting. If access is available, consider the use of a water truck on standby if the hazard is high.
- In areas where there is significant soil and vegetation disturbance (i.e. more than 10 poles being installed or clearing a substation site), ensure that, there are adequate plans in place to prevent soil erosion. This may include the use of silt fences or waterways around pole holes on slopes or around the cleared area. Re-seed the disturbed areas during final cleanup or make arrangements with the Environmental Department to coordinate the environmental reclamation.
- If new right of way access is created in sensitive areas and is not required for maintenance), use techniques to prevent public access.

This may include, fencing and gates, use of large boulders or spread back (logs from clearing) and impassable waterways or diversion berms.

STEP FIVE – Access Out (from site)

- Stay on designated trails and roads.
- Avoid generating dust (i.e. travel slowly).
- Avoid rutting of trails in soft and wet conditions (i.e. avoid spinning of tires).
- Avoid all close contact with wildlife.
- Ensure all gates are left closed.

STEP SIX – Notifications

- Report any damages or alterations to the natural environment and impacts to access trails or roads to the FortisBC Environment Department (i.e. destruction of plants or animals, rutting of the trail or road). In the event of damages, the Environment Department will initiate remediation work.
- Notify the landowner (if required or requested) that the work has been completed.

Document Control

Title:	**Site Access (Crown and Private Land)**
Category:	Environment
Number:	**ENV 07-01**
Release Date:	July 2007
Revision:	
Originator:	Elements
Approved By:	
Comments:	For use on the OTR project only

SITE ACCESS (INDIAN RESERVES)

Title: **Site Access (Indian Reserves)**
Category: Environment
Number: ENV 07-02

BACKGROUND

The following guideline provides basic environmental and cultural protection information when accessing and performing work on company facilities that are located on Indian Reserves or where access through an Indian Reserve is required.

APPLICATION

All employees or contractors must be familiar with and follow the instructions documented in this Environmental Guideline unless otherwise directed by the Project Manager or the Environment Department.

PROCESS

STEP ONE - Notifications

- Ensure that the Indian Reserve designated contact person has been notified that access is required by employees or contractors.
- Note any special requests or conditions by the Indian Reserve and should there be any 'issues' contact Bob Gibney, Manager Municipal Relations (Phone: 250-770-4622).
- Contact the FortisBC Environment Department well in advance of the work being performed in order to identify any environmental issues, develop an environmental protection plan and to obtain any regulatory permits or approvals. Approvals may be required in advance to cross streams and rivers, to work adjacent to waterbodies or to screen the work area for cultural resources by a trained archaeologist and a designated First Nation's representative.
- There may be environmental timing constraints which prohibits access to the work area at specific times of the year. Check with the FortisBC Environment Department well in advance of any proposed work.

STEP TWO - Preparation

- Existing access roads and trails should be utilized. In the event that new access is required, contact the FortisBC Environment Department for assistance. Development of new access may require specific environmental and cultural resource assessments and multiple regulatory approvals. This process may take several months to

complete unless there is an emergency, in which case regulatory agencies may wave certain assessment requirements depending on the circumstances.
- Vehicles must be clean and free of mud or soil that could possibly contain noxious weeds such as knapweed.
- Check to ensure that vehicles and equipment are equipped with adequate spill control equipment to handle any leaks from vehicles or equipment.
- During the fire season, check to ensure that fire fighting equipment (i.e. portable water sprayers and shovel) is carried with vehicles.
- All hazardous materials or dangerous goods must be handled and transported according to all applicable regulatory requirements (i.e. Transportation of Dangerous Goods Regulations, WHMIS, etc.)
- Ensure that you know the restricted activity periods for aquatic areas and wildlife and that work is planned to occur during approved work windows.

STEP THREE - Access In (to site)

- Stay on designated trails and roads unless prior approval to create new access has been obtained from the designated authorities.
- Avoid generating dust (i.e. travel slowly).
- Avoid rutting of trails in soft and wet conditions (i.e. avoid spinning of tires).
- Avoid all close contact with wildlife.
- Ensure all gates are left closed.

STEP FOUR – Construction or Maintenance Work

- Stay on the company right of way unless approval to operate on other lands has been previously obtained.
- Minimize contact and impact to plants and vegetation. In sensitive areas, where appropriate, consider use of foot access, hand clearing and digging and low impact construction that may include helicopter use.
- Avoid all contact with wildlife.
- All waste generated must be collected and returned to a FortisBC facility for disposal.
- Use spill prevention and containment equipment when handling damaged transformers. In the event that transformer oil or any other hazardous substance has been released onto the ground, contact the FortisBC Environment Department for site specific cleanup and remediation instructions. The FortisBC Environment Department is responsible for reporting any spills or environmental and cultural damage that may have occurred as the result of the construction or operation of the FortisBC facility or any work performed by FortisBC personnel or their contractors.
- Portable toilets may be required or provided or existing washroom facilities utilized depending on the length of the work and the location.

- Do not cut down any trees or alter the existing natural landscape unless prior authorization is obtained from the FortisBC Environment Department.
- Minimize noise near landowners and sensitive wildlife areas.
- If working during a fire hazard season, ensure equipment and crews have adequate fire fighting equipment. This generally includes a hand tool for each crew member, Wajax bags and a supply of water in a remote setting. If access is available, consider the use of a water truck on standby if the hazard is high.
- In areas where there is significant soil and vegetation disturbance (i.e. more than 10 poles being installed or clearing a substation site), ensure that, there are adequate plans in place to prevent soil erosion. This may include the use of silt fences or waterways around pole holes on slopes or around the cleared area. Re-seed the disturbed areas during final cleanup or make arrangements with the Environmental Department to coordinate the environmental reclamation.
- If new right of way access is created in sensitive areas use techniques to prevent public access. This may include, fencing and gates, use of large boulders or spread back (logs from clearing) and impassable waterways or diversion berms.

STEP FIVE – Access Out (from site)

- Stay on designated trails and roads.
- Avoid generating dust (i.e. travel slowly).
- Avoid rutting of trails in soft and wet conditions (i.e. avoid spinning of tires).
- Avoid all close contact with wildlife.
- Ensure all gates are left closed.

STEP SIX – Notifications

- Report any damages or alterations to the natural environment and impacts to access trails or roads to the FortisBC Environment Department (i.e. destruction of plants or animals, rutting of the trail or road). In the event of damages, the FortisBC Environment Department will initiate remediation work. Environmental incidents are reported to the appropriate regulatory agency by the FortisBC Environment Department who will notify the Indian Reserve representative
- Notify the designated contact person at the Indian Reserve that the work has been completed.

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Document Control

Title:	**Site Access (Indian Reserves)**
Category:	Environment
Number:	**ENV 07-02**
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Revision:	
Originator:	Elements
Approved By:	
Comments:	For use on the OTR project only

Environmental Guideline

FortisBC

WEED CONTROL

Title: **Weed Control**
Category: **Environment**
Number: **ENV 07-03**

BACKGROUND

The following guideline provides basic information on noxious and invasive weed control issues related to the installation and maintenance of FortisBC facilities. FortisBC will take steps necessary to prevent the transfer and establishment of noxious and invasive weeds on right-of-ways, trails and roads traveled by employees and contractors

APPLICATION

All employees or contractors must be familiar with and follow the procedures documented in this Environmental Guideline unless otherwise directed by the Project Manager or the FortisBC Environmental Department

PROCESS

This guideline applies to all FortisBC employees and contractors in the normal course of maintenance or service installation or facility construction may be bringing vehicles and/or equipment to a right-of-way or facility site.

STEP ONE – Weed Prevention

- Prior to beginning the job (, vehicles and equipment should be cleaned (i.e. pressure washed at a car/truck wash facility to remove any weeds, seeds and soil.
- If entering or leaving a weed management area where there are infestations of noxious weeds, thoroughly clean the undercarriage of any vehicles or machinery.
- Inspect vehicles and equipment prior to entry to a new site for plant material and soil contaminated with plant material. Ensure they are clean and free of mud or soil, as well as any plant material or plant parts that could possibly contain noxious weeds such as knapweed. Inspections should include the frame, wheel wells, undercarriage areas, bumpers, radiators and any other area that can hold material which may hold weed seeds.
- Vehicles and equipment that are not clean must be refused entry onto the project site until they have been power washed or hand cleaned.
- If hand cleaning, ensure that soil and plant material is bagged for landfill disposal.
- Prevent vehicles from moving freely between infested and non-infested areas.

- Stay on designated trails and roads unless prior approval to create new access has been obtained from the designated authorities.

(Are these different from the projects in step 1, the same, or in addition to?)
STEP TWO – Construction or Facilities Modification Works

- If works require excavation or other soil disturbance:
  - Minimize the area of disturbance,
  - Do not move soil to other locations,
  - Re-seed the disturbed areas as soon as the works are completed using only a pre-approved seed mix.
- Inspect vehicles and equipment before leaving the reserve lands. If necessary clean and bag all soil and plant material for disposal at a landfill.
- If ground conditions are such that rutting or other damage is occurring:
  - Avoid areas of soft ground and wet conditions as much as possible without leaving approved RoW, access or facility area,
  - Unless conducting emergency service operations, consider suspending activity until ground conditions improve,
  - Reclaim and seed disturbed areas as soon as ground conditions permit using only pre-approved seed mix.
  - Ensure no soil, mud or plant material is being carried or relocated by vehicles and equipment.

STEP THREE - Site restoration

- Seed disturbed soil areas to help prevent the establishment of weeds using only pre-approved seed mix.
- Check with the FortisBC Environment Department for specifications on seed mixtures to use.

STEP FOUR – Weed treatment or removal

- If weeds become established on the FortisBC right-of-way or property, a weed control program will need to be initiated reqardless of its reason or source. This may involve spraying the weeds with an herbicide, pulling weeds out of the ground by hand or another weed control measure which has been authorized by the FortisBC Land Supervisor. Employees using herbicides should be trained in their use and have a pesticide applicators license.If there is a large infestation, obtain the services of a qualified, licensed vegetation control contractor

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STEP FIVE – Notifications of weed infestations

I) Report noxious weed infestations to the appropriate local weed committee as well as the Fortis Land Supervisor or the environmental department: SOUTH OKANAGAN AND SIMILKAMEEN INVASIVE PLANT COMMITTEE

II) BOUNDARY WEED MANAGEMENT COMMITTEE

III) EAST KOOTENAY WEED COMMITTEE

iv) CENTRAL / WEST KOOTENAY Weed Management Committee

STEP SIX – Conduct Follow-up Inspections

- Conduct a follow up inspection within in the next growing season to ensure there are no noxious weeds resulting from the disturbance and that reclamation and re-vegetation are effective. Repair as necessary.
- If weeds are present in a small amount, consider hand removal (picking or weed whipping/cutting). If weeds are flowering or seed heads have developed in restricted weed species, they may require bagging and landfill for disposal.
-

Document Control

Title:	**Weed Control**
Category:	Environment
Number:	**ENV 07-03**
Release Date:	July 2007
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Comments:	For use on the OTR project only

VEGETATION MANAGEMENT AND CONTROL

Title: Vegetation Management and Control
Category: Environment
Number: ENV 07-04

BACKGROUND

The following guideline provides basic environmental information for the control of vegetation on FortisBC properties and right-of-ways. Vegetation control in this procedure refers to the normal vegetation management and control activities undertaken by FortisBC and their contractors to remove vegetation, particularly trees and limbs of trees that may pose a hazard to service reliability. This also includes vegetation on industrial sites such as substations that may pose a fire hazard to the equipment or weed concerns requiring total vegetation control.

APPLICATION

All employees or contractors must be familiar with and follow the instructions documented in this Environmental Guideline unless otherwise directed by the Project Manager or the FortisBC Environmental Department.

PROCESS

STEP ONE – Notifications & Preparations

- Contact the Environment Department to determine whether any notifications to regulatory agencies or landowners are needed.
- Ensure that all steps from Environmental Guideline 07-01 and 07-02 (Access) have been implemented.

STEP TWO - Preparation

- Plans should include the need for off right-of-way access and approval from the landowner(s). If crossing watercourses or sensitive land and habitat, contact the contact the FortisBC Environment Department for assistance (procedure?).
- Check the Environmental Impact Assessment document for the facilities in question to determine if the vegetation control areas include watercourses, sensitive areas or wildlife habitat. If they do, implement the measures identified in the screening assessment If considering the use of herbicides, contact the FortisBC Land Department and Environmental Department for input or direction.
- Conduct a site inspection to ensure the potential herbicide application areas are at least 30 m from sensitive areas which include but are not limited to:
    - watercourses and water bodies

- habitat of species at risk
- key wildlife habitat
- gardens, orchards, specialty crops
- residences
- schools
- playgrounds
- recreation areas

STEP THREE - Implementation of Mechanical Control in Sensitive Areas

- Use the right-of-way and designated trails and roads unless prior approval for alternate access has been obtained from the designated authorities.
- Restrict the vegetation control to tree tops, limbs and other vegetation that would grow into the hazard zone within 10 years.
- Use selective topping of trees.
- Ensure qualified, experienced utility arborists are used for selective control programs.
- Ensure tops and limbs are cut to lay flat on the ground to minimize fire hazard.
- If excessive amounts of debris are accumulating, pile for burning during a period of low fire hazard (i.e. winter). Ensure burn pile is sufficiently distant from standing trees or other combustible materials so as to not pose a hazard when burning does occur.

STEP FOUR – Implementation of Herbicide Control in Sensitive Areas

Note: Due to the unique requirements below, it is strongly recommended that herbicide applications be conducted by a licensed applicator and supervised by someone knowledgeable in herbicide use. Contact the FortisBC Land and Environment departments for input and direction prior to proceeding with a herbicide application program.

- Use the right-of-way and designated trails and roads unless prior approval to for alternate access has been obtained from the designated authorities.
- If using herbicides on Indian Reserves ensure that the First Nation's key contact has been notified.
- Review the plans and familiarize the application team with the requirements and the restricted zones where herbicides cannot be used.
- Ensure that herbicides selected, have a PCP number and the label permits their use as per the plans.
- Ensure spray vehicles have a spill kit, spill response plans and the operators are familiar with herbicide spill response procedures.
- Ongoing checks for wind conditions should be implemented and herbicide applications suspended when winds are in excess of 16km/hr or there is a risk of drift to off target areas.

- Ensure all operators of herbicide application equipment are using the appropriate PPE (Personal Protective Equipment) for the products in question. As a minimum this should include eye protection and skin protection.
- Do not spray trees over 5 m tall. Mark locations of over height trees for follow-up mechanical control.
- Avoid applying herbicide to shrubs, herbaceous plants, grasses and other vegetation other than the target vegetation.
- The use of herbicides is not permitted within 30 m of a water well, watercourse or water body.

STEP FIVE – Notifications

- Report any damages to, or alterations of the natural environment to the FortisBC Environment Department. In the event of damages, the Environment Department will initiate remediation work. Environmental incidents are reported to the appropriate regulatory agency by the FortisBC Environment Department.

STEP SIX - Follow-up Inspections

- Conduct a follow up inspection within one or two months to ensure:
  - Herbicide efficacy (effectiveness),
  - There is no offsite damage,
  - There are no standing dead trees presenting a fire hazard. Cut down standing dead vegetation and lay flat as necessary.

Document Control

Title:	**Vegetation Management and Control**
Category:	Environment
Number:	**ENV 07-04**
Release Date:	July 2007
Revision:	
Originator:	Elements
Approved By:	
Comments:	For use on the OTR project only

POLE REMOVAL AND REPLACEMENT

Title: **Pole Removal and Replacement**
Category: Environment
Number: ENV 07-05

BACKGROUND

The following guideline identifies environmental and safety issues pertaining to the removal or replacement of FortisBC power poles.

APPLICATION

All employees or contractors must be familiar with and follow the procedures documented in this Environmental Guideline unless otherwise directed by the Project Manager or the FortisBC Environmental Department.

PROCESS

STEP ONE – Pole Removal Protocols

The two principal drivers are end of pole life and capital type programs or projects:

- End of pole life refers to the point at which a pole has met its life expectancy, and in some cases, systemic end of pole life may trigger a major retirement program linked to a capital upgrade. In addition to pole condition, factors such as safety and system reliability are considered when making pole replacement decisions.
- Capital type programs or projects include a wide range of activities such as line relocation, voltage upgrades and other activities that drive the removal and replacement of poles before they meet life expectancy.

STEP TWO - Testing and Planning

- A testing program is an integral part of managing pole life. A best practice is the use of a pole testing and planning program to determine pole condition and then manage pole life cycle. Every pole is tested initially after about 20 years in service and subsequently on about a 5 to 8 year cycle. Results from the testing program are incorporated into the long term planning process. The programs include criteria that set out whether a pole is to be removed as part of the annual pole removal program or whether it becomes part of the pole treatment program to extend pole life. The testing and removal programs are part of ongoing annual operating programs.
- Pole test and re-treatment programs provide environmental and

economic benefit by extending pole life and thereby reducing the demand for new poles to replace old ones. 'Test and Treat' programs are assessed on a regular basis to establish optimum treatment cycles in order to minimize the use of wood preservatives. The programs are also regularly updated to incorporate new treating techniques and wood preservative technologies.

- Capital programs and projects rely on other factors for planning. These programs may be driven externally by other activities such as road widening, development changes or customer demand. They may also be driven by internal projects such as voltage upgrades, or system capacity increases. Pole removal in relation to these programs is a function of the schedules and plans of the other activities.
- In many cases poles are removed that still have significant life expectancy as per the testing process. In order to minimize the waste, these poles are reused whenever possible.

STEP THREE – Site Preparation

- Prior to initiating pole removal, the site must be prepared. In all cases this includes the removal and/or relocation of the power lines. Where poles are being replaced, they may have been pushed over at a slight angle to ensure that the new poles can be placed adjacent to the existing ones to carry the lines in the same corridor. This activity is a frequent practice in distribution removal and replacement activities.

STEP FOUR – Pole Removal Process

All employees and contractors are expected to take reasonable precautions to ensure a safe workplace and minimize environmental impact. Job-site tailgate safety meetings and the use of personal protective equipment are standard industry practice.

- Job roles and responsibilities are also clearly communicated and understood
- Underground utility locations are obtained for the work-site before digging or excavating.
- Environmentally sensitive features at the job site and in the site access footprint are identified. Work procedures are modified as required to mitigate impacts.
- If required, environmental agencies are notified and necessary approvals are obtained through instruction or coordination by the FortisBC Env Coordinator

Trained personnel are assigned to operate the equipment to be used for pole removal. Companies use a variety of equipment for pole removal including backhoes and pole tech trucks. The pole tech trucks are frequently used and are equipped with a boom and a hydraulic lift which facilitates pole removal.

Precautions are taken throughout the work to prevent impact on adjacent streams or other waterbodies, aquatic habitat or riparian areas and other environmentally sensitive areas.

A variety of safety protocols are undertaken depending on the project needs. For example this often includes using fiberglass pole guards, protective rubber equipment, pole tongs and other methods to prevent accidental contact with primary conductors.

In some older urban settings and in many parts of rural BC, communication and cable lines are also attached to the power poles necessitating a two phase pole removal process where lines are to be relocated to an adjacent set of poles. Initially a crew will remove the top 3 m of a pole using a boom and bucket and haul away the top. This allows a communication company to have clear access to the line to lift it and place it on the new adjacent poles.

Usually the poles are lifted from the holes by the use of the hydraulic lifter and boom. The pole is secured by holding it with the boom, guy wires or pole spikes. A chain is secured around the pole and attached to the hydraulic lifter which initially lifts the pole. . Once the lifter has loosened the pole, the boom attached to the pole controls the pole and completes the pole lift. The pole is then placed on a truck for transport or left for pickup. In some remote settings, non treated poles may be left to rot on the ground provided they do not create a significant fuel for potential backcountry fires. Every effort is made to minimize site disturbance resulting from this work.

In some cases the pole cannot be removed from the hole. The pole is then cut off flush with the ground in forested areas or cut off about .5 to 1 m below grade in agricultural land.

In winter conditions particularly, and for some tight holes in other cases, an auger truck may be required to drill 2 or 3 holes adjacent to the poles to loosen the material around the pole enabling a successful removal.

Pole holes left unattended must be regularly inspected and wildlife removed. Covers over unattended pole holes are recommended to prevent inadvertent incidents with wildlife, agricultural animals or members of the public.

The hole is filled with soiltaken from the immediate adjacent area, usually by the use of hand shovels or spades. In order to minimize the disturbance, soil is not normally excavated or removed by a backhoe.

The following photos illustrate the pole removal process:

Photo 1.0 *Preparing the pole for safe removal by installing a protective sleeve or pole guard. The pole boom is also attached to stabilize the pole. Note communication line lower on the pole which will also be removed and placed on the adjacent new pole prior to removal.*

Photo 2.0 *Pole removal showing the boom controlling the pole and the hydraulic pole jack chained to the pole to initiate the lift of the old pole.*

Photo 3.0 and 4.0 *Hydraulic boom removing and lowering the pole. This process is assisted by an employee guiding it with pole tongs at the pole base for safe control.*

Photo 5.0 *Backfilling the pole hole using a spade. Note the small area of minor disturbance.*

STEP FIVE – Site Restoration

- The small area of disturbance depends on the size of the pole, and the removal technique but it usually varies from about 50 to 100 cm in diameter. It is left to re-vegetate by means of encroachment from adjacent vegetation. In areas with problem soils, noxious weeds or other environmental constraints, seeding may be required to ensure reclamation success. STEP SIX – Handling and Transport
- Treated wood power poles alone (without the treatment bandages) are exempted from TDG (Transport of Dangerous Goods) requirements. Bandages may need to be removed and transported separately. Pole loads are secured and hauled using the normal safe practices for this type of load.

Document Control

Title:	**Pole Removal**
Category:	Environment
Number:	**ENV 07-05**
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Environmental Guideline

WILDLIFE AND SPECIES AT RISK

Title: Wildlife and Species at Risk
Category: Environment
Number: ENV 07-06

BACKGROUND

The following guideline provides basic wildlife protection information pertaining to the operation and maintenance of FortisBC facilities.

APPLICATION

All employees or contractors must be familiar with and follow the procedures documented in this Environmental Guideline unless otherwise directed by the Project Manager or the FortisBC Environmental Department.

PROCESS

General and Background Information

- Operation and maintenance activities have the potential to affect wildlife activities and mortality. In the event that wildlife may be adversely impacted by operations and maintenance work, contact the FortisBC Environment Department for assistance. NOTE: There is legislation in place, at the provincial and federal levels. One example is the federal Species at Risk Act (SARA), which provides for the protection of certain species and their habitat or residence. Most acts contain specified penalties for contraventions, including severe fines.
- SARA Permits may be required from the Canadian Wildlife Service (CWS) on federal lands including Indian Reserves. Approvals may be required from the Ministry of Forests or the Ministry of Environment for works on provincial crown land Consult with the FortisBC Environment Department for assistance in obtaining the necessary permits or approvals.
- All employees and contractors working on FortisBC facilities will avoid contact with rare, endangered, threatened or protected wildlife, including their residences, unless undertaking authorized emergency repairs or if there has been an appropriate permit or approval issued. These species include a wide variety of wildlife including birds, fish, reptiles, amphibians, butterflies, and large and small mammals. Consult local resource agencies or the FortisBC Environmental Department to obtain a list of the species of concern in the work area.

Protective Measures

- Try to schedule work activities to avoid key life cycle activities which can include; nesting periods for birds; fish spawning; key bird migration periods; calving and breeding periods. Contact the FortisBC Environment Department, the regional CWS biologist or the nearest district Ministry of Environment office for specific wildlife issues for your particular work area.
- Do not leave out food that might attract wildlife.
- When traveling through key wildlife areas stay on existing access trails and roads. Travel at slow speeds to avoid any wildlife that may be on the trail or road at the time, especially during the night or in poor visibility conditions.
- Crossing through streams or rivers with vehicles and equipment is often prohibited unless in cases of emergencies. See the **Environmental Guideline – Water Crossings ENV 07-08** for more details.

Wildlife Incidents

- All wildlife that may be accidentally injured or killed due to FortisBC related activity must be immediately reported to the FortisBC Environment Department. The FortisBC Environment Department is responsible for reporting to regulatory authorities any damage to or destruction of rare, endangered, threatened or protected wildlife or key wildlife habitat.
- Note: Some species that people may consider dangerous, such as rattlesnakes, are a protected species. Snakes will usually avoid human contact; however they may seek shelter in equipment or supplies that are left overnight. In the event that the work area is near a snake den or high concentration of snakes, contact the FortisBC Environment Department for assistance. The usual resolution is to provide an experienced snake handler to safely move snakes away from operations crews or to schedule work to avoid key periods when interaction could occur.

Document Control

Title:	**Wildlife**
Category:	Environment
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Environmental Guideline

ACCESS OR WORK AROUND AQUATIC AREAS

Title: Access or Work Around Aquatic Areas
Category: Environment
Number: ENV 06-07

BACKGROUND

The following guide provides basic environmental information for work on distribution facilities that are located near water bodies, watercourses, wetlands or riparian areas. Note this includes watercourses that are emphemeral and often referred to as dry washes, dry creeks, coulees or gullies, running seasonally or carrying run-off water.

APPLICATION

All employees or contractors must be familiar with and follow the instructions documented in this Environmental Guideline unless otherwise directed by the Project Manager or the FortisBC Environmental Department.

PROCESS

STEP ONE – Notification

- Contact the Environment Department to determine whether any notifications to regulatory agencies or landowners are needed.
- Ensure that all steps from Environmental Procedure 07-01 and 07-02 (Access) have been implemented.

STEP TWO - Preparation

- Check the Environmental Impact Assessment document for the facilities in question to determine if the work areas will be within 15 m of watercourses, waterbodies, wetlands or riparian areas. If yes, implement the mitigation measures identified in the Environmental Impact Assessment or Environmental Management Plan.
- If any works are proposed within 15 of the normal high water mark of a watercourse or water body, provincial and federal approvals may be required. Contact the environmental department for assistance with a determination and application for approvals.
- Contact the necessary resource agencies to discuss plans either directly, or through Environmental Dept.. This may include the federal Fisheries and Oceans Canada (DFO) and the Canadian Wildlife Service (CWS).

STEP THREE - Conducting Construction or Maintenance Work

- Use the right-of-way and designated trails and roads unless prior approval for alternate access has been obtained from the designated representatives.
- If an authorization or approval has been issued for the works, ensure that a copy of the approval is on site and that all operators are familiar with the terms and conditions of approvals. Know the approved periods of operations as most approvals will restrict activities during critical periods such as nesting of birds in riparian habitats and wetlands or fish spawning and egg incubating in watercourses and tributaries.
- Ensure all vehicles and equipment operating within 30 m of the watercourse, water body, wetland or riparian area are equipped with a spill response kit and that the operators are familiar with the standard spill response procedures
- Do not park vehicles or equipment overnight or for extended periods within 30 m of the watercourse, water body, wetland or riparian area.
- Note: The use of herbicides is not permitted with 30 m of a water well, watercourse, water body, wetland or riparian area.
- If there are activities that cause a disturbance to vegetation and soils, ensure that there are adequate water diversion berms, silt fences or other industry standard methods of erosion control in place to prevent sediment from entering the watercourse, water body, wetland or riparian area.

STEP FOUR – Implementation of Specialized Mitigation Measures

- Replace poles and line in wetlands, across watercourses and riparian areas only during permitted timing windows to avoid disruption during critical life cycle periods.
- If re-wiring requires a crossing of a watercourse, water body, wetland or riparian area, consider using stringing techniques (i.e. overhead with helicopter) to avoid the use of vehicles and equipment in these sensitive areas. For new additions to powerline facilities, consider the use of stream crossing methods that do not need the use of vehicles or equipment in the watercourse, water body, wetland or riparian area. Check ESIA or EMP to determine whether there is a regulatory commitment or requirement to use a helicopter, foot access or other methods.
- Works requiring a federal approval for activities in or near a watercourse, water body, wetland or riparian area usually require some form of habitat compensation and specialized reclamation. Ensure an experienced, professional biologist is available to develop and monitor the implementation of these measures. Contact the FortisBC Environmental Department for assistance and advice.
- If specialized erosion control is required, contact the FortisBC environmental department for assistance or obtain the services of an

experienced environmental professional to design the erosion control techniques and provide direction in their installation.

STEP FIVE – Notifications

- Report any damages or alterations to the natural environment to the FortisBC Environment Department (i.e. destruction of plants or animals, rutting of the trail or road). In the event of damages, the FortisBC Environment Department will initiate remediation work. Environmental incidents are reported to the appropriate regulatory agency by the FortisBC Environment Department.

STEP SIX - Follow-up Inspections

- Conduct a follow up inspection within one or two months to ensure:
  - There is no offsite damage,
  - There has been no adverse impact to aquatic resources.

Document Control

Title:	**Access or Work Around Aquatic Areas**
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WASTE MANAGEMENT

Title: **Waste Management**
Category: Environment
Number: ENV 07-08

BACKGROUND

The following guideline provides basic environmental protection information for the safe handling, identification, storage, treatment and disposal of waste generated by FortisBC operations and facilities.

APPLICATION

All employees or contractors must be familiar with and follow the procedures documented in this Environmental Guideline unless otherwise directed by the Project Manager or the FortisBC Environmental Department.

PROCESS

General and Background Information

- ALL EMPLOYEES OR CONSULTANTS/CONTRACTORS OF FORTISBC WHO HANDLE, SAMPLE, STORE, TRANSPORT OR DISPOSE/TREAT WASTES MUST HAVE RELEVANT QUALIFICATIONS FOR UNDERTAKING THE WORK AND MUST HAVE RECEIVED THE APPLICABLE WASTE MANAGEMENT TRAINING. THE TYPE OF TRAINING MUST BE RELEVANT AND RELATED TO THE TYPE OF WASTES THE EMPLOYEE, CONSULTANT OR CONTRACTOR IS WORKING WITH. (Consider something like this for weed section)

- Waste Prevention is an integral component of the waste management program which incorporates the principles of the **4R's…Reduce, Recycle, Reuse, and Recover.**

- New chemicals and other materials should be evaluated before they are used to determine their potential on waste prevention and waste disposal.
- All wastes must be handled, identified, stored, treated and disposed of in accordance with all applicable regulatory requirements.

STEP ONE – A Waste Is Produced or Generated

- FortisBC does not generate large volumes or many different types of wastes. Most of the waste generated is non hazardous waste and includes; cardboard, wood poles (treated and not treated), tires, various light bulbs, general refuse, rags/absorbents, porcelains, oil contaminated soil, scrap metal, filters, and construction debris.

STEP TWO - The Waste Needs To Be Classified

- FortisBC is required to 'classify' each waste stream that it generates or produces.
- Wastes are classified into different categories, such as 'hazardous waste' or 'non hazardous waste' as per provincial waste regulations. In most cases, the Waste Contractors for FortisBC will classify the waste. If not, the Fortis Environment department will coach you through this process.
- Most materials that are destined to become a 'waste' do not need to be classified as a 'waste' until they leave the custody of FortisBC. For example, used transformer oil is still handled and transported the same as new transformer oil until a waste oil recycler or disposal company takes custody of the used oil.

STEP THREE – Containment of The Waste

- Waste that does not go into an automated system (i.e. dedicated holding tank) needs to be placed into the appropriate container, barrel, metal bin, secondary containment, etc.
- Hazardous liquids such as flammables, paints, solvents, oil, anti-freeze and transmission fluids must not enter drains or sewers. Most "drains" are for waste water or sewage(sewage into a drain???). Ensure you do not store hazardous liquids near drain openings and that you have sufficient spill response equipment available to block any drains in the event of a hazardous liquid spill or release.
- Wastes must be stored in a container designed for that purpose and particular waste. Hazardous wastes will almost always require some form of secondary containment in addition to the primary containment method.
- Use only containment equipment and supplies that are provided through the FortisBC warehouses or company approved waste contractors and suppliers. An exception to this rule is for non hazardous solid wastes that fit into the category of household type wastes or general garbage.

STEP FOUR – Label The Waste Container

- All wastes must be clearly identified as to what they are and the hazard they may pose (i.e. Is the waste flammable, corrosive, toxic, etc.).
- Hazardous wastes may require specific types of labels in order to meet regulatory requirements. For example, if the waste is also a 'dangerous good' it must be labeled in accordance with requirements included in the Transportation of Dangerous Goods Regulations.
- Labels for hazardous wastes may be obtained thru the FortisBC warehouses or company approved waste contractors and suppliers.

- Labels for non hazardous wastes can be created as easily as using a permanent ink marker or a paint pen (preferred) and marking on the container what the waste is.

STEP FIVE – Temporary Storage Of The Waste

- Hazardous wastes must not be kept in service areas (except for Warfield) for longer than 30 days.
- Non hazardous wastes will not be stored for a period longer than one year.
- Some wastes must not be stored in a location near other wastes (e.g. volatile(?) combustibles and rag bin). Unplanned mixtures of hazardous waste can result in disastrous results (i.e. explosions, toxic vapours).
- Do not store wastes in areas (i.e. along the property boundaries) where if an incident occurs, the wastes will cause an adverse impact to the environment or to human health and safety.
- All waste storage areas must have signs designating that the area is for the storage of waste.
- Do not store wastes immediately adjacent to products and non wastes.
- **Store wastes as if you were the person living beside FortisBC.**

STEP SIX – Transport The Waste

- Before wastes are transported they must be properly packaged, labeled/placarded, secured, manifested and transported by qualified personnel. In most cases, waste will be transported for recycling or disposal by a FortisBC approved waste contractor or recycler.
- Some wastes need correct labels and placards to meet the requirements laid out in Transportation of Dangerous Goods (TDG) regulation.

STEP SEVEN – Treat, Recycle Or Dispose Of The Waste

- All waste must be disposed of at government licensed facilities.
- Arrangements have been made with FortisBC approved waste contractors or recyclers for waste disposal who normally will provide all necessary shipping documents.
- Ensure that hazardous waste is not mixed in with non hazardous waste. Hazardous waste must be disposed of only at facilities that are government licensed to accept and treat the particular type of hazardous waste in question. It is illegal to intentionally dilute a hazardous waste to make it a non hazardous waste.

Environmental Guideline

Document Control

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Category:	Environment
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Originator:	Dave Deyell
Approved By:	
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EMERGENCY RESPONSE: SPILL OR FIRE

Title: Emergency Response: Spill or Fire
Category: Environment
Number: ENV 07-09

BACKGROUND

The following guideline provides basic information on how to respond to a spill or fire caused by a FortisBC operation or activity.

APPLICATION

All employees or contractors must be familiar with and follow the procedures documented in this Environmental Guideline unless otherwise directed by the Project Manager or the FortisBC Environmental Department.

PROCESS

STEP ONE – Preparation

- Check to ensure that spill kits are fully stocked and carried with all? vehicles and or equipment.
- Check to ensure that all vehicles and equipment to be used are in good working conditions and that nothing is leaking.
- Check to ensure that fire fighting equipment is carried with all? vehicles.
- Check to see what the fire hazard rating is in the work area and whether the work to be performed may pose a fire hazard. If this is the case, during a pre job meeting ensure that all necessary steps have been covered to prevent fires from occurring. Consult with the nearest Forest Services office for assistance. Note: During high to extreme fire hazard seasons, back country work may be restricted.
- Employees and FortisBC contractors shall ensure that they are competent in the use of personal protective equipment and in initial spill response.

STEP TWO - Spills or Leaks

- In the event of a spill, do not rush in.
- Warn others in the immediate vicinity.
- Try to remotely identify the spilled product or waste and assess the potential hazards.
- If spilled material is flammable, eliminate sources of ignition.
- If spilled material produces vapours, stay upwind and avoid breathing in vapours.
- Do not touch or walk through spilled material.

- If safe to do so, attempt to contain the spill and prevent the spilled material from spreading, running into drains or entering waterways. Once the spilled material is contained, clean up spilled material and any other contaminated material. Place spilled material into secure and proper containers that are designed to contain the particular type of material in question.
- Use absorbent material or other appropriate technique to recover product.
- Once the spill site has been cleaned up, it may be necessary to reclaim the area that was impacted by the spill. Check with the FortisBC Environment Department for site specific remediation methods.
- Spilled material must be either recovered, recycled or disposed of according to local regulatory requirements.

STEP THREE – Fire

- Take immediate action to put out small fires, unless unsafe to do so.
- If fire spreads and cannot be immediately suppressed, initiate a FortisBC emergency, following company emergency response plans.
- Call for help. Contact the nearest fire department, police or Forest Services department.
- If fire cannot be controlled, evacuate the immediate area.

STEP FOUR – Notifications

- All spills or fires, regardless of their size by must be immediately reported to the FortisBC Environment Department.
- The FortisBC Environment Department is responsible to notify all regulatory agencies where there is a regulatory requirement to do so.

Document Control

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ARCHAEOLOGICAL AND CULTURAL RESOURCES

Title: Archaeological and Cultural Resources
Category: Environment
Number: ENV 07-10

BACKGROUND

The following guideline provides basic archaeology and cultural resources related information pertaining to the construction, operation and maintenance of FortisBC facilities.

APPLICATION

All employees or contractors must be familiar with and follow the procedures documented in this Environmental Guideline unless otherwise directed by the Project Manager or the FortisBC Environmental Department.

PROCESS

General and Background Information

- The Okanagan Valley is known to contain many archaeological and cultural sites. These sites may not be easy to identify by the untrained observer.
- Cultural sites include traditional land use areas that are important to First Nation people including but not limited to; native plants used for food, medicine and other traditional uses, hunting and fishing grounds, sacred areas, burial grounds, encampments, mineral resources, and historical trails.
- The location of known archaeological and cultural sites is normally not well published in order to reduce unauthorized access to these sites and the potential damage that might be inflicted on the sites.
- Records of known sites may be kept by the individual Indian Bands, the province of British Columbia and Indian and Northern Affairs Canada (INAC).

Protective Measures

- **Known archaeological and cultural sites must be avoided.** Any work that takes place adjacent to a site must use protective measures to ensure that there is no adverse impact to the archaeological or cultural site. Protective measures may include; temporary fencing of the archaeological or cultural site, the use of blasting mats, timing constraints for the work and the use of an archaeology inspector.

- FortisBC will notify the Indian Band designated contact person of the access, the location and type of the work to be performed.
- Archaeological assessments by a professional archaeologist and a representative from the Indian Band may be necessary in advance of any work, where any new facilities or new means of access is required. Work will not be allowed to proceed until authorization from the Indian Band and the government has been obtained.
- Limit the movement of workers to only the work areas.

Incidents

- Where any work discovers or uncovers something that could be of archaeological or cultural value, the work must be immediately halted in that particular location. Contact immediately both the designated Indian Band representative and the FortisBC Environment Department. An investigation will be needed to evaluate or assess the significance of the find.
- In the event, there is an accidental impact to a known archaeological or cultural site, contact immediately both the designated Indian Band representative and the FortisBC Environmental Department.
- **See the Spill or Fire Response Guide ENV07-09** for any incidents involving a spill or fire.

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FORTISBC

Okanagan Transmission Reinforcement Project
Public Consultation Report

Submitted to: Pierre Dufour, Project Manager

Submitted by: Bruce Rozenhart & Gayle Bukowsky,
COUNTERPOINT Communications Inc.

Ameera Shivji
FortisBC Inc.

December 4, 2007

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EXECUTIVE SUMMARY

FortisBC undertook a comprehensive approach to public consultation for the OTR Project to ensure that stakeholders, area landowners, First Nations and other interested parties had the opportunity to review the Project plan and provide feedback prior to FortisBC filing the Certificate for Public Convenience and Necessity (CPCN) Application. FortisBC's main goal for public consultation was to create a dialogue with interested parties by explaining the need for the Project, presenting FortisBC's preferred Project proposal and alternative proposals considered, and communicating that FortisBC must consider environmental impacts, constructability and rate impacts that would result from the Project as part of the decision making process.

FortisBC's consultation involved informal and formal meetings with impacted stakeholders, First Nations and landowners from January to December 2007 and public open houses in March and May 2007.

Two series of open houses were held in Oliver, Okanagan Falls and Penticton to solicit public input on the Project. Notices were sent out in advance to over 7,000 households in Oliver, Okanagan Falls, and southeast Penticton, in addition to the placement of advertising in the local newspapers. Personal invitations were also sent out to local landowners along the existing transmission line corridor.

Each open house was staffed by eight subject matter experts who responded to questions. Attendees also had the opportunity to provide formal input at the open house through a questionnaire that they were encouraged to complete at the open houses.

The first series of open houses were held from March 6 to 8, 2007 to describe and discuss the Project and seek input on the types of transmission line infrastructure and on the Bentley Terminal Station proposal.

While attendees of the first series of open houses recognized of the need for the Project, questions about visual impacts of the proposed transmission line, environmental impacts and health issues of higher voltage lines were brought up by attendees. Many attendees also expressed the desire to have the new transmission line moved from the existing corridor through the Heritage Hills area, to an alternate route above the area.

The second series of open houses was held from May 22 to 24, 2007. In response to public feedback at the first series of open houses, FortisBC presented, in addition to the preferred Project option, a higher elevation transmission corridor route in the East Skaha Lake area for discussion. FortisBC also provided information on changes made to the Project's transmission line structure. Renderings of the lines, poles, the Bentley Terminal Station, and the changes to the Vaseux and R.G. Anderson Terminal Stations were presented.

While many of the comments and concerns were similar to the prior series of open houses, feedback received at the second series of open houses was more oriented to concerns about the preferred option proposal that used the existing corridor through the Heritage Hills area. A higher percentage of attendees at the Okanagan Falls and Penticton open houses preferred the alternate upland transmission route over the preferred route on the existing right of way.

FortisBC received approximately 40 contacts by e-mails, phone calls and letters expressing for the most part, opposition to using the existing right of way as the preferred Project option. The Heritage Hills area residents in particular, expressed their desire for the transmission line to be relocated to a higher elevation route out of their line of sight.

Follow-up letters were sent to all open house attendees, stakeholders, First Nations and transmission corridor landowners following each open house summarizing key themes of concerns expressed and what the Company's next steps would be. Additionally, a follow-up letter indicating a new timeline and process moving forward was sent in September 2007.

Throughout the consultation process, a number of formal presentations and informal meetings were held with impacted First Nations groups, local government representatives, and business and environmental organizations. At these presentations and meetings, the Project Team provided information about the OTR Project including the need, the preferred Project proposal and alternate transmission line route option for the line from Vaseux Lake to Penticton. These meetings also provided an opportunity for FortisBC to respond to questions. While the key stakeholder and First Nations groups overwhelmingly supported the Project need, in principle, they were divided as to which transmission route was preferred.

INTRODUCTION

- This public consultation report will be filed as part of FortisBC's application for a Certificate of Public Convenience and Necessity (CPCN) for the Okanagan Transmission Reinforcement (OTR) Project.

- This report contains the approach and results of informing and consulting with landowners, First Nations, government, and environmental and business stakeholders impacted by the OTR project.

- This report also contains details about public input received at two series of open houses, meetings and presentations to government, First Nations, environmental and business groups, and a summary of discussion and correspondence with stakeholders who contacted FortisBC throughout the consultation process.

- The report is divided into five sections; The Approach, Informing the Public, Public Input, Factoring Public input, General observations.

    - *The Approach* describes the general approach, objectives and rationale for public consultation for the OTR Project.
    - *Informing the Public* provides the details of notifications for the public consultation program including the advertising, the personal invitations to the open houses, the information provided at the open houses, and how the feedback received was utilized in the OTR Project planning process.
    - *Public Input* presents the results of the open house exit surveys in summary form, along with input received from various presentations, small group meetings and e-mail requests.
    - *Factoring Public Input* notes the follow-up items requiring FortisBC action subsequent to the open houses, identified by open house participants in the public consultation questionnaire.
    - *General Observations* presents a summary of the consultation process, the follow-up actions and issues resolution.

- Samples of all of the public consultation materials and the complete public input data from the questionnaires without attribution are all provided in the appendices.

