



CITY COUNCIL AGENDA REPORT

Subject: AltaLink Transmission Line Relocation

Recommendation(s):

That funding up to \$450,000 (\$300,000 + 30% contingency) to match the funds being provided by AltaLink Transmission and Alberta Tourism, Parks and Recreation to relocate the existing 128 KV transmission line 747L to the east side of Ray Gibbon Drive (Option 3) be referred to Council's 2009-2011 Budget deliberations.

Report Summary:

The AltaLink transmission line currently crosses the mouth of the Sturgeon River near Big Lake. This report provides background on the key environmental, socio-economic and financial issues related to the existing location of the transmission line and outlines the potential options and costs for the relocation of the line.

Legislative History:

At its meeting on October 1, 2007 Council passed the following motion:

C533-2007

That Administration put aside \$350,000 within the update of the capital plan during the 2008 budget review process, as the City's share for the AltaLink project.

Report:

The current alignment of the AltaLink transmission line 747L in the vicinity of Big Lake traverses the eastern shore of Big Lake from Meadowview Drive, then crosses the mouth of the Sturgeon River at the Big Lake viewing platform and then follows the south berm of the Riel pond to its alignment along Levasseur Road.

This alignment of the transmission line has long been of concern to the community as a hazard to the bird populations that are attracted to the wetland habitat around Big Lake and an impact on the views of Big Lake. Reports of bird fatalities associated with collision with the smaller, less visible shield wires above the power lines have been documented in the past. AltaLink has been aware of these concerns for several years and installed Firefly Bird Flappers / Flight Diverters onto the shield wires lines as a means to alert the birds of this hazard in 2005. See Attachment 1.

The creation of the Lois Hole Centennial Provincial Park has further raised the profile of this area and has also garnered the attention of the Provincial government to the relocation of this transmission line. Alberta Tourism, Parks and Recreation representatives for Lois Hole Centennial Provincial Park have indicated that they would like to see the transmission line relocated further from the park to reduce the visual impacts of the line in the Park.

The City approached AltaLink to discuss the potential relocation of the transmission line in conjunction with the work being undertaken on the West Regional Road in 2006. AltaLink was



receptive to the discussion and has been very cooperative in providing detailed technical advice, cost estimates and presentations to City administration and the Environmental Advisory Committee on this issue. AltaLink has also agreed to contribute funding (\$450,000) to move their lines approximately 345 m further downstream from the current location. See Attachments 2 and 3. This is significant as it is the first time that AltaLink will have provided funding for the relocation of a transmission line for social or environmental reasons.

The City and Alberta Tourism, Parks and Recreation would prefer a realignment that is a greater distance from Big Lake to further reduce the visual impacts of the transmission line. Our preferred realignment follows the east side of Ray Gibbon Drive across the river and moves the transmission line out of the Big Lake floodplain north of the river. The route is over twice the cost of AltaLink's base case and funding would have to be topped up by Alberta Tourism, Parks and Recreation and the City. Alberta Tourism, Parks and Recreation have already committed financial assistance (\$300,000) for the relocation and with the approval of the recommended funding \$450,000 from the City this project could be completed. This would also be significant, as it would be the first multi-jurisdictional funded transmission line relocation project in Alberta and an excellent example of how cooperative efforts can address the often-unaddressed environmental and social impacts of transmission lines.

Proposed Cost Allocation for Option 3

	Estimated Cost
AltaLink	450,000
Alberta Tourism, Parks and Recreation	300,000
City of St. Albert	300,000 (+30% = 450,000)
TOTAL	\$1,050,000

Approvals

It is important to note that any proposed realignment would require an application to the Alberta Utilities Commission (which was previously the Energy Utilities Board) for approval. It is the requirement of the AUC that all affected property owners are advised of the proposed change in the route. If there are any objections to the proposal, the board may declare a hearing to be required. It is also important to note that besides the transmission line route change itself AltaLink's financial involvement for any of the proposed changes will also require approval from the AUC.

Potential Timeline

If Council approves the funding for the realignment, the approval, design and construction of the new line would take between 1 – 2 years to complete.

Recommendation from the Environmental Advisory Committee (EAC)

Council also requested that the Environmental Advisory Committee review the potential line relocation options and provide Council with their advice. Administration presented a summary of the relocation options to EAC at their regular July 24th meeting and EAC also held a special meeting on July 30th to receive a presentation and ask questions of AltaLink representatives. Both of these sessions were well attended by members of the public as well. The advice from the EAC is summarized in Attachment 4.

OPTIONS:

The table in Attachment 2 and figure in Attachment 3 summarizes the realignment options that were considered, their estimated costs and their potential pros and cons.

Financial Implications:

The City's \$450,000 contribution to the project could be funded from either the stabilization reserve or the 2009 municipal operating budget. This project does not represent a capital expenditure, as the City would not own the asset once the work was completed. Therefore, as an operating expense, the funding sources are limited to operating reserves or property tax revenue. The current balance in the stabilization reserve is \$1,724,008. It is recommended that Council consider this as part of the 2009-2011 budget deliberations.

Attachments:

1. Bird Collisions with Electric Power Transmission Lines: FAQ's
2. Table of Realignment Options
3. Figure of Realignment Options
4. Comments from Environmental Advisory Committee

Report Date	October 10, 2008
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Legal Review	N/A
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Bird Collisions with Electric Power Transmission Lines: Frequently Asked Questions (FAQs)

Presented By:

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Purpose:

The purpose of this document is to provide background information on how bird mortality results from interactions with power lines. It will also provide an example on how AltaLink is managing the problem, which is particularly heightened at Lois Hole Park in St. Albert, Alberta.

Background:

Thousands of hawks, eagles, owls, waterfowl and other birds die each year from interactions with power lines and other electric utility structures (Stephens, 2002). The electric industry and other affected interests are challenged with solving the problems of collisions, electrocutions and other bird interactions with power lines (Bridges and Anderson, 2000). For example, in 2002 the California Energy Commission awarded a \$1 million grant to the Santa Cruz Predatory Bird Research Group (SCPBRG) to help solve the problem (Stephens, 2002).

AltaLink Management Ltd. is responsible for approximately 85 percent of Alberta's electrical transmission requirements. They operate and maintain 11,850 km of overhead transmission line throughout central and southern Alberta.

How are Birds Killed by Power Lines?

The effect of any particular power line can vary between species and among seasons within a single species, depending upon the way adjacent habitat is used for feeding, roosting, courtship, nesting, or brood rearing (APLIC, 1994). How birds use habitats near power lines affects the probability of collisions and electrocutions. For example, whether or not, and how often, birds in flight must cross a power line within their daily use areas (APLIC, 1994). However, birds can exist near transmission lines in many situations without a significant risk of collisions. Problems occur in very specific situations where certain factors exist to create high collision or electrocution potential (APLIC, 1994). For example, land use, topography, vegetation, wind patterns, and line placement are all factors that may contribute to increased collisions risk (APLIC, 1994).



Figure 1: 25kV Distribution pole – deadend structure with transformers



Figure 2: 240kV Transmission tower

Electrocutions and collisions with transmission lines are two sources of direct mortality associated with power line corridors (Bevanger, 1994). There are two main types of power lines: transmission and distribution. Distribution lines (Figure 1) are typically 69 kV or less and are usually seen along highways and in cities. They distribute power to houses and businesses; because their energized parts are close together, it is easy for birds to bridge the gap between currents and unwittingly become a current-carrying portion of the circuit (Platt, 2005). Raptors are the most common victims of electrocutions because of their natural attraction to power poles for roosting, nesting, courtship, and hunting. Transmission lines (Figure 2) are the large structures that are commonly seen in rural areas. They are typically > 115 kilovolts (kV) and surprisingly, rarely cause electrocutions (Platt, 2005). The main source of mortality for birds associated with transmission lines are from collisions. Large bodied waterfowl such as ducks, geese, herons, and cranes are the most common collision casualties. This is because their large, heavy bodies are less maneuverable, and because they tend to make high speed feeding runs in the morning and at dusk when low lighting conditions are most common.