I. THE APPROACH

- FortisBC's approach to public consultation is to be transparent with Project descriptions and any viable options to Project development.
- The Company seeks out impacted stakeholders, First Nations groups and area landowners to encourage a dialogue and feedback on Project plans for inclusion in CPCN applications.
- For the OTR Project the preferred option was presented, including environmental, social and economic perspectives and considerations, and feedback was solicited about the Project need and the preferred Project routing and options.
- FortisBC held two series of open houses where area residents and interested parties had the opportunity to review a series of informational display boards and ask questions of subject matter experts in engineering, environment, property and public consultation.
- The first series of open houses described the need for OTR Project and the elements required to expand transmission line capacity, and sought public input on the initial Project design.
- The second series incorporated the feedback received from the first open houses by providing, for discussion, an alternate routing consideration.
- Throughout the consultation process, FortisBC conducted meetings with government, environmental, and business stakeholder groups and First Nations groups.

Objectives

- Early in the consultation process, FortisBC identified a number of communications objectives for the public consultation for the OTR Project. Messaging was structured to ensure that the following was communicated:
    - The OTR Project is required to meet the growing electricity requirements of Okanagan communities;
    - FortisBC has an obligation to manage the costs of the OTR Project to ensure that a cost effective solution is proposed, recognizing that the Project impacts rates for all customers across FortisBC's service area;
    - FortisBC is committed to an open dialogue with stakeholders including area residents and First Nations. FortisBC is open to suggestions to improve the Project plan and is committed to responding to questions and concerns; and
    - FortisBC must balance social, economic and environmental impacts with constructability and Project costs.
    - There are benefits and risks associated with the Project.

Step #1: Identification of Stakeholder and First Nations Groups

- To ensure that FortisBC engaged appropriate stakeholders in consultation efforts, the OTR Project team developed the following list of groups to be included in public consultation efforts:

    - **Landowners along existing Oliver-to-Penticton transmission line corridor**
    - **Residents of the Oliver, Okanagan Falls and South Penticton Areas**
    - **Municipal Governments**
        - Town of Oliver
        - City of Penticton
        - District of Summerland
        - City of Kelowna
    - **Regional Districts**
        - Regional District of Okanagan-Similkameen
        - Regional District of Central Okanagan
    - **Environmental Organizations**
        - South Okanagan Similkameen Invasive Plant Society (SOSIPS)
        - South Okanagan Similkameen Conservation Program (SOSCP)
        - The Nature Trust of British Columbia
        - British Columbia Wildlife Federation
    - **Business Organizations**
        - Penticton Chamber of Commerce
        - Kelowna Chamber of Commerce
    - **Provincial Government**
        - Ministry of Environment, regional officials
        - Integrated Land Management Bureau (ILMB)
        - BC Parks Department
    - **Federal Government**
        - Canadian Wildlife Service
    - **First Nations**
        - Okanagan Nation Alliance
        - Osoyoos Indian Band
        - Penticton Indian Band

- As the public consultation proceeded, this list was expanded to include newly identified stakeholders including landowners in the East Skaha area who resided adjacent to, or in the vicinity of, the existing transmission lines and preferred option, and tenure and lease holders on the higher elevation alternate route.

Step #2: Issues Definition

- In January 2007, the Project team determined issues that might arise throughout the consultation process.

- As the technical specifications of the preferred Project option were determined by the FortisBC and BC Hydro engineers, biologists, archeologists and technicians, research was conducted to respond to stakeholder inquires.

- Research areas included the following:
    - Transmission line and station aesthetics;
    - Environmental impacts;
    - Customer rate impacts;
    - Line locations (preferred route and alternate route);
    - Property values and visual impacts;
    - Context of the “public need” for more electricity;
    - First Nations aspects;
    - Regional growth implications; and
    - Electric and Magnetic Fields (EMF).

- Information on the topics above was categorized and converted into brochures and display boards. Samples of these materials are provided in appendix B.

Step #3: Consultation Prior to Open House Series #1

- Initial consultation for the OTR Project began in fall 2006. FortisBC gave the following key stakeholders a high level overview that FortisBC was looking at plans to expand the transmission system in the South Okanagan:
    - Okanagan Nation Alliance
    - Penticton Indian Band
    - Osoyoos Indian Band
    - City of Penticton
    - Town of Oliver
    - Regional District of the Okanagan Similkameen
    - The Nature Trust of British Columbia
    - Provincial Ministry of Environment
    - BC Parks

- Personal invitation letters to the open houses were sent to representatives from the District of Summerland, the Nature Trust of British Columbia, Town of Oliver, City of Kelowna, South Okanagan Cattleman's Association, the Regional District of the Okanagan Similkameen and the City of Penticton.

- Personal invitations to the open houses were sent to all landowners 500 metres to the west and 1,000 metres to the east of the existing transmission line along existing Oliver-to Penticton transmission line corridor in the latter part of February, and printed invitations were mailed to all households in Oliver, Okanagan Falls and southeast Penticton.

- Advertisements inviting the public to the open houses were placed in the four area newspapers.

- Telephone discussions were held with five area landowners who contacted FortisBC when they heard about the Project.

Step #4: Open House Series #1

- Open houses were held in the following locations from 4:00 pm to 8:00 pm:
  - Oliver - Tuesday, March 6 – Southwinds Inn
  - Okanagan Falls - Wednesday, March 7 – Okanagan Falls Elementary School Gym
  - Penticton - Thursday, March 8 – Courtyard Ballroom, Ramada Inn

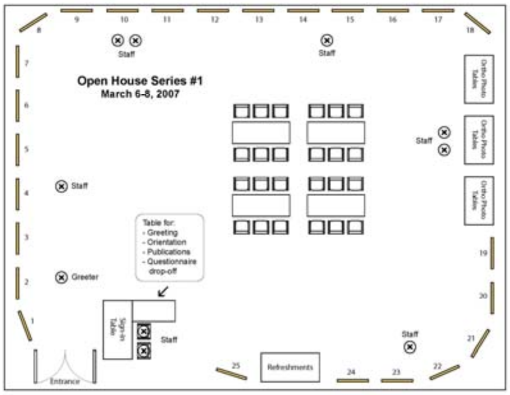
- At each open house, local area residents had the opportunity to review a series of poster boards describing the Project and were provided with handouts detailing the Project.

- The objectives of this initial series of open houses were as follows:
  - Describe and discuss the OTR Project including the need for additional transmission capacity and environmental considerations;
  - Present the preferred Project option on the existing right of way to expand transmission line capacity; and
  - Seek public input and provide feedback channels.

- Over 50 display and orthographic photo boards and four different Project brochures were available at the open houses (details on these materials are provided in Section 2).

- Figure 1 details the floor plan for the open house.

Figure 1



- Attendees were encouraged to complete questionnaires stating their opinions and concerns with the OTR Project. The results of these questionnaires are presented in Section 3.

- The following technical and environmental experts were available at the open house to respond to questions and explain various aspects of the Project:
    - Pierre Dufour, OTR Project Manager, FortisBC;
    - Paul Chernikhowsky, Chief Planning Engineer, FortisBC;
    - Joyce Martin, Manager, Regulatory Affairs, FortisBC;
    - Bob Gibney, Community & Aboriginal Relations, FortisBC;
    - Ameera Shivji, Communications Coordinator, FortisBC;
    - Gary Shtokalko, OTR Project Engineer, BC Hydro;
    - Garry Barnett, Engineering Consultant – Transmission Lines, BC Hydro;
    - Rozlyn Bubela, Engineering Consultant – Transmission Lines, BC Hydro;
    - Rob Sicotte, Natural Resource Specialist, BC Hydro;
    - Steve Morck, Environmental Consultant, Elements Consulting;
    - Pat Beaven, Land Properties Analyst, Beaven Property Services;
    - Bruce Rozenhart, Public Consultation Consultant, COUNTERPOINT Communications; and
    - Gayle Bukowsky, Public Consultation Consultant, COUNTERPOINT Communications

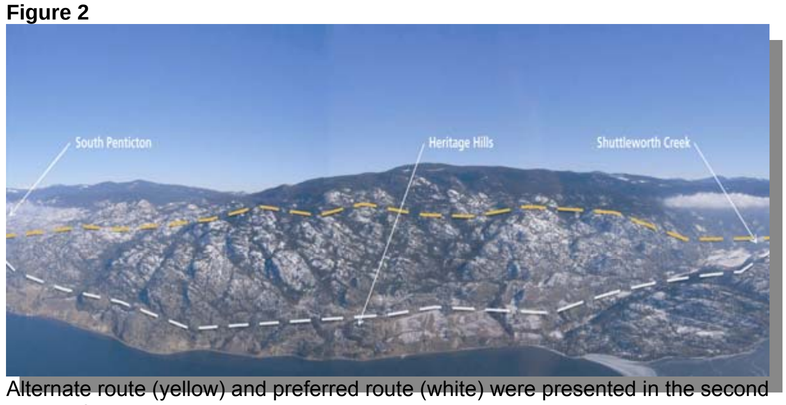
Step #5: Feedback and Additional Informational Requirements

- Feedback from the open houses indicated the following:
    - The majority of the attendees at the first open house series were positive about the OTR Project;
    - There was a preference for poles instead of towers along the transmission line corridor; and
    - The majority of residents in the Heritage Hills development in the East Skaha Lake area had a general desire to have the transmission line in their area moved to a higher

elevation above their development. Their concerns related to impacts to views, property values and health.

- Based on feedback received at the open houses, the OTR Project team continued to evaluate higher elevation transmission line routes around the East Skaha Lake area and included an alternate route (Figure 2) for discussion at the second public outreach and at second series of open houses.

Figure 2



Alternate route (yellow) and preferred route (white) were presented in the second series of open houses.

- A single pole design, which was determined to be aesthetically less invasive, for the Okanagan Falls to Penticton transmission line corridor and double pole design for the Oliver to Okanagan Falls corridor was investigated further based on feedback received from the initial public consultation.

- Analysis of the alternate route and pole structures occurred in April and May 2007.

Step #6: Consultation following Open House Series #1

- In March 2007, two on-site meetings with landowners in Heritage Hills were held to discuss the impacts of the upgraded transmission line and ways to mitigate the impacts.

- Subsequent to the first open houses, as the Project was being refined to include the higher elevation transmission line option for the East Skaha Lake area, FortisBC had discussions with the Nature Trust of British Columbia, the South Okanagan and Similkameen Invasive Plant Society and the Canadian Wildlife Service about the preferred and alternate routes.

- FortisBC responded to approximately 20 e-mails and phone calls between the open houses. Most of the concerns were from residents of the Heritage Hills area and the main areas of concern were transmission line impacts on property values, views and health.

- Two petitions opposing the preferred route option along the existing right of way were received from the Citizens of Okanagan Falls Against High Voltage Overhead Lines (COFAHVOL) which is also known as South Okanagan for Alternative Route (SOFAR). The group will be referred to as "COFAHVOL/SOFAR" in this Report.

- FortisBC began discussions with a real estate developer who had expressed interest in the Project at the first series of open houses.

- Discussions were also held with lease and tenure holders who would be impacted by the higher elevation route.

- Following the first series of open houses consultation continued with the Osoyoos Indian Band and the Penticton Indian Band and in April 2007, formal presentations outlining the OTR Project were made to the Chiefs and councils of both Bands.

Step #7: Open House Series #2

- Open houses were held at the following locations from 4:00 pm to 8:00 pm:
  - Oliver, Tuesday, May 22 – Tuc-el-Nuit Elementary School Gym
  - Okanagan Falls, Wednesday, May 23 – Okanagan Falls Elementary School Gym
  - Penticton, Thursday, May 24 – Skaha Lake Middle School Gym

- During each open house, local area residents had the opportunity to review a series of poster boards describing the Project and were provided with handouts detailing the Project.

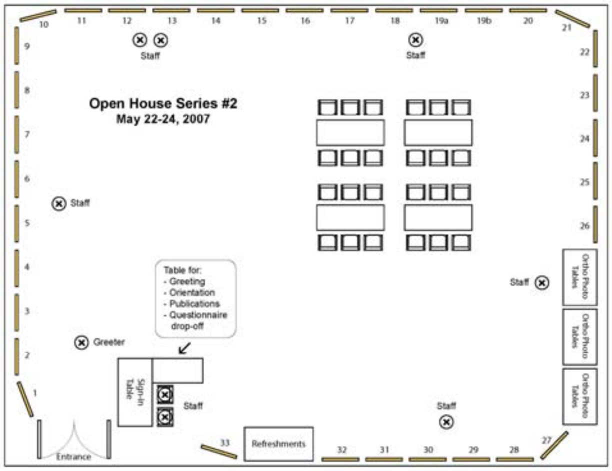
- The second series of open houses presented design and transmission routing options based on the feedback received at the first series of open houses.

- The objectives of this second series of open houses were to:
  - Describe and discuss the OTR Project including the need for additional transmission capacity and environmental considerations;
  - Present the preferred Project option to expand transmission line capacity on the existing right of way; and
  - Present an alternate higher elevation route in the East Skaha Lake area.

- Thirty-four display boards, 32 orthographic photo boards, and four updated Project brochures were available at the open houses (details on these materials are provided in Section 2).

- Figure 3 details the floor plan for the open houses.

Figure 3



- Attendees were again encouraged to complete questionnaires to provide feedback and state any outstanding concerns they might have about the OTR Project.

- The same OTR Project team that participated in the first open houses also participated at the second open houses.

Step #8: Consultation Following Open House Series #2

- FortisBC responded to approximately 20 e-mails and phone calls from residents impacted by the project. The majority of the concerns were from residents of the Heritage Hills area and the main areas of concern were transmission line impacts on property values, views and health.

- Subsequent to the second series of open houses meetings and discussions to review the Project and to describe FortisBC's preferred option were made to the following:
    - City of Kelowna City Council
    - City of Penticton City Council
    - Town of Oliver City Council
    - District of Summerland
    - Regional District of Okanagan-Similkameen
    - Regional District of Central Okanagan
    - Kelowna Chamber of Commerce
    - Penticton Chamber of Commerce
    - Integrated Land Management Bureau
    - South Okanagan Similkameen Conservation Program

- Additional meetings also were held with the Okanagan Nation Alliance, Osoyoos Indian Band and the Penticton Indian Band to update them on the Project, and to continue discussions about the alternate higher elevation route.

- FortisBC met with individuals from COFAHVOL/SOFAR on July 23, 2007. FortisBC received a petition dated July 30, 2007 from COFAHVOL/SOFAR with 83 signatures supporting the statement "Opposition to the planned FortisBC Okanagan Transmission Reinforcement Project (OTR) over the existing right of way."

- An additional petition was received from the Council for Strata Plan K268 representing 16 landowners in the Golden Hills Strata opposed to the upland route option for the transmission line.

- In an effort to solicit feedback, FortisBC sent a letter and the Environmental and Social Impact Assessment (ESIA) for the OTR Project to the following environmental stakeholders on September 19, 2007:
    a. South Okanagan-Similkameen Conservation Program
    b. BC Ministry of Environment - Environmental Stewardship Division
    c. BC Ministry of Environment - Ecosystems Section
    d. BC Parks
    e. Environment Canada - Ecosystem Conservation
    f. Indian and Northern Affairs - Environment and Natural Resources
    g. En'owkin Centre
    h. Land Conservancy of BC
    i. Okanagan Similkameen Conservation Alliance
    j. The Nature Trust of British Columbia

- The letter requested the organizations provide written feedback prior to October 31, 2007. FortisBC received letters from The South Okanagan-Similkameen Invasive Plant Society, the Ministry of Environment – Environmental Stewardship Division and the Nature Trust.

Step #9: Project Follow-Up & Report Preparation

- Follow-up letters were mailed to interested stakeholders on June 20, 2007 providing a summary of the feedback received throughout the public consultation for the OTR Project and the process moving forward.

- An additional letter was sent to these stakeholders on September 19, 2007 with an update on the status of the application and the process moving forward.

- Public input from the second series of open houses was tabulated and analyzed with comments for follow-up noted by the OTR Project team.

- Feedback compiled from informal meetings, e-mail submissions and from formal presentations following the second series of open houses was also collected.

- All of this public input was included in the development of this public consultation report.

II. INFORMING THE PUBLIC

- One key aspect of FortisBC's public consultation was its outreach to stakeholders, First Nations and the general public to inform them about the public open houses.

- A key consideration was to ensure that people attending the open houses had clear and comprehensive information about the OTR Project, the public need for it, environmental and safety considerations, the regulatory process and how attendees could provide feedback.

- This section lays out the timing of public notification, and also presents a summary of the communications materials provided at both series of open houses.

Identifying the Stakeholders, First Nations and Impacted Public

- Efforts were made to identify, contact and update potential stakeholders, First Nations and the general public impacted by the OTR Project.

- Open house attendees' names and addresses were added to this list to ensure that they would be included in any communications.

Schedule of Public Notification

- Local area residents were notified of the open houses through direct mailed letters and invitation cards, and newspaper advertisements.

- A web page on FortisBC's public website was created and the FortisBC contact centre received project information to respond to Project inquiries.

- Table 1 details the schedule of public notification.

Table 1 – Schedule of Public Notification

Date	Notification	Target	Outreach
February 19	Personal letter of invitation to Open House Series 1	All landowners 500 metres to the west and 1,000 metres to the east of the existing transmission line along existing Oliver-to Penticton transmission line corridor	297 letters
February 19 – 23	Printed invitation to Open House Series 1	Defined areas including all of Oliver, Okanagan Falls and southeast Penticton	7,359 invitations
February 21 – March 4	Newspaper advertisements for Open House Series 1	Penticton, Okanagan Falls and Oliver newspapers	
April 11	Follow-up letter included a general update and the next steps FortisBC will take in preparation for Open House Series 2	All landowners along existing Oliver-to Penticton transmission line corridor and all Open House Series 1 registered attendees	451 letters
May 7	Personal letter of invitation to Open House Series 2	All landowners along existing Oliver-to Penticton transmission line corridor and all Open House Series 1 registered attendees	508 letters
May 8 - 14	Printed invitation to Open House Series 2	Defined areas including all of Oliver, Okanagan Falls and southeast Penticton	7,359 invitations
May 9 - 20	Newspaper advertisements for Open House Series 2	Penticton, Okanagan Falls and Oliver newspapers	
June 20	Follow-up letter included a synopsis of the open houses, a general description of the OTR project proposal	Expanded list of landowners along existing Oliver-to Penticton transmission line corridor and previous open house attendees and leaseholders along the higher elevation alternate route. Series 1 and 2 registered attendees.	524 letters
September 19	Delay letter included notification of postponement of BCUC submission due to the need for further analysis (engineering & environmental analysis)	List of landowners along existing Oliver-to Penticton transmission line corridor and previous open house attendees and leaseholders along the higher elevation alternate route. Series 1 and 2 registered attendees.	519 letters

Communications Materials

- FortisBC's communications materials included advertisements, letters and invitations used to notify the general public and key stakeholders about the open houses and brochures and display boards which were used as support materials at the open houses and meetings.

- Details of the communications materials are provided in the Table 2 and samples of the communications materials are provided in appendix B.

Table 2 – Communication Materials

Communications Material	**Description**
Open House Notification	
Personal Invitation Letters (2)	o A one-page letter from the OTR Project Manager was sent to landowners adjacent to the existing transmission line corridor for Open House Series #1 over two weeks before the open houses. o A one-page letter from the OTR Project Manager was sent to Open House Series #1 attendees and to additional landowners within the sight line of the existing transmission line corridor in the East Skaha Lake area for Open House Series #2 over two weeks before the open houses. o The letters described the OTR Project and invited the addressees to attend the open houses.
Newspaper Advertisements	o Quarter-page advertisements were placed in local newspapers beginning approximately two weeks before the open houses. o The advertisements ran four times, bi-weekly in the Penticton Western News and Penticton Herald and twice in the Oliver Chronicle and the Okanagan Falls Review. o The advertisements provided a simple map showing the existing transmission line corridor and described the OTR Project. The time, date and locations of the open houses were listed with the OTR Project phone number, e-mail and website.
Printed Direct Mailed Invitations to the Public	o A colour, 5” by 8-1/2” public invitation was distributed to all businesses and households in the Oliver to south Penticton area. o The card provided a simple map showing the existing transmission line corridor and described the OTR Project. o The time, date and locations of the open houses were listed with the OTR Project phone number, e-mail and website. o Approximately 7,900 invitation cards were mailed out.
Personal Open House Follow-up Letters (2)	o FortisBC committed to report back to open house attendees on the general findings of the open houses. o Personal follow-up letters were mailed to landowners along the existing transmission line corridor and to those who attended the Open House Series #1 and #2. o In addition to summarizing the input at the open houses, the letters also noted the next steps FortisBC would take with the input and with its CPCN application.
Personal Follow-up Letters with Project Update	o FortisBC had indicated in previous communications and the open houses that the CPCN application would be filed prior to September 2007. o Because the initial proposed timeframe was delayed, FortisBC sent letters to interested stakeholders providing a new timeline and information on the process moving forward. o Personal follow-up letters were mailed to landowners along the existing transmission line corridor and to those who attended the Open House Series #1 and #2.

Open House Materials	
Discussion Guide (2)	o This colour brochure gave a general Project overview. o The discussion guide for Open House Series #2 was more detailed providing photographic renderings of the proposed transmission lines and poles. o It presented the risks and benefits of the preferred route option in the East Skaha Lake area and the alternate higher elevation route. o It also showed photographic renderings of the proposed Bentley Substation and of the new lines at the Vaseux and RG Anderson Substations.
Backgrounder: Environment	o This colour handout gave a detailed overview of the environmental considerations and studies that would be undertaken as a part of the CPCN.
Backgrounder: Public Need	o This handout provided information on the Projected 30-year growth for the Okanagan using a BC Statistics table, and also showed the increase in building permits demonstrating the need for additional electricity capacity
Display Boards	o The display boards showed all of the key information about the OTR Project and noted its commitments. o For Open House Series #2, information was also presented about the alternate route option in the East Skaha lake area. o Large versions of the photographic renderings of the new lines and power poles were presented. o The first series of open houses had 25 display boards, plus 32 aerial orthographic photo boards showing the proximity of the proposed line with local properties. o The second series of open houses had a total of 34 boards that included the photographic renderings, plus 32 aerial orthographic boards. o A color hand-out of all of the display boards was offered to all open house attendees.
Questionnaire	o All open house attendees were given a questionnaire when they registered at the door. o Attendees were encouraged to complete the questionnaires prior to leaving. o The summary results of the questionnaires are presented in the following section. A full report of all questionnaire input is provided in Appendix C.
FortisBC Website	o The FortisBC website was updated to include information about the OTR Project. o The site included all OTR Project communications materials, and also the aerial orthographic photos of the preferred and alternate routes for the transmission line corridor. The website was noted in all newspaper advertisements and OTR publications.

III. PUBLIC INPUT

Prior to Open House Series #1: February 2007

- After invitations and notices were sent out to the public and stakeholders for the first series of open houses, FortisBC received five phone and e-mail inquiries from local area residents.

- The points of inquiry were generally related to impacts to views and on property values and health concerns of upgrading the transmission lines in the Heritage Hills areas.

Open House Series #1: March 6 – 8, 2007

- FortisBC received feedback through questionnaires and verbal comments made to the subject matter experts at the open houses.

- A summary of open house attendance is provided in Table 2.

Table 2 - Summary of Attendance

Location	Date	Attendance	Completed Questionnaires	
Oliver	06-Mar-07	34	23	68%
OK Falls	07-Mar-07	38	38	100%
Penticton	08-Mar-07	38	26	68%
Total		**110**	**87**	**79%**

- In the questionnaire, open house attendees were asked to respond to questions relating to the OTR Project, the Open House information and general questions pertaining to where they lived in relation to the line and how long they had lived in the Okanagan.

- Responses varied depending on the geographic location. In all areas, participants appeared to understand and agree with the need for the Project. However, as the Open Houses progressed northward towards Penticton, where the existing transmission lines run through newer subdivisions, participants expressed concerns about the routing of the transmission lines.

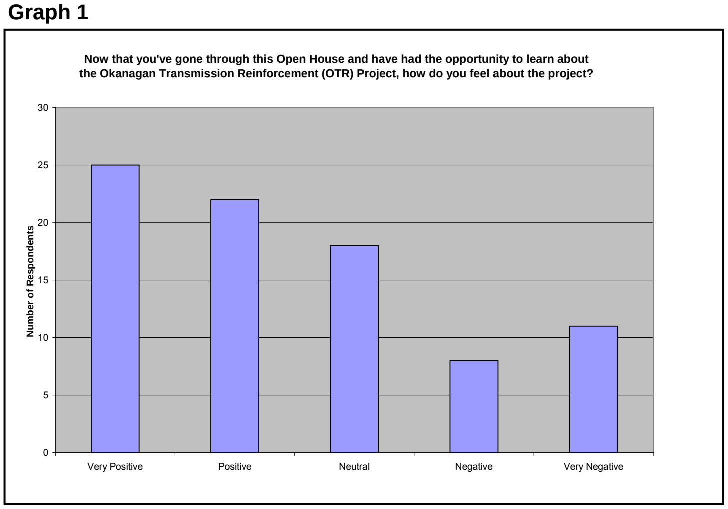
- The general comments received were divided into four categories: Project Need; Routing Considerations; Visual Consideration and Environmental and Safety Considerations.

- The following summarizes representative comments from the questionnaires in each of these categories:

  - **Project Need:**
    - "Necessary to meet power needs in future."
    - "Need reliable power."
    - "We need to accept change and growth – we are growing therefore our needs are."
  - **Routing Considerations:**
    - "Move the line out of the populated areas."
    - "Not in my backyard please – put on Crown land."
    - "Leave the transmission line in the existing corridor."
    - "Reduce land acquisition and clearing."
  - **Visual Considerations:**
    - "Need more visual screening of substations."
    - "Give public a chance to see the pole choice, once decided."
    - "Need to see height of towers and lines related to views."
    - "Concerned about view spaces and appearance of the new line."
  - **Environmental and Safety Considerations:**
    - "Protect wildlife sensitive areas – i.e., Bighorn Sheep lambing areas and Mountain Goats."
    - "I am glad preserving and protecting the environment are on the agenda."
    - "I am concerned about increased EMFs."

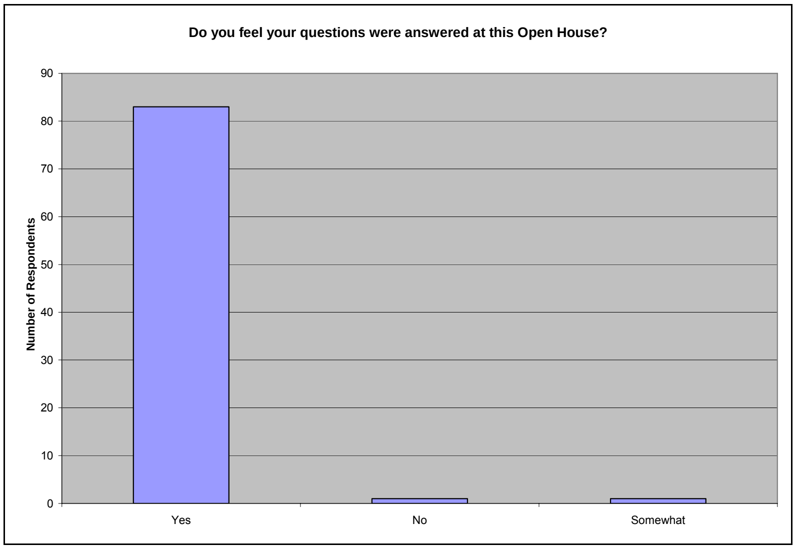
- Overall, the majority (54%) of the open house attendees felt positive about the OTR Project after they had gone through the open houses; 22% felt negative about it.

Graph 1



- When asked if they had concerns about the OTR Project prior to the open houses, 70% of the attendees indicated they had concerns.

Graph 2

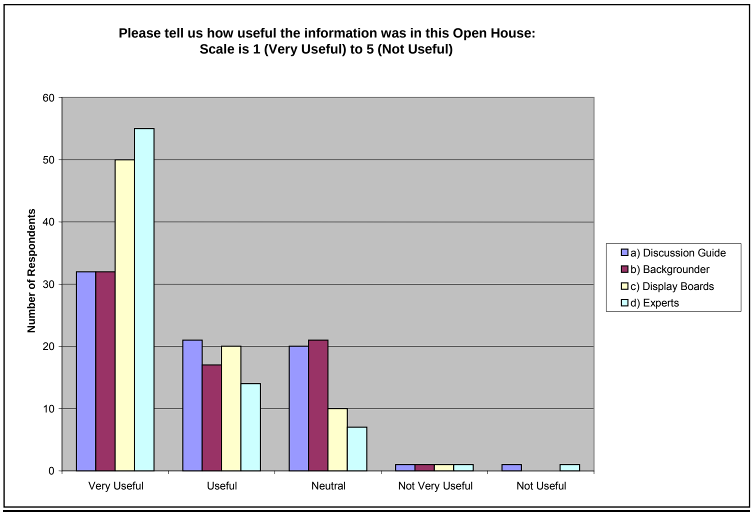


- When asked if their concerns were addressed in the open houses, 95% of the attendees indicated their concerns were addressed.

- One of the key aspects of the open houses was to identify points for follow-up at the second series of open houses. 21% of the attendees indicated they had questions. Details on these questions are presented in Section 4.

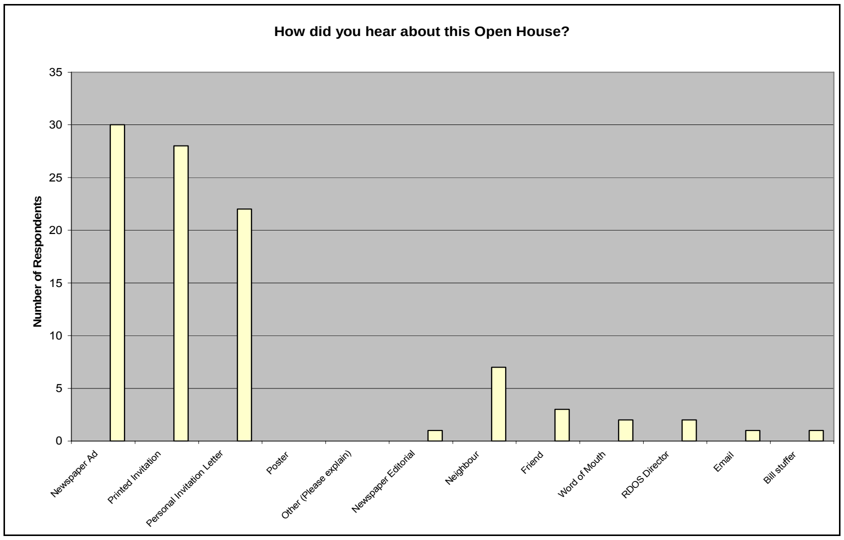
- Attendees were also asked to critique the usefulness of the information provided at the open houses, and most attendees were most positive about having the Company experts on hand.

Graph 3



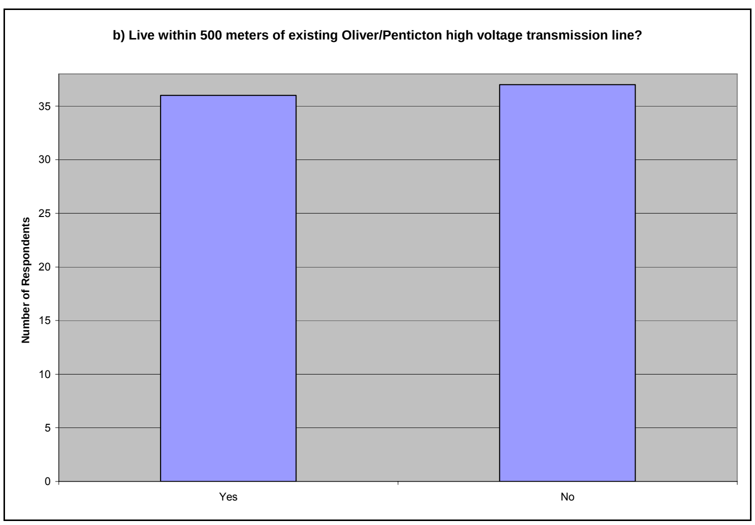
- Attendees also were asked how they had heard about the open houses. Most attendees indicated that they had seen the newspaper ad (34%) or had received a printed invitation (32%) or personal invitation (25%).

Graph 4



- About half of the attendees (41%) said they lived within 500 meters of the existing Oliver/Penticton transmission line and another half (43%) indicated they did not live within 500 meters.

Graph 5



- Addressing how long the attendees had lived in the Okanagan, 45% had lived there longer than 20 years, 20% 10-20 years, 16% 5-10 years, and 15% under 5 years.

Following Open House Series #1: March - May 2007

- FortisBC answered approximately 20 e-mails and phone calls between the open houses. The majority of the concerns were about transmission line location in the Heritage Hills area and the desire to have the line moved to an upland route, along with concerns about property values, and health impacts of the transmission line.

- Two petitions opposing the preferred route option over the existing right of way were received from the COFAHVOL/SOFAR. The March 28, 2007 petition contained 101 signatures and the May 10, 2007 petition contained 103 signatures. The group made two suggestions in their correspondence with FortisBC; rerouting the line to a higher elevation route and placing the lines underground.

- FortisBC had discussions with The Nature Trust of British Columbia, the South Okanagan and Similkameen Invasive Plant Society and the Canadian Wildlife Service about the preferred and alternate routes. These organizations expressed that there would be fewer environmental impacts by proceeding with the OTR Project along the existing transmission line corridor.

Open House #2: May 22 – 24, 2007

- FortisBC received feedback at the open houses through questionnaires and verbal comments marked down by the subject matter experts.

- A summary of attendance has been provided in Table 3.

Table 3 - Summary of Attendance

Location	Date	Attendance	Completed Questionnaires	
Oliver	22-May-07	8	4	50%
OK Falls	23-May-07	72	53	74%
Penticton	24-May-07	48	44	92%
Total		**128**	**101**	**79%**

- An increased number of Heritage Hills area residents attended the Okanagan Falls and Penticton open houses.

- A majority of residents from Heritage Hills expressed that they did not like the preferred Project option and expressed a desire to have the transmission line relocated to a higher elevation route.

- Participants were asked to respond to questions relating to the OTR Project's preferred option, the Open House information and general questions relating to where they lived in relation to the line and how long they had lived in the Okanagan. Responses varied depending on the geographic location.

- In Oliver, attendance was very low. The open houses in Okanagan Falls and Penticton saw increases in attendance.

- The majority of attendees were residents of Heritage Hills where the existing right of way is located.

- The general comments received fell into four categories: Project Need; Routing Considerations; Visual Consideration and Environmental and Safety Considerations.

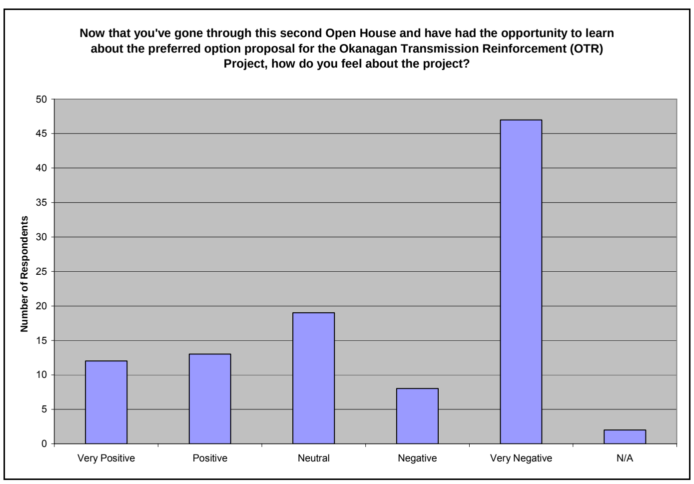
- The following summarizes representative comments in each of these categories:

  - **Project Need:**
    - “I see the Project as a necessary part of planned (and apparently inevitable) growth in this region.”
    - “It’s not a question that with progress/growth more transmission is required.”
    - “Project is fine – proposed location is not.”
    - “I recognize the need for the expanded capacity. I am opposed to the suggested route. The upland route would satisfy both.”
    - “I want to make it clear I support the plan to increase power supply in this valley but I adamantly oppose your preferred routing of the line.”
  - **Routing Considerations:**
    - “I can realize the Project is necessary but believe the route needs to take into consideration where the maximum growth is likely to be in the future.”
    - “Aggressively review the pros of the alternate route; take the lines out of residential areas.”
    - “Worried about land values and health if you don’t do alternative upland route.”
    - “We prefer the alternate route.”
    - “I am extremely opposed of developing the power lines on the existing ROW.”
    - “Using the preferred route is a no-brainer.”
    - “I think the existing route is a good business decision.”
  - **Visual Considerations:**
    - “I realize there is an increasing demand for electricity but sincerely believe that Fortis can come up with an alternative that will impact our view a lot less.”
    - “I will be close to the line on the preferred route and will have my view spoiled.”
    - “The lines will be raised to the sight of hundreds of homes depreciating property values.”
    - “Worried about the ambience and land values, health from power line fallout, view cut off by power lines.”
    - “View, view, view.”
    - “The increased pole height will push the lines up into our view.”

- **Environmental and Safety Considerations:**
  - "I support your preferred option even though the towers are visible from my house. I am not in favour of the alternate route because of environmental concerns."
  - "Public safety should outweigh environmental concerns."
  - "The valley needs power; this (existing route) is the most environmentally friendly way to do it."
  - "Efforts have been made to assess the impact of the Project on wildlife and plant species with no apparent regard for potential long term health affects on human life."
  - "The radiation from higher voltage lines is sure to be much more harmful with the twin lines and higher voltage."
  - "EMFs are a concern."

- Attendees were again asked about how they felt about the OTR Project, having gone through the open houses. Following the second series of open houses, there were more negative responses that were qualified with a need to move the transmission line to the alternate route.

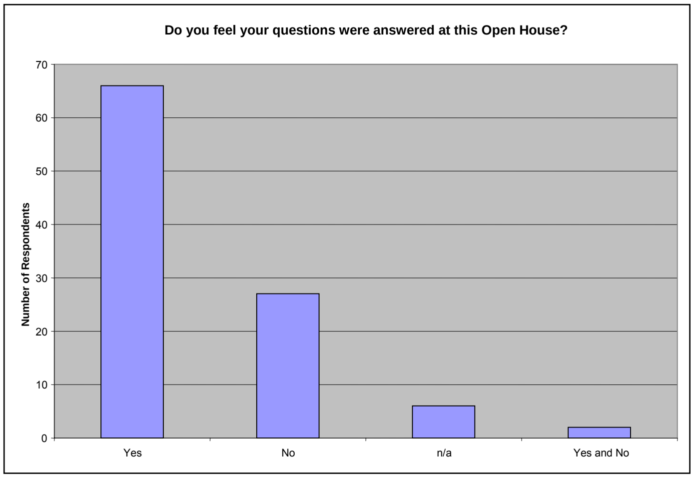
Graph 6



- 83% of the attendees filling out the questionnaire indicated that they had concerns about the OTR Project prior to these open houses.

- When asked if their concerns were addressed in the open houses, 65% of the attendees indicated their concerns were addressed.

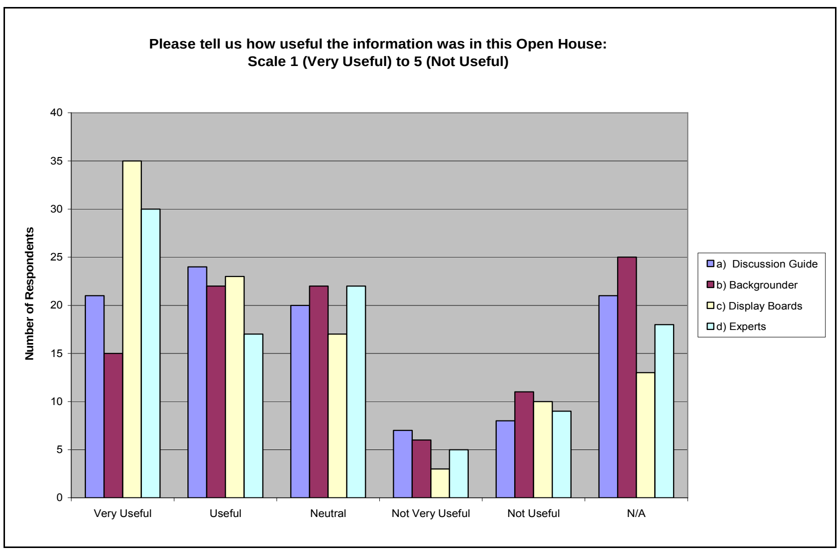
Graph 7



- When asked if attendees required follow up on points to make them more comfortable with the OTR Project, 64% of the attendees indicated they had questions. Details on these questions are presented in Section 4.

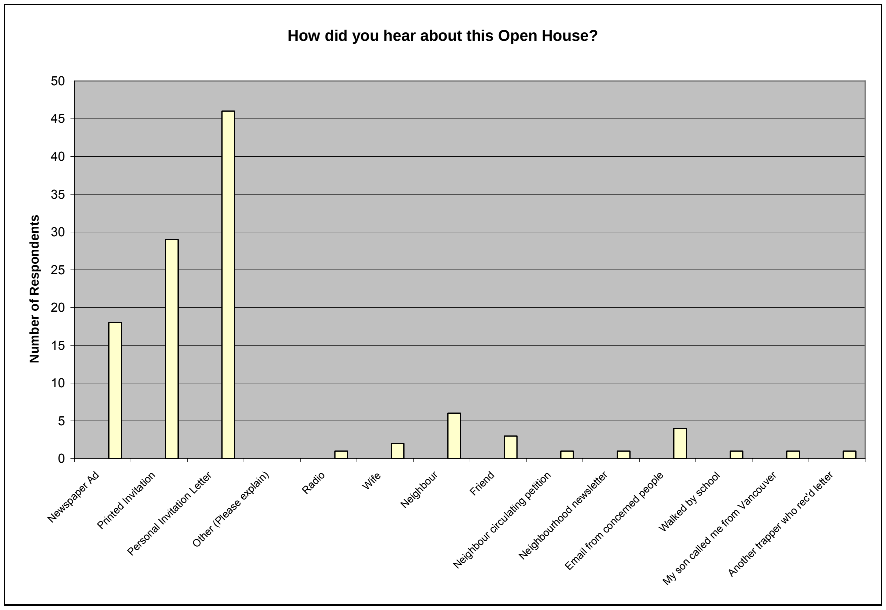
- Attendees were again asked to critique the usefulness of the information provided at the open houses, and this time the majority of attendees found the experts and the display boards most useful.

Graph 8



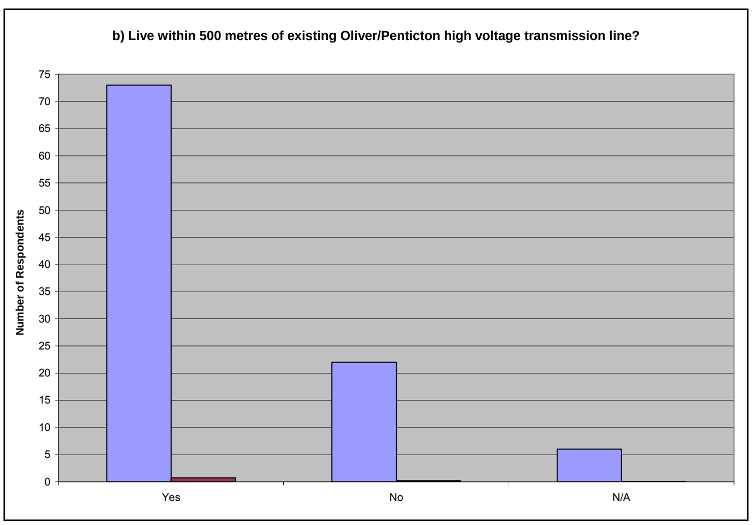
- Attendees also were asked how they had heard about the open houses, and most indicated that they had seen the newspaper ad (18%) or had received a printed invitation (29%) or personal invitation (46%), where the responses for the first open house series were newspaper ad (34%), printed invitation (32%) or personal invitation (25%).