How do Birds Collide with Overhead Transmission Lines?

Overhead transmission lines are the type of power line that pose the greatest risk for bird collisions. Birds most often collide with the overhead shield wire, the wire that protects the system from lightning damage (Figure 3). This is because birds seem to recognize the mass of the supporting towers, but because overhead shield wires are normally 0.9 to 1.3 centimeters in diameter, they sometimes appear invisible due to background or lighting conditions (APLIC, 1994).

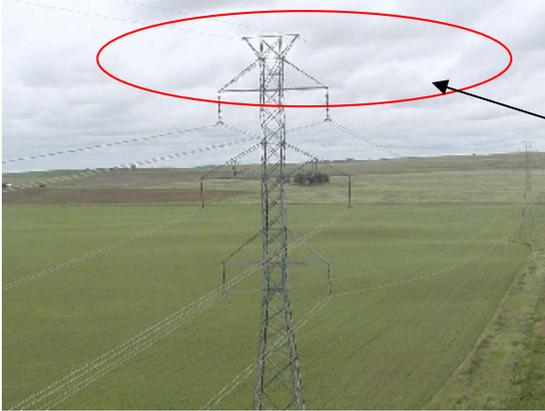


Figure 3: Overhead Shield Wire

What is the Purpose of Shield Wire?

High-voltage electric transmission lines are designed and constructed to withstand the effects of lightning with a minimum amount of damage and interruption of operation (Kurtz and Shoemaker, 1985). When the lightning strikes an overhead shield wire on a transmission line, the lightning current is conducted to ground through the ground wire installed along the pole (Kurtz and Shoemaker, 1985).

How can Bird Collisions with Shield Wire be Prevented?

The most common way to reduce bird collisions is to mark the shield wire so that becomes more visible to birds (APLIC, 1994). There are many types of visibility enhancing devices available but unfortunately only a small number of them are able to successfully reduce bird collisions. For AltaLink, early attempts at solving this problem included the installation of spiral dampers on the shield wire, which at the time, was the most effective method known. The spiral dampers have proved to be less effective than anticipated, and because of this, alternate mitigation devices should be used.

Common mitigation devices include various marking devices such as Firefly bird flappers / flight diverters, swan flight diverters, bird flight diverters, and spiral dampers (see Figure 4). The effectiveness of the device is dependent on the environmental, species, and transmission voltage characteristics.

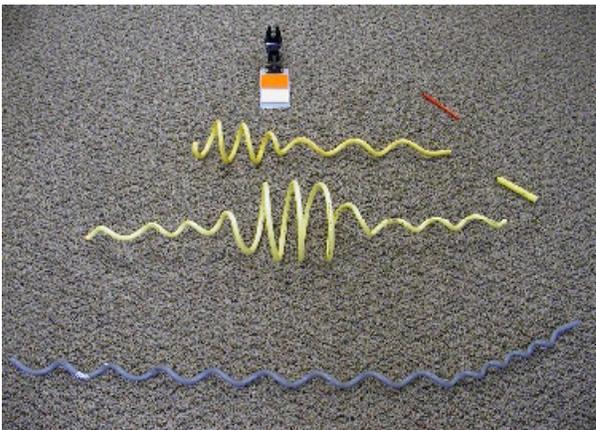


Figure 4: Common collision mitigation devices. From top to bottom: Firefly bird flapper / flight diverter, bird flight diverter (BFD), swan flight diverter (SFD), and spiral damper.

Example: Lois Hole Park (Big Lake), St. Albert, Alberta



Figure 5: Lois Hole Park showing placement of the AltaLink transmission line.

Lois Hole Park in St. Albert was identified as a high risk area for bird collisions with AltaLink power transmission lines. A literature review and consultation with other utility groups and industry experts were used to determine the best possible solution in this area. Based on the research conducted, the Firefly Bird Flapper / Flight Diverter (Figure 5) was determined to be the device that would be most effective at preventing bird collisions at Lois Hole Park, St. Albert. In August of 2005, 75 devices were installed along five spans of transmission line at 10m intervals along the overhead shield wire.

Will the Installation of Firefly Bird Flappers Solve the Problem?

The Firefly Bird Flapper / Flight Diverter was developed in the United States to protect birds from colliding with overhead power lines and communication towers. Based on research conducted, it is believed that this is the most effective device for preventing bird collisions at Lois Hole Park (California Energy Commission 2002). These devices are visible in low light conditions, the time when collisions are most common. Motion, reflectivity, and light emissions to deter problem birds from an area are all incorporated into the design. The devices glow at night for up to ten hours, flutter in the wind to alert birds of the presence of an obstruction, and use a unique “Moon Shine” system that reflects UV + Visible light even in low light / fog conditions.

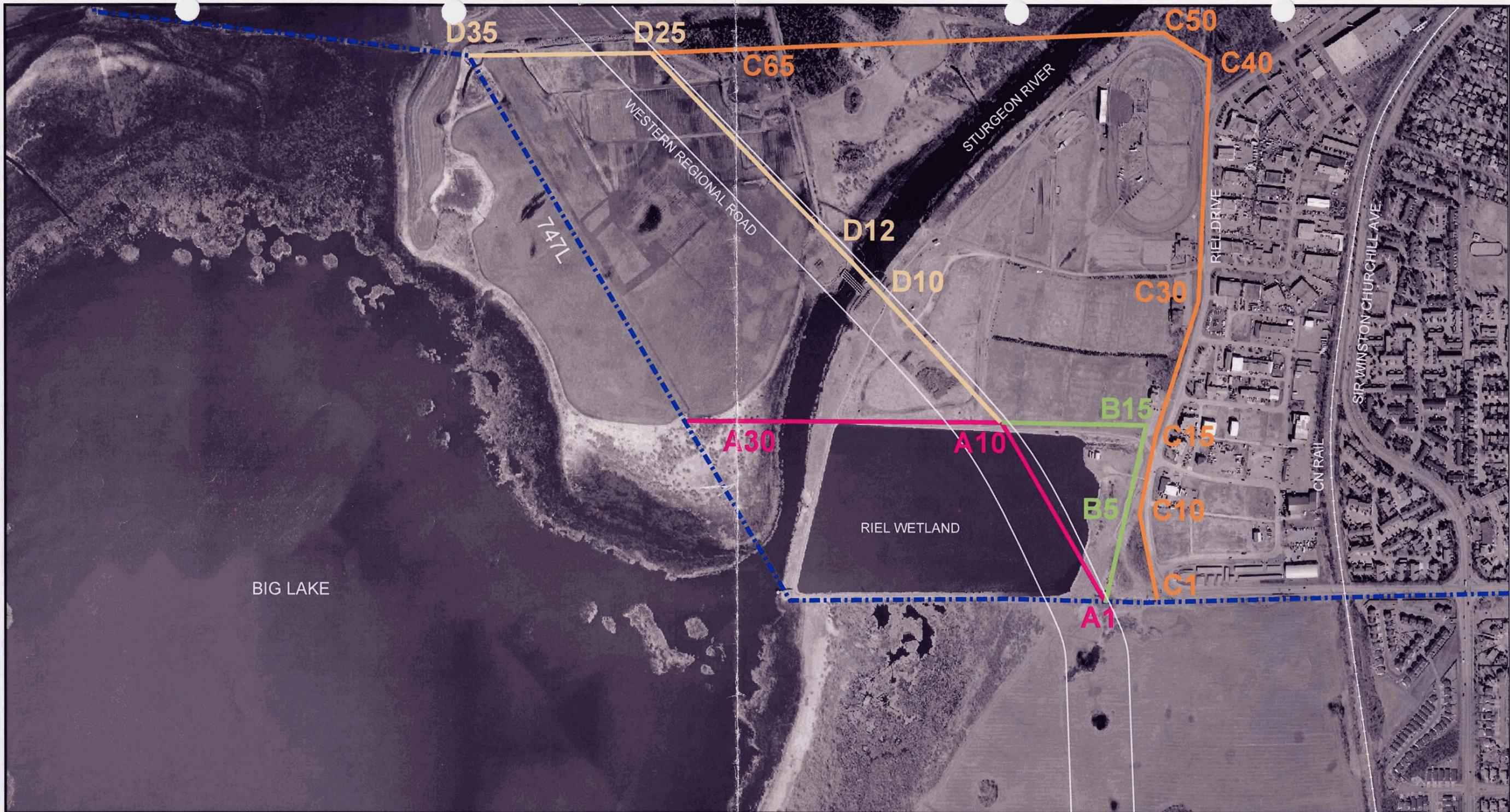
References:

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- Bevanger K. 1994. Three questions on energy transmission and avian mortality. *Fauna Norvegica Series C Cinclus* :17 (2):107-14.
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<http://www.expressnews.ualberta.ca/article.cfm?id=3695>
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Attachment 2: Potential Relocation Options

OPTIONS	LOCATION*	COSTS (+/- 30%)	PROS	CONS
1 – Status Quo (No relocation)	Blue Line	-	<ul style="list-style-type: none"> AltaLink would continue to monitor to identify any additional measures that may further reduce bird collision rates 	<ul style="list-style-type: none"> Does not address the existing visual or socio-political impacts.
2 – AltaLink Base Case	A1-A10-A30 (Pink Line)	\$450,000	<ul style="list-style-type: none"> AltaLink would provide funding equivalent to this base case scenario. Moves line ~345 m. Moves line away from the high bird activity area at the mouth of the Sturgeon River. Moves line away from viewing platform and Provincial Park. 	<ul style="list-style-type: none"> The base case scenerio was determined largely for funding allocation purposes only. It is unlikely that AltaLink would pursue relocating the line if the partnership funding was not approved.
3 – Along East side of Ray Gibbon Drive	A1-A10-D10-D12-D25-D35 (Tan Line)	\$1,050,000 (+/- \$315,000)	<ul style="list-style-type: none"> Moves line ~650m Moves line away from high bird activity area Moves line away from viewing platform and Provincial Park. Aligns transmission line and visual impacts with Ray Gibbon Drive 	<ul style="list-style-type: none"> It has not been determined if the line could be placed within or adjacent the Ray Gibbon ROW Lines would be closer to Riel Park and the existing soccer fields (Pole locations and overhead conductors could be positioned to minimize the impacts to the fields). Potential for vehicle and transmission pole collisions. Pole placement in existing landfill.
4 - Along West side of Riel Drive	C1-C10-C15-C30-C40-C50-C65-D25-C35 (Orange Line)	\$2,750,000	<ul style="list-style-type: none"> Moves line ~1000m Moves line away from high bird activity area Moves line away from viewing platform and Provincial Park. Moves line away from Riel Park. 	<ul style="list-style-type: none"> Adjacent to more property owners. May be clearance issues between existing buildings or streetlights. May have proximity issues with ATCO high-pressure gas pipeline. Would require tree clearing through the White Spruce Forest.
5 – Underground along Ray Gibbon Drive	A1-A10-D10-D12-D25-D35 (Tan Line)	\$6,300,000	<ul style="list-style-type: none"> Removes all bird collision risks. Removes visual impacts. 	<ul style="list-style-type: none"> Involve ~1700 m of underground construction. Would involve crossing existing landfill and special construction methods and additional costs. Would involve directional drilling under the river. Would involve disturbing existing wetlands on north side of the river. Would involve adding new structures, i.e. transition stations, maintenance Creates additional ongoing operational risks associated with a buried power line Usually considered an optional upgrade thus AltaLink would not provide any funding.
6 – Onground Casing along Existing Route	Blue Line	\$8,500,000	<ul style="list-style-type: none"> Removes all bird collision risks. Removes transmission line visual impacts. May provide public access. Fewer impacts on wetlands than underground construction. Offers some flexibility to location of onground structures. 	<ul style="list-style-type: none"> Involve ~1800 m of onground construction. Would require winter construction to minimize impacts to wetlands. Would involve directional drilling under the river. Would involve disturbing existing wetlands on north side of the river.