Graph 9



- 72% of the attendees said they lived within 500 meters of the existing Oliver/Penticton transmission line compared to 41% who attended in the first open houses; 22% (43% in first open houses) indicated they did not live within 500 meters.

Graph 11



- Regarding how long the attendees had lived in the Okanagan, 32% (compared with 45% - first open house series) had lived there longer than 20 years, 24% (20%) 10-20 years, 15% (16%) 5-10 years, and 24% (15%) under 5 years.

Following Open House Series #2: June - December 2007

- FortisBC met with a number of business, government and environmental stakeholders following the second series of open houses. Dates of these meetings are identified in table 4 below.

Table 4 – Stakeholder Presentations

Presentation	Date
City of Penticton	22-May-07
City of Kelowna	18-Jun-07
Kelowna Chamber of Commerce	31-Aug-07
Penticton Chamber of Commerce	27-Jun-07
Central Okanagan Regional District	9-Jul-07
Regional District Okanagan Similkameen	21-Jun-07
District of Summerland	28-May-07
Town of Oliver	9-Jul-07
Integrated land Management Bureau	2-Jun-07

- FortisBC met with individuals from COFAHVOL/SOFAR on July 23, 2007 to discuss the upland route, an additional route to the east of the proposed upland route and the group's willingness to absorb a portion of additional costs of relocating the line.

- FortisBC received a petition dated July 30th from COFAHVOL/SOFAR with 83 signatures supporting the statement "Opposition to the planned FortisBC Okanagan Transmission Reinforcement Project (OTR) over the existing right of way." The petition was phase three of petitions previously sent by their predecessor organization COFAHVOL/SOFAR.

- A petition was also received from the Council for Strata Plan K268 representing 16 landowners in the Golden Hills Strata opposed to the upland route option for the transmission line. The petition dated August 10, 2007 stated that the upland route option would have irreversible, lasting negative impacts on the watershed for the area.

- The City of Kelowna adopted a motion which stated that they supported, in principle, the need and proposed solution, including the preferred route and distribution of costs for the OTR Project. Written confirmation of the motion was provided to FortisBC in a letter dated June 19, 2007.

- In a letter dated August 20, 2007, the Town of Oliver provided written confirmation of a resolution passed by council which supported the OTR Project in a way that has the lowest cost to the user.

- The District of Summerland provided a letter dated August 16, 2007 supporting use the existing right of way for the OTR project for cost and environmental reasons; specifically they were concerned about the spread of noxious weeds that could arise from clearing a new right of way.

- Regional District of the Central Okanagan adopted a resolution supporting the OTR project in principle. The resolution was forwarded to FortisBC in a July 12, 2007 letter.

- The Penticton Chamber of Commerce provided a letter dated July 6, 2007 supporting the use of the existing right-of-way for environmental, cost and timing reasons, but also stated that they would support an alternative route, if it could be secured in a cost effective and timely manner.

- In a letter dated August 23, 2007, the Kelowna Chamber of Commerce provided a letter supporting the OTR project move forward to address the strain on the electrical system that has occurred because of the substantial growth in the Okanagan.

- The City of Penticton provided a letter dated June 11, 2007 supporting the OTR Project, but asking that FortisBC consider relocating a portion of the transmission line in order to minimize any impact on potential future development in the area. Upon receipt of this letter, FortisBC asked if the City would be willing to pay any additional costs incurred as a result of moving the route upland. No written response was received. Verbal responses indicated that extra costs would be incurred by developers.

- The Regional District of the Okanagan Similkameen (RDOS) supported the need for the upgrade of power service in the Okanagan Valley in a letter dated July 4, 2007. However, the Board passed a motion that it did not support upgrading of the existing corridor and urged FortisBC to relocate the line east of the existing site avoiding developed settlements. Upon receipt of this letter, FortisBC asked RDOS If they would be willing to pay any additional costs incurred as a result of moving the route upland. In a letter dated August 30, 2007, they responded that they would not.

- Following a meeting on June 25, 2007, the Integrated Land Management Bureau (ILMB) sent a letter to FortisBC dated June 27, 2007. In the letter they stated that they preferred use of the existing right of way for the transmission line because it would have the least impact on the land base. They did indicate that they would consider an application on the alternate route, but encouraged FortisBC to pursue all other options to use the existing right of way prior to proceeding with this. On October 3, 2007 FortisBC met with the ILMB again. The Upland route, specifically acquiring a right-of-way, was discussed. The ILMB outlined all of the risks, variables and process around First Nations, environment and existing tenure holders. They also explained that the consultation and acquisition process to acquire a new right of way could take two or more years to complete.

- In a letter dated August 24, 2007, the Protection Branch of the Ministry of Forests and Range provided a letter supporting the initiative because the new structures would better protect their assets from the risk of wildfires and simplify fire suppression efforts in and around these assets when they occur.

- FortisBC had a discussion with the Ministry of Health on October 10, 2007. They had received a letter from COFAHVOL/SOFAR about EMF and Health issues. FortisBC responded and outlined the project and provided resources for further EMF research.

- In an effort to solicit feedback, FortisBC sent a letter and the Environmental and Social Impact Assessment (ESIA) for the OTR Project to the following environmental stakeholders on September 19, 2007:
    a. South Okanagan-Similkameen Conservation Program
    b. BC Ministry of Environment - Environmental Stewardship Division
    c. BC Ministry of Environment - Ecosystems Section
    d. BC Parks
    e. Environment Canada - Ecosystem Conservation
    f. Indian and Northern Affairs - Environment and Natural Resources
    g. En'owkin Centre
    h. Land Conservancy of BC
    i. Okanagan Similkameen Conservation Alliance
    j. Nature Trust of British Columbia

- The letter requested the organizations provide written feedback prior to October 31, 2007. FortisBC received letters from The South Okanagan-Similkameen Invasive Plant Society, the Ministry of Environment – Environmental Stewardship Division and the Nature Trust.

- In an October 4, 2007 letter the South Okanagan-Similkameen Invasive Plant Society suggested the following:
    a. FortisBC conduct a detailed inventory on invasive plants using the 2008 field season
    b. FortisBC build on this baseline data and prepare an Invasive Plant Management Plan
    c. FortisBC use SOSIPS approved seed mixes to re-vegetate disturbed soil
    d. FortisBC implement a long term monitoring and post-construction treatment program and recommended a five year program be implemented.

- In a letter dated October 31, 2007, the Ministry of Environment – Environmental Stewardship Division commented on the ESIA. Their recommendations have been summarized below:

a. Based on the information presented, an upgrade on the existing right-of-way would have lesser impacts on fish, wildlife and habitat values.
b. That FortisBC engage a qualified professional with a background in local fish and wildlife species, their habitat requirements, the general ecosystem types and experience in environmentally sensitive project design and monitoring practices.
c. That construction timeframes consider a raptor "least risk window" and a lambing "no-work window" for Big Horn Sheep.

- In a letter dated November 7, 2007, The Nature Trust of British Columbia indicated that they are not in a position to support the upland route, given that this option would result in significant degradation of habitat to Nature Trust owned conservation lands.

First Nations

- When initial public outreach for the OTR Project began in fall 2006, FortisBC made high level overview presentations of its plans to expand the transmission system in the South Okanagan to the Okanagan Nation Alliance (ONA). FortisBC sought to clarify the appropriate entity to work with on the OTR project. It was agreed that the ONA's preference was that FortisBC deal directly with the Osoyoos Indian Band (OIB) and the Penticton Indian Band (PIB). FortisBC subsequently met with both the PIB and OIB.

- Informal meetings with the OIB and the PIB were held in February 2007 to seek initial feedback on the aesthetic, environmental and economic aspects of the Project. Later meetings were also held with the OIB and the PIB in April 2007 to update them on the Project, and to obtain input on the alternate higher elevation route.

- Formal presentations outlining the Project were made to the Chiefs and councils of the Osoyoos and Penticton Indian bands in May 2007. The Osoyoos Indian Band had questions related to the structure types and whether the transmission line on reserve land would require an expansion of the right of way. The Penticton Indian Band expressed concerns about the alternate route option. They also had questions about employment opportunities for local residents during the Project construction.

- The Osoyoos Indian Band provided a letter of support for the Project dated August 20, 2007. In the letter they stated that their support was subject to upgrades to the transmission line being completed within the existing right of way from Vaseux Lake to Okanagan Falls. The Penticton Indian Band provided a letter of support dated August 28, 2007. In the letter they stated that that they supported the upgraded power line remaining on the existing right of way. .

- On October 19, 2007, FortisBC met with the Okanagan Nations Alliance to update them on the consultation process with the Osoyoos and Penticton Indian Bands and requested they review and provide comments on the letters received from the Indian Bands. In a letter dated November 5, 2007 the Okanagan Nation Alliance stated they agreed with the OTR Project Plan which entails upgrading the existing transmission lines from 161 kV to 230 kV between Vaseux Lake and Oliver and Vaseux Lake and Okanagan Falls. They explained that their support for the Project is subject to upgrades being performed within FortisBC's existing right-of-way and if an alternate route is proposed, the Okanagan Nation Alliance will be involved in all aspects of the review and part of the decision making process for acceptance, rejection, or modification of the proposal.

IV. FACTORING IN PUBLIC INPUT

- The approach of the public consultation process was to inform impacted and interested stakeholders, First Nations and general public about the OTR Project and to seek input.

- Open House Series #1 sought input on elements of Project design for the transmission line structure, including pole/tower design, station aesthetics.

- Open House Series #2 sought input on the transmission line structure changes that had been made as a result of input from Open House Series #1.

- Open House Series #2 also presented an alternate higher elevation line option in the East Skaha Lake area which resulted from input received from the first open houses and other consultation from a variety of stakeholders in the area. Support for the higher elevation route is mainly from landowners and residents in the Heritage Hills development.
    - Upon evaluation of the input from Open House Series #1, FortisBC continued engineering and environmental analysis to find an economical and environmentally viable alternate route in this area.
    - Open House Series #2 presented the benefits and risks of both the "preferred option" and the Upland alternate option.

Items for Follow-Up – Open House Series #1

The following comments are <u>all</u> of the responses to question 5 in the Open House questionnaire *("We will be having a second set of Open Houses (tentatively scheduled for May 2007) to present and discuss our preferred option proposal prior to our submission to the BC Utilities Commission. Are there any questions you still have about the OTR that we should follow up on in advance of the second set of Open Houses?")*:

- What other options are possible/considered and why were they discarded, i.e., conservation, lack of public support, local power generation by individuals adding to grid.
- Design and aesthetics.
- What impact will this Project have on future residential electricity rates? Any absolute figures available?
- Minimize footprint of towers.
- Is there a possibility of moving the existing right of way up the mountain range, away from the Heritage Hills subdivision?
- Wildlife sensitive areas - re Bighorn Sheep lambing areas and Mountain Goats.
- The power line should be put on crown land behind the subdivision (Heritage Hills) or underground.
- Take a look at other option - i.e. crown land above us (Heritage Hills).
- Still concerns on how many lines and poles and height and voltage.

- Concern about power poles being moved to better serve the developer.
- EMF currently and predicted for planned expansion. (under and next to transmission lines)
- How much is it going to cost the people to upgrade?
- Keep the power line route open to Princeton to connect BC Hydro.
- Location (of lines).
- Information on regular maintenance of habitat underneath power lines (weed control, herbicide use, etc.)
- Is there an alternative route above Heritage Hills?
- If option is to leave lines in existing - how is FortisBC willing to discuss location of tower to minimize visual impact or impact of view for residents.
- Types of tenders you will be seeking for local contracts, time frame for proposing bids.
- Concern about installation, blasting - final look.

Actions to Address Follow-up items

- There was considerable interest from many Heritage Hills homeowners in the East Skaha Lake area in seeing the existing and proposed transmission lines moved out of the area.
    - FortisBC's engineering and environmental team did on-site analyses for a higher, mid-elevation alternate route, and for a higher, top-of-mountain alternate route.
    - As a result of the technical analyses, FortisBC discounted the mid-elevation route for engineering, cost and environmental reasons.
    - The high elevation alternate option was considered a viable technical option. However, the higher elevation route would have more negative impacts than the "preferred option" along the existing route through Heritage Hills.
    - A comprehensive consultation with all of the landowners and stakeholders along the higher elevation route was not completed prior to Open House Series #2 because of time constraints, so this was noted as a potential risk to the development of this option. FortisBC has since consulted with these landowners and stakeholders in tandem with further technical analyses of this option.

- For Open House Series #2, renderings of the proposed transmission lines and poles were provided at a variety of views along the "preferred option" route.

- The topic of EMF was further explored and additional research resources were provided in the Discussion Guide.

- All of the environmental aspects of the Project discussed in the Display Boards and Environmental Backgrounder for Open House Series #2.

Items for Follow-Up - Open House Series #2

The following comments are all of the responses to question 5 in the Open House questionnaire ("*We will be submitting our application for the OTR to the BC Utilities Commission early this summer. Are there any questions you still have about the OTR that we should follow up on in our application other than those you have already noted in this questionnaire?"*):

- What compensation or mitigation has been considered for residents impacted?
- Placing of structures and staying in ROW.
- What is the phone and address of the BC Utilities Commission?
- Move it up the mountain. We'll be opposing your applications.
- How would you like to live there and have your view blocked by a pole?
- Aggressively review the pros of the alternate route; take the lines out of residential areas.
- Move lines away from houses and livestock.
- Listen to your customers we want the power lines moved.
- Cost of the upland route and provide better information on the comparative costs. Also answer the questions you have raised about land uses of the "upland route".
- I don't feel that the possible health concerns have been adequately addressed - what research has been done to show there is "no impact".
- Decrease in property values; will ruin our view that we have paid the price to live here.
- Worried about land values and health if you don't do alternative upland route.
- The change of right of way.
- Health issues; property values; view.
- Definitely the "preferred route" option has been much better researched than the alternate route. We don't have the resources to pay someone to research it (i.e. experts). Comments from Fortis officials here indicated they are quite prepared to "defend" their position to BCUC. The regular person is ill equipped to defend against Fortis.
- What does it take for Fortis to actually consider the concerns of residents affected?
- How do you balance the benefits to those needing back-up (mostly Kelowna) with the … it on those affected by construction and operation.
- Environmental study.
- Why do you believe that the cost at another $5,000,000 is not easily doable? Considered the cost to us taxpayers health? Please follow-up to let me know when the next hearing is.
- What is the true cost of alternative? What are the environmental impacts of the alternative?
- Issues over not disclosing previous questions.
- Should the BC Utilities not approve the alternate route what can we do. It's not only the view but what about the value of our property.
- Alternative route is the way to go.

- It appears that the preferred route option has been far better researched than the alternate route. Why hasn't more research been done on the alternate route?

Items Addressed in the CPCN

- The questionnaire for Open House #2 included a question that specifically asked if there were points for follow-up that should be included in the CPCN other than follow-up points in response noted in Question #4.

- In large part, comments were oriented to wanting to have the new line moved to the alternate route.

- FortisBC was asked to relocate the existing line and proposed line in the East Skaha Lake (Heritage Hills) area. To address these suggestions, FortisBC completed the following actions:
    - The alternate higher elevation route option has been included as a technically viable option in the CPCN application for consideration.
    - The Company continued to conduct costing, engineering, and environmental analyses of the alternate higher elevation route following Open House Series #2, and this additional work included in FortisBC's CPCN application.

- FortisBC investigated the impact of the proposed new lines along the East Skaha Lake (Heritage Hills) area and their impact on real estate values. FortisBC consulted real estate and property consultants and determined that there would be no long-term impacts on real estate values in the area as there has been a transmission line in place since the 1960s.

Response to Public Feedback Outside of the Open Houses

- Three petitions opposing the preferred route option over the existing right-of-way were received from COFAHVOL/SOFAR. The group made two suggestions in their correspondence with FortisBC; rerouting the line to a higher elevation route and placing the lines underground.
    - Their suggestion for re-routing the transmission line to a higher elevation behind Heritage Hills was considered as the alternate route option in Open House Series #2 and is proposed as a technically viable option in FortisBC's CPCN Application.
    - Their suggestion for placing the transmission line underground was evaluated and discarded. The underground option was not considered technically or environmentally feasible because of the additional costs to mitigate these concerns

- FortisBC received feedback from three environmental organizations in October 2007. The recommendations and feedback received has been addressed in the ESIA or will be in the Environmental Management Plan. All environmental feedback received was considered in FortisBC selection of the preferred project option.

V. GENERAL OBSERVATIONS

The Need for the OTR Project

- There was a general recognition of the need for the Project. There was a wide recognition for the growth in the area and the necessity for the additional and reliable electricity the OTR Project would provide.

- Routing of the transmission line in the existing transmission line corridor through the Heritage Hills was the subject of considerable discussion at both series of open houses.

The Open Houses

- There was an expressed appreciation for all of the information provided by FortisBC at the open houses and for the technical experts at the open houses and for how helpful they were at responding to questions.

- Attendance at both series of open houses was moderate and the tenor of the open houses was for the most part friendly, congenial and open.

- Some landowners in the East Skaha Lake area were vocal in stating their demand that the transmission line routing in their area be developed at a higher elevation away from their houses.

The OTR Project

- There was some recognition for the Company's inclusion of an alternate route option for the East Skaha Lake area; although, there was some mistrust that the route would be included in the CPCN submission.

- For the most part, attendee questions were addressed at the open houses. Key concerns expressed at the open houses have been identified below:

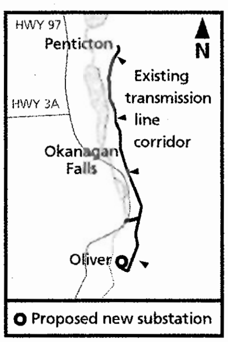
    - Transmission line aesthetics along with a request to move the lines to the alternate route behind Heritage Hills.
    - Health issues around EMF of the upgraded lines.
    - Property values of residents on the existing right of way.
    - Environmental Impacts of the Project.
    - Process moving forward.

FortisBC

An Invitation to You To Attend Our Open House...

Okanagan Transmission Reinforcement Project

This project is one of many taking place throughout the FortisBC service area aimed at replacing aged infrastructure and meeting growing customer electrical load requirements.



✦ FortisBC Inc. is a Canadian owned electric utility operating in the southern interior of British Columbia.

FortisBC is in the process of developing an application to the BC Utilities Commission to enhance the supply of electricity to the Okanagan. The Okanagan Transmission Reinforcement (OTR) Project is being proposed to meet the growing public demand for electricity in the Okanagan by developing additional transmission capacity. FortisBC is proposing to:

- Upgrade existing transmission lines from 161kV to 230kV between Vaseux Lake and Oliver, and Vaseux Lake and Penticton, and add an additional 230kV line to the north between Vaseux Lake and Penticton.
- Modify the Oliver, Vaseux and South Penticton's RG Anderson substations.
- Build a new substation east of the existing Oliver substation.

Learn more about the OTR Project at our open houses which are from 4 p.m. to 8 p.m. at the following locations:

- **Oliver** – Tuesday, March 6, 2007 – Southwind Inn, 34017 – 97th Street, Oliver (Hwy 97)
- **Okanagan Falls** – Wednesday, March 7, 2007 – Okanagan Falls Elementary School Gym, 1141 Cedar Street, Okanagan Falls
- **Penticton** – Thursday, March 8, 2007 – Ramada Inn, Courtyard Ballroom, 1050 Eckhardt Avenue West, Penticton

For Further Information, contact us at:
Phone - 1-866-4FORTIS (436-7847)
E-mail - otrproject@fortisbc.com
Website - www.fortisbc.com/otrproject.html

www.fortisbc.com

Insertion Dates (Open House Series #1)

Oliver Chronicle:
February 21 and 28, 2007
Penticton Western News:
February 21, 25, 28 and March 4, 2007
Penticton Herald:
February 21, 24, 28 and March 3, 2007
Okanagan Falls Review:
February 22 and March 1, 2007

Open House Series #1 March 2007

FORTISBC

An Invitation to You

To Attend Our Open House...

FortisBC is in the process of developing an application to the BC Utilities Commission to enhance the supply of electricity to the Okanagan. The Okanagan Transmission Reinforcement (OTR) Project is being proposed to meet the growing public demand for electricity in the Okanagan by developing additional transmission capacity.

FortisBC will be hosting open houses, so that residents in the area can learn more about the OTR Project and provide feedback.

Learn more about the OTR Project at our open houses which are from 4 p.m. to 8 p.m. at the following locations:

- **Oliver** – Tuesday, March 6, 2007 – Southwind Inn, 34017 – 97th Street, Oliver (Hwy 97)
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Okanagan Transmission Reinforcement Project

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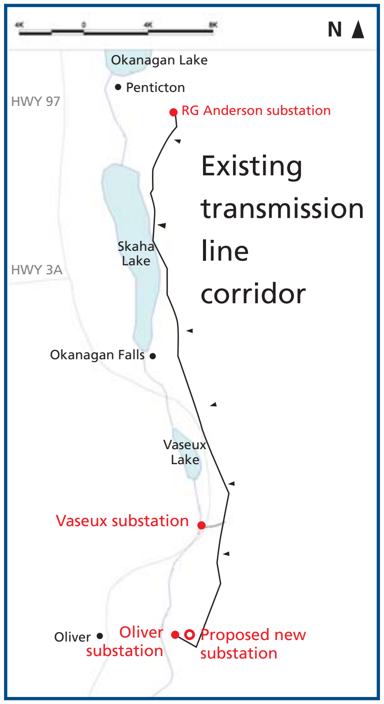


The Growing Demand for Electricity

Over the past 10 years the Okanagan has experienced significant growth. FortisBC is making system enhancements to ensure that customers have long-term, reliable power supply to service the residential and business growth in the Okanagan. The Okanagan Transmission Reinforcement (OTR) Project is a key component in FortisBC's 20 year system development plan, which involves major investments to upgrade our transmission and distribution infrastructure.

The Project

- Upgrades to existing transmission lines from 161kV to 230kV between Vaseux Lake and Oliver, and Vaseux Lake and Penticton, and adding an additional 230kV line to the north between Vaseux Lake and Penticton.
- Modifications to the Oliver, Vaseux and RG Anderson (south Penticton) substations.
- Construction of a new substation east of the existing Oliver substation.

Our Public Consultation

We are committed to open dialogue with our customers, First Nations and other stakeholders. Our open houses will give local residents the opportunity to learn more about the project, discuss why it is needed and also help us identify potential issues, concerns and opportunities for us to improve the project plan.

Once preliminary planning and engineering has been completed in April 2007, we will hold additional open houses (tentatively scheduled for May 2007) to present and review the preferred option proposal that will be developed for our application to the BC Utilities Commission.

Our objective is to put forward a transmission line and station option that balances environmental, social and economic impacts.

For Further information, contact us at:
Phone: 1-866-4FORTIS (436-7847)
E-mail: otrproject@fortisbc.com
Website: www.fortisbc.com/otrproject.html

FORTISBC

FortisBC Inc.
5th Floor, 1628 Dickson Ave
Kelowna, BC V1Y 9X1
1-866-4FORTIS (436-7847)
otrproject@fortisbc.com
www.fortisbc.com/otrproject.html

February 16, 2007

Address

Dear ___________:

FortisBC is in the process of developing an application to the BC Utilities Commission to enhance the supply of electricity to the Okanagan. The project, named the Okanagan Transmission Reinforcement (OTR) project, is being proposed to meet the growing public demand for electricity in the Okanagan by developing additional transmission capacity.

We are proposing to upgrade our existing transmission lines from 161kV to 230kV between Vaseux Lake and Oliver, and Vaseux Lake and Penticton, and adding an additional 230kV line to the north between Vaseux Lake and Penticton.

The OTR Project includes modifications to the Oliver, Vaseux and RG Anderson (south Penticton) substations. We are also proposing to build a new substation east of the existing Oliver substation as part of this upgrade.

We will be hosting open houses in March to seek public input as we develop the OTR project plan. Your property is adjacent to the existing transmission line route so I am extending an invitation to you to participate in our March open houses to discuss the options we have available in terms of construction phases and timing, transmission line routing and environmental aspects of the options. We will be advertising the open houses shortly and will be sending out open house invitation cards to the public in the general area of the transmission route as well.

Please feel free to attend any of our open houses from 4:00 p.m. to 8:00 p.m. at:

- **Oliver** – Tuesday, March 6, 2007 – Southwind Inn, 34017 – 97th Street, Oliver (Hwy 97).
- **Okanagan Falls** – Wednesday, March 7, 2007 – Okanagan Falls Elementary School Gym, 1141 Cedar Street, Okanagan Falls.
- **Penticton** – Thursday, March 8, 2007 – Ramada Inn, Courtyard Ballroom, 1050 Eckhardt Avenue West, Penticton.

Once preliminary planning and engineering has been completed in April, 2007, we will be holding additional open houses (tentatively scheduled for May, 2007) to present and review the preferred transmission corridor option proposal that will be developed for our application for the Certificate of Public Convenience and Necessity (CPCN) submission to the BC Utilities Commission.

Our objective is to put forward a transmission line and station option that balances environmental, social and economic impacts.

If you have any comments or concerns in the meantime, please feel free to call or e-mail me directly.

I look forward to seeing you at one of our open houses.

Yours truly,

Pierre Dufour,
Manager, Okanagan Transmission Reinforcement (OTR) Project
Phone: 1-866-4FORTIS (436-7847) e-mail: otrproject@fortisbc.com
www.fortisbc.com/OTRproject

Open House Series #1 March 2007

FORTISBC

Discussion Guide

Dialogue

We are committed to open dialogue with our customers, First Nations and other stakeholders. The Okanagan Transmission Reinforcement (OTR) Project team is hosting open houses in the communities of Oliver, Okanagan Falls and Penticton. Our open houses will give local stakeholders the opportunity to learn more about the project, discuss why it is needed and also help us identify potential issues, concerns and opportunities for us to improve the project plan. Once preliminary planning and engineering has been completed in April 2007, we will hold a second set of open houses (tentatively scheduled for May 2007) to present and review the preferred option proposal that will be developed for our application to the BC Utilities Commission.

Our objective is to put forward a transmission line and station option that balances environmental, social and economic impacts. In addition, it would provide a cost-effective solution for our customers and long-term investment for the energy needs of the Okanagan. ***Public input is vital in meeting this objective.***

Who We Are

FortisBC is a Canadian owned integrated electrical utility serving approximately 152,000 customers and employing over 570 people in the southern interior of British Columbia. The utility has four hydroelectric generating plants with a combined capacity of 235 megawatts and over 6,750 kilometres of transmission and distribution power lines. Over the next five years FortisBC is investing approximately $500 million in electrical system improvements to better serve its customers.

For more information regarding the Okanagan Transmission Reinforcement Project please contact:

1-866-4FORTIS (436-7847)
otrproject@fortisbc.com
www.fortisbc.com/otrproject.html

FortisBC Inc. is a Canadian owned electric utility operating in the southern interior of British Columbia.

Okanagan Transmission Reinforcement Project

FORTISBC

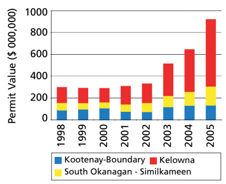
Okanagan Transmission Reinforcement Project

A Growing Region

Over the past 10 years the Okanagan has experienced significant growth. FortisBC is making system enhancements to ensure that customers have long-term, reliable power supply to service the residential and business growth in the Okanagan. The Okanagan Transmission Reinforcement (OTR) Project is a key component in FortisBC's 20 year system development plan, which involves major investments to upgrade our transmission and distribution infrastructure.

The Vaseux project, completed in fall 2005, installed a second strong energy source in the Okanagan. The OTR Project will further strengthen the Okanagan transmission system by delivering additional power from Vaseux Lake to supply electricity demand for growth, and to improve the reliability of power supply in the Okanagan.

With the forecast load growth for the area projected at 5% per year, the existing transmission line and the RG Anderson substation in south Penticton will reach their capacity by 2010. The recent growth will require that the transmission system be upgraded to provide the capacity to maintain service to customers even in the event of a major system component outage or malfunction.



The Project

Project Area

We are proposing to upgrade our existing transmission lines from 161kV to 230kV between Vaseux Lake and Oliver, and Vaseux Lake and Penticton, and adding an additional 230kV line to the north between Vaseux Lake and Penticton.

The Substations

The OTR Project includes modifications to the Oliver, Vaseux and RG Anderson (south Penticton) substations. We are also proposing to build a new substation east of the existing Oliver substation as part of this upgrade.

The Environment

Sustaining and enhancing the environment in our service area is a priority. The OTR Project Team includes environmental specialists who understand the local environment including Species at Risk, Protected Areas and Special Grasslands. OTR Project planners will consider environmental impacts as part of the application submitted to the BC Utilities Commission for approval of the project. The environmental specialists prepare a detailed Environmental and Social Impact Assessment (ESIA) prior to construction identifying how the environment may be impacted by the OTR Project. Following the development of the ESIA, a comprehensive site-specific Environmental Management Plan (EMP) will be prepared to delineate sensitive areas and describe measures to avoid, prevent, or mitigate anticipated environmental impacts. Local, provincial and federal environmental agencies and environmental organizations will be consulted during the development of the ESIA and EMP.

Electric and Magnetic Fields (EMF's)

We are sensitive to local stakeholder concerns regarding electrical facilities. In all locations along the OTR Project's proposed transmission and distribution line right of way, the EMF's will be within the public exposure guidelines supported by the World Health Organization.

Line and Station Aesthetics

Making a transmission line less obtrusive while still protecting public safety and environmental integrity is challenging. Upgrading from the existing 161kV to 230 kV lines requires taller structures to maintain safe clearance between the lines and the ground. While presenting some challenges, it also allows opportunities to change the type and height of these structures – something that we are discussing with stakeholders in this initial stage of public consultation.

The project also involves the construction of a new Bentley substation east of the existing Oliver station. Our goal is to design a substation with minimal visual impact on the surrounding area.

The Process

We are currently in the 'option review' stage of the OTR Project. A preferred option will be developed following the planning, preliminary engineering and initial consultation. We will present the preferred option in a second series of open houses tentatively set for May 2007. We will outline why we feel it is the best option to take forward to the BC Utilities Commission.

The preferred option will then be presented to the BC Utilities Commission as an application for a Certificate for Public Convenience and Necessity (CPCN).

Following CPCN approval, engineering could begin early in 2008 followed by construction of the new transmission lines and facilities starting in late 2008, with completion anticipated for 2010.

The construction of the line, its timing and description, will be communicated to the landowners along the line as well as those in the vicinity of our substations.

The Benefits

The predicted population growth in the Okanagan demands that we provide more electricity.

Enhanced transmission capability to the south Okanagan will give the region more flexibility to supply the current and future energy needs of the region. The project will provide an alternate supply from both the north and south reducing the risk of prolonged power outages.

FortisBC's investments in the electrical infrastructure in the Okanagan will increase the reliability in the region. It will also allow us to avoid electricity shortfalls that are currently projected to begin as early as 2010. The new transmission infrastructure will allow Okanagan business sectors, and communities to grow.

The Options

The OTR Project team is planning for the long-term. We are exploring a number of route options including using the existing right of way as well as relocating the line. A preferred transmission line option will be determined over the next few months as we go through the public consultation, planning, and preliminary engineering process.

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Backgrounder

The Public Need for Electricity

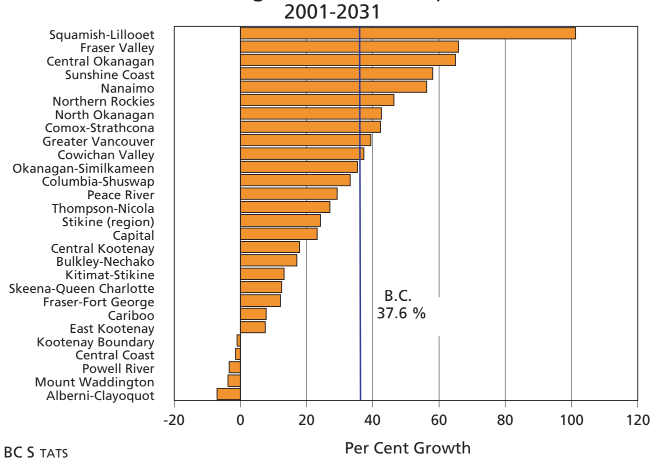
A Growing Region.
Over the past 10 years the Okanagan has experienced significant growth. FortisBC is making system enhancements to ensure that customers have long-term, reliable power supply to service the residential and business growth in the Okanagan. The Okanagan Transmission Reinforcement (OTR) Project is a key component in FortisBC's 20 year system development plan, which involves major investments to upgrade our transmission and distribution infrastructure.

The Vaseux Project, completed in fall 2005, installed a second strong energy source in the Okanagan. The OTR Project will further strengthen the Okanagan transmission system by delivering additional power from Vaseux Lake to supply electricity demand for growth, and to improve the reliability of power supply in the Okanagan.

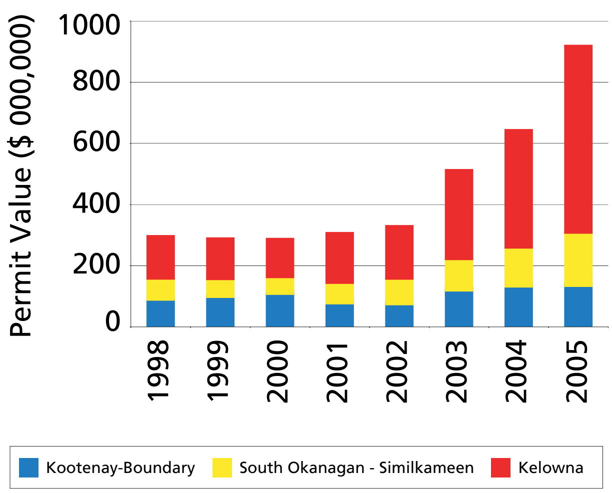
The Population is Increasing
According to the Provincial Government's BC Statistics branch, the population of the central, north and south Okanagan will grow significantly to 2031.

Increased Building Permits = Increased Energy Demands
Building permits for the Okanagan are on the increase, resulting in an increased public demand for electricity.

Figure 12
PEOPLE 31 Regional District Population Growth
2001-2031



BC STATS



For Further Information, contact us at:
Phone - 1-866-4FORTIS (436-7847)
E-mail - otrproject@fortisbc.com

Backgrounder

A Softer Footprint
The OTR Project and the Environment:

Ospreys are evident around the Okanagan.

Protecting Migratory Birds
At this time we are not aware of the OTR Project transmission line being in close enough proximity to critical flight paths around wetlands to be a concern. In addition, the transmission line runs parallel to the valley which is the same direction as migratory flights and is in terrain that would generally not be chosen for migratory flights except at very high altitude well above the terrain features and the transmission lines. Potential impacts resulting from this project on migratory birds will not be fully known until after the completion of the detailed Environmental and Social Impact Assessment.

Supporting Communities.
Environmental partnerships with the community and environmental groups demonstrate FortisBC's commitment to environmental stewardship. Over the past few years FortisBC has:

- Partnered with the South Okanagan Invasive Plant Society, the Boundary Weed Management Committee and the Central Kootenay Invasive Plant Committee on several invasive plant control programs.
- Worked with the Ministry of Environment and wildlife biologists to minimize power outages and electrocution risk to osprey.
- Been the primary sponsor of an environmental education program called the FortisBC Wild Festival for Youth – a program focused on promoting environmental responsibility and sponsorship to school-aged children.
- Helped our customers conserve approximately 23,000 megawatt hours of energy through the adoption of energy efficient upgrades through our PowerSense Program.
- Launched the Bright Ideas energy efficiency public awareness campaign.

Local initiatives include:

- Environmental enhancement projects related to the new Vaseux substation, that offset of sensitive antelope brush needle-and-thread grass plant community displaced by the substation footprint.
- Assisting the Lower Similkameen Indian Band in developing their Habitat Stewardship plan. This plan includes a special designation of over 500 acres of land to protect endangered plant and animal species.
- Providing support to the Osoyoos Desert Centre, an interpretive education and research facility offering insight into the area's sensitive desert ecosystem, its plants and animals.

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Backgrounder

A Softer Footprint
The OTR Project and the Environment:

FortisBC is committed to operating our business in an environmentally responsible manner. Sustaining and enhancing the environment and supporting the communities in our service area is a priority.

Protecting the environment
The Okanagan Transmission Reinforcement (OTR) project will identify the areas that require environmental management to ensure that measures are in place to avoid, prevent or mitigate any anticipated impacts. Our application for Certificate of Public Convenience and Necessity (CPCN) submitted to the BC Utilities Commission includes how the Project Team will consider environmental impacts.

The OTR Project includes environmental specialists who understand the local environment including species at risk, protected areas, special grasslands, and wildlife in general. Prior to construction, these specialists will prepare a detailed Environmental and Social Impact Assessment (ESIA) that identifies how the environment may be impacted by the OTR project. The detailed ESIA is expected to be completed by the fall of 2007.

Following the development of the ESIA, a comprehensive, site-specific, Environmental Management Plan (EMP) will be prepared to delineate sensitive areas and describe measures to avoid, prevent or mitigate anticipated environmental impacts. With project approval, we anticipate the EMP will be completed by late fall 2007. The EMP will be updated prior to construction to reflect detailed design.

Local, provincial and federal government agencies and environmental organizations will be consulted during the development of the ESIA and EMP.

Behr's Hairstreak Butterfly on Yarrow plant.

Species at Risk
The South Okanagan area is home to several Species at Risk (SAR) in Canada. SAR includes those listed federally and provincially. Examples expected on or near the vicinity of the OTR project facilities include: Pacific Gopher snake, Northern Pacific Rattlesnake, Pallid Bat, Spotted Bat, Behr's Hairstreak (butterfly), Lewis's Woodpecker, and California Bighorn Sheep.

General measures that may be included in the EMP to protect SAR may include:

- Behr's Hairstreak: relocating poles to avoid disruption of Antelope brush and Yarrow habitats with populations of hairstreak; timing work to avoid effects during critical life cycle phases.
- Big Horn Sheep: installing (where possible) new equipment and facilities away from critical lambing areas; timing work to avoid disturbance during critical life cycle stages (e.g. late winter stress and the lambing season); ensuring that suitable migratory corridors exist for Big Horn Sheep during construction activities; and avoiding or limiting the construction of new access roads to backcountry areas.

FORTISBC

Backgrounder

A Softer Footprint
The OTR Project and the Environment:

Relocating bitter root flower plant from the Vaseux substation.

Protected Areas and Parks
The Vaseux Protected Area is the only "protected area" directly affected by the OTR project. This protected area is comprised of two sites, including the Right Of Way (ROW) at Vaseux Creek (McIntyre) Canyon, the ROW east of the Vaseux substation, the ROW through Manuel's canyon east of the Vaseux substation and the ROW east of Vaseux Lake Park. This protected area was established as a wildland protected area primarily to preserve California Bighorn Sheep habitat including a key lambing area in the Vaseux Creek Canyon.

Potential impacts resulting from the OTR project on the Vaseux Protected Area will not be fully known until after the completion of the detailed Environmental and Social Impact Assessment.

Protecting the Big Horn Sheep
The Big Horn Sheep have adapted well to the existing right-of-way and continue to use the cliffs of the canyon for lambing. It will be important to ensure that right-of-way activities and disturbance are timed to avoid any disruption of this critical habitat area during its period of use. All reasonable route alternatives will be considered and compared based on the relative environmental, community, and economic costs and benefits. Based on initial evaluations, we think the most suitable location is to use the existing right-of-way through this area.

Potential impacts on bighorn sheep lambing areas resulting from the OTR project will not be fully known until after the completion of the detailed Environmental and Social Impact Assessment. Where feasible, smaller changes in engineering design will be considered e.g., height of structures, specific locations for structures etc., where these changes will provide improvements.

In addition, there are Nature Trust lands and Canadian Wildlife Service lands on or adjacent to the right-of-way which include examples of California Bighorn Sheep habitat and which will be included in our environmental assessment and analysis.

Mule deer are regulars around the area.

Protecting the Grasslands
Potential impacts to shrub steppe grasslands from the OTR Project will not be fully known until after the completion of the detailed Environmental and Social Impact Assessment.

Examples of general measures that may be included in the EMP to protect these areas may include:

- Where possible, adjusting engineering design (e.g pole locations) to avoid impacts to important, critically sensitive species within the grassland ecosystems.
- Avoiding or limiting the construction of new access roads to backcountry areas.
- Power-washing and inspecting all heavy duty equipment and vehicles before entering disturbed, and /or shrub steppe grassland areas to prevent weed transport and infestation.
- Inspecting and keeping all passenger vehicles free of soil, mud, and weeds (including their undercarriages) before entering disturbed, and /or shrub steppe grassland areas.
- Salvaging and relocating special vegetation prior to construction, as well as ensuring that reclamation and revegetation efforts are implemented with the use of native plant species after construction.

In addition, Nature Trust land located adjacent to the Vaseux substation and near Vaseux Creek was obtained during construction of that substation with the support of FortisBC -- for the purpose of preserving endangered antelope brush needle-and-thread grass vegetation community, and habitat for various SAR in the project area.

Protecting Local Snakes
Potential impacts of the OTR Project on local snakes cannot be fully determined until after the completion of the detailed Engineering design of the project and the Environmental and Social Impact Assessment (ESIA). The ESIA will include field investigations and inventories for dens. Following completion of the ESIA, a detailed site-specific EMP will be prepared to delineate sensitive areas and describe measures to avoid, prevent, or mitigate anticipated impacts to reptiles.

Examples of general measures for protection of local reptiles include:

- Not installing poles installed within 15 metres of known snake dens.
- Timing clearing and construction activities to avoid migration periods.
- Where poles cannot be immediately installed, (i.e. blasting and drilling in remote locations), covering pole holes to prevent reptile access.
- Creating habitat piles along the ROW providing temporary dens and cover from predators and habitat for prey.

Gopher snakes are another key aspect of our wildlife studies.

Backgrounder

FAQs About the OTR Project (cont'd)

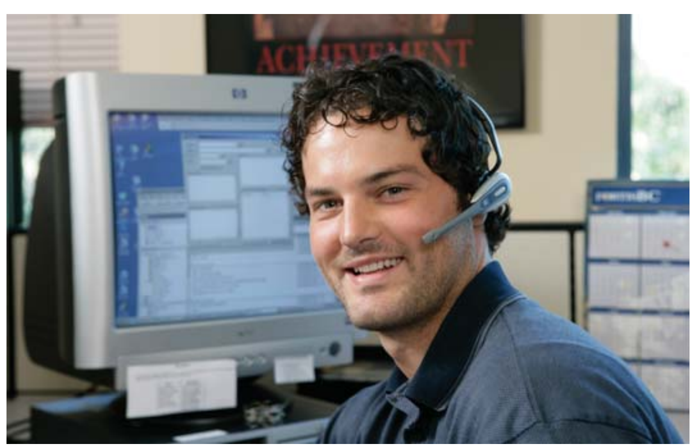
7) Economics

a) What are you basing your expansion on? What are your economic projections?

A - The Okanagan has experienced economic growth at a rate of approximately 4 - 5% per annum, which is well over the national average of 1 - 2%. It is important that we meet the needs of our growing customer base.

b) Why do we need this power now? Can't we wait?

A - The Okanagan has grown considerably over the past years, and we've worked hard to keep up with that growth. This project is needed because of the increased demand for electricity driven by residential and business growth in the Okanagan area over the past 10 years. The enhanced transmission capability to the south Okanagan will give the region more flexibility to supply the future energy needs of the region. The project will also provide an alternate supply from both the north and south, reducing the risk of prolonged power outages.



8) Public Consultation

a) What is your public consultation process for this project?

A - FortisBC is committed to open dialogue with our customers where new facilities are required. We will be having open houses with residents in Penticton, Okanagan Falls and Oliver which will discuss the project need and will seek public input to help us identify potential issues and concerns. Once preliminary planning and engineering have been completed, we will be holding additional open houses to present and review the preferred option proposal developed for submission to the BC Utilities Commission.

We've already started informal meetings with key stakeholders in the area, including First Nations.

b) How and where will public input be used on this project?

A - Our objective is to put forward an option that balances environmental, social and economic impacts, while taking into consideration constructability and customer rates. That option will be determined over the next few months as we go through the planning, preliminary engineering and consultation process. Public input is vital in meeting this objective.

c) Will you be reporting back to the public on how their input is being used for this project?

A - We have tentatively scheduled additional open houses in May 2007 where we will present and review the preferred option. This option will be the one that balances environmental, social and economic impacts while taking into consideration constructability and customer rates.

For Further Information, contact us at:
Phone - 1-866-4FORTIS (436-7847)
E-mail - otrproject@fortisbc.com

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Backgrounder

FAQs About the OTR Project

1) The Project

a) Why are you doing this project now?

A - This project is needed because of increased demand for electricity, driven by the residential and business growth in the Okanagan over the past 10 years. The proposed additional supply from the Vaseux substation will increase reliability of power supply in the Okanagan.

b) How many lines are you proposing to add to the existing lines?

A - Presently there is one 161kV line from Vaseux Lake to Penticton and one 161kV line from Vaseux Lake to Oliver. We are proposing to upgrade both of these lines to the north and south of Vaseux Lake to 230kV, in order to meet capacity needs. We are also proposing to add an additional 230kV line to the north from Vaseux Lake to Penticton, thus further increasing reliability in both the Penticton and Kelowna areas.

c) When will the project start?

A - We need to apply to the BC Utilities Commission first, which we hope to do by July 2007. If our application is approved, we expect to start engineering in early 2008 followed by construction of the new transmission lines and facilities starting in late 2008, with completion expected by 2010.

d) How long will the project take – start to finish?

A - Two to three years after project approval from the BC Utilities Commission.

e) What is the cost of the project – and who's paying for it?

A - Approximately $70 million. All FortisBC customers will pay for this project under customer rates set with approval of the BC Utilities Commission. We anticipate an increase of approxiately 2 to 3% as a result of this project.

f) How will this project really benefit me?

A - More reliable electrical power in the long term.

2) Line Corridor Location

a) What is the location of the proposed new line?

A - Our preferred route is on the existing transmission line right-of-way because there are existing lines there and it may be more cost-effective and less environmentally-invasive than building a new corridor.

b) Are you prepared to look at other transmission corridor routing options?

A - Yes, our objective is to put forward the routing option that balances environmental, social and economic impacts while considering constructability and customer rates. The existing route meets these criteria. However, the final route will be determined over the next few months as we go through the planning, preliminary engineering and a public consultation process.

Backgrounder

FAQs About the OTR Project (cont'd)

3) Substation Construction

a) Why are you building a new substation and changing the existing substation in Oliver?

A – The existing Oliver substation site is physically too small. We need a new transmission substation to handle the additional equipment required to meet power needs in the Okanagan.

b) What changes are you going to be making to the Vaseux substation?

A – There will be a new line from Vaseux Lake to Penticton added to the substation via the corridor to the east. Also, there will be some equipment added within the substation, but there won't be any noticeable changes to the substation appearance.

c) What about the RG Anderson substation in south Penticton – any changes there?

A – A new line from Vaseux Lake to Penticton to will be added to the substation via the corridor to the south. Also, there will be some equipment added within the substation, but it should not create any noticeable changes to the substation appearance. The station transmission voltage already includes 230kV; the upgrade will convert the other half of the substation from 161kV to 230kV. One of the main transformers will be replaced by a newer one.

4) Visual Impact of Lines

a) Will the new line be another line with other poles?

A – We're proposing to have the new line and existing line between Vaseux and Penticton located on new steel pole structures. The line to be re-built from Vaseux Lake south to Oliver will be rebuilt primarily using new steel or wood pole structures.

b) What are our options to make the transmission corridor look better?

A – We're looking at various structure types in terms of line carrying efficiency. There may be an opportunity in some areas to use structures that have less visual impact.

c) Why don't you put the line underground?

A – Due to the nature of the type of terrain for the proposed line route, underground transmission lines may not be technically feasible. Underground transmission lines are also approximately ten times more expensive than overhead lines. Because our customers bear the costs of this project it is important that we manage this.

5) Environmental

a) What species are at risk in your corridor, and what are you doing to protect them?

A – The south Okanagan is home to several Species at Risk (SAR) in Canada. Species at Risk include those listed federally and provincially. Examples expected on or near the vicinity of the project facilities include: Pacific Gopher snake, Northern Pacific Rattlesnake, Pallid Bat, Spotted Bat, Behr's Hairstreak (butterfly), Lewis's Woodpecker, and California Bighorn Sheep.

Prior to any construction, a detailed Environmental and Social Impact Assessment (ESIA) will be under taken to identify the SAR likely to be affected by the project. The detailed ESIA is expected to be completed at the end of September 2007. Following completion of the ESIA, a detailed site-specific Environmental Management Plan (EMP) will be prepared to delineate sensitive areas and describe measures to avoid, prevent, or mitigate anticipated environmental impacts. Local, provincial, and federal environmental agencies and NGOs will be consulted during the development of the ESIA and EMP. The EMP is expected to be complete by the late Fall of 2007.

b) What impacts will your new lines have on the local protected areas and parks?

A - The Vaseux Protected Area is the only protected area directly affected by the project. This protected area includes the Right Of Way (ROW) at Vaseux Creek (McIntyre) Canyon, the ROW east of the Vaseux Lake Terminal Station, and the ROW through Manuel's Canyon east of the Vaseux substation. This protected area was established as a wildland protected area primarily to preserve California Bighorn Sheep habitat including a key lambing area in the Vaseux Creek Canyon.

Potential impacts resulting from this project on the Vaseux Protected Area will not be fully known until after the completion of the detail Environmental and Social Impact Assessment which is expected to be completed by the end of September 2007. Following completion of the ESIA, a detailed site-specific EMP will be prepared to delineate sensitive areas and describe measures to avoid, prevent, or mitigate anticipated impacts to the Vaseux Protected Area. The EMP is expected to be complete by the late Fall of 2007.

6) Public Safety

a) What are you doing about Electric and Magnetic Fields (EMF) that are produced by the new line?

A - Although Health Canada does not consider exposures to EMF from electrical devices and power lines to be associated with any known health concerns, FortisBC is sensitive to customers' concerns. In all locations along the transmission and distribution line right of way, the EMF levels associated with this specific project will be within the public exposure guidelines supported by the World Health Organization.

If residents would like further information, Health Canada's EMF guideline is set out in their document entitled "Electric and Magnetic Fields at Extremely Low Frequencies," which is available online at http://www.hc-sc.gc.ca/iyh-sv/environ/magnet_e.html.

b) Will the new lines be safer than the current ones?

A - All FortisBC facilities meet the highest safety standards in the utility industry.

Okanagan Transmission Reinforcement Project

Display Boards

Open House Series #1: March, 2007

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Welcome to Our Open House

Please sign in,
and help yourself to refreshments

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Okanagan Transmission Reinforcement Project

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What This Open House is All About

Our Open House is your opportunity to:

- Meet the OTR Project Team
- Learn about the Project
- Ask questions
- Provide feedback to us
- Sign up to receive project updates

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Okanagan Transmission Reinforcement Project

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Okanagan Transmission Reinforcement Project

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Who We Are

- Canadian-owned integrated electrical utility
- Formerly known as West Kootenay Power & Light from Trail, BC, established in 1897
- We serve approximately 152,000 customers in the southern interior of BC
- We plan to invest approximately $500,000,000 in electrical system improvements over the next 5 years
- We employ over 570 people in BC

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Okanagan Transmission Reinforcement Project

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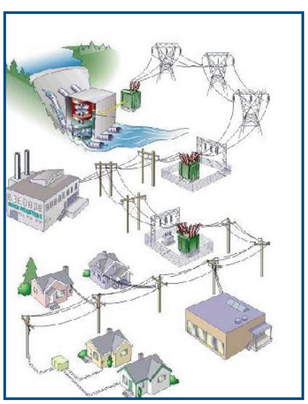
Our System



1) Hydroelectric dam - Water stored in the reservoir behind the dam flows through large pipes (penstocks) through turbine generators at the bottom of the other side of the dam. The water forces the turbines to spin, converting the spin energy into electrical energy.

2) Step-Up transformer - The electrical energy generated by the turbines has a low voltage. Therefore, a step-up transformer converts this low voltage to a high voltage. Voltage is the pressure that makes energy flow through electrical lines.

3) Grid high transmission lines - These are thick lines with high voltage (161-500 kilovolts) supported by tall metal towers that carry high voltage electricity long distances.

4) Terminal substations - These substations take the high voltage transmissions and step them down to subtransmission voltage that are transmitted through lower voltage, subtransmission lines.

5) Subtransmission lines - These lines, supported by large pole structures, distribute stepped down voltage (69-138 kilovolts) to large industrial users and distribution substations.

6) Distribution substations - These substations reduce voltages for distribution to residential, commercial and small and medium industrial users.

7) Local distribution lines - These lines are thick lines running on the top of tall wood poles that you see close to homes and businesses. Sometimes these lines run to underground transformers that distribute electricity via underground lines to homes.

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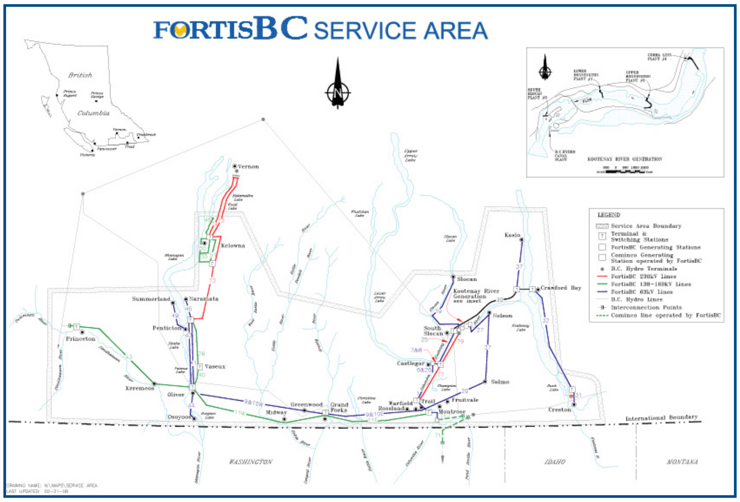

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What is the OTR Project?

A key component in maintaining safe and reliable electrical service to our customers.

Our proposal includes:

- **Upgrading existing transmission lines**
  - **between Vaseux Lake and Oliver from 161kV to 230kV**
  - **between Vaseux Lake and Penticton from 161kV to 230kV**
- **Adding an additional 230kV line to the north between Vaseux Lake and Penticton**
- **Building a new substation to the east of the existing Oliver substation**
- **Making modifications to the RG Anderson (south Penticton), Vaseux and Oliver substations**

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Okanagan Transmission Reinforcement Project

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What is the OTR Project?

- Over the past 10 years the Okanagan has experienced significant growth
- The OTR Project will further strengthen the Okanagan transmission system by delivering additional power from Vaseux Lake to supply electricity demand for growth, and to improve the reliability of power supply in the Okanagan
- With the forecast load growth for the area projected at 5% per year, the existing transmission line and the RG Anderson substation in south Penticton will reach their capacity by 2010
- This recent growth has meant that the transmission system must be upgraded to provide the capacity to maintain reliability to customers even in the event of a major system component outage or malfunction

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Continuing the Plan for a Growing Okanagan

- In 2003 the BC Utilities Commission approved the South Okanagan Supply (SOK) Project which built additional electrical capacity for the Okanagan. This project included the Vaseux substation and connection to the BC Hydro 500kV transmission system.
- The SOK Project was completed in 2005 and set the strategy for supplying electrical load growth in the Okanagan by providing the second strong source in the area from which transmission lines could deliver additional power to the Okanagan.
- In the planning and application for that project, FortisBC had evaluated a number of options to supply the Okanagan including options for other lines from Trail, from BC Hydro and gas-fired generation in the Okanagan. The Vaseux project was determined to be the best option of the group.
- The OTR Project is the follow-on project to Vaseux to increase the capacity of the Okanagan transmission system to deliver that power from Vaseux to a growing Okanagan region.

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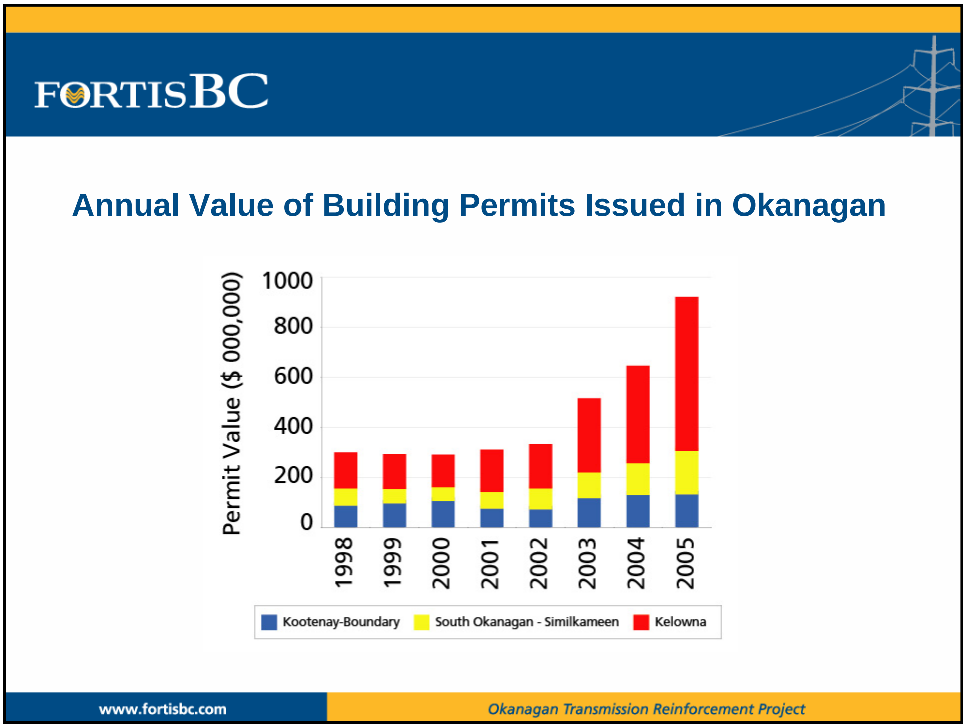

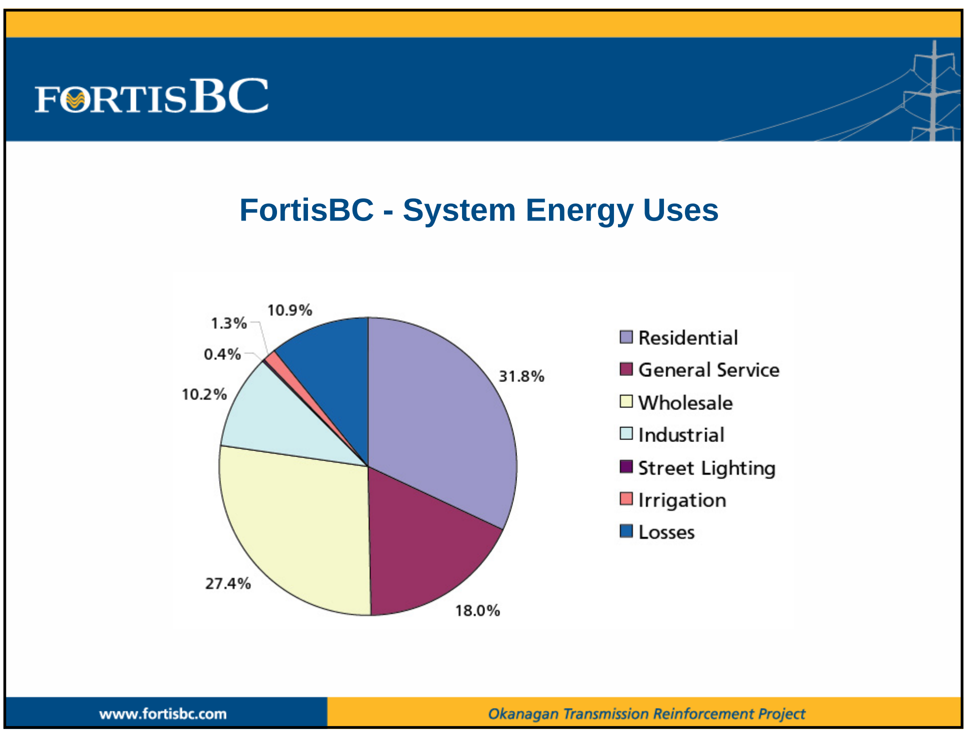

Okanagan Transmission Reinforcement Project

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Demand for Reliable Power

- Transmission upgrades are needed to increase capacity and reliability of power in the Okanagan
- The upgrades will strengthen the system connections to the north and south power sources so that if one major source is interrupted the second source will maintain supply to customers

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Okanagan Transmission Reinforcement Project

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Our Recent Projects...

Ellison Substation

FortisBC is proposing to build a substation in the Ellison area to meet the growing customer demand in north Kelowna

Big White Transmission Supply

Construction on the Big White Supply project began in November 2006. The project involves the construction of a new substation at Big White Village and a transmission line

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Our Recent Projects...

Black Mountain
FortisBC is proposing to build a substation in the Black Mountain area to meet the growing customer demand

Kettle Valley Distribution and Source Project
Construction on the Kettle Valley Distribution and Source Project will begin in March 2007. The project involves the construction of a new substation in Kettle Valley, upgrades to the electrical system and installation of a high speed communication system

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Okanagan Transmission Reinforcement Project

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Our Recent Projects...(cont'd)

Nk'Mip (East Osoyoos)
Construction on the Nk'Mip Project will begin in Spring 2007. This project involves building a substation on the east side of Osoyoos and the construction of electrical lines from Oliver to the substation in Osoyoos

South Okanagan Supply (Vaseux)
Construction on the Vaseux Project was completed in fall 2005. This project consisted of a new substation at Vaseux, located east of Vaseux Lake and Okanagan Falls, and some short line connections. The station connected to the BCTC/BC Hydro 500kV transmission system providing a new power supply source located in the south Okanagan

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Okanagan Transmission Reinforcement Project
Display Boards
Open House Series #1: March, 2007

FortisBC

Our Environmental Commitments

FortisBC is committed to operating our business in an environmentally responsible manner. Sustaining and enhancing the environment in our service area is a priority.

- The OTR Project includes environmental specialists who understand the local environment including species at risk, protected areas, special grasslands, and wildlife in general
- Our application submitted to the BC Utilities Commission will include how the project team considered environmental impacts
- Environmental specialists prepare a detailed Environmental and Social Impact Assessment (ESIA) prior to construction that identifies how the environment may be impacted by the OTR project
- Following the development of the ESIA, a comprehensive, site-specific Environmental Management Plan (EMP) is prepared to delineate sensitive areas and describe measures to avoid, prevent or mitigate anticipated environmental impacts
- Local, provincial and federal government agencies and environmental organizations will be consulted during the development of the ESIA and EMP

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Okanagan Transmission Reinforcement Project

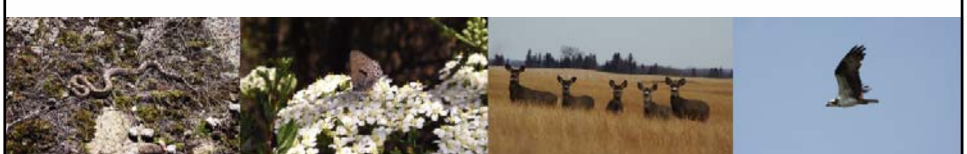
FortisBC

Our Environmental Record

FortisBC is committed to environmental stewardship.

In 2006 FortisBC:

- Partnered with the South Okanagan Invasive Plant Society, the Boundary Weed Management Committee and the Central Kootenay Invasive Plant Committee on several invasive plant control programs
- Worked with the Ministry of Environment and wildlife biologists to minimize power outages and electrocution risk to osprey
- Was the primary sponsor of an environmental education program called the FortisBC Wild Festival for Youth - a program focused on promoting environmental responsibility to school-aged children
- Helped our customers conserve approximately 23,000 megawatt hours of energy through the adoption of energy efficicient upgrades through our PowerSense Program



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Okanagan Transmission Reinforcement Project

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The Vaseux Project (Completed 2005)

Environmental Measures Undertaken:

- Care was taken to minimize disturbances of sensitive vegetation and protected areas
- A probable prehistoric shelter was identified. The structures for the 230kV line were placed to avoid the site
- Special snake exclusion fencing and grates were designed and constructed to prevent snake mortality and to avoid human contact
- Plant salvage was conducted prior to clearing the facility site
- Plants were replanted in a variety of areas to help re-establish the antelope brush needle and thread grass vegetation community in other areas
- Wildlife trees/snags were created from the large Ponderosa Pine that were located on the terminal station site. Lewis's woodpecker (a blue listed threatened species) were observed nesting and foraging on the trees within one season
- FortisBC worked closely with neighbours and adjusted schedules and timing of activities to ensure constructon activities creating the most noise were mitigated

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The Vaseux Project (Completed 2005)

Substation (inside – opening day)

Completed

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Okanagan Transmission Reinforcement Project
Display Boards
Open House Series #1: March, 2007

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Our Plan for Growth – The Path of Least Impact

- Our objective is to put forward a transmission line and substation option that balances environmental, social and economic impacts
- In addition, it will provide a cost-effective solution for our customers and long-term investment for the energy needs of the Okanagan

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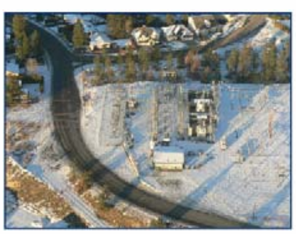
Our Plan for Growth – Substation Upgrades

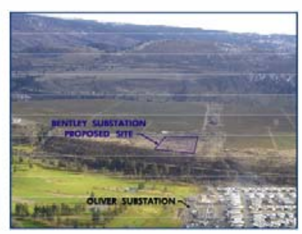


RG Anderson Substation (south Penticton)

- Additional transmission line in
- Additional equipment in substation

Vaseux Terminal (construction 2005)

- Additional transmission line in
- Additional equipment in substation



Oliver Proposed Bentley Substation

- Proposed Bently substation
- Modifications to existing Oliver substation

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Display Boards
Open House Series #1: March, 2007

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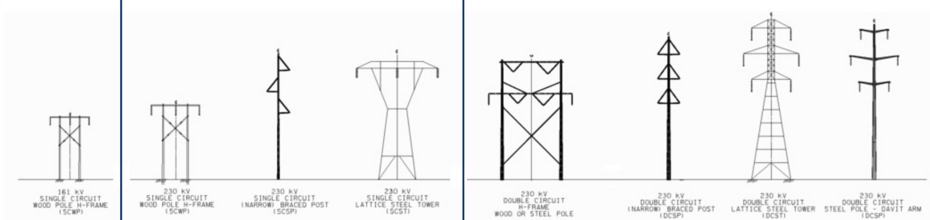
Our Plan for Growth – Structure Options for the Proposed Lines



Typical Existing 161kV Structure	Options for Oliver to Vaseux	Options for Vaseux to RG Anderson

Note: FortisBC is not considering lattice steel structures

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Community Safety

FortisBC is:

- Committed to protecting the safety of our employees and customers
- Committed to educating the community about the dangers of electricity
- A leader in community outreach safety intiatives

Safety and Electric Magnet Fields (EMF's):

- EMF's are found everywhere electricity is used from house wiring and household appliances to electric power facilities such as substations and electrical lines. Health Canada does not consider exposures to EMF's from electrical devices and power lines to be associated with any known health risk

FortisBC is sensitive to customer's concerns.

- In all locations along the transmission and distribution line right of way, the EMF levels associated with the OTR Project will be within the public exposure guidelines supported by the World Health Organization

(For more information please go to the FortisBC website (www.fortisbc.com) – under Safety and Environment – Electric and Magnetic Fields)

www.fortisbc.com | *Okanagan Transmission Reinforcement Project*

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Okanagan Transmission Reinforcement Project
Display Boards
Open House Series #1: March, 2007

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The BC Utilities Commission Approval Process

(www.bcuc.com)

- Based on preliminary engineering, environmental screening and public consultation, FortisBC will develop a preferred option for the OTR Project
- FortisBC will then apply to the BC Utilities Commission (BCUC) for a Certificate of Public Convenience and Necessity (CPCN)
- FortisBC must show that the new system or extension is viable, in the public's interest, and is necessary
- The BCUC may hold a written or oral hearing process for further public review
- The BCUC will take public concerns and suggestions into account prior to rendering a decision

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Okanagan Transmission Reinforcement Project

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The Next Steps

Keeping you informed

- If we have your contact information, we'll send you a summary of the input we received from our open houses

Opportunity for further review

- We'll hold open houses, tentatively set for May 2007 to present and review the "preferred option" for the OTR Project.
- This will be an opportunity for you to see and comment on our proposal to the BCUC

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Okanagan Transmission Reinforcement Project

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Okanagan Transmission Reinforcement Project

Display Boards

Open House Series #1: March, 2007

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We Need Your Input...

We hope we've answered your questions have your comments

Your input will help us in the final planning for the OTR Project

Please take a couple of minutes to fill out our questionnaire so that we

Thanks for taking the time to discuss the OTR Project with us!

www.fortisbc.com

Okanagan Transmission Reinforcement Project

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Okanagan Transmission Reinforcement Project

March 6-8, 2007

OTR Questionnaire

1) Now that you've gone through this Open House and have had the opportunity to learn about the Okanagan Transmission Reinforcement (OTR) Project, how do you feel about the project? (Please circle your choice)

   Very Positive 1 2 3 4 5 Very Negative

Please explain your choice.

____

____

____

____

2) Prior to this Open House, did you have any concerns about the OTR project? (Please circle your choice)

   Yes No

Please explain your choice.

____

____

____

____

3) Do you feel your questions were answered at this Open House? (Please circle your choice)

   Yes No

Please explain your choice.

____

____

____

____

4) Are there any other points we can follow up on that would make you feel more comfortable with our proposal to build the OTR project?

(Please circle your choice)

   Yes No

If yes, please list your points.

____

____

____

____

Additional comments about the OTR Project...

5) We will be having a second set of Open Houses (tentatively scheduled for May 2007) to present and discuss our preferred option proposal prior to our submission to the BC Utilities Commission. Are there any questions you still have about the OTR that we should follow up on in advance of the second set of Open Houses? (Please circle your choice)

Yes No

If Yes, please list your points.

____

____

____

____

6) Please tell us how useful the information was in this Open House.

a) Discussion Guide	- Very Useful	1	2	3	4	5	Not Useful
b) Backgrounder	- Very Useful	1	2	3	4	5	Not Useful
c) Display boards	- Very Useful	1	2	3	4	5	Not Useful
d) Experts	- Very Useful	1	2	3	4	5	Not Useful

7) How did you first hear about this Open House?
(Check one.)

Newspaper Ad ___ Printed invitation ___ Personal Invitation letter ___ Poster ___
Other ____- Please explain : ____________________

8) If you are interested in receiving information about our final proposal or about our next Open Houses, please provide us your contact information below. (Please print)

Name: ____________________ Phone: ____________
Mailing Address: ____________________________
E-mail address: __________________ Fax: ____________

9) What is the best way to contact you with new information about the OTR project?
(Please circle your choice)

Mail Fax E-Mail

10) To give us a better idea of the people attending this Open House, we would appreciate it if you would answer the following questions. (Please circle your choice)

a) Are you... Male Female
b) Live within 500 meters of existing Oliver/Penticton high voltage transmission line.
Yes No
c) How long have you lived in the Okanagan?
Less than 5 years 5 – 10 years 10 – 20 Years 20 years+

11) Are there any other comments you'd care to share with us? Please use space on the back of page 1.

Thank you very much for your comments. Please return this questionnaire to the questionnaire box in the refreshment area.

OTR Project Open Houses
March 6, 7 and 8, 2007

SUMMARY OF RESULTS

March 11, 2007

Summary of Attendance

Location	Date	Attendance	Completed Questionaires	
Oliver	6-Mar-07	34	23	68%
OK Falls	7-Mar-07	38	38	100%
Penticton	8-Mar-07	38	26	68%
Total		**110**	**87**	**79%**

Note: Some results may not add up to 100% due to incomplete questionaire responses.

1) Now that you've gone through this Open House and have had the opportunity to learn about the Okanagan Transmission Reinforcement (OTR) Project, how do you feel about the project?
Scale is 1 (Very Positive) to 5 (Very Negative)

1	2	3	4	5
25	22	18	8	11
29%	25%	21%	9%	13%

2) Prior to this Open House, did you have concerns about the OTR Project?

Yes	No
61	24
70%	28%

3) Do you feel your questions were answered at this Open House?
Please Circle Choice (Yes or No)

Yes	No	Somewhat
83	1	1
95%	1%	1%

OTR Project Open Houses
March 6, 7 and 8, 2007

SUMMARY OF RESULTS

March 11, 2007

4) Are there any other points we can follow up on that would make you feel more comfortable with our proposal to build the OTR project?
Please circle your Choice: (Yes or No)

Yes	No
41	37
47%	43%

5) We will be having a second set of Open Houses (tentatively scheduled for May 2007) to present and discuss our preferred option prior to our submission to the BC Utilities Commission. Are there any questions you still have about the OTR that we should follow up on in advance of the second set of Open Houses?
Please circle your Choice: (Yes or No)

Yes	No
18	52
21%	60%

6) Please tell us know useful the information was in this Open House:
Scale is 1 (Very Useful) to 5 (Not Useful)

Publication	1	2	3	4	5
a) Discussion Guide	32	21	20	1	1
	37%	24%	23%	1%	1%
b) Backgrounder	32	17	21	1	0
	37%	20%	24%	1%	0%
c) Display Boards	50	20	10	1	0
	57%	23%	11%	1%	0%
d) Experts	55	14	7	1	1
	63%	16%	8%	1%	1%

OTR Project Open Houses
March 6, 7 and 8, 2007

SUMMARY OF RESULTS

March 11, 2007

7) How did you hear about this Open House:
(Check one)

Newspaper Ad	30	34%
Printed Invitation	28	32%
Personal Invitation Letter	22	25%
Poster	0	0%
Other (Please explain)		
Newspaper Editorial	1	1%
Neighbour	7	8%
Friend	3	3%
Word of Mouth	2	2%
RDOS Director	2	2%
Email ?	1	1%
Bill stuffer?	1	1%

8) Names & Addresses - see consolidated listing

9) What is the best way to contact you - see consolidated listing

10) To give us a better idea of the people attending this Open House, we would appreciate it if you would answer the following questions:

a) Are You

Male	Female
58	29
67%	33%

b) Live withing 500 metres of existing Oliver/ Penticton high voltage transmission line

Yes	No
36	37
41%	43%

c) How long have you lived in the Okanagan?

<5 years	5 - 10 years	10 - 20 years	20 years +
13	14	18	39
15%	16%	21%	45%

FORTISBC

Pierre Dufour
Manager
Okanagan Transmission
Reinforcement Project

FortisBC Inc.
5th Floor, 1628 Dickson Ave.
Kelowna, BC V1Y 9X1
1-866-4FORTIS (436-7847)
otrproject@fortisbc.com
www.fortisbc.com/otrproject.html

April 11, 2007

Address

Dear ____________,

The public demand for electricity in the Okanagan has grown to such an extent that we have to increase our transmission line capacity to meet that demand. Last month we notified you that FortisBC was in the process of developing an application to the BC Utilities Commission to enhance the supply of electricity to the Okanagan. As part of our commitment to open dialogue with our customers, we extended an invitation to you and the public to attend our March open houses to learn more about our Okanagan Transmission Reinforcement (OTR) Project.

We appreciate the time you and others took to learn more about the project and why it is needed, and also to help us identify potential issues, concerns and opportunities for us to improve the project plan.

To help us gather valuable feedback, we asked participants to complete a questionnaire about the OTR project. A majority of participants responded, and the results indicated that the majority of attendees felt neutral to very positive about the OTR Project. However, some identified concerns regarding viewscapes, property values, EMF, environmental issues and tower sizes. Following the open houses additional input was received from customers that will be added to the public consultation record.

As a result of this feedback, as well as the due diligence required by the BC Utilities Commission, FortisBC is currently looking at various route options for the transmission line upgrades. These options include the re-use of the existing right-of-way between Oliver and Penticton, as well as other alternate routes.

Our objective is to put forward a preferred routing option to the BC Utilities Commission that best balances environmental, social and economic impacts while considering constructability and customer rates. This final route will be determined over the next few months as we go through the planning, preliminary engineering and public consultation.

FortisBC will host a second series of open houses in mid to late May to present our preferred project option proposal. We will be advising you, our customers, stakeholders and the public of the exact timing of these open houses early May. We encourage you to attend the next series of open houses, learn about the proposal, and provide your valuable feedback to the project.

If you have any questions or concerns please do not hesitate to call or email me directly.

Sincerely,

Pierre Dufour,
Manager, Okanagan Transmission Reinforcement (OTR) Project
FortisBC Inc.
Tel: 1-866-4FORTIS (1-866-436-7847)
Email: otrproject@fortisbc.com

FORTISBC

Pierre Dufour
Manager
Okanagan Transmission
Reinforcement Project

FortisBC Inc.
5th Floor, 1628 Dickson Ave.
Kelowna, BC V1Y 9X1
www.fortisbc.com
otrproject@fortisbc.com
www.fortisbc.com/otrproject.html

September 19, 2007

Address

Dear _____________:

Re: Okanagan Transmission Reinforcement Project

As indicated in our letter to you on June 20, 2007, FortisBC has been preparing an application for Okanagan Transmission Reinforcement (OTR) Project for submission to the BC Utilities Commission (BCUC). We originally planned to submit our application by July 2007. However, further engineering and environmental analysis are required to ensure we present comprehensive information to the BCUC. A number of studies will be completed over the next few months and we expect to submit our application in December 2007 or January 2008.

Over the last few months we have continued consultation with landowners, municipalities, regional districts, chambers of commerce, First Nations groups and environmental organizations in the region to provide information on the project and to obtain their feedback. FortisBC is also in the process of updating the Environmental and Social Impact Assessment (ESIA) for the OTR Project and this requires feedback from a number of environmental organizations.

We have continued to review all viable options and feedback received throughout public consultation will be included in our application. Our objective is to bring forward a project option to the BCUC that best balances environmental, social and economic impacts while considering constructability and customer rates.

If you have any questions or concerns, please do not hesitate to call or email me directly.

Sincerely,

Pierre Dufour,
Manager, Okanagan Transmission Reinforcement (OTR) Project
FortisBC Inc.
Tel: 1-866-4FORTIS (1-866-436-7847)
Email: otrproject@fortisbc.com

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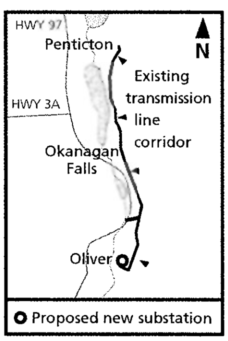
An Invitation to You To Attend Our Open Houses...

Okanagan Transmission Reinforcement Project

This project is one of many taking place throughout the FortisBC service area aimed at replacing aged infrastructure and meeting growing customer electrical load requirements.



FortisBC Inc. is a Canadian owned electric utility operating in the southern interior of British Columbia.

The Okanagan Transmission Reinforcement (OTR) Project is being proposed to meet the growing public demand for electricity in the Okanagan by developing additional transmission capacity. FortisBC is proposing to:

- Upgrade existing transmission lines from 161kV to 230kV between Vaseux Lake and Oliver, and Vaseux Lake and Penticton, and add an additional 230kV line to the north between Vaseux Lake and Penticton.
- Modify the Oliver, Vaseux and South Penticton's RG Anderson substations.
- Build a new substation east of the existing Oliver substation.

As a follow-up to our initial open houses held in March 2007, FortisBC will be hosting a second series of open houses.

- **Oliver** – Tuesday, May 22, 2007, 4:00pm - 8:00pm
  Tuc-el-Nuit Elementary School Gym,
  36850 - 79 Street
- **Okanagan Falls** – Wednesday, May 23, 2007, 4:00pm - 8:00pm
  Okanagan Falls Elementary School Gym,
  1141 Cedar Street
- **Penticton** – Thursday, May 24, 2007, 4:00pm - 8:00pm
  Skaha Lake Middle School Gym,
  110 Green Avenue West

For more information,
Phone - 1-866-4FORTIS (436-7847)
E-mail - otrproject@fortisbc.com
Website - www.fortisbc.com/otrproject.html

www.fortisbc.com

Insertion Dates (Open House Series #2)

Oliver Chronicle:
May 9 and 16, 2007
Penticton Western News:
May 9, 13, 16 and 20, 2007
Penticton Herald:
May 9, 12, 16 and 19, 2007
Okanagan Falls Review:
May 10 and 17, 2007

Open House Series #2 May 2007

FORTISBC

An Invitation to You

To Attend Our Open Houses...

FortisBC is in the process of developing an application to the BC Utilities Commission to enhance the supply of electricity to the Okanagan. The Okanagan Transmission Reinforcement (OTR) Project is being proposed to meet the growing public demand for electricity in the Okanagan by developing additional transmission capacity.

As a follow-up to our initial open houses held in March 2007, FortisBC will be hosting a second series of open houses. The objective will be to give local area residents an opportunity to learn more about the OTR Project and to provide feedback on our preferred option proposal.

Learn more about the OTR Project at our open houses at the following locations from 4:00pm to 8:00pm:

- **Oliver – Tuesday, May 22, 2007**
  Tuc-el-Nuit Elementary School Gymnasium,
  36850 – 79th Street, Oliver, B.C.
- **Okanagan Falls – Wednesday, May 23, 2007**
  Okanagan Falls Elementary School Gymnasium,
  1141 Cedar Street, Okanagan Falls, B.C.
- **Penticton – Thursday, May 24, 2007**
  Skaha Lake Middle School Gymnasium,
  110 Green Avenue West, Penticton, B.C

FortisBC Inc. is a Canadian owned electric utility operating in the southern interior of British Columbia.

Okanagan Transmission Reinforcement Project

This project is one of many taking place throughout the FortisBC service area aimed at replacing aged infrastructure and meeting growing customer electrical load requirements.

www.fortisbc.com

Okanagan Transmission Reinforcement Project

Open House Series #2 May, 2007

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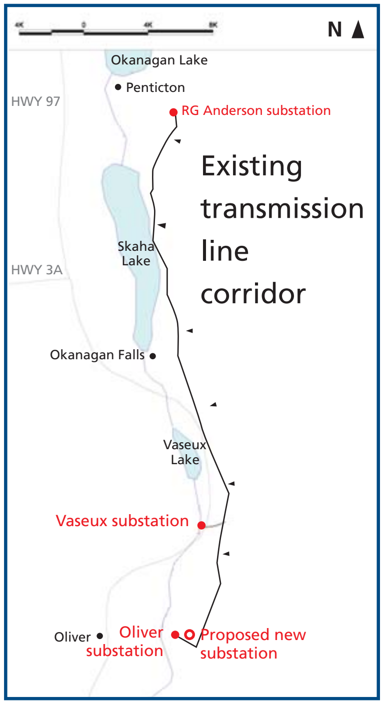

The Growing Demand for Electricity

Over the past 10 years the Okanagan has experienced significant growth. FortisBC is making system enhancements to ensure that customers have long-term, reliable power supply to service the residential and business growth in the Okanagan. The Okanagan Transmission Reinforcement (OTR) Project is a key component in FortisBC's 20 year system development plan, which involves major investments to upgrade our transmission and distribution infrastructure.

The Project

- Upgrades to existing transmission lines from 161kV to 230kV between Vaseux Lake and Oliver, and Vaseux Lake and Penticton, and adding an additional 230kV line to the north between Vaseux Lake and Penticton.
- Modifications to the Oliver, Vaseux and RG Anderson (east Penticton) substations.
- Construction of a new substation east of the existing Oliver substation.

Our Public Consultation

We are committed to open dialogue with our customers, First Nations and stakeholders. Open houses in March 2007 gave local residents the opportunity to learn more about the project, discuss why it is needed and helped us identify potential issues, concerns and opportunities for us to improve our preferred OTR option proposal.

We have now completed our preliminary planning and engineering of various substation and route options and have developed our preferred OTR option proposal. Open houses this month will lay out our proposal for discussion with the public. Following these open houses, we will submit our proposal to the BC Utilities Commission for approval.

Our objective is to put forward a project option that best balances environmental, social and economic impacts.

For Further information, contact us at:
Phone: 1-866-4FORTIS (436-7847)
E-mail: otrproject@fortisbc.com
Website: www.fortisbc.com/otrproject.html

www.fortisbc.com

Okanagan Transmission Reinforcement Project

FORTISBC

Pierre Dufour
Manager
Okanagan Transmission
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5th Floor, 1628 Dickson Ave
Kelowna, BC V1Y 9X1
1-866-4FORTIS (436-7847)
otrproject@fortisbc.com
www.fortisbc.com/otrproject.html

May 7, 2007

Address

Dear _________,

It's no secret that the Okanagan is growing steadily and requires more electricity for this growth. As a result, FortisBC is moving ahead with our Okanagan Transmission Reinforcement (OTR) Project application to the BC Utilities Commission (BCUC) to expand our system in the south Okanagan. It consists of line and substation upgrades between Oliver and Penticton.

The reason for my letter is to let you know that our application will be including a new alternate route option that may impact on your Crown land license area between Shuttleworth Creek and south Penticton on the upland elevation to the east of Skaha Lake. This routing was suggested as an alternative at our initial OTR public consultation open houses in March 2007, at which time we suggested that our preferred option route was along the existing transmission line right of way which runs at a lower elevation.

We feel it is important for you to be aware of the possibility of the alternate transmission line route option. I would encourage you to attend our second set of open houses later this month to ensure that you understand our project and to provide input to us for both transmission line route options.

The objective of these open houses will be to give local area residents an opportunity to learn more about our preferred option proposal for the OTR Project and to provide further feedback to us.

Oliver – 4 pm – 8pm, Tuesday, May 22, 2007
- Tuc-el-Nuit Elementary School Gym, 36850 – 79 Street

Okanagan Falls, 4 pm – 8pm, Wednesday, May 23, 2007
- Okanagan Falls Elementary School Gym, 1141 Cedar Street

Penticton, 4 pm – 8pm, Thursday, May 24, 2007
- Skaha Lake Middle School Gym, 110 Green Avenue West

Our objective is to put forward a project option to the BC Utilities Commission that best balances environmental, social and economic impacts while considering constructability and customer rates.

I look forward to seeing you at one of these open houses. If you have any questions or concerns, please do not hesitate to call or email me directly.

Sincerely,

Pierre Dufour,
Manager, Okanagan Transmission Reinforcement (OTR) Project
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Tel: 1-866-4FORTIS (1-866-436-7847)
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otrproject@fortisbc.com
www.fortisbc.com/otrproject.html

May 7, 2007

Address

Dear __________,

As I indicated in my previous letter, FortisBC is moving ahead with the application process to the BC Utilities Commission (BCUC) to expand our system in the south Okanagan. It's no secret that the Okanagan is growing steadily and requires more electricity for this growth.

At our initial open houses in March 2007, we received very useful feedback to help in the planning and preliminary engineering of the Okanagan Transmission Reinforcement (OTR) Project. We've incorporated that input along with other input received from interested parties subsequent to those open houses into the development of our preferred option proposal and a possible alternate route option. At our March open houses, we clearly laid out our commitment to have a second set of open houses to present the preferred project option we plan to use in our application to the BCUC.

We would like to invite you to attend our follow-up open houses this month. The objective of these open houses will be to give local area residents an opportunity to learn more about our preferred option proposal for the OTR Project and to provide further feedback.