* The potential realignments are shown in Attachment 3.



- LEGEND**
- EXISTING TRANSMISSION LINE ROUTE
 - POSSIBLE ALTERNATIVE TRANSMISSION LINE ROUTE A
 - POSSIBLE ALTERNATIVE TRANSMISSION LINE ROUTE B
 - POSSIBLE ALTERNATIVE TRANSMISSION LINE ROUTE C
 - POSSIBLE ALTERNATIVE TRANSMISSION LINE ROUTE D

ALTALINK

PROPOSED

RELOCATION OF
138kV TRANSMISSION LINE: 747L
AT LOIS HOLE PARK, ST. ALBERT

AERIAL PHOTO MOSAIC MAP
TP.53 RG.25 W.4M.

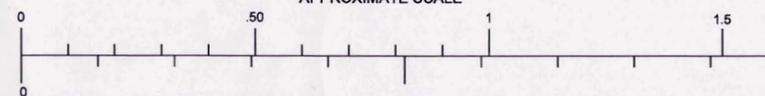
W.O.: 35009223
DATE: 2006-11-16

PROJECT: 747L LOIS HOLE PK
REVISION: 0

M1



Photography dated : - -
APPROXIMATE SCALE



St. Albert Environmental Advisory Committee

Advice for Council on the Potential Relocation Options for AltaLink Transmission Line (747L)

The St. Albert Environmental Advisory Committee (EAC) has reviewed the issues relating to AltaLink's 747L transmission line that currently crosses the mouth of the Sturgeon River near Big Lake. There is public pressure to move the line due to the fact that it has a negative aesthetic effect on the landscape, given that it is within the vista of Big Lake and Lois Hole Provincial Park, and that there are known bird collisions with the transmission line infrastructure. We understand that there have been ongoing discussions between the City of St. Albert, AltaLink and Alberta Tourism, Parks, Recreation and Culture (ATPRC) regarding the potential relocation of this transmission line. As a result, the City of St. Albert, AltaLink and ATPRC have agreed, in principle, to share the costs of relocating the transmission line.

The EAC has received two presentations on this issue, and considers itself to be well-informed of the various stakeholder positions and technical considerations. However, the EAC also recognizes that there is a high degree of uncertainty with regards to final route selection and ultimate costs, and therefore the advice below aims to address the issue in a broad sense.

On the basis of the information received, it is the recommendation of the EAC that Council endorse the relocation of AltaLink's 747L transmission line and move towards the process of final route selection. The EAC strongly recommends that the selection of the final route maintain the existing cost-sharing partnerships while striving to balance social, aesthetic, environmental, and economic factors. Based on our current understanding, a re-alignment that achieves these goals may be best realized by relocating the transmission line parallel to and to the east of the Ray Gibbon Drive Right-of-Way (route A1-A10-D10-D12-D25-D35 (Tan Line) in Attachment 3); this is referred to as Option 3 in the accompanying Agenda Report and in Attachment 2.

We believe that Options 4 through 6 are cost-prohibitive; additionally, Options 4 and 5 include construction practices that would require the destruction of existing wetland and/or tree stands. While Option 5 might be considered "ideal" by some from the perspective of removing aesthetic concerns and collision risk, we could not responsibly endorse its consideration unless the balance of funding came from non-municipal tax sources and evidence was presented that the environmental concerns relating to construction could be minimized. Option 2 may relieve some of the concerns regarding the social and environmental aspects, but in our opinion does not move the transmission line far enough away as Option 3 to be acceptably effective at minimizing environmental and aesthetic effects. The EAC does not support Option 1 as we consider the status quo to be unacceptable.

After serious and careful consideration of all options proposed in the Agenda Report, the EAC reiterates its support for relocating transmission line 747L and specifically for Option 3 because it provides higher mitigation value and superior benefit to the Lois Hole Provincial Park and the integrity of Big Lake and adjacent wetlands, in general.