Oliver – 4 pm – 8pm, Tuesday, May 22, 2007

- Tuc-el-Nuit Elementary School Gym, 36850 – 79 Street

Okanagan Falls, 4 pm – 8pm, Wednesday, May 23, 2007

- Okanagan Falls Elementary School Gym, 1141 Cedar Street

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Email: otrproject@fortisbc.com

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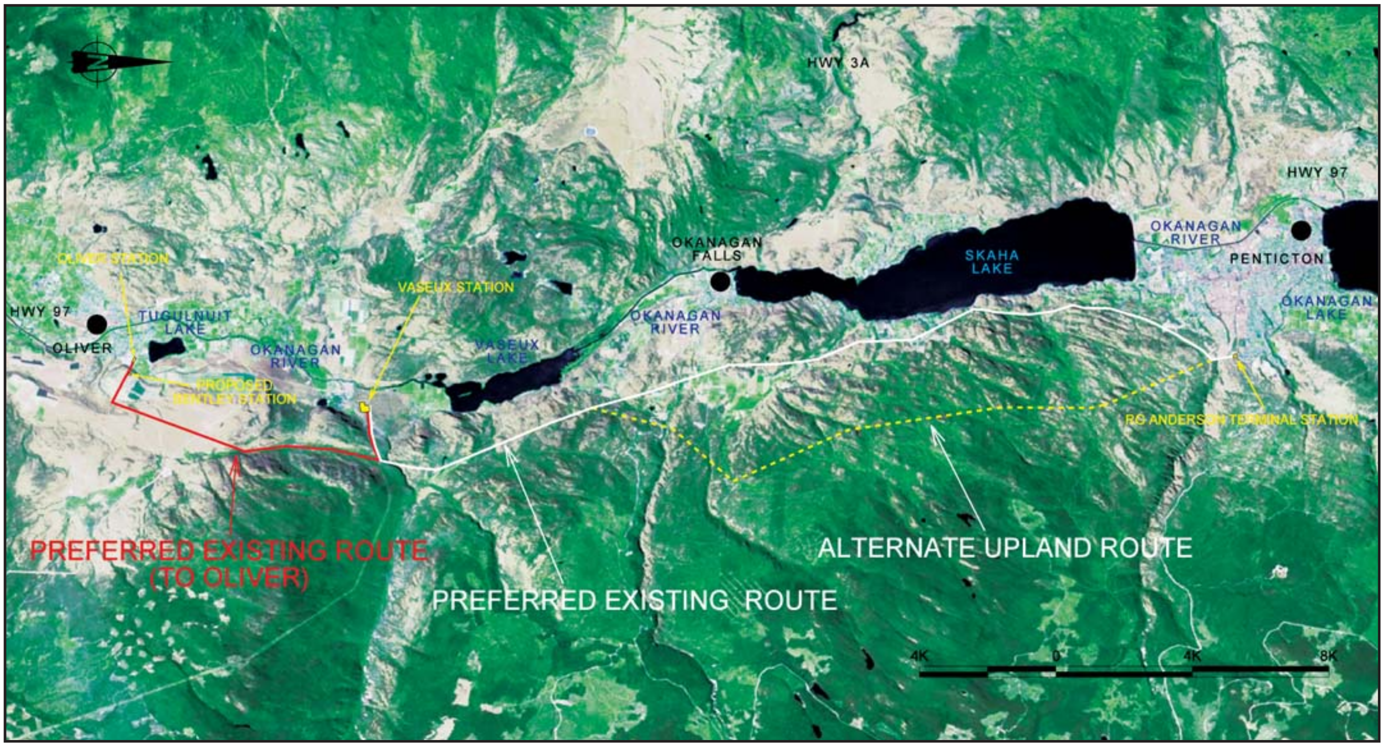
Discussion Guide

Okanagan Transmission Reinforcement Project

FORTIS BC



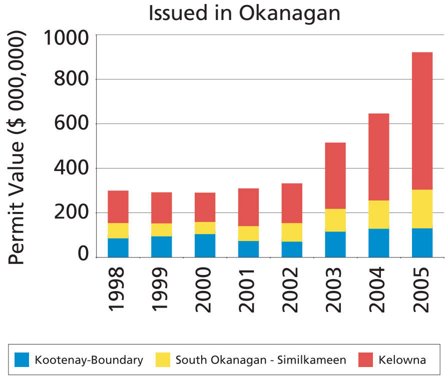
A Growing Region

The Okanagan has experienced significant growth over the past decade and this trend is expected to continue. FortisBC is making system enhancements to ensure that customers have long-term, reliable power supply to service the residential and business growth in the Okanagan. The Okanagan Transmission Reinforcement (OTR) Project is a key component in FortisBC's 20 year system development plan, which involves major investments to upgrade our transmission and distribution infrastructure.

The Vaseux project, completed in fall 2005, installed a second strong energy source in the Okanagan. The OTR Project will further strengthen the Okanagan transmission system by delivering additional power from Vaseux to supply electricity demand for growth, and to improve the reliability of power supply in the Okanagan.

With the forecast load growth for the area projected at 5% per year, the existing transmission line and the RG Anderson substation in east Penticton will reach capacity by 2010. This growth will require that the transmission system be upgraded to provide the capacity to maintain service to customers even in the event of a major system component outage or malfunction.

Annual Value of Building Permits Issued in Okanagan



Okanagan Transmission Reinforcement Project

The Project

Project Area
We are proposing to upgrade our existing transmission lines from 161 kilovolt (kV) to 230 kV between Vaseux Lake and Oliver, and Vaseux Lake and Penticton, and adding an additional 230 kV line to the north between Vaseux Lake and Penticton.

The Substations
The OTR Project includes modifications to the Oliver, Vaseux and RG Anderson (east Penticton) substations. We are also proposing to build a new Bentley substation east of the existing Oliver substation as part of this upgrade.

The Benefits

The predicted population growth in the Okanagan demands that we provide more electricity.

Enhanced transmission capability to the South Okanagan will allow more flexibility to supply the current and future energy needs of the region. The project will provide an alternate supply from both the north and south reducing the risk of prolonged power outages.

FortisBC's investments in the electrical infrastructure in the Okanagan will increase the reliability in the region. It will also allow us to avoid electricity shortfalls that are currently projected to begin as early as 2010. The new transmission infrastructure will allow Okanagan business sectors and communities to grow.

Proposed Bentley substation site

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Existing poles and transmission line in Skaha Lake area

Proposed single steel pole design in Skaha Lake area

Our Preferred Option Proposal

The OTR Project team explored a number of route options over the past months including using the existing right-of-way as well as relocating the line. An alternate higher elevation route was investigated following feedback received during our first public consultation open houses.

Based on preliminary research, our preferred route continues to be along the existing transmission line right-of-way that was established in 1963. Overall the existing route best balances environmental, social and economic impacts.

Comparing the Routes

Following the request of some stakeholders, we developed the upland alternative routing for the transmission line above the residential area on the east side of Skaha Lake. Initial assessments of this route indicate that there could be significant negative impacts on the environment and tenure holders, and that engineering and construction costs would be higher than if we used existing right-of-way.
A comparison of our preferred option and the upland alternative route is on the next page.

Okanagan Transmission Reinforcement Project

Preferred Option Proposal

(Based on single pole steel construction & 40 meter right-of-way)

Options	Advantages	Concerns
Existing right-of-way route	• Least environmental impacts • Utilizes an existing corridor in place since 1963 • Easier access for construction and maintenance • Lowest cost for ratepayers	• Increased visual/aesthetic impacts • Increased disturbance during construction to residents (ie, increased sound levels and dust associated with vehicles and equipment) • Some disturbance to established vegetation communities on the right-of-way • Risk of further spread of existing populations of invasive plant species along the right-of-way • Species at Risk are established in unique features on or adjacent to the right-of-way including skinks and snakes • More residential owners are present along the route • Crosses Protected Areas
Upland alternate route	• Fewer residential owners along the route • Least visual/aesthetic impacts • Lower construction disturbance activities to residents (ie sound levels, dust and traffic from trucks and equipment)	• Most environmental impacts: - Reduction in bird habitat due to right-of-way clearing - Reduction in the type of protective cover for Bighorn Sheep and other large mammals - Creates new access and associated disturbance to wildlife in remote areas during critical life cycles during and following construction - Creates potential new areas for the spread of invasive species (weeds) - Removes some old timber which may have habitat potential for bats (ie, daytime roosts) - Expected to impact Species at Risk • Higher costs for ratepayers • More difficult access for construction increasing the capital cost of the transmission line • More difficult access for operations, maintenance, and outage response • Crosses traditional use areas of First Nations • Project delays and associated costs of establishing new right-of-way • Various tenure types may be affected by the new right-of-way: - Grazing Leases - Forest/Timber Licenses - Guiding and Outfitting - Mineral Rights - Water Licences - Trapline Permits - Recreational Permits/Leases • Crosses Protected Areas

Preferred existing (white line) and alternative (yellow line) OTR transmission line routes on the east side of Skaha Lake

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Transmission Structures/ Line Aesthetics

Upgrading from the existing 161 kV to 230 kV lines requires taller structures to maintain safe clearance between the lines and the ground. While presenting some challenges, it allowed us to change the type and height of these structures – based on input we received from stakeholders in March 2007.

The proposed two-line transmission structures from Vaseux to Penticton will be changed from the 18-meter, double pole wooden structure, to 30-meter steel pole construction, putting the lines at a greater height from the ground. Generally they will be single pole construction. The construction will consist of flat-finish galvanized steel poles and non-glare conductors to minimize visual impact.

For the single transmission line from Vaseux to Oliver the proposed structures will be similar to the existing double pole wooden structures but about 10% larger and of steel construction for protection from wildfire.

Double steel pole with steel top beam proposed for Oliver to Vaseux transmission line (similar to existing structures shown above)

Single steel pole design proposed for Vaseux to Pentiction transmission line

Behr's Hairstreak Butterfly on Yarrow plant

Snake den in the Vaseux area

The Environment

Sustaining and enhancing the environment in our service area is a priority. The OTR Project Team includes environmental specialists who understand the local environment including Species at Risk, Protected Areas and Special Grasslands. FortisBC also utilizes First Nation expertise when carrying out environmental and archeological studies.

OTR Project planners completed initial screening of the environmental impacts of the OTR Project in order to assess the transmission route options. The screening results will be considered as part of the application submitted to the BC Utilities Commission for approval of the project.

The environmental specialists will prepare a detailed Environmental and Social Impact Assessment (ESIA) prior to construction identifying how the environment may be impacted by the OTR Project. Following the development of the ESIA, a comprehensive site-specific Environmental Management Plan (EMP) will be prepared to delineate sensitive areas and describe measures to avoid, prevent, or mitigate anticipated environmental impacts. Local, provincial and federal environmental agencies and environmental organizations will be consulted during the development of the ESIA and EMP.

Electric and Magnetic Fields (EMFs)

We are sensitive to local stakeholder concerns regarding electrical facilities. In all locations along the OTR Project's proposed transmission and distribution line right-of-way, the EMFs will be within public exposure guidelines supported by the World Health Organization. In fact, EMFs of the new lines will be reduced because of the increased height and configuration of the transmission line.

The Process

We have completed our "option review" stage of the OTR project, and have now developed our "preferred option proposal", based on preliminary engineering, environmental impact screening, and public input received during and after our first series of public consultation open houses in March 2007.

We are now in the process of sharing our preferred option proposal, and alternate route option, with our customers and stakeholders. All input received from our open houses and subsequent discussions will be taken into consideration and included in our application to the BC Utilities Commission. Our preferred and alternate route options will be included in our application. We plan to submit our application for a Certificate of Public Convenience and Necessity (CPCN) to the BCUC by July 2007.

Following CPCN approval, detailed engineering could begin early in 2008, followed by construction of the new transmission lines and facilities starting in late 2008, with completion anticipated for 2010.

The construction of the line, its timing and description, will be communicated to the landowners along the line as well as those in the vicinity of our substations.

The Dialogue

We are committed to open dialogue with our customers, First Nations and stakeholders. The Okanagan Transmission Reinforcement (OTR) Project team is hosting our second set of open houses in the communities of Oliver, Okanagan Falls and Penticton this month.

This second series of open houses is meant to give local customers and stakeholders the opportunity to learn more about the project and its alternatives. Following these open houses, we will further refine project planning, and continue discussion with our customers, First Nations and stakeholders. Input received during our public open houses and discussions will be included in our application.

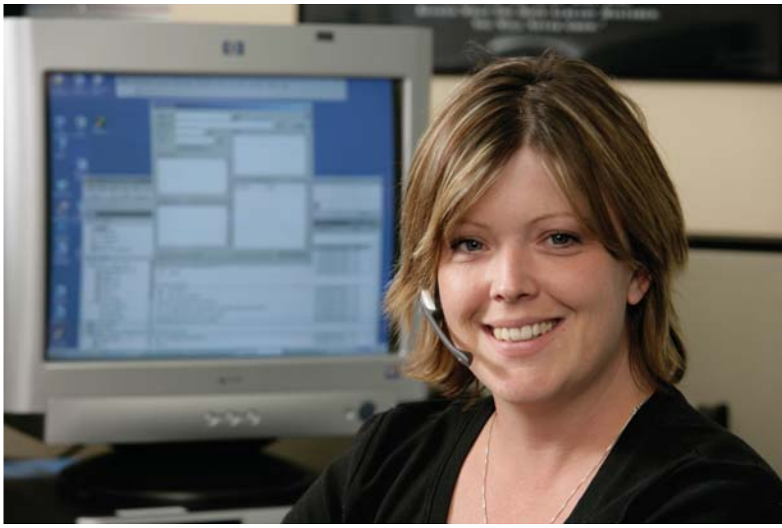
We appreciate your input and support in meeting our objective – to find a solution that best balances environmental, social and economic impacts, while meeting the future energy needs of the region.

Who We Are

FortisBC is a Canadian owned integrated electrical utility serving approximately 152,000 customers and employing over 570 people in the southern interior of British Columbia. The utility has four hydroelectric generating plants with a combined capacity of 235 megawatts and over 6,750 kilometres of transmission and distribution power lines. Over the next five years FortisBC is investing approximately $500 million in electrical system improvements to better serve its customers.

For more information regarding the Okanagan Transmission Reinforcement Project please contact:

1-866-4FORTIS (436-7847)
otrproject@fortisbc.com
www.fortisbc.com/otrproject.html



FortisBC Inc. is a Canadian owned electric utility operating in the southern interior of British Columbia.

FortisBC

Backgrounder

The Public Need for Electricity

A Growing Region.

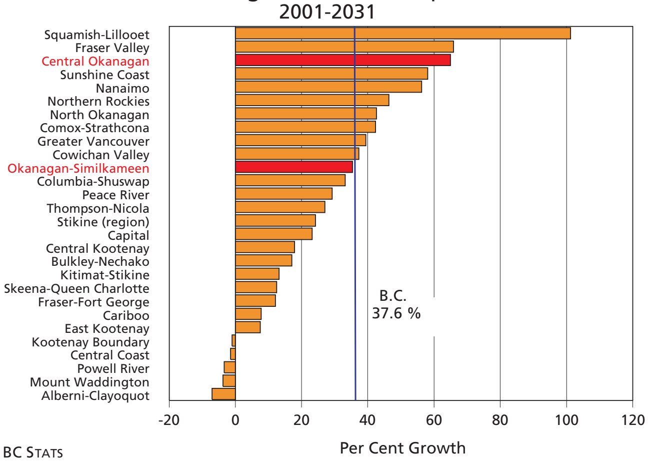
Over the past 10 years the Okanagan has experienced significant growth. FortisBC is making system enhancements to ensure that customers have long-term, reliable power supply to service the residential and business growth in the Okanagan. The Okanagan Transmission Reinforcement (OTR) Project is a key component in FortisBC's 20 year system development plan, which involves major investments to upgrade our transmission and distribution infrastructure.

The Vaseux Project, completed in fall 2005, installed a second strong energy source in the Okanagan. The OTR Project will further strengthen the Okanagan transmission system by delivering additional power from Vaseux Lake to supply electricity demand for growth, and to improve the reliability of power supply in the Okanagan.

The Population is Increasing

According to the Provincial Government's BC Statistics branch, the population of the central, north and south Okanagan will grow significantly to 2031.

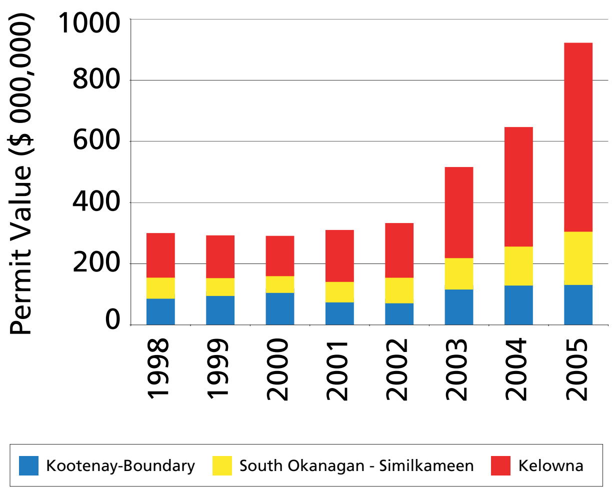
Figure 12
PEOPLE 31 Regional District Population Growth
2001-2031



BC STATS

Increased Building Permits = Increased Energy Demands

Building permits for the Okanagan are on the increase, resulting in an increased public demand for electricity.



For Further Information, contact us at:
Phone - 1-866-4FORTIS (436-7847)
E-mail - otrproject@fortisbc.com

Open House Series #2 - May 2007

FORTISBC

Backgrounder

A Softer Footprint
The OTR Project and the Environment:

Ospreys are evident around the Okanagan.

Protecting Migratory Birds
At this time we are not aware of the OTR Project transmission line being in close enough proximity to critical flight paths around wetlands to be a concern. In addition, the transmission line runs parallel to the valley which is the same direction as migratory flights and is in terrain that would generally not be chosen for migratory flights except at very high altitude well above the terrain features and the transmission lines. Potential impacts resulting from this project on migratory birds will not be fully known until after the completion of the detailed Environmental and Social Impact Assessment.

Supporting Communities.
Environmental partnerships with the community and environmental groups demonstrate FortisBC's commitment to environmental stewardship. Over the past few years FortisBC has:

- Partnered with the South Okanagan Invasive Plant Society, the Boundary Weed Management Committee and the Central Kootenay Invasive Plant Committee on several invasive plant control programs.
- Worked with the Ministry of Environment and wildlife biologists to minimize power outages and electrocution risk to Osprey.
- Been the primary sponsor of an environmental education program called the FortisBC Wild Festival for Youth – a program focused on promoting environmental responsibility and sponsorship to school-aged children.
- Helped our customers conserve approximately 23,000 megawatt hours of energy through the adoption of energy efficient upgrades through our PowerSense Program.
- Launched the Bright Ideas energy efficiency public awareness campaign.

Local initiatives include:

- Environmental enhancement projects related to the new Vaseux Substation, that offset of sensitive antelope brush needle-and-thread grass plant community displaced by the substation footprint.
- Assisting the Lower Similkameen Indian Band in developing their Habitat Stewardship plan. This plan includes a special designation of over 500 acres of land to protect endangered plant and animal species.
- Providing support to the Osoyoos Desert Centre, an interpretive education and research facility offering insight into the area's sensitive desert ecosystem, its plants and animals.

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www.fortisbc.com

Backgrounder

A Softer Footprint
The OTR Project and the Environment:

FortisBC is committed to operating our business in an environmentally responsible manner. Sustaining and enhancing the environment and supporting the communities in our service area is a priority.

Protecting the environment
The Okanagan Transmission Reinforcement (OTR) Project will identify the areas that require environmental management to ensure that measures are in place to avoid, prevent or mitigate any anticipated impacts. Our application for Certificate of Public Convenience and Necessity (CPCN) submitted to the BC Utilities Commission includes how the Project Team will consider environmental impacts.

The OTR Project includes environmental and First Nations specialists who understand the local environment including species at risk, protected areas, special grasslands, and wildlife in general. Prior to construction, these specialists will prepare a detailed Environmental and Social Impact Assessment (ESIA) that identifies how the environment may be impacted by the OTR Project. The detailed ESIA is expected to be completed by the fall of 2007.

Following the development of the ESIA, a comprehensive, site-specific, Environmental Management Plan (EMP) will be prepared to delineate sensitive areas and describe measures to avoid, prevent or mitigate anticipated environmental impacts. With project approval, we anticipate the EMP will be completed by late fall 2007. The EMP will be updated prior to construction to reflect detailed design.

Local, provincial and federal government agencies and environmental organizations will be consulted during the development of the ESIA and EMP.

Gopher snakes are another key aspect of our wildlife studies.

Species at Risk
The South Okanagan area is home to several Species at Risk (SAR) in Canada. SAR includes those listed federally and provincially. Examples expected on or near the vicinity of the OTR Project facilities include: Great Basin Gopher snake, Western Rattlesnake, Pallid Bat, Spotted Bat, Behr's Hairstreak (butterfly), Lewis's Woodpecker, and California Bighorn Sheep. Initial field studies have also identified Western Skink (lizard) along the corridor.

General measures that may be included in the EMP to protect SAR may include:

- Behr's Hairstreak: relocating poles to avoid disruption of Antelope brush and Yarrow habitats with populations of Hairstreak; timing work to avoid effects during critical life cycle phases.
- Bighorn Sheep: installing (where possible) new equipment and facilities away from critical lambing areas; timing work to avoid disturbance during critical life cycle stages (e.g. late winter stress and the lambing season); ensuring that suitable migratory corridors exist for Bighorn Sheep during construction activities; and avoiding or limiting the construction of new access roads to backcountry areas.

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Okanagan Transmission Reinforcement Project

FORTISBC

Backgrounder

A Softer Footprint
The OTR Project and the Environment:

Relocating bitter root flower plant from the Vaseux substation.

Protected Areas and Parks
The Vaseux Protected Area is the only "Protected Area" directly affected by the OTR project. This protected area is comprised of two sites, including the right-of-way at Vaseux Creek (McIntyre) Canyon, the right-of-way east of the Vaseux substation, the right-of-waythrough Manuel's canyon east of the Vaseux Substation and the right-of-way east of Vaseux Lake Park. This Protected Area was established as a wildland protected area primarily to preserve California Bighorn Sheep habitat including a key lambing area in the Vaseux Creek Canyon. The Canadian Wildlife Service (CWS) owns land along the route near the Vaseux protected area which is designated as a "National Wildlife Area".

Potential impacts resulting from the OTR Project on the Vaseux Protected Area and CWS National Wildlife Area will not be fully known until after the completion of the detailed Environmental and Social Impact Assessment.

Protecting the Bighorn Sheep
The Bighorn Sheep have adapted well to the existing right-of-way and continue to use the cliffs of the canyon for lambing. It will be important to ensure that right-of-way activities and disturbance are timed to avoid any disruption of this critical habitat area during its period of use. All reasonable route alternatives will be considered and compared based on the relative environmental, community, and economic costs and benefits. Based on initial evaluations, we think the most suitable location is to use the existing right-of-way through this area.

Potential impacts on Bighorn Sheep lambing areas resulting from the OTR Project will not be fully known until after the completion of the detailed Environmental and Social Impact Assessment. Where feasible, smaller changes in engineering design that may provide improvements will be considered e.g., height of structures, specific locations for structures etc.

In addition, there are Nature Trust lands and Canadian Wildlife Service lands on or adjacent to the right-of-way which include examples of California Bighorn Sheep habitat and which will be included in our environmental assessment and analysis.

Mule deer are regulars around the area.

Protecting the Grasslands
Potential impacts to shrub steppe grasslands from the OTR Project will not be fully known until after the completion of the detailed Environmental and Social Impact Assessment.

Examples of general measures that may be included in the EMP to protect these areas may include:

- Where possible, adjusting engineering design (e.g. pole locations) to avoid impacts to important, critically sensitive species within the grassland ecosystems.
- Avoiding or limiting the construction of new access roads to backcountry areas.
- Power-washing and inspecting all heavy duty equipment and vehicles before entering disturbed, and/or shrub steppe grassland areas to prevent weed transport and infestation.
- Inspecting and keeping all passenger vehicles free of soil, mud, and weeds (including their undercarriages) before entering disturbed, and/or shrub steppe grassland areas.
- Salvaging and relocating special vegetation prior to construction, as well as ensuring that reclamation and revegetation efforts are implemented with the use of native plant species after construction.

In addition, Nature Trust land located adjacent to the Vaseux substation and near Vaseux Creek was obtained during construction of that substation with the support of FortisBC – for the purpose of preserving endangered antelope brush needle-and-thread grass vegetation community, and habitat for various SAR in the project area.

Protecting Local Snakes
Potential impacts of the OTR Project on local snakes cannot be fully determined until after the completion of the detailed Engineering design of the project and the Environmental and Social Impact Assessment (ESIA). The ESIA will include field investigations and inventories for dens. Following completion of the ESIA, a detailed site-specific EMP will be prepared to delineate sensitive areas and describe measures to avoid, prevent, or mitigate anticipated impacts to reptiles.

Examples of general measures for protection of local reptiles include:

- Not installing poles installed within 15 metrrs of known snake dens.
- Timing clearing and construction activities to avoid migration periods.
- Where poles cannot be immediately installed, (i.e. blasting and drilling in remote locations), covering pole holes to prevent reptile access.
- Creating habitat piles along the ROW providing temporary dens and cover from predators and habitat for prey.

Behr's Hairstreak Butterfly on Yarrow plant.

c) Will you be reporting back to the public on how their input is being used for this project?

A - Yes, we reported back to stakeholders by letter after our first set of open houses in March 2007, and we are providing the feedback received in this backgrounder and at our May 2007 open houses.

We will be following up with stakeholders after our May 2007 open houses.

All input received from our open houses and subsequent discussions will be taken into consideration when we file our application to BC Utilities Commission.

d) What were the results of the first open house series in March 2007?

A - We received a lot of constructive and positive input at our March 2007 open houses. Some of the input is presented below.

We based our decision on the transmission line corridor and pole design based on public input received at the open houses and input received subsequent to them.

Most of all, we used this input to balance the environmental, social and economic aspects with cost impacts to ratepayers.

Responses to the March 2007 Open House questionnaire (87 questionnaires):

- How attendees felt about OTR project following open house
  54% - Positive to very positive
  21% - Neutral
  22% - Negative to very negative
  3% - No answer

- Did you have concerns about the OTR Project before this open house?
  70% - Yes
  28% - Neutral
  2% - No answer

- Do you feel your concerns were answered at this open house?
  95% - Yes
  1% - No
  1% - Somewhat
  3% - No answer

- Representative comments from open houses:

-Project Need:
"Necessary to meet power needs in future."
"Need reliable power."
"We need to accept change and growth – we are growing therefore our needs are."

-Routing Considerations:
"Move the line out of the populated areas."
"Not in my backyard please – put on Crown land."
"Leave the transmission line in the existing corridor."
"Reduce land acquisition and clearing."

-Visual Considerations:
"Need more visual screening of substations."
"Give public a chance to see the pole choice, once decided."
"Need to see height of towers and lines related to views."
"Concerned about viewspaces and appearance of new lines."

-Environmental and Safety Considerations:
"Protect wildlife sensitive areas – ie, Bighorn Sheep lambing areas and Mountain Goats."
"I am glad preserving and protecting the environment are on the agenda."
"I am concerned about increased EMFs."

9) First Nations Consultation

a) Have you done any consultation with First Nations?

A - One of our first considerations with the preferred route option and the alternative route options was the traditional territory of the local First Nations.

We are continuing our ongoing consultations with the Penticton Indian Band, Osoyoos Indian Band and the Okanagan Nation Alliance.

For Further Information, contact us at:
Phone - 1-866-4FORTIS (436-7847)
E-mail - otrproject@fortisbc.com

Open House Series #2 - May 2007

FORTISBC

Backgrounder

FAQs About the OTR Project

1) The Project

a) Why are you doing this project now?

A - This project is needed because of increased demand for electricity, driven by the residential and business growth in the Okanagan over the past 10 years. The proposed additional supply from the Vaseux Substation will increase reliability of power supply in the Okanagan.

b) How many lines are you proposing to add to the existing lines?

A - Presently there is one 161 kilovolt (kV) line from Vaseux to Penticton and one 161 kV line from Vaseux Lake to Oliver. We are proposing to upgrade both of these lines to the north and south of Vaseux Lake to 230 kV, in order to meet capacity needs. We are also proposing to add an additional 230 kV line to the north from Vaseux to Penticton, thus further increasing reliability in both the Penticton and Kelowna areas.

c) When will the project start?

A - We need to apply to the BC Utilities Commission first, which we hope to do by July 2007. If our application is approved, we expect to start engineering in early 2008 followed by construction of the new transmission lines and facilities starting in late 2008, with completion expected by 2010.

d) How long will the project take – start to finish?

A - Two to three years after project approval from the BC Utilities Commission.

e) What is the cost of the project – and who's paying for it?

A - Preliminary estimates and evaluations indicate the project will be greater than $120 million. All FortisBC customers will pay for this project under customer rates set with approval of the BC Utilities Commission. We anticipate an increase of approximately 3 to 4% as a result of this project.

f) How will this project benefit me?

A - More reliable electrical power in the long term.

2) Line Corridor Location

a) What is the location of the proposed new line?

A - Based on our preliminary research, our preferred route continues to be along the existing line right-of-way. We believe our proposal achieves our objective to have a project that best balances environmental, social and economic impacts.

b) Did you look at alternate line routes?

A - Yes, we did. We looked at two alternate routes above residential and higher density areas between Vaseux and Penticton. One was a mid-elevation alternate route and one was a high-elevation alternate route to the east of Skaha Lake The mid-elevation alternate was discounted in that the landscape challenges limited construction and maintenance access. Although the high-elevation alternate route option was considered more viable than the mid-elevation one, it poses acquisition, environmental, construction and cost challenges.

3) Substation Construction

a) Why are you building a new substation and changing the existing substation in Oliver?

A – The existing Oliver Substation site is physically too small. We need a new transmission substation to handle the additional equipment required to meet power needs in the Okanagan.

b) What changes are you going to be making to the Vaseux Substation?

A – There will be a new line from Vaseux to Penticton added to the substation via the corridor to the east. Also, there will be some equipment added within the substation, but there won't be any noticeable changes to the substation's appearance.

FORTISBC

Backgrounder

FAQs About the OTR Project (cont'd)

c) What changes are you going to be making to the RG Anderson substation in east Penticton?

A – A new line from Vaseux to Penticton will be added to the substation via the existing corridor to the south. Also, there will be some equipment added within the substation, but it should not create any noticeable changes to the substation's appearance. The station transmission voltage already includes 230 kV; the upgrade will convert the other half of the substation from 161 kV to 230 kV. One of the main transformers will be replaced by a newer one.

4) Visual Impact of Lines

a) What will the new transmission lines look like?

A – The proposed two-line transmission structures from Vaseux to Penticton will be changed from the 18-meter, double pole wooden structure, to 30-33-meter steel pole construction, putting the lines at a greater height from the ground with the lines stacked up vertically. Generally they will be single pole construction. The construction will consist of flat-finish galvanized steel poles and non-glare conductors to minimize visual impact.

For the single transmission line from Vaseux to Oliver the proposed structures will be similar to the existing double pole wooden structures but about 10% larger and of steel construction for protection from wildfire.

b) What are your options to make the transmission lines look better?

A – We chose to go with the 30-meter single steel pole in that it was smallest footprint with the least amount of horizontal coverage – taking up less space than the current lines.

For the residential area east of Skaha Lake, we have explored an alternate two-pole design to reduce the pole height and visual impact. The poles would be about 3 to 4 meters higher than the existing poles, as opposed to 15 meters higher for the single steel pole design. The trade-offs of this alternative include twice as many structures with shorter spans along the right-of-way. This pole design alternative would occupy a wider portion of the right-of-way.

c) Why don't you put the line underground?

A – Due to the nature of the type of terrain for the proposed line route, underground transmission lines may not be technically feasible. Underground transmission lines are also approximately ten times more expensive than overhead lines. Because our customers bear the costs of this project it is important that we manage this.

5) Environmental

a) What species are at risk in your corridor, and what are you doing to protect them?

A – The South Okanagan is home to several Species at Risk (SAR) in Canada. Species at Risk include those listed federally and provincially. Examples expected on or near the vicinity of the project facilities include: Great Basin Gopher snake, Western Rattlesnake, Pallid Bat, Spotted Bat, Behr's Hairstreak (butterfly), Lewis's Woodpecker, Western Skink and California Bighorn Sheep.

Prior to any construction, a detailed Environmental and Social Impact Assessment (ESIA) will be undertaken to identify the SAR likely to be affected by the project. The detailed ESIA is expected to be completed by the fall of 2007. Following completion of the ESIA, a detailed site-specific Environmental Management Plan (EMP) will be prepared to delineate sensitive areas and describe measures to avoid, prevent, or mitigate anticipated environmental impacts. Local, provincial, and federal environmental agencies and NGOs will be consulted during the development of the ESIA and EMP. The EMP is expected to be complete by late fall 2007.

b) What impacts will your new lines have on the local protected areas and parks?

A - The Vaseux Protected Area is the only protected area directly affected by the project. This protected area includes the right-of-way at Vaseux Creek (McIntyre) Canyon, the right-of-way east of the Vaseux Lake Terminal Station, and the right-of-way through Manuel's Canyon east of the Vaseux Substation. This protected area was established as a wildland protected area primarily to preserve California Bighorn Sheep habitat including a key lambing area in the Vaseux Creek Canyon. Canyon. The Canadian Wildlife Service (CWS) owns land along the route near the Vaseux Protected Area, which is designated as a "National Wildlife Area".

Potential impacts resulting from this project on the Vaseux Protected Area and the CWS National Wildlife Areas will not be fully known until after the completion of the detailed Environmental and Social Impact Assessment which is expected to be completed by the fall of 2007. Following completion of the ESIA, a detailed, site-specific EMP will be prepared to delineate sensitive areas and describe measures to avoid, prevent, or mitigate anticipated impacts to the Vaseux Protected Area. The EMP is expected to be complete by the late fall of 2007.

c) Can't you mitigate the environmental impacts of the high-elevation alternate route?

A - Some impacts can be mitigated, for example, erosion and sediment control can be largely mitigated by retaining some ground cover and instituting a reclamation program that includes erosion control features and seeding. Other impacts such as the reduction in bird habitat; changes in the type of protective cover for Bighorn Sheep during winter; human access and disturbance to wildlife in remote areas during critical life cycles during and following construction; and the potential spread of invasive weeds are examples of impacts that are much more difficult to effectively mitigate.

6) Public Safety

a) What are you doing about the Electric and Magnetic Fields (EMF) that are produced by the new lines?

A - The EMFs of the new lines will be reduced compared to the existing lines due to the increased height and the configuration of the transmission line.

Although Health Canada does not consider exposures to EMF from electrical devices and power lines to be associated with any known health concerns, FortisBC is sensitive to customers' concerns. In all locations along the transmission and distribution line right of way, the EMF levels associated with this specific project will be within the public exposure guidelines supported by the World Health Organization.

If residents would like further information, Health Canada's EMF guideline is set out in their document entitled "Electric and Magnetic Fields at Extremely Low Frequencies," which is available online at http://www.hc-sc.gc.ca/iyh-sv/environ/magnet_e.html.

b) Will the new lines be safer than the current ones?

A - All FortisBC facilities meet the highest safety standards in the utility industry.

7) Economics

a) What are you basing your expansion on?

A - The Okanagan has experienced economic growth at a rate of approximately 4 - 5% per annum, which is well over the national average of 1 – 2%. It is important that we meet the needs of our growing customer base.

b) Why do we need this power now?

A - The Okanagan has grown considerably over the past years, and we've worked hard to keep up with that growth. This project is needed because of the increased demand for electricity driven by residential and business growth in the Okanagan area over the past 10 years. The enhanced transmission capability to the South Okanagan will give the region more flexibility to supply the future energy needs of the region. The project will also provide an alternate supply from both the north and south, reducing the risk of prolonged power outages.

8) Public Consultation

a) What is your public consultation process for this project?

A - FortisBC is committed to open dialogue with our customers where new facilities are required.

We held our first open houses with residents in Penticton, Okanagan Falls and Oliver in March 2007 which discussed the project need and sought public input to help us identify potential issues and concerns.

We used this, and subsequent public input for the preliminary planning and engineering for our preferred option proposal.

In our May 2007 open houses we are presenting our preferred option proposal for discussion with the public.

b) How and where will public input be used on this project?

A - Our objective is to put forward an option that balances environmental, social and economic impacts, while taking into consideration constructability and customer rates. Public input is vital in meeting this objective.

Okanagan Transmission Reinforcement Project
Display Boards
Open House Series #2: May, 2007

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Welcome to Our Open House

Please sign in,
and help yourself to refreshments

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What This Open House is All About

This is our second set of open houses

- **Open House #1: March 2007 obtained public input on project design**
- **Open House #2:**
  - **Presents our preferred option proposal which will be part of FortisBC's application to the BC Utilities Commission (BCUC)**
  - **Explains the details and rationale for our preferred option proposal**
  - **Requires your input for inclusion in our submission to the BCUC**

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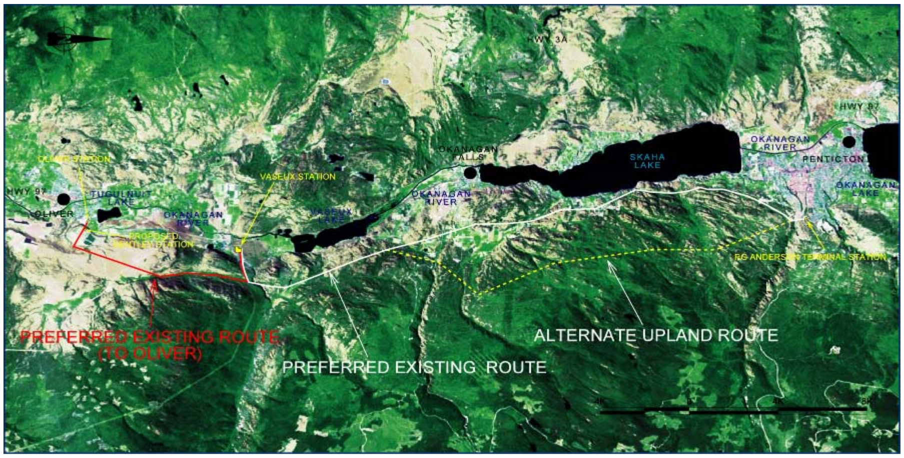
Display Boards
Open House Series #2: May, 2007

The Project



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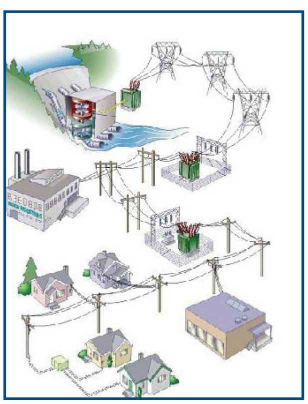
Our System



1) Hydroelectric dam - Water stored in the reservoir behind the dam flows through large pipes (penstocks) through turbine generators at the bottom of the other side of the dam. The water forces the turbines to spin, converting the spin energy into electrical energy.

2) Step-Up transformer - The electrical energy generated by the turbines has a low voltage. Therefore, a step-up transformer converts this low voltage to a high voltage. Voltage is the pressure that makes energy flow through electrical lines.

3) Grid high transmission lines - These are thick lines with high voltage (161-500 kilovolts) supported by tall metal towers that carry high voltage electricity long distances.

4) Terminal substations - These substations take the high voltage transmissions and step them down to subtransmission voltage that are transmitted through lower voltage, subtransmission lines.

5) Subtransmission lines - These lines, supported by large pole structures, distribute stepped down voltage (69-138 kilovolts) to large industrial users and distribution substations.

6) Distribution substations - These substations reduce voltages for distribution to residential, commercial and small and medium industrial users.

7) Local distribution lines - These lines are thick lines running on the top of tall wood poles that you see close to homes and businesses. Sometimes these lines run to underground transformers that distribute electricity via underground lines to homes.

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Display Boards
Open House Series #2: May, 2007

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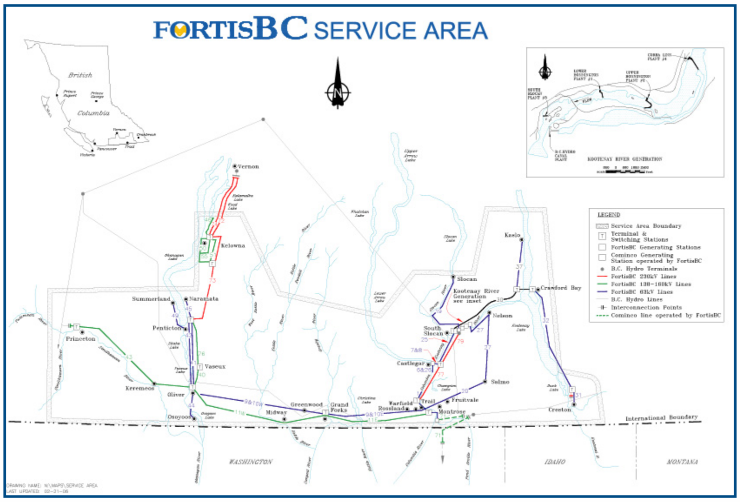

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Demand for Reliable Power

- Transmission upgrades are needed to increase capacity and reliability of power in the Okanagan
- The upgrades will strengthen the system connections to the north and south power sources so that if one major source is interrupted the second source will maintain supply to customers

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Okanagan Transmission Reinforcement Project
Display Boards
Open House Series #2: May, 2007

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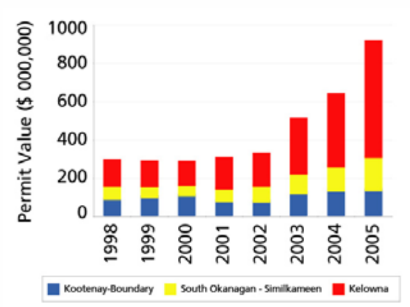
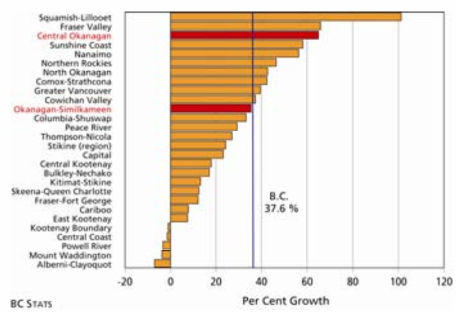
Annual Value of Building Permits Issued in Okanagan



BC Regional District Growth Projected for 2001-2031



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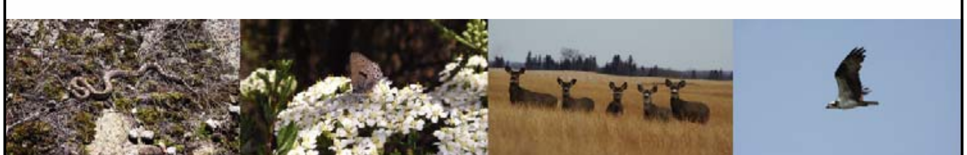
Our Environmental Commitments

FortisBC is committed to operating our business in an environmentally responsible manner. Sustaining and enhancing the environment in our service area is a priority

- The OTR Project includes environmental specialists who understand the local environment including species at risk, protected areas, special grasslands, and wildlife in general
- Our application submitted to the BC Utilities Commission will include how the project team considered environmental impacts
- Environmental specialists prepare a detailed Environmental and Social Impact Assessment (ESIA) prior to construction that identifies how the environment may be impacted by the OTR project
- Following the development of the ESIA, a comprehensive, site-specific Environmental Management Plan (EMP) is prepared to delineate sensitive areas and describe measures to avoid, prevent or mitigate anticipated environmental impacts
- Local, provincial and federal government agencies and environmental organizations will be consulted during the development of the ESIA and EMP



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Okanagan Transmission Reinforcement Project
Display Boards
Open House Series #2: May, 2007

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Our Environmental Record

FortisBC is committed to environmental stewardship

In 2006 FortisBC:

- Partnered with the South Okanagan Invasive Plant Society, the Boundary Weed Management Committee and the Central Kootenay Invasive Plant Committee on several invasive plant control programs
- Worked with the Ministry of Environment and wildlife biologists to minimize power outages and electrocution risk to osprey
- Was the primary sponsor of an environmental education program called the FortisBC Wild Festival for Youth - a program focused on promoting environmental responsibility to school-aged children
- Helped our customers conserve approximately 23,000 megawatt hours of energy through the adoption of energy efficicient upgrades through our PowerSense Program

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Okanagan Transmission Reinforcement Project

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Summary of Input:
March Open Houses

How attendees felt about OTR project following open house (87 responses):

- 54% - Positive to very positive
- 21% - Neutral
- 22% - Negative to very negative
- 3% - No answer

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Okanagan Transmission Reinforcement Project
Display Boards
Open House Series #2: May, 2007

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Summary of Input: March Open Houses

Did you have concerns about the OTR Project before this open house?
- 70% - Yes
- 28% - Neutral
- 2% - No answer

Do you feel your concerns were answered at this open house?
- 95% - Yes
- 1% - No
- 1% - Somewhat
- 3% - No answer

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Summary of Input: March Open Houses

What attendees had to say (representative comments):

- **Project Need:**
  "Necessary to meet power needs in future."
  "Need reliable power."
  "We need to accept change and growth – we are growing therefore our needs are."

- **Routing Considerations:**
  "Move the line out of the populated areas."
  "Not in my backyard please – put on Crown land."
  "Leave the transmission line in the existing corridor."
  "Reduce land acquisition and clearing."

- **Visual Considerations:**
  "Need more visual screening of substations."
  "Give public a chance to see the pole choice, once decided."
  "Need to see height of towers and lines related to views."
  "Concerned about viewspaces and appearance of new lines."

- **Environmental and Safety Considerations:**
  "Protect wildlife sensitive areas – ie, Bighorn Sheep lambing areas and Mountain Goats."
  "I am glad preserving and protecting the environment are on the agenda."
  "I am concerned about increased EMFs."

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Display Boards
Open House Series #2: May, 2007

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Considering the Environment

We have undertaken:

- Preliminary impact assessments of the project for:
  - Wildlife, water resources, fisheries and aquatic habitat
  - Archaeology
  - Viewscapes, sound levels, agriculture, land use and other areas of consideration
- Continued consultation and participation with First Nations
- Discussions with local environmental organizations

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Since the last Open Houses, we have:

- Prepared preliminary designs of substations
- Prepared preliminary designs and comparison of the existing line and an alternate route between Vaseux and Penticton
- Prepared renderings of what the new lines and stations would look like
- Continued consultation with First Nations
- Conducted initial discussion with various environmental groups, stakeholders and interested parties
- Identified tenure holders and other stakeholders impacted by alternate route

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Display Boards
Open House Series #2: May, 2007

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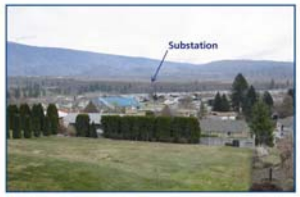
New Bentley Substation

Proposed Bentley Substation site



View of Bentley
from Oliver neighbourhood

View of Bentley Substation
looking west from Osoyoos Indian
Band Reserve benchland

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Transmission Line – Oliver Area – Existing Right-of-Way

Proposed pole structure type
for Oliver to Vaseux

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Open House Series #2: May, 2007

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Vaseux Substation

Vaseux Substation - Before OTR

Vaseux Substation - After OTR

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Vaseux to RG Anderson Substation Transmission Lines
(Existing right-of-way and alternate route)

- **Existing right-of-way (white line) – no change to route**
- **Upland alternate route (yellow line)**
  - **The first 10 km of the new lines north of Vaseux would remain in existing corridor (not shown)**
  - **The remaining 20 km would be re-routed at a higher elevation to the east around**
  - **Shuttleworth Creek, Heritage Hills and southeast Penticton (as shown above)**

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Display Boards
Open House Series #2: May, 2007

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Vaseux to RG Anderson Substation Transmission Lines
Comparing the routes
(Based on single pole steel construction & 40 meter right-of-way)

Option	Advantages	Concerns
Existing right-of-way route	• Least environmental impacts • Utilizes an existing corridor in place since 1963 • Easier access for construction and maintenance • Lowest cost for rate payers	• Increased visual/aesthetic impacts • Increased disturbance during construction to residents (ie increased sound levels and dust associated with vehicles and equipment) • Some disturbance to established vegetation communities on the right-of-way • Risk of further spread of existing populations of invasive plant species along the right-of-way • Species at Risk are established in unique features on or adjacent to the right-of-way including skinks and snakes • More residential owners are present along the route • Crosses Protected Areas

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Vaseux to RG Anderson Substation Transmission Lines (Con't)
Comparing the routes
(Based on single pole steel construction & 40 meter right-of-way)

Option	Advantages	Concerns
Upland alternate Route	• Fewer residential owners along the route • Least visual/aesthetic impacts • Lower construction disturbance activities to residents (ie sound levels, dust and traffic from trucks and equipment)	• More environmental impacts: - Reduction in bird habitat due to right-of-way clearing - Reduction in the type of protective cover for Bighorn Sheep and other large mammals - Creates new access and associated disturbance to wildlife in remote areas during critical life cycles during and following construction - Creates potential new areas for the spread of invasive species (weeds) - Removes some old timber which may have habitat potential for bats (ie, daytime roosts) - Expected to impact Species at Risk • Higher costs for ratepayers • More difficult access for construction increasing the capital cost of the transmission line • More difficult access for operations, maintenance and outage response. • Crosses traditional use areas of First Nations • Project delays and associated costs of establishing new right-of-way • Various tenure types may be affected by the new right-of-way: - Grazing Leases - Water Licences - Forest/Timber Licenses - Trapline Permits - Guiding and Outfitting - Recreational Permits/Leases - Mineral Rights • Crosses Protected Areas

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Okanagan Transmission Reinforcement Project
Display Boards
Open House Series #2: May, 2007

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Preferred Route:
Oliver to Penticton – Existing Right-of-Way

- Rationale:
  - Least environmental impact, softest footprint
  - Least costly to access, construct and maintain transmission lines
  - Lowest customer rate impact
  - Least schedule impact
  - Existing right-of-way, since 1963

- Best balances environmental, social and economic impacts

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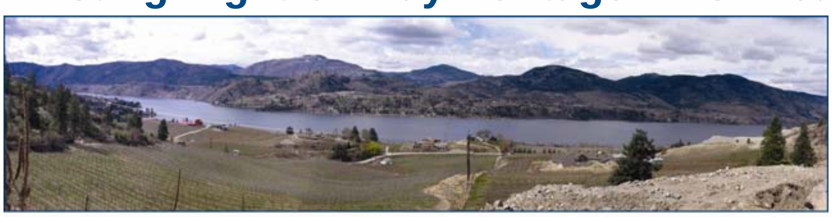
Existing Right-of-Way Heritage Hills Area



Existing transmission line

Proposed transmission line

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RG Anderson Substation

Existing (white) and alternate (yellow) transmission line routing

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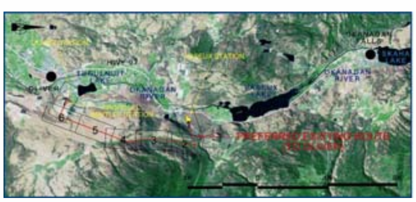
Detailed Orthophoto Index



Oliver to Vaseux

Vaseux to RG Anderson

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Display Boards
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Preferred Pole Designs

Oliver to Vaseux:
Proposed: Double steel poles with steel top beam (similar to existing structures shown above)

Vaseux to Penticton (Shuttleworth Creek Area):
Existing: Double wood poles

Vaseux to Penticton:
Proposed: Single steel pole

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Community Safety

FortisBC is:

- **Committed to protecting the safety of our employees and customers**
- **Committed to educating the community about the dangers of electricity**
- **A leader in community outreach safety intiatives**

Safety and Electric Magnet Fields (EMFs):

- **EMFs are found everywhere electricity is used from house wiring and household appliances to electric power facilities such as substations and electrical lines. Health Canada does not consider exposures to EMFs from electrical devices and power lines to be associated with any known health risk**

FortisBC is sensitive to customer's concerns.

- **In all locations along the transmission and distribution line right of way, the EMF levels associated with the OTR Project will be within the public exposure guidelines supported by the World Health Organization**

(For more information please go to the FortisBC website (www.fortisbc.com) – under Safety and Environment – Electric and Magnetic Fields)

www.fortisbc.com | *Okanagan Transmission Reinforcement Project*

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Okanagan Transmission Reinforcement Project
Display Boards
Open House Series #2: May, 2007

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(www.bcuc.com)

The BC Utilities Commission Approval Process

- Based on preliminary engineering, environmental screening and public consultation, FortisBC will develop a preferred option for the OTR Project
- FortisBC will then apply to the BC Utilities Commission (BCUC) for a Certificate of Public Convenience and Necessity (CPCN)
- FortisBC must show that the new system or extension is viable, in the public's interest, and is necessary
- The BCUC may hold a written or oral hearing process for further public review
- The BCUC will take public concerns and suggestions into account prior to rendering a decision

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Okanagan Transmission Reinforcement Project

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The Next Steps

- Further refine project planning for existing and alternate routes
- Continue discussions with:
  - Local area residents
  - First Nations
  - Environmental groups and other stakeholders
- All input received from our open houses and subsequent discussions will be taken into consideration when we file our application to BC Utilities Commission (BCUC)
- Our preferred and alternate route options will be included in our application
- We plan to submit an application for a Certificate of Public
- Convenience and Necessity to the BCUC by July 2007

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Display Boards
Open House Series #2: May, 2007

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We Need Your Input...

We hope we've answered your questions have your comments

Your input will help us in the final planning for the OTR Project

Please take a couple of minutes to fill out our questionnaire so that we

Thanks for taking the time to discuss the OTR Project with us!

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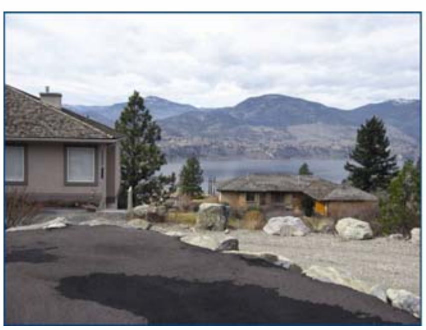
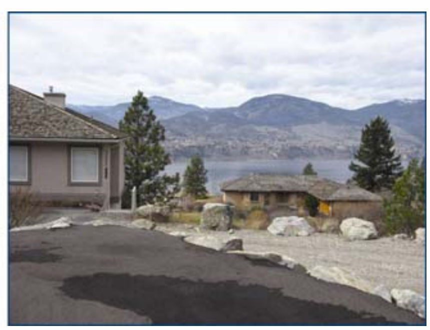
Heritage Hills



Existing transmission line structures



Proposed transmission line structures

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Looking south from Heritage Hills

Existing transmission line structures

Proposed transmission line structures

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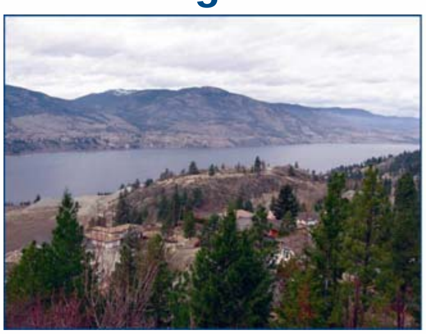
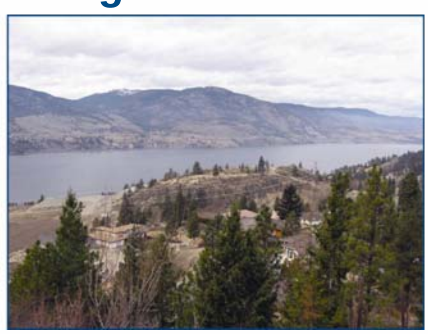
Heritage Hills overlooking Skaha Lake



Existing transmission line structures



Proposed transmission line structures

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Proposed Bentley Substation

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Proposed Bentley Substation

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Okanagan Transmission Reinforcement Project

May 22 - 24, 2007

OTR Questionnaire

1) Now that you've gone through this second Open House and have had the opportunity to learn about the preferred option proposal for the Okanagan Transmission Reinforcement (OTR) Project, how do you feel about the project?
(Please circle your choice)

Very Positive 1 2 3 4 5 Very Negative

Please explain your choice.

____

____

____

____

2) Prior to this Open House, did you have any concerns about the OTR project?
(Please circle your choice)

Yes No

Please explain your choice.

____

____

____

____

3) Do you feel your questions were answered at this Open House?
(Please circle your choice)

Yes No

Please explain your choice.

____

____

____

____

4) Are there any other points we can follow up on that would make you feel more comfortable with our proposal to build the OTR project?
(Please circle your choice)

Yes No

If yes, please list your points.

____

____

____

____

Additional comments about the OTR Project...

5) We will be submitting our application for the OTR to the BC Utilities Commission early this summer. Are there any questions you still have about the OTR that we should follow up on in our application other than those you have already noted in this questionnaire? (Please circle your choice)

Yes No

If Yes, please list your points.

____

____

____

____

6) Please tell us how useful the information was in this Open House.

a)	Discussion Guide	- Very Useful	1	2	3	4	5	Not Useful
b)	Backgrounder	- Very Useful	1	2	3	4	5	Not Useful
c)	Display boards	- Very Useful	1	2	3	4	5	Not Useful
d)	Experts	- Very Useful	1	2	3	4	5	Not Useful

7) How did you first hear about this Open House?
(Check one.)

Newspaper Ad ___ Printed invitation ___ Personal Invitation letter ___ Poster ___
Other ____- Please explain : ________________________

8) If you are interested in receiving information about our final proposal, please provide us your contact information below. (Please print)

Name: ________________________ Phone: ________________
Mailing Address: ________________________________
E-mail address: ________________________ Fax: ________________

9) What is the best way to contact you with new information about the OTR project?
(Please circle your choice)

Mail Fax E-Mail

10) To give us a better idea of the people attending this Open House, we would appreciate it if you would answer the following questions. (Please circle your choice)

a) Are you... Male Female

b) Live within 500 meters of existing Oliver/Penticton high voltage transmission line.

Yes No

c) How long have you lived in the Okanagan?

Less than 5 years 5 - 10 years 10 - 20 Years 20 years+

11) Are there any other comments you'd care to share with us? Please use space on the back of page 1.

Thank you very much for your comments. Please return this questionnaire to the questionnaire box in the refreshment area.

For Further Information – 1-866-4FORTIS (436-7847)

OTR Project Open Houses
May 22, 23 and 24, 2007

SUMMARY OF RESULTS

June 15, 2007

Summary of Attendance

Location	Date	Attendance	Completed Questionaires	
Oliver	22-May-07	8	4	50%
OK Falls	23-May-07	72	53	74%
Penticton	24-May-07	48	44	92%
Total		**128**	**101**	**79%**

1) Now that you've gone through this second Open House and have had the opportunity to learn about the preferred option proposal for the Okanagan Transmission Reinforcement (OTR) Project, how do you feel about the project?
Scale is 1 (Very Positive) to 5 (Very Negative)

1	2	3	4	5	N/A	
12	13	19	8	47	2	
12%	13%	19%	8%	47%	2%	100%

2) Prior to this Open House, did you have concerns about the OTR Project?

Yes	No	N/A	
84	14	3	
83%	14%	3%	100%

3) Do you feel your questions were answered at this Open House?
Please Circle Choice (Yes or No)

Yes	No	n/a	Yes and No	
66	27	6	2	
65%	27%	6%	2%	100%

4) Are there any other points we can follow up on that would make you feel more comfortable with our proposal to build the OTR project?
Please circle your Choice: (Yes or No)

Yes	No	N/A	
65	30	6	
64%	30%	6%	100%

5) We will be submitting our application for the OTR to the BC Utilities Commission early this summer. Are there any questions you still have about the OTR that we should follow up on in our application other than those you have aready noted in this questionaire?

Please circle your Choice: (Yes or No)

Yes	No	N/A	
27	48	25	
27%	48%	26%	100%

6) Please tell us know useful the information was in this Open House:
Scale is 1 (Very Useful) to 5 (Not Useful)

Publication	1	2	3	4	5	N/A	
a) Discussion Guide	21	24	20	7	8	21	
	21%	24%	20%	7%	8%	21%	100%
b) Backgrounder	15	22	22	6	11	25	
	15%	22%	22%	6%	11%	25%	100%
c) Display Boards	35	23	17	3	10	13	
	35%	23%	17%	3%	10%	13%	100%
d) Experts	30	17	22	5	9	18	
	30%	17%	22%	5%	9%	18%	100%

OTR Project Open Houses
May 22, 23 and 24, 2007

SUMMARY OF RESULTS

June 15, 2007

7) How did you hear about this Open House:
(Check one)

Newspaper Ad	18	18%
Printed Invitation	29	29%
Personal Invitation Letter	46	46%
Other (Please explain)		0%
Radio	1	1%
Wife	2	2%
Neighbour	6	6%
Friend	3	3%
Neighbour circulating petition	1	1%
Neighbourhood newsletter	1	1%
Email from concerned people	4	4%
Walked by school	1	1%
My son called me from Vancouver	1	1%
Another trapper who rec'd letter	1	1%
		113%

(Reflects individuals who noted receiving notice from more than one source.)

8) Names & Addresses - see consolidated listing

9) What is the best way to contact you - see consolidated listing

10) To give us a better idea of the people attending this Open House, we would appreciate it if you would answer the following questions:

a) Are You

Male	Female	N/A	
58	37	6	
57%	37%	6%	100%

b) Live withing 500 metres of existing Oliver/ Penticton high voltage transmission line

Yes	No	N/A	
73	22	6	
72%	22%	6%	100%

c) How long have you lived in the Okanagan?

<5 years	5 - 10 years	10 - 20 years	20 years +	N/A	
24	15	24	32	6	
24%	15%	24%	32%	6%	100%

Pierre Dufour
Manager
Okanagan Transmission
Reinforcement Project

FortisBC Inc.
5th Floor, 1628 Dickson Ave
Kelowna, BC V1Y 9X1
1-866-4FORTIS (436-7847)
otrproject@fortisbc.com
www.fortisbc.com/otrproject.html

June 20, 2007

Address

Dear _________,

As indicated during our Okanagan Transmission Reinforcement (OTR) Project public consultation meetings in March and May 2007, FortisBC will be filing an application to the BC Utilities Commission (BCUC) to expand our transmission system in the south Okanagan. We expect this application to be submitted by the end of July 2007.

As presented at our open houses, we will be submitting our preferred option to BCUC using the existing right-of-way because it best balances environmental, social and economic impacts while considering constructability and customer rates. Our application will also include as a viable technical alternate option the higher elevation route for the transmission line along East Skaha Lake as an option for consideration.

Based on feedback we received from the open houses, overwhelmingly attendees recognized the need for the project and the necessity for FortisBC to be able to continue to supply reliable electrical service for the rapidly growing Okanagan area.

Our open houses in March 2007 sought input on elements of project design for the transmission line structure, including pole design, and substation aesthetics. We appreciate all of the input received from these open houses and subsequent communication from a variety of stakeholders in the Heritage Hills area. Upon evaluation of this input FortisBC's engineering and environmental specialists began to look for an economical and environmentally viable alternate route for the transmission line impacting these residents.

Our open houses in May 2007 presented an alternate higher elevation route as well as the preferred option using the existing right-of-way. Each option identified the benefits and risks. The alternate route shown at these open houses will be described in detail in our application. The application will also note that many residents of the Heritage Hills area preferred this option.

We thank all of the residents and stakeholders who took the time to attend the open houses and write letters. All comments will be included in our application to BCUC. The application will be available on the BCUC website following our submission. The process around the application and subsequent public meetings will also be posted on their website.

If you have any questions or concerns, please do not hesitate to call or email me directly.

Sincerely,

Pierre Dufour,
Manager, Okanagan Transmission Reinforcement (OTR) Project
FortisBC Inc.
Tel: 1-866-4FORTIS (1-866-436-7847)
Email: otrproject@fortisbc.com

OKANAGAN TRANSMISSION REINFORCEMENT PROJECT **MARCH 2007**

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

Summary of Attendance

Location	Date	Attendance
Oliver	6-Mar-07	34
OK Falls	7-Mar-07	38
Penticton	8-Mar-07	38
Total		**110**

Oliver Open House - March 6, 2007

Attending from OTR Project:

Pierre Dufour - FortisBC
Bob Gibney - FortisBC
Ameera Shivji - Fortis BC
Paul Chernikhowsky - FortisBC
Joyce Martin - FortisBC
Gary Shtokalko - BC Hydro
Rob Sicotte - BC Hydro
Garry Barnett - BC Hydro
Rozlyn Bubela - BC Hydro
Steve Morck - BC Hydro (Elements)
Pat Beaven - BC Hydro (Beaven Property Services)
Bruce Rozenhart - BC Hydro (Counterpoint Communications)
Gayle Bukowsky - BC Hydro (Counterpoint Communications)

Participants **34** **Completed Questionair** **23** **68% of participants responded** **(1 questionaire x 2)**

1) Now that you've gone through this Open House and have had the opportunity to learn about the Okanagan Transmission Reinforcement (OTR) Project, how do you feel about the project?

Scale is 1 (Very Positive) to 5 (Very Negative)

1	2	3	4	5
8	11	3	1	0

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

Please explain your choice:

1 - Very Positive

Necessary expansion, supported by concern for residents of affected areas
Good conversations
Information to the public
Built in redundancy to ensure supply during regional interruptions
Proactive planning vs reactive planning
We live next door to the Oliver sub station and eliminatiion of noise and less visual is a plus!
Realize the need for more power in the OK Valley
Based on visual impacts of Vaseux substation and T/L connected thereto - Well Done!
Based on choices of structures offered to those impacted
Based on effot to reduce land acquisition and clearing
Not going thru residental property.

2

Power security is important
Apparently not too much of a negative environmental footprint
Done at an affordable cost
Project for the most part stays out of valley bottom
It is necessary for the growth of the valley but I would prefer to see all transmission lines out of populated areas as they are just going to grow more.
Live next door to Oliver sub - understand it will eliminate the buzz sound - great
It is a good feeling to know Fortis is looking after the Okanagan Valley (x2)
Necessary to meet power needs in future

3

Noise reduction at Cherry Grove

4

Power is necessary. A blite on the landscape is not effective

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

2. Prior to this Open House, did you have any concerns about the OTR Project?
Circle Choice: Yes or No

Yes	No
15	8

Please explain your choice:

Yes

Possible disturbance to natural environment
Eastside of Osoyoos Lake which is void of any manmade structures and it should stay that way.
Impact of new power line along Vaseux Lake
Increase in electricity fees to fund the project
Adequate protection for unexpected interruptions due to environment.
Objective/strategy considered positive re balance / politics
I did not want to see it from my house.
Worried about environmental issues, particularly nesting eagles which could be disturbed by activity at wrong time of year.
Worried that the new lines were going to go thru our backyard!
Noise
Thought Oliver would be a storage area!
Our concern was the upgrading of lines and where they were going. (x2)
We were concerned how much expansion would go on at Vaseux Lake. (x2)
Wanted to know location of new substation in Oliver.
How this will affect Town of Oliver
Using old right of way.
I had concerns re Vaseux Lake Project

No

You know what you are doing.
We understood it would eliminate a lot of the noise and visual (live near Oliver substation)

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

3) Do you feel your questions were answered at this Open House?
Please Circle Choice (Yes or No)

Yes	No
23	

Please explain your choice:

Yes

Answers to questions were good.
All the staff were very informative - especially Gary and Ameera.
* Very positive that other issues re billing changes and concerns regarding Energy Sense, incentive to reduce electrical consumption were addressed by the Communications Rep. (Ameera)
Lots of people to explain things.
Lots of people available to answer questions.
Oliver substation downgrading
Your staff was very helpful explaining everything in great detail. Thanks. (x2)
Staff was very knowledgeable!
Project team members were friendly and knowledgeable. All questions answered!
Very complete explanation of scope and focus of project.

4) Are there any other points we can follow up on that would make you feel more comfortable with our proposal to build the OTR project?
Please circle your Choice: (Yes or No)

Yes	No
4	17

Yes

Encourage BC Hydro to subsidize less costly energy saving upgrades to older housing:
radiant space heaters vs furnace replacement $300 vs $5000
reflective window film vs replacement windows $100 vs $1000
underfloor insulation - save up to 80%
insulated windo blinds
ducting to outside of furnace intake aire rather than from middle of crawlspace

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

Yes cont'd

I would like to see the line out of populated areas in OK Falls
To make sure the noise is lowered preferrably to nothing.
More visual screening is necessary at all power plants in the area

No

Happy with results.
Look forward to attending the next open house

5) We will be having a second set of Open Houses (tentatively scheduled for May 2007) to present and discuss our preferred option prior to our submission to the BC Utilities Commission. Are there any questions you still have about the OTR that we should follow up on in advance of the second set of Open Houses?

Please circle your Choice: (Yes or No)

Yes	No
1	20

Yes

What other options are possible/considered and why were they discarded. Ie conservationl, lack of public support.
Local power generation by individuals adding to grid.

No

Not for this area - looks good.

6) Please tell us know useful the information was in this Open House:
Scale is 1 (Very Useful) to 5 (Not Useful)

Publication	1	2	3	4	5
a) Discussion Guide	11	6	3	0	0
b) Backgrounder	10	6	2	1	0
c) Display Boards	15	3	3	1	0
d) Experts	15	3	1	0	1

OKANAGAN TRANSMISSION REINFORCEMENT PROJECT **MARCH 2007**

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

7) How did you hear about this Open House:
(Check one)

Newspaper Ad	9
Printed Invitation	10
Personal Invitation Letter	3
Poster	0
Other (Please explain)	
Bill stuffer?	1

8) Names & Addresses - see consolidated listing

9) What is the best way to contact you - see consolidated listing

10) To give us a better idea of the people attending this Open House, we would appreciate it if you would answer the following questions:

a) Are You

Male	Female
17	6

b) Live withing 500 metres of existing Oliver/ Penticton high voltage transmission line

Yes	No
8	14

c) How long have you lived in the Okanagan?

<5 years	5 - 10 years	10 - 20 years	20 years +
5	4	2	12

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

Additional Comments from Questionaires:

Enjoyed conversation with Rozlyn Bubela
Good presentation
Preference for DCSP Narrow Braced Post transmission line
Just keep the humming down.
Thank you - your people were very helpful. (x2)
Remember that those not working for Fortis may have differing opinions
Optimistic of future job opportunities for Okanagan First Nations and consideration given to our culture and environmental habitat and the prospect of enhancement of existing habitat.
Thank you!

Concerns posted to Display Boards:

Board 14	Noxious / invasive weeds
	Disturbance of livestock
	Access impacts
Board 16	Eagle nesting near Vaseux Lake - sensitive to activity and noise
Board 18	Road safety issues - no poles for this project will be located along Hwy 97
	Acreage owner south of Highway - visual concerns/ impact to property values if bigger poles put in; wants to develop
	Why not move poles from developed area?
Board 19	Like to know future expansion plans for FAS (BCHydro and Fortis)
	Noise noticed occasionally by resident in new home south of VAS
	Resident at 136 Cherry Wood - noise from new Oliver station (lives close to existing Oliver station which is noisy
Board 20	Higher voltage and EMF levels
Board 21	Re EMF associated with higher voltage line near Allandale Rd.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

Okanagan Falls Open House - March 7, 2007

Attending from OTR Project:
Pierre Dufour - FortisBC
Bob Gibney - FortisBC
Ameera Shivji - Fortis BC
Paul Chernikhowsky - FortisBC
Gary Shtokalko - BC Hydro
Garry Barnett - BC Hydro
Rozlyn Bubela - BC Hydro
Steve Morck - BC Hydro (Elements)
Pat Beaven - BC Hydro (Beaven Property Services)
Bruce Rozenhart - BC Hydro (Counterpoint Communications)
Gayle Bukowsky - BC Hydro (Counterpoint Communications)

Participants 38 Completed Questionaires 38 **100% of participants responded** (1 questionaire x 2)

1) Now that you've gone through this Open House and have had the opportunity to learn about the Okanagan Transmission Reinforcement (OTR) Project, how do you feel about the project?
Scale is 1 (Very Positive) to 5 (Very Negative)

1	2	3	4	5
12	7	12	3	4

Please explain your choice:

1 - Very Positive

There is a need for more power
Fortis is acting in a proactive way to ensure continued service to existing and projected new growth customer in their utility service area.
All our questions were answered clearly. Nothing we heard disturbs us.
Existing ROW well to the east of me.
I like leaving the line where it is.
Need reliable power.
It is nice that the same space will be used. No further distrubance in the area. The new poles seem fine and safe, if not safer than the old ones.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

2

Will not be expanding the right-of-way
I found it very informative, answering all my questions. I feel positive.
Good if the EMF's are lower, should be fewer power problems in our area
We need increased capacity therefore we have to accept the changes. I'm pleased the additional line will not require additional right-of-way, etc. (it's good its going on the existing route).
Improved power is definitely needed. Too many outages now.
I realize there must be an upgrade - things have to get done!!
Needed - willing to work with residents - using existing Row.

3

Questions were answered and explained well and now I need to do further research.
Glad to be able to ask my questions in this format rather than a meeting.
Good personal attention given to individuals.
I'm concerned about the type of tower that will be chosen.
Ok - not always happy with growth in Valley.
Understand the need to completed. Proposed project will effect potential land development within our property
If it stays in the same right-of-way a single pole though higher would look less massive and therefore easier to look at.
Leave the transmission line in the existing corridor.
If the present line is followed and right of ways are not widened and habitat sensitive areas are disturbed to a minimum. Also lambing areas for the Mountain Sheep.

4

The options would all appear to have a negative effect on our property. My concerns are an increase in height of the transmission towers plus a twofold increase in the number ofwire attached to the towers.
Can new towers be put lower down on existing easement?
My choice would be the smallest steel towers and put them up on crown land.

5

My wife and I have purchased a view lot (parcel 66 - Heritage Hills) and are about to build our retirement home. Structure 94 is presently directing in our view of a winery and orchard below us, as well as Skaha Lake. To raise this structure further wil significantly invade the new we have paid a premium for. The area I am concerned about is within the Heritage Hills subdivision on the east side of Skaha Lake, between Penticton and OK Falls. Our property is located at the extreme south end of Heritage Blvd. and overlooks an orchard, Blasted Church winery below. This far area is a depression

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

5 cont'd

with structures #94 directly in line of our view, but it is just low enough that its level of invasiveness is acceptable to us. To raise the power lines and raise the tower would impact on our view, negatively to say the least. However, the tower structures to the north and south of structure 94 may have enough elevation to suspend the power lines sufficiently that structure 94 may not be required. Although the power lines would remain in our view the absence of structure 94 would definitely mitigate its impact on our view, as well as that of our neighbours.

This issue may seem minor within the general scheme of things but I have been waiting and searching my entire adult life for a retirement property that would suit both of our needs. We finally found it and are starting to excavate and build. Replacing the structure 94 with a higher tower would be devastating to us, as I know it would be to you if you found yourselves in similar circumstances.

I have been living 10 years on our property and have never invisioned large towers in front of our property and extra power lines going across. X 2

Move the line higher on the crown land, not behind our homes.

2. Prior to this Open House, did you have any concerns about the OTR Project?
Circle Choice: Yes or No

Yes	No
27	12

Please explain your choice:

Yes

Size of towers and placement and Magnetic Energy Field
Wasn't sure what line you meant, there is a smaller line close to our property
EMF's
I am here as an observer and customer of this utility - my concern is less environmental in nature have seen the proposals. Now I have some concern about how this major project will impact our power rates.
Promity of higher voltage lines to residences.
Change - what did the upgrade represent.
Voltage, height, location
Unaware of the impact.
We didn't know what to expect.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

Yes cont'd

I wish triangle pole on our property - Lot 2, Plan 34762, District Lot 6815. 3655 McLean Creek Road
I thought that maybe a new right of way was planned for the new 260 KV line
Thought it as being moved behind my house (1545 Chapman Road)
Where the transmission line was.
I did not know the options.
Height of poles
My wife and I have purchased a view lot (parcel 66 - Heritage Hills) and are about to build our retirement home. Structure 94 is presently directing in our view of a winery and orchard below us, as well as Skaha Lake. To raise this structure further wil significantly invade the new we have paid a premium for. The area I am concerned about is within the Heritage Hills subdivision on the east side of Skaha Lake, between Penticton and OK Falls. Our property is located at the extreme south end of Heritage Blvd. and overlooks an orchard, Blasted Church winery below. This far area is a depression with structures #94 directly in line of our view, but it is just low enough that its level of invasiveness is acceptable to us. To raise the power lines and raise the tower would impact on our view, negatively to say the least. However, the tower structures to the north and south of structure 94 may have enough elevation to suspend the power lines sufficiently that structure 94 may not be required. Although the power lines would remain in our view the absence of structure 94 would definitely mitigate its impact on our view, as well as that of our neighbours.

This issue may seem minor within the general scheme of things but I have been waiting and searching my entire adult life for a retirement property that would suit both of our needs. We finally found it and are starting to excavate and build. Replacing the structure 94 with a higher tower would be devastating to us, as I know it would be to you if you found yourselves in similar circumstances.

Location - on east side - near sanitary landfill might be the location for anew line. Pierre D. say not so.
I thought the line was going to be relocated which I would have wanted details of - but that is not the case as I have learned.
More wires plus health concerns, 230KV in residential area.
More lines and heavier electric cables.
Again, we were (are) worried that the power lines would come closer to our house. X 2
Higher voltage in our residental area.
I was concerned that huge structures would go up and the old ones would remain as well.
Push through - not resident sypathetic.

No

I have lived with the existing power line all my life.
Very public process. Lots of opportunity for and requirements for input from eg. Environmental folks.
We need the power because of the growth in the area.
Have been informed

3) Do you feel your questions were answered at this Open House?
Please Circle Choice (Yes or No)

Yes	No	
36	1	1 - Somewhat

Please explain your choice:

Yes

All questions I had were answered openly
Very helpful, non confrontational staff -- great job!
Everyone was very eager to help and very clear in their explanations
But the options are still many.
Knowlegeable reps at the meeting
All our questions were answered clearly - nothing we heard disturbed us.
Great help
Your representatives were very informtive, professional and wonderful to deal with. But, their responses concern me greately as most people move to the Okanagan for the view, which is highly valued, upgrading the power lines however, may jepardize those views.
Just wanted to know the location
All my questions were answered thoroughly by your staff.
I am annoyed that this project would be put through our subdivision. X 2
Somewhat
Very helpful and what I asked was answered.
Several staff explained project - able to answer far ranging questions.

No

Until rep comes out to look at my concerns.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

4) Are there any other points we can follow up on that would make you feel more comfortable with our proposal to build the OTR project?
Please circle your Choice: (Yes or No)

Yes	No
18	15

Yes

The types of poles to be used.
Design and aesthetics
Give public opportunity to see pole choice (once decided) to get time to accept it.
Smaller footprint of the towers
As our property has a grade-slope - would like to see the hight of towers as they relate to our existing grade, ie obstruction of view
Alternte routes away from residential - see concept drawings
We would like to be kept informed as the plan progress.
Re-route the lines away from Heritage Hills
To find some compromise that will not increase the invasiveness of the power lines that are already present. This may be achievable by removing structure 94 altogether as the towers to the north and south may offer enough clearance for the power lines to be suspended.
Time frames for going through lambing areas and other ungulate sensitive areas.
Between Shuttleworth and McLean Creeks, place poles near property line (singles for haying purposes specifically structures #69 and #70.
Between Shuttleworth Cr. And McLean Cr. Road try to put new structures (poles) on property lines specifically #'s 69 and 70.
Move it lower down or behind the subdivision (Heritage Hills) x 2
Keep line of communication open.
Move lines over crown land above Heritage Hills
I appreciate you coming out to look at existing lines and poles and to see if something can be modified to better suit the look of the lines to be put on the poles.
I hope the resident will be considered.
Heritage Hills residents - full disclosure of what will look like - one on one for 10-15 residents to alleviate concerns.

No

Not at present

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

5) We will be having a second set of Open Houses (tentatively scheduled for May 2007) to present and discuss our preferred option prior to our submission to the BC Utilities Commission. Are there any questions you still have about the OTR that we should follow up on in advance of the second set of Open Houses?

Please circle your Choice: (Yes or No)

Yes	No
10	23

Yes

Design and aethetics
What impact will this project have on future residential electricity rates? Any absolute figures available?
Minimize footprint of towers
Is there a possiblity of moving the existing right of way up the mountain range, away from the Heritage Hills subdivision?
Wildlife sensitve areas - re Bighorn Sheep lambing areas and Mountain Goats
The power line should be put on crown land behind the subdivision (Heritage Hills) or underground. X 2
Take a look at other option - ie crown land above us (Heritage Hills)
Still concerns on how many lines and poles and height and voltage
Concern about power poles being moved to better serve the developer.

No

Additional questions will come apparent

6) Please tell us know useful the information was in this Open House:
Scale is 1 (Very Useful) to 5 (Not Useful)

Publication	1	2	3	4	5
a) Discussion Guide	14	10	6	1	1
b) Backgrounder	13	8	7		
c) Display Boards	24	8	4		
d) Experts	26	6	2	1	

Note: comment made that publications could have been made available on website to download.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

7) How did you hear about this Open House:
(Check one)

Newspaper Ad	7
Printed Invitation	11
Personal Invitation Letter	14
Poster	0
Other (Please explain)	
RDOS Director	2
Neighbour	2
Friend	1
Word of Mouth	1

8) Names & Addresses - see consolidated listing

9) What is the best way to contact you - see consolidated listing

10) To give us a better idea of the people attending this Open House, we would appreciate it if you would answer the following questions:

a) Are You

Male	Female
25	13

b) Live withing 500 metres of existing Oliver/ Penticton high voltage transmission line

Yes	No
10	18

c) How long have you lived in the Okanagan?

<5 years	5 - 10 years	10 - 20 years	20 years +
4	8	9	17

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

Additional Comments from Questionaires:

Thanks for this opportunity.

We live at the north end of Sunvalley Way on the west side of the road. Whilst we are uncertain as to the cause we do wonder whether we are from time to time receiving less than 120v as our radial arm saw works well then fails to run for a few days, then, without our doing anything to it, operates perfectly well.

Looks good - do a good job - good luck.

I am glad preserving and protecting the environment are on the agenda.

Concerns posted to Display Boards:

Board 20	Concerns about seeing six wires, plus fiber, on double circuit lines at increased height
Board 20	Concerns about viewscapes and appearance of new lines
Orthos	Lot 35 - Heritage Blvd. Concern about existing crushing rock below Transmission line Pcl 79
	Pcl 59 - Would like to see what the Transmission Line would look like with new structure.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

Penticton Open House - March 8, 2007

Attending from OTR Project:

Pierre Dufour - FortisBC
Bob Gibney - FortisBC
Ameera Shivji - Fortis BC
Paul Chernikhowsky - FortisBC
Corey Sinclair - FortisBC
Gary Shtokalko - BC Hydro
Garry Barnett - BC Hydro
Rozlyn Bubela - BC Hydro
Rob Sicotte - BC Hydro
Pat Beaven - BC Hydro (Beaven Property Services)
Bruce Rozenhart - BC Hydro (Counterpoint Communications)
Gayle Bukowsky - BC Hydro (Counterpoint Communications)

Participants 38 Completed Questionaires 26 68% of participants responded (2 questionaires X 2)

1) Now that you've gone through this Open House and have had the opportunity to learn about the Okanagan Transmission Reinforcement (OTR) Project, how do you feel about the project?

Scale is 1 (Very Positive) to 5 (Very Negative)

1	2	3	4	5
5	4	3	4	7

Please explain your choice:

1 - Very Positive

I understand the need for our city and outside areas
A new power line to Kelowna bypass Naramata 230kv
Necessary - cost more later.
We need to accept change and growth - we are growing therefore our needs are.

2

As I do not live or own property within visual of the lines it seems like a minimal impact to achieve what appears to be a legitimate upgrade.
My concerns were addressed regarding environmental and employment.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

3

We are affected by the project but see the need for growth.
We realize it is necessary.
Neutral. I can see that most of the increased capacity is for the Kelowna area, but South Okanagan bears more of the impact of increased line/tower sizes.

4

Towers may be in the line of sight of my home.
Concerned that 2 x 230 was not disclosed by Fortis when I asked for development info prior to purchase in May/05. Concerned that rate concerns will outweight impact on residents and that environmental concerns of relocation will also be given undue weight.
1) Existing structure directly above house in steep bedrock. 2) Magnetic field? And height and look of proposed poles.
Apprehensive because existing structure is right above our house in bedrock - blasting could cause a problem.

5

See attached letter from C. Danninger
In viewing the project I am extremely concerned that the high voltage transformers are so close to resident's homes on Evergreen Drive.
The change woulud have huge impact on our property value, as it would have a definant(sp) obstruction to our existing view.
It would impact on our enjoyment of our view of the lake and most probably decrease our property value.
We don't need massive big structures thru subdivisions it decreases price of properties and the lines are noisey even with the same lines "Pls go higher to the bush line." X2
Not satisfied.

Other (no rating given)

The impact on my property in regards to additional noise and EMF is a "remain to be seen" situation. The outcome cannot possibly predicted until the project is completed and a comparison is made from before and after.
Representing the Nature Trust of BC, many of our properties purchased for conservation are involved with the project. There are access issues with individual properties that should be addressed on an individual basis.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

2. Prior to this Open House, did you have any concerns about the OTR Project?
Circle Choice: Yes or No

Yes	No
19	4

Please explain your choice:

Yes

- Detrimental effects on value of my property.
- As we live next to the Anderson substation my concerns are the increase in noise and EMF in regards to the upgrade.
- Was there any other options. Did not have a whole lot of information (prior).
- Are there other optional routes available for the project?
- Height of poles, wires, etc.
- Was wondering about the footprint of any new substations.
- Size of towers, impeeding our views
- Unsure what impact it would have on my property.
- Concerned that 2 x 230 was not disclosed by Fortis when I asked for development info prior to purchase in May/05. Concerned that rate concerns will outweight impact on residents and that environmental concerns of relocation will also be given undue weight. I have been following with interest since Fall of 05 and 2006 Capital Plan filed by Fortis.
- When property purchased in 1985 had concerns about existing line.
- Environmental issues/health issues.
- Would like to see a new line farther east of the current line. Perhaps as far up as the gas pipeline - within 30 - 40 yards would be well within the city.
- My concers were addressed rergarding environmental and employment.
- Concerned about larger line going across our property.
- When we bought (20 years ago) we were worried about the power voltage. X 2

No

- Not aware of the project.
- Didn't know about it.
- Didn't know about it.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

Other: (no choice given)

Local involvement ie - resources, contractors.

3) Do you feel your questions were answered at this Open House?
Please Circle Choice (Yes or No)

Yes	No
24	

Please explain your choice:

Yes

Felt the spokespeople were very helpful and informative and gave valuable information.
I addressed my concerns and requested readings of noise and EMF levels before and after the project is completed to satisfy my concerns in regards to our quality of living.
The development was explained - in a professional manner.
Very good resource people explaining project and answering questions.
Questions I had at the time were answered.
…but did not eliminate my concern.
I have less concerns about health issues.
As a preliminary layout - well explained.
All that I asked was explained in detail and informative.
My concerns were addressed regarding environmental and employment
People very knowledgeable
Explained the different look and how the power would be speated(?) x 2

No

Yes & No

Willing to try but I want to know weighting of decision components - studies not done yet - sense that most feel relocation unlikely.

Other: (no rating given)

I have a better understanding of the project now but am eager to learn more.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

4) Are there any other points we can follow up on that would make you feel more comfortable with our proposal to build the OTR project?

Please circle your Choice: (Yes or No)

Yes	No
19	5

Yes

No expansion of powerline and construction of alternative corridor to the east.
I don't understand the reasoning for routing the lines so close to our homes when there is a vast area behind. I feel the transformers should be pushed back as far as possible. I am concerned as well with the emissions from these transformers.
Readings of noise and EMF readings on my property.
Visual rendering of the Bentley site would be important.
If the line could find a new route to the Carmi substation from Oliver.
Alternate routes options for the power line.
Alternate routes of options.
What is the timeline for completion of the line.
Go higher to the bush line. What will more power do to fruit trees? Keep the lines\ out in the bush away from people. Never mind the environment the people building houses have moved them. X2
Timeline for construction
Not in my back yard please - put on crown land.
Tower size will be smaller than xpected keeping towers in the same location as existing.
Are alternatives available to runlines other than thru Heritage Hills?
More information on how preferred option will be selected. How will future growth of residentail units along/parallel to ROW be factored in?
More proposed line to higher elevation.
Move the line about mile up and over the mountain. X 2

No

Information on regular maintenace of habitat underneath power lines (weed control, herbicide use, etc.

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

Other: (no rating given)

LRT or monorail train requires small substation.
I would like to visit individual structure points as Nature Trust holdings.
Not at this time.

5) We will be having a second set of Open Houses (tentatively scheduled for May 2007) to present and discuss our preferred option prior to our submission to the BC Utilities Commission. Are there any questions you still have about the OTR that we should follow up on in advance of the second set of Open Houses?
Please circle your Choice: (Yes or No)

Yes	No
7	9

Yes

EMF currently and predicted for planned expansion. (under and next to transmission lines)
How much is it going to cost the people to upgrade?
Keep the power line route open to Princeton to connect BC Hydro.
Location.
Information on regular maintenace of habitat underneath power lines (weed control, herbicide use, etc.
Is there an alternative route above Heritage Hills
If option is to leave lines in existing - how is Fortis willing to dicuss location of tower to minimize visual impact or impact of view for residents.
Types of tenders you will be seeking for local contracts, time frame for proposing bids.
Concern about installation, blasting - final look. X 2

No

Other: (No rating given)

Not yet
Not at this time
We would like to see if the line could be moved a bit up the hill and east on our property.
How much is it going to cost the people to upgrade? X2

OKANAGAN TRANSMISSION REINFORCEMENT PROJECT **MARCH 2007**

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

6) Please tell us know useful the information was in this Open House:
Scale is 1 (Very Useful) to 5 (Not Useful)

Publication	1	2	3	4	5
a) Discussion Guide	7	5	11	1	0
b) Backgrounder	9	3	12	0	0
c) Display Boards	11	9	3	1	0
d) Experts	14	5	4	1	0

7) How did you hear about this Open House:
(Check one)

Newspaper Ad		4
Printed Invitation		6
Personal Invitation Letter		5
Poster		0
Other (Please explain)		
	Newspaper Editorial	1
	Neighbour	5
	Friend	2
	Word of Mouth	1
	Email	1

Note: "Person down the street said you lied in your flyer."

8) Names & Addresses - see consolidated listing

9) What is the best way to contact you - see consolidated listing

10) To give us a better idea of the people attending this Open House, we would appreciate it if you would answer the following questions:

a) Are You

Male	Female
16	10

b) Live withing 500 metres of existing Oliver/ Penticton high voltage transmission line

Yes	No
18	5

PUBLIC CONSULTATION PHASE 1 OPEN HOUSES

c) How long have you lived in the Okanagan?

<5 years	5 - 10 years	10 - 20 years	20 years +
4	2	7	10

1 person not yet resident, have lot and plan to build

Additional Comments from Questionaires:

See attached letter from C. Danninger

Notes from Natures Trust Rep:

Many of our properties in the area are leased to the Ministry of Environment for co-management. We need to consult with them as well (BC Parks). Any replacement structurres should be painted to reduce the aesthetic impact (ie camoflage). In general, existing ROW's should be maintained unless the line can be moved to an area with minimal habitat value.

How long will construction take?

How much say do we have if access acreoss our property is requested?

If we are not happy with construction remidiation what avenues are open to us?

Will there be blasting associated with construction of towers?

Should we anticipate further development in ROW over next 25 years

there is already noticeable line noise - will it increase or decrease?

I am a realtor in Penticton. I feel it would be beneficial in promoting our area to have the power lines moved further back from residential areas. As more people move to the Okanagan we will be looking to develop around where the current line runs. It will open up more space to grow if the lines are moved back further from residential. People are concerned with health issues and prefer not to be close to main power lilne. Also it will probably be more environmental friendly to have the lines moved.

Concerns posted to Display Boards:

	Board 16	Clearing a new ROW east of Heritage Hills would create new habitat for deer and Big Horn Sheep
	Board 16	Keep the transmission line on the existing alignment
Map	Penticton	Measure EMF around substation
Map	Heritage H	Concern re access, blasting, erosions during construction
	Board 20	Concerns about increased audible noise (corona) from higher voltage lines in Heritage Hills. Options for hardware to reduce noise

Summary of Attendance

Location	**Date**	**Attendance**
Oliver	22-May-07	8
OK Falls	23-May-07	72
Penticton	24-May-07	48
Total		**128**

Oliver Open House - Phase 2 - May 22, 2007

Attending from OTR Project:

Pierre Dufour - FortisBC
Bob Gibney - FortisBC
Ameera Shivji - Fortis BC
Paul Chernikhowsky - FortisBC
Joyce Martin - FortisBC
Gary Shtokalko - BC Hydro
Rob Sicotte - BC Hydro
Garry Barnett - BC Hydro
Rozlyn Bubela - BC Hydro
Steve Morck - BC Hydro (Elements)
Pat Beaven - BC Hydro (Beaven Property Services)
Bruce Rozenhart - BC Hydro (Counterpoint Communications)
Gayle Bukowsky - BC Hydro (Counterpoint Communications)

Participants **8** **Completed Questionnai** **4** **50% of participants responded**

1) Now that you've gone through this second Open House and have had the opportunity to learn about the preferred option proposal for the Okanagan Transmission Reinforcement (OTR) Project, how do you feel about the project?
Scale is 1 (Very Positive) to 5 (Very Negative)

1	**2**	**3**	**4**	**5**
2	2	0	0	0

Please explain your choice:

1 - Very Positive

Use the cheapest route
I feel reassured that all area residents opinions are being considered

2

I realize that the project is necessary however I have concerns about the impact visually in the Oliver area

2. Prior to this Open House, did you have any concerns about the OTR Project?
Circle Choice: Yes or No

Yes	No
3	1

Please explain your choice:

Yes — Mostly because I did not fully understand the total project.
I wanted to know what the new station would look like from my home
Just the visual thing

No — No comments received

3) Do you feel your questions were answered at this Open House?
Please Circle Choice (Yes or No)

Yes	No
4	0

Please explain your choice:

Yes — I have a better idea what I will be looking at because of the pictures provided and the explanation given.
Fortis reps have done their homework

4) Are there any other points we can follow up on that would make you feel more comfortable with our proposal to build the OTR project?
Please circle your Choice: (Yes or No)

Yes	No
0	4

No comments received

5) We will be submitting our application for the OTR to the BC Utilities Commission early this summer. Are there any questions you still have about the OTR that we should follow up on in our application other than those you have already noted in this questionnaire?
Please circle your Choice: (Yes or No)

Yes	No	N/A
0	3	1

No comments received

6) Please tell us know useful the information was in this Open House:
Scale is 1 (Very Useful) to 5 (Not Useful)

Publication	1	2	3	4	5
a) Discussion Guide	3	0	0	0	0
b) Backgrounder	2	0	0	0	0
c) Display Boards	4	0	0	0	0
d) Experts	3	0	0	0	0

7) How did you hear about this Open House:
(Check one)

Newspaper Ad	2
Printed Invitation	1
Personal Invitation Letter	1
Poster	
Other (Please explain)	
	0

8) Names & Addresses - see consolidated listing

9) What is the best way to contact you - see consolidated listing

10) To give us a better idea of the people attending this Open House, we would appreciate it if you would answer the following questions:

a) Are You

Male	Female
3	1

b) Live within 500 metres of existing Oliver/ Penticton high voltage transmission line

Yes	No
1	3

c) How long have you lived in the Okanagan?

<5 years	5 - 10 years	10 - 20 years	20 years +
2	0	0	2

Additional Comments from Questionnaires:

No additional comments received

Concerns posted to Display Boards:

Environment Board	Concern re use of herbicides on ROW and the inadvertent consumption of "treated" plant products. (by animals)
	Concern re public availability of heritage site information, eg mapping made available including sensitive information.

Okanagan Falls Open House - May 23, 2007

Attending from OTR Project:
Pierre Dufour - FortisBC
Maureen Grainger - FortisBC
Ameera Shivji - Fortis BC
Joyce Martin - FortisBC
Paul Chernikhowsky - FortisBC
Gary Shtokalko - BC Hydro
Garry Barnett - BC Hydro
Rozlyn Bubela - BC Hydro
Steve Morck - BC Hydro (Elements)
Pat Beaven - BC Hydro (Beaven Property Services)
Bruce Rozenhart - BC Hydro (Counterpoint Communications)
Gayle Bukowsky - BC Hydro (Counterpoint Communications)

Participants: 72 **Completed Questionnaires: 53** **74% of participants responded**

1) Now that you've gone through this second Open House and have had the opportunity to learn about the preferred option proposal for the Okanagan Transmission Reinforcement (OTR) Project, how do you feel about the project?
Scale is 1 (Very Positive) to 5 (Very Negative)

1	2	3	4	5	N/A
6	7	8	6	25	1

Please explain your choice:

1 - Very Positive

- I think the existing route is a good business decision and that some of the alternate routes would be very expensive and more time needed to do this project, and too costly with money and environmentally.
- The existing line makes more sense in actuality it is a tidier line than the existing one.
- Yes - we definitely need to maintain hydro power but at what expense. Removing a few trees for an alternate route (the pine beetle will do that; bothering the wildlife?? - when does this ever supersede human life? Financial cost minimal when you consider the continuing complaints from residents in the coming years if you maintain the existing route.
- Using preferred option is a no brainer!
- Very positive
- Excellent presentations - Good homework

2

The valley needs the power - this is the most environmentally friendly way to do it.
We need the power unfortunately some people's views may be affected however.
I see the project as a necessary part of planned (and apparently inevitable) growth in this region. This Open House answered questions I had concerning tower height and removal of existing towers. Also I have concerns about wildlife impact in any consideration of the "out-of-sight" route. The info was available.
Would like more detail on impact on land owners i.e.. Would there be consideration to place pole or towers in more preferable locations.
It's OK because more power is required to supply the area - it has to be done somehow!
If it stays in its existing location

3 (Neutral)

I feel its necessary for growth purposes but expensive. I don't feel the ground in Heritage Hills is safe ground to build anything.
Project is fine - proposed location is not.
From reading the info and listening to Fortis I would like to see the alternate route used even though it will cost more and take longer to complete it will be better for everyone in the long run. The environment will adapt as long as you watch out for nesting and birthing times of birds and animals.
I can realize the project is necessary but believe the route needs to take into consideration where the maximum growth is likely to be in the future.
Nothings changed
I recognize the need for the expanded capacity. I am opposed to the suggested route. The upland route would satisfy both.
Alternate route would be more appropriate

4

Feel the second route would be more suitable, cause less frustration to existing homeowners, environmental concerns are minimal.
The unknown noise factor.
Why does it have to be us? It devalues our property by 1M.
I like the alternative route better. Look forward to the future. If you do have to change do the right thing now and we won't be going through this again.
I will be close to the line on the preferred route and will have my view spoiled.
Efforts have been made to assess the impact of the project on wildlife and plant species with no apparent regard for potential long term health affects on human life.

5 Very Negative

My choice would be to spend the extra 7 to 10% and move the lines up the hill behind the residential area for a long term fix that would be beneficial to Fortis and their customers in the future.

We want the lines relocated - the proposed lines are unacceptable, unsightly and I can't believe you're actually considering more unsightly lines in an area that will be growing considerably.

The lines will be raised to the sight of hundreds of homes depreciating property values.

Danger to human health!

Find another route.

Alternate route.

Want the alternate upland route. Feeling afraid that Fortis won't listen.

I prefer the alternate route if any.

The new lines will pass right in front of my lake view. This will impact my enjoyment and lessen the value of my property.

Use the alternate route - get the lines out of people's views.

As a resident of Heritage Hills it does not address any of my concerns.

While we can understand the need to conserve costs wherever possible, there is also a consideration of the visual impact -- i.e. visual pollution ("urban blight" and other such terms). The aesthetic appreciation of the Okanagan Valley is a prime concern to me. My other concern is that the strong concerns (in particular) Heritage Hills residents have been ignored - i.e. the decision is made.

Visual impact for both residents and visitor to the South Okanagan. Health concerns for residents under ROW in spite of statement "no effect".

We prefer alternate route.

I prefer the alternate route .

This phrase (preferred option proposal) is misleading. I am extremely opposed of developing the power lines on the existing ROW Map Boards 6 to 15). I am in favour of developing the power line on the alternate route (Map Boards 16 - 25).

This is an expansion that I believe will have a negative impact on my property value.

These huge towers should not go in the middle of the subdivision. Your pictures do not show the true impact of people living on Heritage Boulevard. (x2)

The proposed option is very negative to our area. The towers are much too tall.

I don't agree with staying with the preferred existing route. I would have a very positive opinion if you went with the alternate upland route.

Question is very unclear as to whether you are for or against the existing or alternate routes. I am for the alternate route only.

Impact on sight lines, property value of homeowners in area - rights and impact on costs, environmental, etc. have been considered but not on the homeowner directly impacted.

I'm very disappointed that we will lose a beautiful view - something that the Okanagan Valley is noted for. If this goes through our view will consists of Fortis BC power lines. With so much technology available this is what Fortes comes up with?

2. Prior to this Open House, did you have any concerns about the OTR Project?
Circle Choice: Yes or No

Yes	No	N/A
44	7	2

Please explain your choice:
Yes

I was at the first meeting and I was waiting to see what the peoples input had been. It surprised me how many people want to spend more so it not in their back yard so to speak.
Route choice
Not happy with the alternate option.
Does not impact my trap line
1) Removal of the old towers if existing route used (i.e. not have 2 sets of towers visible)
2) Impact on sheep habitat if alternate route used.
Make an effort to place structures onto property lines - out of hay fields and onto the edge.
Proposed line will interfere with our view.
I do not like the upgrading of the existing corridor and I still don't, we all know we will pay in the end monetarily so why not jump in and do the right thing.
Concern that the preferred route is going through the area that is most likely to see all the increased growth in the next fifty years.
Location.
Increased capacity and structures within 150 feet of my backyard. Lake view is not a concern as we don't have one.
Concerns about relocating the line farther east.
Height and placing of poles.
The effect an increase in power would have on humans and the aesthetics of the Skaha Lake view.
Property devaluation (harder sale)
If there is a limit to the cost we will have to pay/say one thing and do some else. What about the magnetic field where can we see a place where is wires are in place and ask the people who live there.
Placing of the poles - house values go down.
Concerned about health and property values.
Location. Health impacts.
The radiation from higher voltage lines is sure to be much more harmful with the twin lines and higher voltage. The visual aspects will be very much worse than present.
We want the lines relocated - the proposed lines are unacceptable, unsightly and I can't believe you're actually considering more unsightly lines in an area that will be growing considerably.
The lines will be raised to the sight of hundreds of homes depreciating property values.
Danger to human health.

Yes cont'd

Too close to area (Heritage Hills)
Intrusion of tower across the whole view.
Worried about the ambience and land values, health from power line fallout, view cut off by power lines.
The existing route needs to be changed.
My health will suffer because of the proximity of the new lines.
Location and height of lines
Health issues; property values; view
While we can understand the need to conserve costs wherever possible, there is also a consideration of the visual impact -- i.e. visual pollution ("urban blight" and other such terms). The aesthetic appreciation of the Okanagan Valley is a prime concern to me. My other concern is that the strong concerns (in particular) Heritage Hills residents have been ignored - i.e. the decision is made.
Continued push to have line use existing right of way and statement in newspaper the "upland" route would cost $5M to $10M more with no support and wide range in construction costs.
I did not like the power line on my land.
I am extremely opposed of developing the power lines on the existing ROW Map Boards 6 to 15). I am in favour of developing the power line on the alternate route (Map Boards 16 - 25).
When I purchased the property I accepted the 161 kv line, however an expansion to 2 x 230 kv is a very big concern.
When we bought our property there was never any mention of a huge change with towers and more power lines. WE would not have bought if we would have known. (x2)
The proposed option is very negative to our area. The towers are much too tall.
I don't agree with staying with the preferred existing route. I would have a very positive opinion if you went with the alternate upland route.
Experts made you feel as if the project was a done deal along existing route.
Unfortunately I was unable to attend.
Impact on sight lines, property value of homeowners in area - rights and impact on costs, environmental, etc. have been considered but not on the homeowner directly impacted. And health concerns.
Because of the result of the Naramata substation.

No

I had no concerns because I didn't know about it.
Knew nothing about this project.
Doesn't really affect my property.

N/A

Would like more detail on impact on land owners i.e.. Would there be consideration to place pole or towers in more preferable locations.

3) Do you feel your questions were answered at this Open House?
Please Circle Choice (Yes or No)

Yes	**No**	Yes and No	N/A
34	15	2	2

Please explain your choice:

Yes

I was concerned about the way the wires hung on the new poles. The rep. calmed my illusion.
Good explanation on EMF
Well laid out and pretty self explanatory.
The questions tat I asked were answered but are answered by Fortis employees who are obviously bias.
BUT, the concerns remain and in some cases are increased eg. The ground clearance of the bottom conductors will they be at the same height as the existing and the other 4 will be higher on the line of sight from my planned retirement home - Value?
That there is absolutely no rights for the existing homeowner. (x2)
The questions were answered.
We wish you move the move east.
From Fortis point of view.

No

The pictures taken of Heritage Hills were taken where the least impact would be. Take some from Heritage Blvd and Christie Mtn. Lane.
All pro Fortes propaganda
Everything presented was for only the existing route.
Continued push for the cheap option without any consideration for the homeowner. How many land users of "upland" route would be affected? Why would negotiations delay the project if this route selected no attempt to answer these questions.
If I try to look at the preferred and alternate upland proposals for the lines in a rational and balanced way, I am given no information to help with my assessment, eg it is not enough to say that the route is more costly than that one. Surely you have done the research and know exactly the difference?
The advantages listed under the "Upland Alternate Route" does not even address 2 of my 3 concerns noted above i.e. health issues; property values and view.
Health issues, view blocks, more construction.
Want the alternate upland route, got the impression minds were already made up.
Talk "around" concerns.
The replies from the Fortis representatives were all negative to an alternate route rather than discussing the future advantages to Fortis and the public.
Fortis has done a good job in responding to why they want to follow the existing route. They have not provided sufficient information on an alternate route - i.e. extra costs for construction.
The alternate route is preferable not the proposed one.

Yes/No Yes there is an alternative but by the research it probably won't be used.
Both yes and no. All your staff were very informative and straight forward with their answers and comments.

4) Are there any other points we can follow up on that would make you feel more comfortable with our proposal to build the OTR project?
Please circle your Choice: (Yes or No)

Yes	No	N/A
41	11	1

Yes
Would like more detail on impact on land owners i.e.. Would there be consideration to place pole or towers in more preferable locations.
Tell us the difference in dollars, between the existing route and the alternate route
Just consider human beings before wildlife, aboriginal viewpoints, etc. etc.
Show us the difference in costing out the alternative over your proposed existing corridor use. Time is not always a factor! With increased growth in this area the proposed fields your existing corridor goes through now will be residential areas in probably 15 years - so move it u onto the mountain.
Move the line to the top of Crown land not blocking our view of many years.
Property value impact; Health concerns
Adopt the Upland Route as your preferred proposal.
Health issue, view blocked, more construction
You could build the alternate upland route please.
Ensure people concerns are listened to and take alternate route
Use alternate route
Real cost figures; Alternate route is on crown land - what is the real impact (and number of) the various leases and licenses - how many people are affected and are they really?
Why the tall single pole? I drove Highway 3 from Castlegar to Osoyoos on May 29th and noted that a similar transmission line was on a much lower profile pole. Why are you not considering a lower profile if you go with existing right of way.
Move the line to the alternate route (map boards 16 to 25)
Move the lies to the alternate upland route
Run lines over alternate route
I am so afraid that Fortis has already made the decision to go with the existing route and these open houses are to make the impacted residents feel good.
Change your ideas - move in another direction.
Strongly consider the alternate route
To consider environmental impact you make with your preferred route.
We knew there was a right of way. Did not expect to have huge towers in front of us.(x2)
Thru Heritage Hills review existing housing that is and planned to be built under the power lines.
EMF's are a concern; property values will decline with the increase of number of lines
Reassure close residence to the lines of the noise and possible health issues.
When you get graphs done on EMF for submission - please email so I can show my neighbours. dalejude@telus.net.
If it goes into the alternate route I have concerns on the environment and wildlife. I am a registered trapper in the area and do not want to see the alternate route come about.

Use alternate route
I would like to see a vote of the residents for or against the proposed route.
Move the line
Move it up the mountain. I'm told the up charge will be roughly $.40/$100. This is not a problem. The route shown on maps 16 - 25 is preferable.
Let's look at a place where they are already in place.
Use the other route.
Have a public meeting where people can voice their points of view know to others.
Alternate route on crown land.
Leave the right of way where it is.
That the views of homeowners were given equal representation in your presentations.
Put the pole structures near property lines in hay field.
Make an effort to place structures onto property lines - out of hay fields and onto the edge. Either side of Allandale Lake Rod. AND be sure that crews stay on Right of Way and leave the ROW as it was - take care of damages.
Hopefully line will be built along the existing R/W - no further impact to animals. No additional access for quads and 4 x 4.s
Keep applying good business since and although you have the peoples input there is a practical sense to this too and we count on you to be professionals.

No Move the line

5) We will be submitting our application for the OTR to the BC Utilities Commission early this summer. Are there any questions you still have about the OTR that we should follow up on in our application other than those you have already noted in this questionnaire?
Please circle your Choice: (Yes or No)

Yes	No	N/A
14	23	**15**

Yes What compensation or mitigation has been considered for residents impacted.
Placing of structures and staying in ROW
What is the phone and address of the BC Utilities Commission
Move it up the mountain. We'll be opposing your applications.
How would you like to live there and have your view blocked by a pole.
Aggressively review the pros of the alternate route; take the lines out of residential areas
Move lines away from houses and livestock
Listen to your customers we want the power lines moved.
Cost of the upland route and provide better information on the comparative costs. Also answer the questions you have raised about land uses of the "upland route".

I don't feel that the possible health concerns have been adequately addressed - what research has been done to show there is "no impact".
Decrease in property values; Will ruin our view that we have paid the price to live here.
Worried about land values and health if you don't do alternative upland route.
The change of right of way.
Health issues; property values; view.

6) Please tell us know useful the information was in this Open House:
Scale is 1 (Very Useful) to 5 (Not Useful)

Publication	1	2	3	4	5
a) Discussion Guide	10	14	10	3	6
b) Backgrounder	7	14	10	3	7
c) Display Boards	19	12	8	0	8
d) Experts	13	10	9	4	7

Additional Comments:

5 Very one sided. Displays were well done but very one sided.
Because I get the feeling the experts are leaving heavily toward the existing rte.
All information skewed to cheapest rte versus best rte.

3 Not enough information about alternatives - both route and type of poles.
Nicely prepared - very professional looking but not enough details about alternate route.

7) How did you hear about this Open House:
(Check one)

Newspaper Ad	8
Printed Invitation	17
Personal Invitation Letter	26
Other (Please explain)	
Radio 100.7	1
Email from concerned people	4
Friend	2
Neighbour	3
Another trapper who received the letter	1

8) Names & Addresses - see consolidated listing

9) What is the best way to contact you - see consolidated listing

10) To give us a better idea of the people attending this Open House, we would appreciate it if you would answer the following questions:

a) Are You

Male	Female	N/A
33	19	1

b) Live within 500 metres of existing Oliver/Penticton high voltage transmission line

Yes	No	N/A
41	8	4

c) How long have you lived in the Okanagan?

<5 years	5 - 10 years	10 - 20 years	20 years +	N/A
14	7	13	17	2

Additional Comments from Questionnaires:

Your environmental concerns about the alternate route are interesting. Your preferred route will suffer the same consequences to wildlife since the land along this route has been relatively undisturbed since 1963. As well, this important habitat could be reclaimed and made into parkland further mitigating the aggregate effect on the land.
I want to make it clear I support the plan to increase power supply in this valley but I adamantly oppose your preferred routing of the line.

The health impact on the existing route is going to be huge; as well as the visual impact. This open house was not to show us anything about the alternate route. It was only about the existing route. We were led to believe that the alternate route would be discussed at this open house - it wasn't.

I don't believe that the response figures you provided reflect the true opposition to the project. The first open house in March was poorly advertised and we heard of it after the fact. I expect that the 70% yes and 95% concerns answered do not reflect the feelings of the actual people who live along the right of way. Most people I have talked to are not in favor of the existing route and prefer Fortis to use the upland route. I also don't believe your response to environmental concerns are accurate. There will be as much effect on flaura and fauna on the existing route, if not more than the upland route. What about the "sheep" conservation area. What about snakes along the existing route, invasive weeks can be controlled better at higher elevations than in the valley as examples. I do believe that the upgrade of the power to the Penticton and Kelowna area is important, but not along the existing route. The South Okanagan is an important tourist area and the visual impact of what visitors see is important and if Fortis proceeds along the existing right of way the visual pollution you will have added is a loss to the Okanagan.

I sense your decisions have already been made and these forums/feedback (negative) will change your minds with staying with your preferred route.

We pray that Fortis has the foresight to choose the alternate route 1) health 2) property values 3) preserve our view, 4) Look to the future, have some foresight.

I support your preferred option even though the tower are visible from my house. I am not in favour of the alternate route because of the environmental concerns.

I'm in support of keeping the existing route. The line currently passes our property and we will certainly see more of it with higher towers and more lines in place. That said, the interference potential re wildlife habitat and the opening up of wild uplands which could result from using the alternate route is not in my view, justified or responsible. In the long run we are all stewards of this landscape.

Wildlife? View of lake at poles. Power lines will lessen price of home. High voltage lines - illness has already been proven by high voltage lines at homes. If doing the project - do it right. More homes need more electricity. Heritage Hills is growing and more homes in Vintage Hills will be right under the lines and more electricity will be necessary as that project and lots are sold and homes built. I understand we need more electricity it would be appropriate to use the alternate route.

We never heard about the first open house so I'd have to say communication was limited. None of the Fortis representatives live in this area… Knowledgeable, but…..The additional cost of relocating the lines would be paid for by us - the consumer. What's the problem here.

I would like some used poles when you change them out in my areas - please and thanks.

Just find an alternate route - don't take the easy way and cheaper way - health and property values. You main concern seems to me that your more concerned about the wildlife than humans.

Make everyone happy - go with the alternate site on top of Christie Mtn.

The reason for the expansion is because of increased demand now and in the future. The cost of moving the line now will be spread across a very large rate base and will not add much to each customer's monthly invoice. The benefit to Fortis will be the ability to expand in the future without the additional cost associated with more public meetings with objections from a much larger public at that time. There are going to be many ore houses built along Skaha Lake as it is a desired area for new construction whereas the alternate route is through an area where future development will be greatly restricted.

A transmission line that was established in 1963 took into account the needs of the time. Such is not the case today. Just as you wish to upgrade and modernize so do sub divisions. You have the opportunity to move the existing line to satisfy both objectives. If you really want true community feedback an open meeting format would be best.

I think that existing power line has more negative impact that your alternate route. We already live under the power line. Who is impacted more? Us or sheep. The sheep live in this consider also your alternate route will open more grazing for the deer. How many stakeholders are impacted now? And how many on the alternate route - Please consider.

We've been in the Okanagan 4 years. We built our dream home in Heritage Hills with a gorgeous lake view and were going to use the equity in that house to help us in old age. If the existing route is used for the transmission line that equity will be greatly reduced. I realize there is an increasing demand for electricity but sincerely believe that Fortis can come up with an alternative that will impact our view a lot less. I hope you will take a long and serious look at the alternative route with an open mind.

The statistics posted in percentages of those in favor and opposed to the project are misleading and do not reflect what percentages of people responding to using the existing right of way.

You are planning to inc. hgt for inc. in pop to 2014 - 2020 - short time frame - concern you will inc. again in future

Concerns posted to Display Boards:

Summary of Input Board:

Should be a public meeting where residents can hear the concerns of other residents

The question is misleading. Does it consider the fact that some residents support the need for new infrastructure but not the location.

Environment Board:

The additional costs associated with the alternate route are insignificant compared to the benefits.

Public safety should outweigh environmental concerns

Penticton Open House - May 24, 2007

Attending from OTR Project:

Pierre Dufour - FortisBC
Maureen Grainger - FortisBC
Ameera Shivji - Fortis BC
Joyce Martin - FortisBC
Paul Chernikhowsky - FortisBC
Gary Shtokalko - BC Hydro
Garry Barnett - BC Hydro
Rozlyn Bubela - BC Hydro
Steve Morck - BC Hydro (Elements)
Pat Beaven - BC Hydro (Beaven Property Services)
Bruce Rozenhart - BC Hydro (Counterpoint Communications)
Gayle Bukowsky - BC Hydro (Counterpoint Communications)

Participants: 48 **Completed Questionnaires: 44** **92% of participants responded**

1) Now that you've gone through this second Open House and have had the opportunity to learn about the preferred option proposal for the Okanagan Transmission Reinforcement (OTR) Project, how do you feel about the project?
Scale is 1 (Very Positive) to 5 (Very Negative)

1	2	3	4	5	N/A
4	4	11	2	22	1

Please explain your choice:

1 - Very Positive

Less impact to the Bighorn sheep and other wildlife species
Limited impact to the overall environment
I believe the OTR project would be less of an impact to everything considered using the existing route.
The project has been thoroughly thought out and all concerns have been considered.

2

Prefer upland route and minimal disruption to communities
Positive about the project provided the alternate route is chosen.
Nothing is perfect. After looking and listening I feel the impale on my home and living will be minimal.

3 (Neutral)

Neither proposal impacts me directly but concern about esthetics of bigger power poles.
Realize need to increase line.
I feel more could be done to cut back on individual power use. But realize that the valley is growing and more power is needed for the future.
There is always pros and cons wherever the lines go. I know costs are involved but feel high tension wires in residential areas

	are not good - health problems arise.
	The option to place the power lines beyond the houses of the hills overlooking Skaha Lake should be considered as a better option than the 2 proposals offered. Of the 2 offered the alternate route would be preferable.
4	I strongly believe the alternative route has to be chosen. That would solve any future upgrades much easier.
	Should remain in existing right of way for minimal environmental impact.
5 Very Negative	Environmental concerns are a priority as you state in your discussion guide - then health of citizens must be on top of this list -- building a transmission line on the lower level should not even be considered.
	The preferred option will impact our entire subdivision. Homes in this area were purchased for views and ambiance which will be destroyed by taller structures. Being that it is such a long term devastating effect, the alternate route should be chosen even if it is more costly, etc.
	The increased pole height will push the lines up into our view. The existing line has very minimal impact on our view. This will negatively impact our property value.
	When we bought 2 years ago we were told that the line would be expanded from 161 to 230 - there was no disclosure about the extend of what I am seeing here - with this upgrade there should be only one option - the one that respects the rights of the property owners. I hear lost of talk about compensation for water rights, traditional use (native) for the alternate but nothing for the loss of value for all home owners in the Heritage Hills area. Experts talk about schedule risk with the alternate route - I believe there is equal or greater schedule risk from legal challenges or the actions available to civil society.
	I live in Heritage Hills and would be directly affected by more power lines, the alternate route going behind Heritage Hills would be a better choice.
	Yes we are affected by this new proposal. The Okanagan view lots should not be affected and the alternate route is by far the better choice.
	I live within 500 metres of the existing lines. Which I did not notice until I had placed the offer on my home. An additional "black" cable line was added a couple of years ago - even that changed the peacefulness of the view. I am a cancer survivor - I am concerned about the health implication "known:" that come with living by transmission lines. And now this is being increased!
	Very one sided.
	Question itself is ambiguous. Map boards are misleading. Alternate Upland route is only acceptable option.
	Do not want to see environment used as an excuse not to go to the alternate route.
	1. Visual impact to home. 2. Health impacts to residents 3. Disturbance during construction 4. Lack of valuation of these impacts.
	Concerned visual impacts; lack of evaluations of how this will affect the community; environmental concerns; not thinking about the future - How big will the pole lines be in 20, 30, 40 years.
	Want alternate upland route.
	Just don't like the change to higher power poles - more voltage.
	Do not explain fully map doe not show exactly. The handout does not really cover questions.
	I do not like the preferred option.
	I am still very concerned about the route.
	I am not in favour of the preferred option upgrade to the existing route in my area (Heritage Hills). I would prefer the alternate (upland) route.
	We are not in favour of the line going on the existing right of way - we are in favour of the alternate route - when the right of way was built in the 60's it was a far less populated area and the transmission lines were less voltage. **(X 2)**
	Right now we don't see most of wires, after OTR … nothing but!
	Following acquisition of property in this high-value area based on lake view, I find I will be looking at power lines vs lake which given number of For Sale signs listed since your presentation equals loss in equity.

No preference shown:

The Alternate route is my choice. I am still very concerned about the current route and the impact it would have on the residents residing close to the power lines and increased voltage . I definitely feel the alternate route would be a better choice.

2. Prior to this Open House, did you have any concerns about the OTR Project?
Circle Choice: Yes or No

Yes	No	N/A
37	6	1

Please explain your choice:
Yes

We were concerned on the road through Harkin Creek Valley
We were concerned on the other route which went through Harkin Creek Valley
Am not in favor of the existing route from Olive to Penticton. Would want the alternate route to be selected route.
Transformer noise, corona (halo) effect, traffic.
Was concerned about health risks but this has been explained to me.
Would like to see it moved above residential areas. Lot of people concerned about magnetic fields.
I had not attended the other open houses and was concerned where the preferred and alternate proposal would be located and how it would affect our property and home.
Did not attend the March Open House. Concerns re the proposed route and size of structures (poles).
Although originating poles and cables have no effect on our view but with higher poles the wires will be very visible in our view.
The most broadly polluting element of development in the Okanagan are the power lines. Some of the most beautiful views on the face of the planet are in BC and in this area and are often marred by the power lines.
Magnetic and electrical field affecting health.
EMF's are a major concern - I would like to see the research that states the higher they are the less the impact on humans.
I had heard about the issue from neighbours - looked at the effect it will have. I am concerned about my life investment. I would not have purchased my home in this area if I had known about this 18 months ago.
The increased pole height will push the lines up into our view. The existing line has very minimal impact on our view. This will negatively impact our property value.
Nothing has changed and I suspect this will be a very contentious application.
The line passes directly over our property.
The lines are going through our property.
Do not want the upgraded lines to go through residential area. Five million on top of $70 million is acceptable to move lines.
Lines going through our neighbourhood.
1. not being invited to first meeting 2. major view impacts 3. health impacts
Was not invited or informed of first open house. Lack of information to residents.
Concern that route through Heritage Hills community will be selected.
Do not want upgrade - devalue homes - electrocute.
Location of project.
View, view, view.
The increased voltage, safety issues, closeness of poles
Power lines too close to livestock (X 2)
What are the health/safety risks of increasing the kv near residences?
That the new high power lines were going to go on the existing right of way and not on an alternate, less populated route. (X2)
First meeting was presented as a tea party invitation and not as a serious issue that would affect our neighbourhood - thus most didn't attend and now find out survey conducted at the ill-attended meeting is basis for 51% are ok or neutral with project? Big business - big lies.
Entire process has been deceptive with no real attempt to highlight to property owners the visual

impact of 100 plus foot towers.

No	Personally we demand power, have for years, but when it comes to increase and change, the public is too quick to oppose what has been in place since the 60's.
	No knowledge of it.
	Just moved here from Ontario. This is my first look at the plan.
	I did know when we bought the lot that "Kooteny Power" had a right of way on the bottom of our lot.
no y or n	Had been answered at previous open house.

3) Do you feel your questions were answered at this Open House?
Please Circle Choice (Yes or No)

Yes	No	N/A
28	12	4

Please explain your choice:

Yes

Plenty of staff with information (X2)
But do not take this as positive.
Very helpful. Every person I asked about my concerns answered or referred me to someone who could.
The OTR team has answered all my questions and concerns. They are open to suggestions and offered alternative routes, which in my opinion is more of an impact that the existing.
Patrick was very informative and answered my concerns.
Well prepared informative posters, friendly staff.
But don't perceive this as a positive in your stats.
Yes however we do not agree with the project.
I feel Fortis only wants to push the existing route and is not interested in the alternate route.
Questions answered but if the alternate route goes through - great - although lots of agreements have to happen for this to proceed.
Very well, the staff were very willing to explain and answer all the questions that were asked.
Would prefer upper option.
Very well laid out and personnel were very knowledgeable.
All yes except the answer that cost is the main deterrent to burying the lines. In high population areas this is a very acceptable method.
All questions were answered and understand this process and significant work into the project.
You have explained the overall picture very well - your staff are very informative.
Good explanation have been given by your staff at this meeting.

No

Did not address issues already submitted. Do not take this as positive.
However, it felt that the questions were answered in a bias point of view - as if the decision has already been made. Did not have sufficient information or answers about alternatives.
1. Why not underground the section through Heritage Hills. 2. Considered decreased property value as a result of the line and tally it in the economic assessment bias towards preferred option.
No active "listening" to our opposition. Not accurate that -- but don't perceive my comments as supportive or positive.
Yes but I don't believe on the stats.
Your experts -- admittedly would not purchase a house along the line - that speaks volumes. Many people feel this way - therefore property value decreases. Your experts skirted around the questions - sales answers and propaganda.
This will be one area of my intervention: When we bought 2 years ago we were told that the line would be expanded from 161 to 230 - there was no disclosure about the extent of what I am seeing here with this upgrade there should be only one option - the one that respects the rights of the property owners. I hear lots of talk about compensation for water rights, traditional use (native) for the alternate but nothing for the loss of value for all home owners in the Heritage Hills area.
I found everyone very helpful and pleasant.
It is a controversial topic. While Fortis BC reps were positive, residents of affected areas that have researched the subject more than I have were negative. I still have a guarded/negative

attitude to increasing the power so close to my house if an alternate route away from residences is suitable.

Most yes/no question asked met with long winded, cushioned responses that never concluded with a firm yes or no. Except for a couple - i.e. Q - can Fortis bury these wires? Answer: Fortis isn't a company that does that kind of wiring? Q: Why not? Answer - We just aren't that kind of company.

No real explanation was given for why wires cannot go underground through Heritage Hills.

N/A

Yes questions were answered but not to our satisfaction regarding the outcome. (X2)

4) Are there any other points we can follow up on that would make you feel more comfortable with our proposal to build the OTR project?

Please circle your Choice: (Yes or No)

Yes	No	N/A
24	16	4

Yes

Go with the alternate upland route to protect existing community.

Replacement of existing power lines and poles should be a high priority.

Compensation for loss of value of all properties affected by OTR. I may sell, rather than build.

Put the power line through crown land instead of my neighbourhood.

Public meeting where public in south Okanagan is properly ? (sentence ended)

cost to underground section through Heritage Hills only as a 3rd option.

Impact on property values

More information on alternatives; impact on local community; concise environmental evaluation for alternative routes.

Lines go over top of home/swimming pool; need to address questions.

Keep the right of way as far away from homes or potential development

Reducing hum and noise from the Anderson sub, perhaps use of wall sound barriers.

Keep us informed as to permits.

I would prefer the power line be at the alternative route "upland route"

Gather more definitive information on the alternative route; Are you willing to pay for the drop in value of my home?

The alternate route.

Just use the alternative route please.

Definitely consider the alternate route.

Following up with Paul - possible interference.

Improve all initiative to alternative energy - solar, wind and geothermal for example; Explore underground routing of wiring especially in urban areas.

1. Investigate burying lines. 2. Explain the best interest concept to me the property owners vs a company that will monopolize my electric/gas/view to the lake.

Approve the alternate (upland) route and avoid the residential area.

Come up with a viable solution to either go behind the well populated and quickly growing residential area of Heritage Hills or become a company that buries wiring. The supposed "alternate" route was obviously done to placate landowners into a false hope that Fortis might actually consider another route. After seeing the effort and push for the preferred route all hope this Fortis is seriously considering the 2nd route seems lost.

No

It's not a question that with progress/growth more transmission is required. It's the location to the best interest of homeowners, human beings how they are impacted. Animals migrate, trap lines can be moved - mineral right - rich get richer. What about the hard working individuals who just want to come home to peace and serenity, enjoy their view and health?

The upgrade I hope, remains on the existing route, we got used to the lines that are in place and we will get used to the new line. We need the increase and quite frankly it doesn't look that bad - in fact it actually looks more appealing than what is there.

N/A

The only way we would feel more comfortable with the proposal would be if the alternate route was chosen between Vaseux and Penticton and the current right of way was not used. (x2)

5) We will be submitting our application for the OTR to the BC Utilities Commission early this summer. Are there any questions you still have about the OTR that we should follow up on in our application other than those you have already noted in this questionnaire?
Please circle your Choice: (Yes or No)

Yes	No	N/A
13	22	**9**

Yes

Definitely the "preferred route" option has been much better researched than the alternate route. We don't have the resources to pay someone to research it (i.e. experts) . Comments from Fortis officials here indicated they are quite prepared to "defend" their position to BCUC. The regular person is ill equipped to defend against Fortis.

What does it take for Fortis to actually consider the concerns of residents affected?

How do you balance the benefits to those needing back-up (mostly Kelowna, with the ________it on those affected by construction and operation.

Environmental study.

Why do you believe that the cost at another $5,000,000 is not easily doable. Considered the cost to us taxpayers health? Please follow-up to let me know when the next hearing is.

What is the true cost of alternative? What are the environmental impacts of the alternative?

Issues over not disclosing previous questions.

Should the BC Utilities not approve the alternate route what can we do. Its not only the view but what about the value of our property.

Alternative route is the way to go.

It appears that the preferred route option has been far better researched than the alternate route. Why hasn't more research been done on the alternate route?

1. Why are surveys only being presented for immediate completion at your presentations? 2. What independent survey is / has been conducted?

If the alternate (upland) route is pursued will the existing line be removed? One FortisBC rep I spoke with seemed to think that would be the case.

Do you mean questions that you could then formulate a tidy response to present to the BCUC in a neat little package, all loose strings tied up? Here's a question: Why didn't you just mail your "first survey" form the "first meeting" to all landowners and business owners in the affected areas in the first place? Question 2 - why were people expected to complete this survey on site rather than being asked to mail it in, giving them time to consider their responses? We had to ask to mail in and got a reluctant yes.

6) Please tell us know useful the information was in this Open House:
Scale is 1 (Very Useful) to 5 (Not Useful)

Publication	1	2	3	4	5
a) Discussion Guide	8	10	10	4	2
b) Backgrounder	6	8	12	3	4
c) Display Boards	12	11	9	3	2
d) Experts	14	7	13	1	2

Note: Of the 44 questionnaires submitted 4 did not respond to this question and others were incomplete.

Additional Comments:

Experts are patient in a difficult situation.

Define useful - Useful to whom? Useful in what way? This innocent question is a double edged sword to be used by Fortis for Fortis.

7) How did you hear about this Open House:

(Check one)

Newspaper Ad	8
Printed Invitation	11
Personal Invitation Letter	19
Other (Please explain)	
Neighbours	3
Wife	2
Neighbours circulating petition	1
Neighbourhood newsletter	1
Friend	1
Walked by school	1
My son rang me from Vancouver	1

I received an invitation after I emailed Fortis and the BC Utilities Commission with my concerns.

Additional Comments:

Fortis spared no expense on the second invitation - hopefully they won't present money as an issue to go ahead with the project by their preferred route at 100 foot towers.

8) Names & Addresses - see consolidated listing

9) What is the best way to contact you - see consolidated listing

10) To give us a better idea of the people attending this Open House, we would appreciate it if you would answer the following questions:

a) Are You

Male	Female	N/A
22	17	5

Additional Comments:

Why do you need this information?

b) Live within 500 metres of existing Oliver/ Penticton high voltage transmission line

Yes	No	N/A
31	11	2

Additional Comment:

Hopefully no one was so tired after a long days work to answer #10.

c) How long have you lived in the Okanagan?

<5 years	5 - 10 years	10 - 20 years	20 years +	N/A
8	8	11	13	4

Additional Comment:

Hmmm… interesting question - fairly obvious how you'll use the answer to Fortis' advantage.

Additional Comments from Questionnaires:

Power poles through communities have no place. A mistake about where they are now was made - time to correct it and consider the upland route. am sure if you asked for a few cents more people would agree to cover the costs to chose the alternate route.

Living here with this upgrade there should be only one option - the one that respects the right of the property owners. I hear lots of talk about compensation for water rights, traditional use (native) for the alternate but nothing for the loss of value for all homeowners in the Heritage Hills area. Experts talk about schedule risk with the alternate route - I believe there is equal challenges on the other actions available to civil society.

Would you live under a power line?

You haven't asked me which option we prefer and why we prefer it. We prefer the alternative route: make the alternative route a pedestrian hiking trail - huge positive recreational trail - benefits should be added into project assessment. You say it is the right option, on balance, the issue is how much blight you put on the various parameters. The social impacts are very significant to us. This the wrong thing to do to a residential area.

From what I have been told it appears there has been minimal effort to look at the viability of the alternate route. I was told that you do not even know if you could get this route. All you seem to know is that it would cost more and take longer.

I know the residents in Heritage Hills are very concerned about the reinforcement plan and several petitions have been started. Alderman Frimaldi who resides in Heritage Hills has voiced her concerns which have been noted in the Penticton paper. Well the residents in the Evergreen / Blackhawk area are concerned as well and plan on starting a petition as well. I definitely feel the residents in al affected areas should be considered and not just one particular area. The route of choice is definitely the "alternate route".

Learn from Europe.

No information on how decrease in property values will be assessed. Health concerns - lines running through subdivisions. Visual impacts - loss of enjoyment of a pristine view. Haven't had public input. Alternatives need to be look at in depth and detailed information provided. Only one option has lots of info. No info on construction disturbances, mess and noise. Discussions - felt like decisions has already been made. Process very one-sided.

My concerns are more with speed of growth and number of units being built for seasonal residents. Power line is approximately 1000 metres from our property so my concerns are more environmental/wildlife pressures.

If you could afford to buy Teresan Gas you could afford to find an alternate route or "bury" your wires. Last question for now: What's the chance any of what's written here will be made available on your website? Included in the survey results? Used out of context? Make any difference to the outcome?

1) It may cost more to go the alternate route, but when the project is $120 million the percent is low - why not do it up right now and anticipate the future needs - instead of doing mini upgrades and add-ons every few years.

2) Should not go in the existing right of way - too much voltage in too populated an area when the existing route was set up in the 60's it was not as populated and much less voltage - now is the time to upgrade -- but now is the time to move it also.
If it was done in the alternate route now the required districts could then do proper planning and hopefully create buffer zones between the lines and any new subdivisions so this disagreement would not take place in the future.

3) There are just as many environmental concerns along the current right of way as there is along a new right of way regarding endangered species, etc.

4) Surveys can be very misleading. Greater voice and weight should be given to those people who are directly affected by the line choice - i.e. landowners and those people directly under and around these high voltage lines. The disruption and noise of construction and the resulting increase in voltage and visual impact (also environmental impact) will be long-lasting to those directly affected. Those people directly affected should be taken more seriously with their concerns and have a greater weight in survey results than those who live in gated communities and are not directly involved and just come out for coffee and cookies.

INTERWEST PROPERTY SERVICES (1991) LTD.
630 CARNARVON STREET, NEW WESTMINSTER, B.C. V3M 1E5
TEL. (604) 522-1621 • FAX (604) 522-5624 • www.interwest.info

December 11, 2007

Reference: File # 07-9-16 - Fortis

Fortis BC Inc.
5th Floor, 1628 Dickenson Avenue
Kelowna, B.C.
V1Y 9X1

Attention: **Pierre Dufour**

Dear Sir:

Re: **Okanagan Transmission Reinforcement Project Route Options**

In accordance with your request and authorization, this summary report considers the approximate cost, probability and time delay to route delivery for an alternate route to the present Fortis right of way that is situated on the east side of the Okanagan Valley, south of Penticton. The area of the possible diversion from the present right of way that is considered in this letter report is from Penticton at the RG Anderson substation to the north end of Vaseux Lake.

There is currently a 160 KV circuit situated on this 28 Km of right of way which requires upgrading to a 230 KV double circuit in order to balance loads in the area between Kelowna and Osoyoos. This letter briefly examines and summarizes a cross section of economic variables that are required in the consideration of upgrading the electric transmission facilities within the present right of way or utilizing an alternate route.

The writer is familiar with the land base on which the alternate right of way is situated and is familiar with the wildlife concerns in the area. The writer has carried out the appraisals on which the charges for Crown Land tenure were based in the early 80's and has provided expert testimony regarding the impacts of High Voltage Transmission lines and rights of way on real estate values. Studies have been carried out with regard to the impact on subdivision lots, subividable properties, small acreage sites and the impacts on agricultural properties. Testimony on these issues has been provided for both claimants and authorities in expropriation hearings.

Cont'd…2

December11, 2007
Page 2

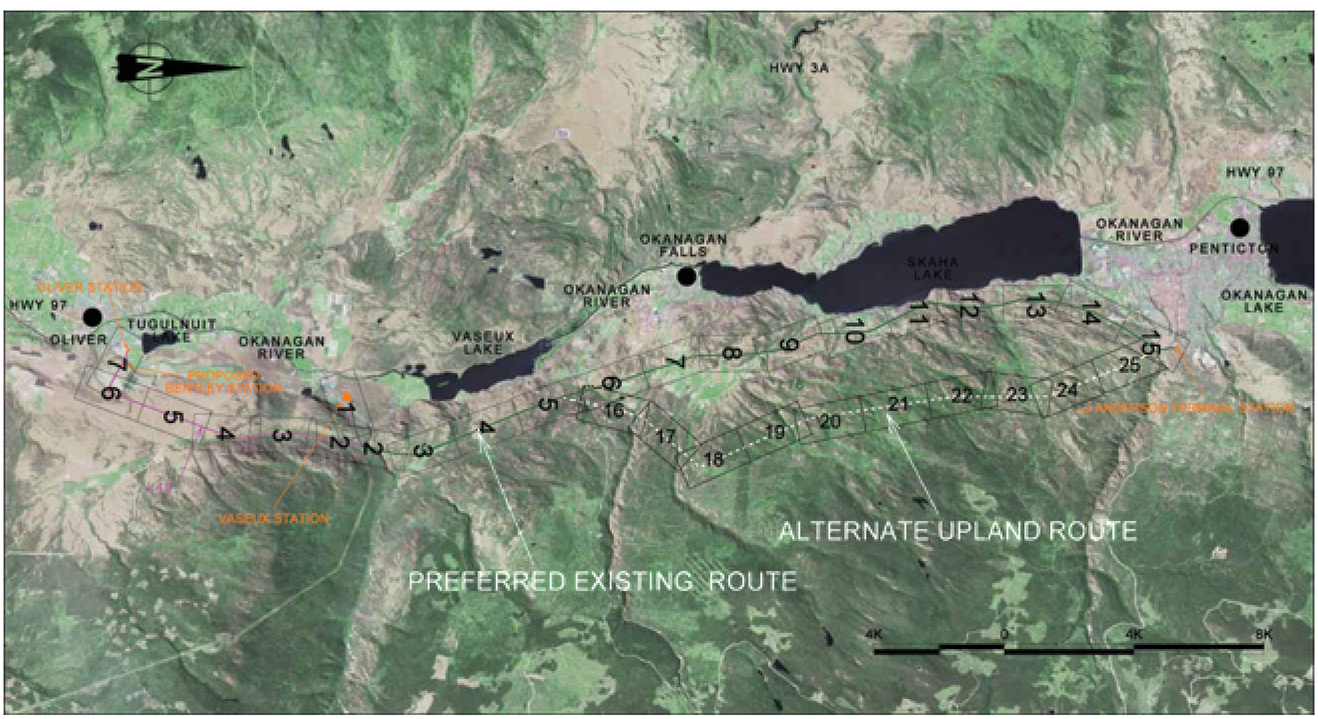
Budgetary appraisals for linear projects as well as individual property appraisals for acquisition have been provided on many major projects in British Columbia. A similar route study through Arizona and New Mexico was completed for Tucson Gas and Electric in association with Coates Field Service.

Interwest Property Services (1991) Ltd. and its predecessor companies have provided full project appraisal permitting, acquisition costs on many major linear projects. The writer has also provided expert testimony regarding First Nations land rentals and values.

In addition to new appraisals for statutory rights of way the writer and Interwest Property Services (1991) Ltd. have provided studies to Utility companies regarding the value in use and the value of abandoned linear rights of way. A complete CV is included as an attachment to this summary letter.

Support material for any opinions of a general appraisal nature is retained in the appraiser's files. No appraisal opinions for any specific property are provided in this letter.

This letter relies upon the reader's access to full project information and mapping to supplement the discussions and conclusions. However the present route is shown from key map numbers 4 through 15 and the Alternate Upland Route is shown on key map numbers 16 to 25, which are indicated on the following key map.



Cont'd…3

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Page 3

PRESENT ROUTE AND UPLAND ALTERNATE

Cont'd…4

PROJECT PREFERRED ROUTE

The project preferred route and construction is to alter the current 160 KV configuration that is on H-Frame wood towers within a right of way that has been in place since 1965. The present wood H frame towers are proposed to be replaced with single pole steel towers that are 11 meters or 36 feet taller with a configuration of three pairs of conductors each above the present full height of the H-Frame towers.

THE ALTERNATE ROUTE

The alternate route considered in this report is known as the Alternate Upland Route and is considered in Fortis Documentation as:

Project Alternative 2a, the Upland Route with a 30-metre single pole steel structure;

Project Alternative 2b, the Upland Route with two 19-metre high, H-Frame, steel poles, with a two single-circuit configuration;

Project Alternative 3 is a combination of the present route and the Upland Route.

The Upland Alternate Route requires a 1.1 Km right of way over a privately held Nature Trust Property and a new statutory right of way on Crown Land over a distance of approximately 19 Kilometers. The Upland Alternative Route will also require either a duplication of the existing right of way, or at least the diminution of value of the existing right of way resulting from under utilization, or the complete abandonment of the value of the existing right of way. The value of the existing right of way includes large areas of higher value lands, previously incurred clearing and construction costs, soft costs and survey and legal costs.

The Upland Alternate Route Location Description

From a point just east of the north end of Vaseux Lake shown on project plans as Shuttleworth Creek, the upland route proceeds northeast and climbs the Easterly Valley Mountain to an elevation maximum of 1,200 metres or 3,936 feet. From a point due east of Okanagan Falls, the upland route then precedes north/northwesterly to just north of Ellis Creek at Penticton where the RG Anderson Terminal is located.

Tenure

From the points of diversion from the existing right of way, the upland route is situated on Crown Land administered by -- The Integrated Land Management Bureau. The tenure available will be a Statutory Right of way with a prepaid value for the interest in land or an annual payment. Although the tenure on Crown Land will provide security for financing, title remains with the Crown.

Cont'd…5

Land Costs

The right of way, if available would be provided on the basis of an annual fee from a published schedule of values. If proximity is close to an urban area, fees can vary from the published rates, but there is no urbanization in close proximity to the Upland Route lands.

Although not exact at this time, depending on which option is selected, the upland route is estimated to require a cleared area of from 77 to 105 hectares plus access and danger tree protection. The estimated land area that would be protected in the Upland Alternate route is estimated to require a right of way area of 161.8 hectares, including the area of danger tree protection.

Although subject to change, the published zone value is $1,080 per hectare so the total pre-payment for the statutory right of interest is then estimated to be $174,744. In addition, application fees and an investigative permit would be required for an additional cost of $1,590. Discussions with 'Front Counter Staff" for the Integrated Land Management Bureau reveals that there would be several issues requiring extensive consideration with an application for this tenure application, particularly First Nations issues and Wildlife Management issues that make this 'Alternate Route' option a risk of not being acceptable.

In addition to the major issue considerations, there are other interest holders with grazing licenses, water licenses and trap lines where consultations, monitoring of the construction and change in vegetation impact on these interests. Likely pre and post construction releases will be required.

After an application is submitted, studies of the extraordinary issues, a multi agency review of studies, canvassing of other interested parties, replies and responses will cause this application to be considered over a time period of 1-2 years prior to either a negative or positive or conditional response to the Tenure Application.

Right of Way Clearing Costs

Not including the cost of the timber, less any recovery through its sale, accesses for construction costs are estimated to be $661,300 and clearing costs by helicopter are estimated to be $5,308,451. Ground based clearing costs, although lower at $1,934,046, should not be anticipated because of the limited vehicle access permitted in the area.

Potential Conflicting Uses

Issue A, Wildlife: The upland route traverses grazing habitat for one of the California Big Horn Sheep herds that are situated in the eastern Okanagan Valley. The Upland Alternate Route passes through the Derenzy Bighorn Sheep Habitat resource Management Zone (RMZ). Concerns are related to increased accessibility that would be created by construction and service roads.

Cont'd…6

BIGHORN SHEEP AT HERITAGE HILLS 11/07

Much of this area is currently inaccessible due to the rocky terrain and much of it is mapped as having restricted vehicle access. The band of sheep is reported to be the largest herd of California Big Horn Sheep in British Columbia. However, due to a disease related die off the herd was severely reduced in 2000. These sheep are known to have restricted feed within this range and that they migrate on traditional routes, imprinting the young. They are known to be difficult to transplant because of these traits.

The full limits of the range they occupy is mapped and the Upland A1ternate Route is known to cross the habitat on the westerly side. The valley subdivisions, now advancing easterly, beyond the existing right of way at Heritage Hills, encroach on the Big Horn Sheep range.

A diverse and sometimes rare group of additional animals are found in this range area as well. There are a number of blue and red listed species in this area. White tail and mule deer, elk, moose, bear, cougar, snakes, including rattlesnakes and night snakes and any number of upland bird species will also require consideration, works of accommodation and construction scheduling. There is also some unique vegetation.

Cont'd…7

Remedy:

A detailed Environmental Impact Statement has been prepared, however an even more specific study documenting the habitat, feeding and breeding habits and migration routes of the California Bighorn Sheep as well as establishing mitigation criteria may be a requirement of securing the Crown Land Tenure. More detailed study of all the endangered species and vegetation in the area may also be required. Nature Trust has indicated a preference for the existing route where environmental impacts have already occurred and are more manageable than the Upland Alternate Route. Final route selection, if approved and construction scheduling will not likely be known until after one to two full years of study and deliberation.

Issue B, First Nations: The Penticton First Nations has reported that there is a specific land claim involving timber rights in the area of the upland route possibly dating back to the McKenna McBride report of approximately 1914-1916. Confirmations of the details of this land claim have not been possible. The Penticton First Nations have indicated a preference for the existing right of way over the Upland Alternative Route. The Osoyoos First Nations have also indicated a preference for the existing right of Way, as have the Okanagan Nations Alliance.

It should therefore be expected that an Application for Tenure on the Crown Lands will be resisted by these First Nations interests.

Although Penticton Indian Reserve #1 is located on the west side of the valley, it should be noted that Penticton Indian Reserve #2 is situated just east of the RG Anderson Terminal.

Remedy:

After consultations and ratification of an agreement with the First Nations groups, it may be possible to place funds in trust for the timber required to be cut for the new right of way as the right of way areas are kept clear for safety considerations. Unless there is a pre-project surrender of these lands for Penticton First Nations, the security of the statutory right of way on the Upland Alternate Route may not be acceptable for mortgage purposes.

Agreements for the disposition of a portion of land in a land claim matter may require general Penticton Band ratification. It may also require the project proponent (Fortis) to fund both a timber cruise and legal and value advice for the Band's use. The acquisition or disposition of property is a lengthy process involving the specific First Nation, DIAND and likely the legislatures of the federal and provincial government. All of these parties may require legal, valuation and environmental advice prior to agreement. Each study or review may require Fortis funding, with no pre-agreement commitment possible on the intent of the specific parties on the issue of the route and construction.

Cont'd…8

Issue C, Grazing permits and licenses: Three grazing licenses for commensurate lands of local ranches are impacted by this route. The Range Amendment Act provides for the deletion of grazing capacity, but there is no reason for the construction or final tower placement to have a permanent detrimental impact on the grazing capacity. However, the conductors, insulators and towers are weed seed traps and maintenance provisions will be required to eliminate the spread of noxious weeds in this range.

Agreement on the maintenance of fencing that separates the permits or licenses will also be necessary as well as a sign off of the licenses. Construction and reseeding will require cattle to be restricted from the right of way to provide for successful re-vegetation. This aspect may require compensation for alternate grazing during construction and a two-season period of re-growth of range grasses.

Issue D, Water Licenses: On the entire project, a total of 47 water licenses, including both domestic and irrigation licenses on 10-15 creeks are crossed by the existing and Upland Alternate Route right of way. In the areas of the Upland Alternate Route there are less than 20 license holders on less than 10 creeks require pre-construction planning.

To protect the flows of each of the impacted creeks as well as some low height re-vegetation to protect against evaporation losses to maintain the licensed volumes must also be considered. Pre and post monitoring is recommended to uncomplicate possible claims relating to alterations of flows as the licensed diversions on these creeks are known to exceed the seasonally available water volume in some instances.

Remedy:

Planning, approved engineering of crossings and consultations and releases from the licensees should satisfy this issue and it should be handled in a single season prior to construction and two additional seasons of monitoring following construction.

Issue E, Construction Scheduling: The Bighorn Sheep require more protection during lambing and other protected species in this area require other protected windows such that construction will be limited to fall months. This is not considered to be a significant economic issue.

Issue F, Maintenance: As much of the area is restricted from vehicle access, the control of weeds inherent with the presence of transmission line towers will be by hand application of chemicals where animal access to treated areas cannot be limited during the short life of the treatment. Mechanical maintenance of the right of way would require vehicular access and is therefore unlikely. Tower maintenance is also expected to be limited to helicopter access and will be more expensive than a line that can be regularly accessed by ground transportation and service vehicles.

Cont'd…9

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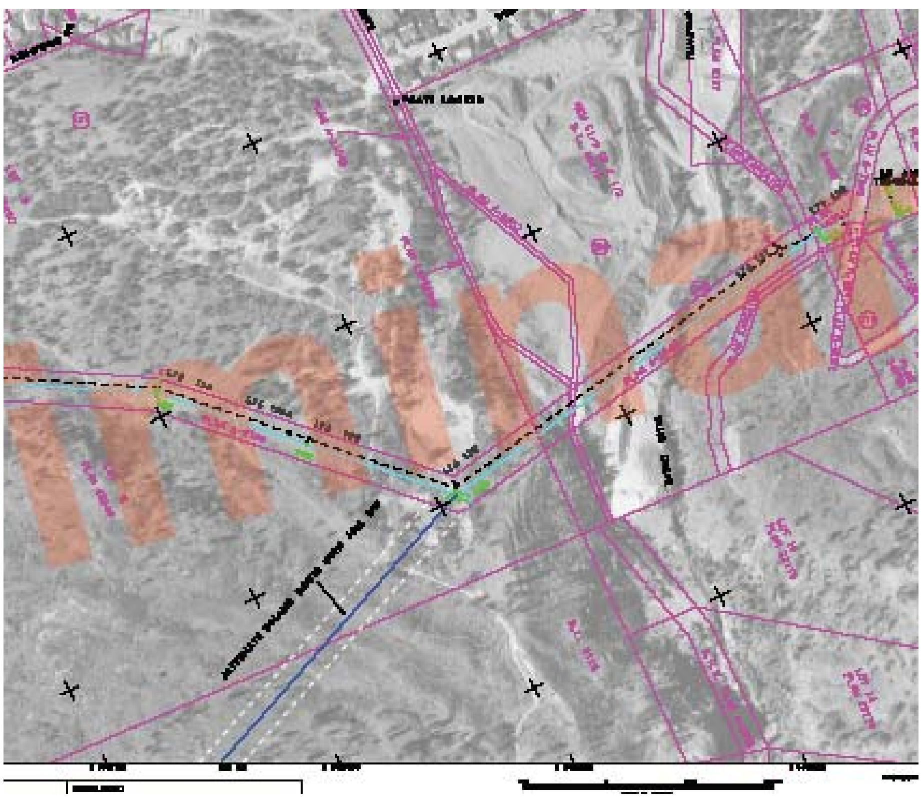
Vegetative controls require certain herbicide application windows to effectively control Knapweed and other noxious weeds from overtaking the range grasses and these windows may conflict with the RMZ management goals.

Issue G, Support of Penticton and the Regional District of Okanagan Similkameen (RDOS) for the Upland Alternative route:

On the basis of residential subdivision expansion potential, both the city of Penticton and the RDOS have supported the abandonment of the present right of way in favor of an Upland Alternative route. Detailed inspection of the existing right of way in the non-Agricultural Land Reserve areas indicates very limited acreage of topographically suitable land for residential development east of the current right of way. Areas of potential benefit from pole or tower movement are in the Wiltse Flat, Pineview and Heritage Hills and possibly the Shuttleworth Creek area.



Wiltse area, Map 15

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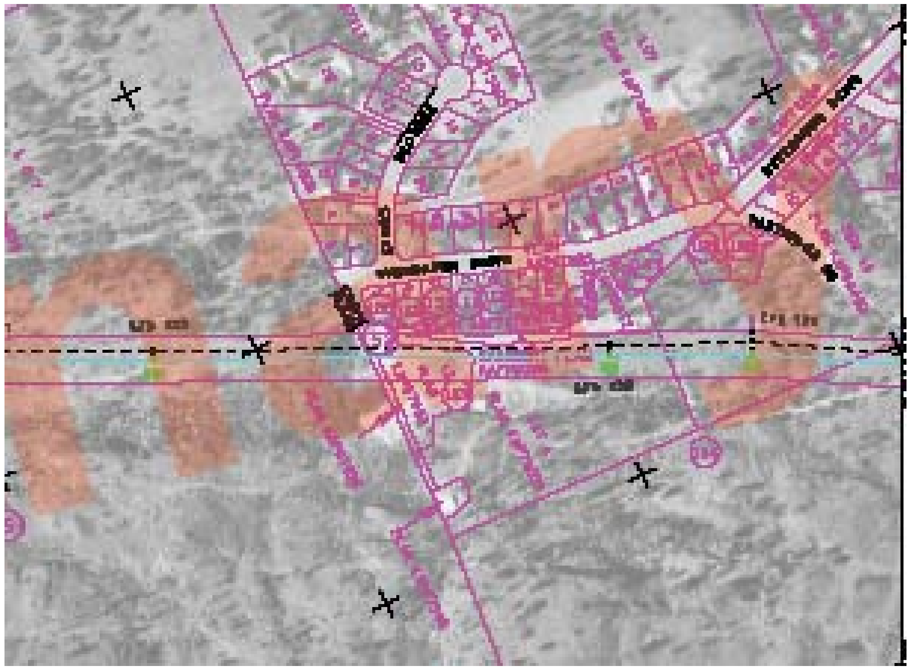
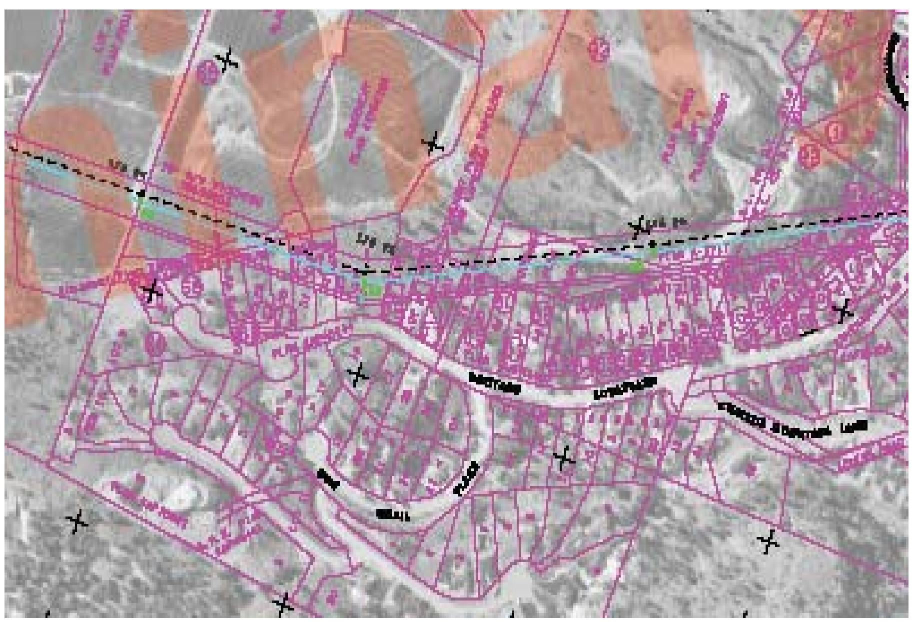


Pine View Area, Map 14



Heritage Hills area, Map 10

Although a private, financial issue in the subdivision process, negotiations have been ongoing with the specific developers involving the movement of poles and possibly right of way. This is an issue that is dealt with in most urban areas. This is also an issue that is dealt with in other utility situations such as railway crossings, natural gas pipeline crossings, municipal dyke and ditch locations, sewer main crossings, road exchanges, etc.

Cont'd…11

Where developers determine that the movement of poles and possible movement or reduction of right of way will result in a net benefit to the property, the developer pays the utility for the net increase in costs. That is, where poles or towers are aging; the replacement of old towers with new will be an offset to the total cost to the developer. This process often involves raising conductors, changing the H Frame configuration for single steel poles and utilities have been willing to reflect the present value benefit to them of the longer life and lower maintenance of the new configuration.

The issue of potential benefits for a few properties of limited acreage will not provide a sufficient offset to economically justify alterations to the right of way beyond these property boundaries.

Remedy: Where private development can benefit from tower relocation, where economic, negotiations between the utility and the land owner can resolve the applicable cost benefit analysis which will either result in tower and right of way relocation or development which incorporates the existing right of way into the subdivision plan with the least impact on costs and lot values.

Issue H; Agricultural Lands;

The area considered is the present right of way from Vaseux Lake north to Heritage Hills, shown on route Maps 5 through 10, which currently crosses a limited number of orchards, vineyards and pastures. The proposed alterations from H frame to single steel towers on this right of way will improve agricultural efficiency in all cases. In some cases very small tower movements to field boundaries will eliminate interference to agricultural operations. In the case where routing Alternative 3, utilizing both rights of way would be chosen, the benefit to Agriculture that would have been derived from the planned tower replacement on the present right of way would be eliminated.

<u>Issue I. Potential Recovery of values within the present right of way:</u>

There is some developable land that will be benefited by the removal of the present right of way but to date the owners have not provided any indication of a willingness to contribute to the costs of movement even on their own properties. At Wiltse Flats, some benefit could be expected, at Pine View very little additional useable land will become available and at Heritage Hills the development is already under and east of the present right of way and any benefits would only be derived by a limited number of individual lots improving view. Significant view benefits will also be derived from the tower replacement and line raising option on several properties. In a few instances the tower height will bring conductors into view where they were previously below the view level. These instances appear to be limited to lots above Heritage Drive.

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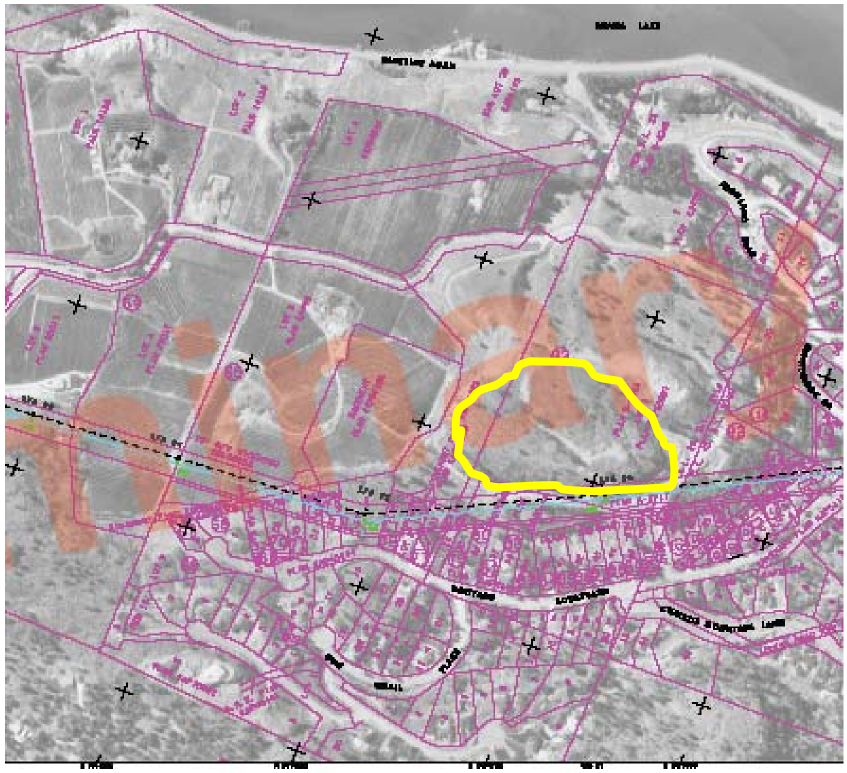

It is noted that this potential obstruction of the conductors will be from several hundred feet away and that each conductor will be at a separate level, not in the more visible groupings of the H frame tower format. This type of decorative single pole and conductor format was installed along Highway 99 in Delta and Richmond approximately 30 years ago because of the less objectionable appearance. Although there have been a few luxury homes constructed along this right of way, most are some distance away from the towers because of historic parcel configurations and the ALR status of the land.

Cont'd…13

SINGLE STEEL TOWER RICHMOND

Previous studies on the impact of Electric Transmission Lines indicated no impact on property values from the second and third row of residences from the right of way, even with the more visually intrusive steel multi-plate structures or H frame towers. Where the current conductor levels are directly in front of the views to Okanagan Lake from the row of encumbered lots adjacent to the west of Heritage Boulevard, there will be an enhancement of views.

In some instances in the Heritage Hills area, for the first level of lots to the east of Heritage Hills Boulevard, where the conductors were previously screened by the houses, they will come into view. However, as the towers are at the 440 meter level and the houses east of Heritage are at the 470 to 480 meter level, most of the distant lake views from the homes is above the propose conductor levels. These views are from 150 to 200 feet distance where the conductors become less visible. For the houses on the next roads to the east that is Bighorn Trail, One Quail Place and Apple road, the elevation differential between the right of way and the house locations is 60-100 meters above the proposed conductor height making the view of Okanagan Lake over the top of the two to three rows of houses in front and over the new tower height.

Cont'd…14

It must be noted that many of the lots adjacent to the present right of way have either a directed view of the lake to the southwest or an obstructed view caused by the knoll in the center of the above aerial view. The obstructed Skaha lake view properties are not anticipated to have a noticeable view change. It should also be noted that there are only three tower locations. One is barely visible to any of the lots as it is below the view corridor to the south west of the subdivision. The next is a triple tower at the point of intersection, which is quite visible to all lots above or to the east of Heritage Boulevard. The third is on the knoll, which obstructs the view of the lake.

Sales of properties in this area and the assessment roll for all of plan KAP 48437 have been reviewed and the heavily encumbered lots 29 through 32 are among the highest assessed land values with view through the existing conductors. Lots 34 to 49, with view obstructed by the knoll are assessed at 10%-20% less. Unfortunately, the lot sales occurred over such a long time frame that no analysis of the impact on lot sales is possible within this plan.

H FRAME TOWER HERITAGE HILLS

Cont'd…15

TRIPLE TOWER ON LOT 33

In all of the subdivisions studied in the past by this firm, there has been no consistent evidence of a negative impact on property values other than the encumbered, even when the towers and conductors were not yet obscured by the construction of houses.

It is very unlikely that a market examination before and after the change in towers will reveal any impact on market value from the propose change in the tower height or tower appearance. As the conductors will be higher, at greater distance from the homes and in a configuration reported to reduce EMF effects from the present lower voltage lines, there should not be any change in market values resulting from perceived health risks.

Over much of the land in the present right of way, tower placement was on high points of very low utility land. In the agricultural areas, field planning an orchard and vineyard planting has been modified to facilitate the placement of towers many years ago. The value gained by tower removal in these instances will be deferred until such time as complete farm replanting is undertaken. The present value of this future potential will be such that the contributory value is insufficient to pay for the cost of moving each tower a small distance and an insignificant contribution when considered against the movement of the 20 km of right of way.

Cont'd…16

General Observations;

Many of the above issues will require the additional involvement of legal counsel, forest and land valuators, environmental consultants, specialists in wildlife management, and land agents for contacts with multiple interest holders and specialized liaison with the Penticton First Nations. In some instances, Fortis staff has the required specialization to produce this information, but there will be independent experts required for valuations of timber and land tenure and for environmental and wildlife studies and solutions.

Contacts made within the independent study areas would indicate 1-2 years to bring the wildlife, habitat and First Nations issues to conclusion as well as significant costs related to consultants and legal issues.

Observations and Conclusions:

Right of Way costs are not required on the present route and if approved, will be moderate across areas of lesser land values on the Upland Alternative Route. Notification of construction timing and compensation for construction damages should be expected for the facilities upgrade on the present route.

Clearing Costs are not required on the present route and will be excessive on the upland Alternative route, particularly if aerial logging is required.

Construction costs are higher on the Upland Alternative route.

Construction timing delays on the Upland Alternative route appear to be from 1 - 2 years to approval and with final design and planning, construction during an acceptable season would be delayed for 3 years.

Maintenance costs will be higher on the upland route where there will freshly disturbed soils and maintenance may be restricted to aerial or on-foot inspections in the environmentally and wildlife sensitive areas.

Consultant fees regarding wildlife habitat and mitigation will be significant on the upland route. Although most studies are complete, most of the studies will still require response to Integrated Land Management Bureau inquiry as well as expert monitoring during and post construction.

Right of Way agent fees securing releases from Range Tenure Holders are not required on the present route and will be required on the Upland alternative route. Compensation will be required for the restrictions of cattle from the right of way during construction and re-vegetation.

Cont'd…17

Consultant and monitoring fees regarding water-licensed creeks are not required on the present route but in order to accurately quantify any compensation or mitigation issues arising from the impact of the upland alternative route on the creeks and water flows, monitoring on the Upland route is required. Right of Way agent fees securing releases from water licensed tenure holders and possible compensation for impacts will also be required.

Loss of the value of the existing right of way, if abandoned, is significant. The acquisition, survey documentation, clearing and non-tower costs associated with the present route will be lost. The base land value varies from lands with residential lot subdivision potential, small rural acreage and some productive orchard and vineyard land will be lost with little or no recovery from present land owners for the potential benefits to a few parcels.

It is concluded that should the Upland Alternate Route is to be the directive to Fortis for this project, that total costs in addition to the construction costs expected on the present route will total $6,000,000 to $7,000,000. It is further concluded that it will be unlikely to determine the outcome of the required application for the statutory right of way tenure on the Crown Land for one to two years and that there may be expenses of objectors to the route, for which Fortis may be responsible.

All of the mitigating measures that may be required cannot be estimated without route finalization and the entire required consultant and right of ways costs could not be estimated without route finalization. With route finalization, project experience by many utilities would indicate that close budget estimates will only be within 25% of actual costs.

Respectfully submitted,

Danny R. Grant, P. Ag. SR/WA

Attachments
Qualifications of Danny R. Grant

CLIENT AND
PROJECT SUMMARY.(

QUALIFICATIONS OF DANNY R. GRANT

EDUCATION:

1. High School - Graduated from St. George's
   Vancouver, B.C.
2. University and College:

   a) Washington State University
      Freshman year in Agricultural Economics

   b) University of Hawaii
      Sophomore year in Agricultural Economics

   c) California State Polytechnic College
      Graduated June 1967 with a Bachelor of Agricultural Science degree, majoring in Agricultural Business Management

   University Courses Included:

   - California Real Estate Management
   - Farm Appraisal
   - Civil Engineering
   - Forestry and Range Management
   - Senior Thesis - Pasture Rental Values
   - Point Reyes, California

PROFESSIONAL DESIGNATIONS:

P.Ag. Professional Agrologist - Registered Agrologist
B.C. Institute of Agrologists

Member of Canadian Consulting Agrologists Association

SR/WA Senior Member of the International Right of Way Association,
Awarded: October 15, 1979

ADDITIONAL COURSES:

a) Appraisal I Successfully completed the American Institute of Real Estate Appraisers' - Course I, Lincoln, Nebraska, 1968

b) Appraisal II: Successfully completed the American Institute of Real Estate Appraisers' - Course II, San Francisco, 1974

c) Appraisal IV: Successfully completed the American Institute of Real Estate Appraisers' Litigation Appraisal - San Diego, 1982

Cont'd…

Additional Courses Continued

d) Appraisal V: Successfully completed the American Institute of Real Estate Appraisers' - Course V, Logan, Utah, 1968.

e) Property Successfully completed the Institute of Management Real Estate Management Course I, Phoenix, Arizona, 1970.

f) Right of Way: Completed International Right of Way Association courses:
201 - Communication
202 - Interpersonal Relations
203 - Advanced Communications
204 - Group Communications
301 - Management of the Right of Way Organization

g) Right of Way: Successfully completed Valuation International Right of Way Association Course - 401, Economics of Right of Way Valuation

h) Commercial Arbitration: Attended Continuing Legal Education Society of British Columbia, Vancouver, May 1982

LICENSES FORMERLY HELD:

1) Alberta Real Estate Salesman - Mac Grant Realty Company Limited
2) California Real Estate Salesman - Weber Land Services

EXPERIENCE:

1) Contract Appraiser/Negotiator to B.C. Hydro, Arrow Lakes Project, 1967/68
2) Contract Right of Way Agent, Gulf Interstate Engineering, 1968
3) Appraiser - Weber Land Services, Santa Maria, California, 1968/69
4) Appraiser - Ronald D. Grant Limited Canada and Ronald D. Grant, M.A.I. Arroyo Grande, California
5) Senior Appraiser and Principal - Ronald D. Grant & Sons Delta and Penticton, 1970/80
6) Senior Appraiser and Principal - Interwest Property Services Limited 1980 to Present

TEACHING:

1) Approved Instructor - International Right of Way Association Courses 101 and 401

APPEARANCES IN ARBITRATIONS OR COURTS

1. Hildebrand v. Department of Highways - Arbitration
2. Cattermole v. Seabird Island Indian Band - Federal Court
3. Svec v. B.C. Hydro & Power Authority - B.C. County Court
4. City of Nelson v. Province of British Columbia - Arbitration
5. Kinjerski v. Royal Insurance Company - B.C. Supreme Court
6. Zak v. Grand Forks School District - Arbitration
7. Leeder v. Department of Highways - Arbitration
8. Weidman-Stone v. Provincial Department of Public Works - Arbitration
9. Lower Fraser Valley Exhibition Association v. District of Surrey - Arbitration
10. Noakes et al v. Province of British Columbia Parks -
    Re: Midge Creek - B.C. Supreme Court
11. Westcoast Transmission v. B.C. Assessment Authority
    Assessment Appeal Board
12. Lillian Mann v. District of Burnaby - Arbitration
13. McDanniels v. District of Coquitlam - Commissioner's Hearing
14. Lalji v. Lalji - Registrar's Hearing
15. Nash v. Ministry of Transportation and Highways - Arbitration
16. Foothills Pipeline (South B.C.) Limited v. Wallace - County Court
17. Kelly Douglas v. Charterhouse Investments - Arbitration
18. City of Castlegar v. Paulson, Lazareff & Polovejchuck - Commissioner's Hearing
19. Ministry of Highways v. Boxer Holdings - Arbitration
20. Foothills Pipeline (South B.C.) Limited v. Hubbard - County Court
21. Young v. Wolstencroft - Supreme Court of British Columbia
22. Farquharson Farms v. Ministry of Highways - Arbitration
23. City of Kamloops v. Sternig - Arbitration
24. City of Kamloops v. W.J. Ellis Company - Arbitration
25. Granite Developments v. Ministry of Highways - Arbitration
26. Virtue v. United Realty - Supreme Court of British Columbia
27. A.T.C.O. Lumber v. B.C. Hydro- Arbitration
28. Witke v. District of Surrey (Kwantlen College) - Arbitration

Arbitration Continued

29. B.C. Hydro v. Frolek Cattle Company - B.C. County Court
30. Mason v. District of Surrey - Arbitration
31. Winskill v. Revenue Canada - Federal Tax Court
32. Little Shuswap Property Owners v. Department of Indian Affairs
    (Leighton v. The Queen) - Federal Court - B.C. Supreme Court
33. Kay Motors v. Canadian Imperial Bank of Commerce - B.C. Supreme Court
34. Desert Inn Restaurant v. Desert Inn Motel - Rent Arbitration
35. Kingsway Developments v. McDonald's Restaurants - Rent Arbitration
36. Calvary Temple v. City of Kamloops - Arbitration
37. Copper Beach Estates Limited v. Revenue Canada - Federal Tax Court
38. Lum v. Harman - B.C. Supreme Court
39. Ristad and Griffen v. Perry - B.C. Supreme Court
40. May Estate v. Ministry of Transportation and Highways
    B.C. Expropriation Compensation Board
41. Neill v. Ministry of Transportation and Highways
    B.C. Expropriation Compensation Board
42. Jesperson v. District of Chilliwack - B.C. Expropriation Compensation Board
43. 3400 Investments Limited v. Webb & Knapp Limited - Rent Arbitration
44. Reimer Mobile Homes Limited v. District of Chilliwack
    B.C. Expropriation Compensation Board
45. Kelly Douglas & Company, Limited v. 331750 B.C. Limited
    d/b/a Maple Leaf Property Management Incorporated - Rent Arbitration
46. Corner's Pride Farms Limited v. Ministry of Transportation and Highways
47. Branscombe v. Ministry of Transportation and Highways
    B.C. Expropriation Compensation Board
48. Devick v. Ministry of Transportation and Highways
    B.C. Expropriation Compensation Board
49. Grove Crest Farms Limited v. Revenue Canada - Federal Tax Court
50. Shell Oil Limited v. Ministry of Transportation and Highways
    B.C. Expropriation Compensation Board
51. L.A. Fischer v. Windermere School District - Expropriation - Single Arbitrator

Arbitration Continued

52. McPhail v. District of Surrey - B.C. Expropriation Compensation Board
53. McCullough v. Prost - Commercial Arbitration - Re: Purchase Option
54. MOTH v. Payless - B.C. Expropriation Compensation Board
55. MOTH v. Hertel - B.C. Expropriation Compensation Board
56. Creston v. Ingham - B.C. Expropriation Compensation Board
57. Creston v. Kowalski - B.C. Expropriation Compensation Board
58. Creston v. Jamieson - B.C. Expropriation Compensation Board
59. Richmond v. River Properties - Expropriation - Single Arbitrator
60. Blackwell Stores v. Naramata Irrigation District
61. Musqueam Indian Band v. Glass et al., Federal Court
62. Reti v. Sicamous - B.C. Expropriation Compensation Board
63. Concord v. Henderson - Single Arbitrator
64. Boundary Bay Airport - B.C. Assessment Appeal Board.
65. C.B. Lanac v. Windermere School District, Misrepresentation
66. Glendale Trading v. MOTH, B.C. Expropriation Compensation Board
67. Maddocks Farms v Surrey, B.C. Expropriation Compensation Board
68. Wozny v. City of Richmond, Expropriation - Single Arbitrator
69. Farrell Estates - B.C. Assessment Appeal Board
70. Fredericks v. Ministry of Transportation
71. Clements, Penfold, Ferguson, Potter, James v. City of Penticton,
72. B.C. Expropriation Compensation Board
    Chivers v. Ministry of Transportation, B.C. Expropriation Compensation Board
73. Fritz v. Sicamous, B.C. Expropriation Compensation Board
74. Country Park Leaseholder v. Country Park Village – Federal Court
75. Federicos Rent review – Arbitration
76. Golden Valley v. Ministry of Transportation and Highways
77. Kluane Wilderness Lodge v. Miller, B.C. Expropriation Compensation Board