

Table 3.7-1: EBA Comparison of North and South All-Season Road

Item		Northern	Southern
1	length of road	114 km	104 km
2	# of bridges	14, not including the 400 meter long Thelon River Crossing	6
3	# of culverts	13	19
3	Quarries	good rock quarries spaced evenly throughout alignment	no rock quarries for final 25 km of alignment. Only potential for borrow is well sorted sands. Will require either a very long haul if rock is to be used or sand can be used for embankment but rutting and erosion issues must be addressed.
4	Construction Staging	favourable construction staging. Can be built out of the Baker Lake community. Multiple headings possible.	Difficult construction staging. None of the route can be directly connected to the community of Baker Lake. Port Facility would have to be constructed to allow for heading to start from the southern end of the project.
5	Terrain	Terrain is generally dry, located on higher areas where possible.	Terrain is not as favourable as the northern road as a significant portion of the road is in lower, wetter areas. Will result in a greater degree of maintenance.
6	Geometrics	some gradients in the order of 5 to 6 %	gradients relatively gentle- in the order of 2-3 %

From an engineering perspective, the north route is preferable to the south route due to the less favourable terrain of the south all-season road. The south all-season road is less constructable not only due to the terrain type, but the road cannot be constructed from the community of Baker Lake, which could pose logistical challenges.

3.8 2011 Community Review

Road construction for the Kiggavik site was a concern for the HTO members at the community review meeting in 2011. The management of the Kiggavik Road was a major source of concern for the HTO participants, specifically the impact of roads on the wildlife (ie. habitat fragmentation, noise, the potential for animal-vehicle collisions, and dust). In particular, the interview participants were most concerned for the migrating caribou.

The interview participants explained that although roads do provide easier access to caribou for hunters, they can also have negative impacts. One hunter said that the roads can produce a lot of dust in the summer, and then the caribou feed on dusty grass by the roadside, which is not good for

them (IQ-BLHT 2011²⁴). Participants requested industry to minimize dust on the roads (IQ-BLHT 2011^{27,25}). They expressed concern that a road to Kiggavik may act in combination with other roads in disturbing caribou (IQ-BLHT 2011²⁶). The participants expressed concern that mining and roads associated with the Kiggavik site may affect migrating caribou in a negative way (IQ-BLHT 2011²⁷).

One hunter said that there should be three or four wildlife monitors employed to supervise the construction [and operation] of the AREVA road to Kiggavik (IQ-BLHT 2011²⁸). The timing for wildlife monitors to be present on the Kiggavik road would depend on the timing of the caribou migration, but one participant estimated that June through to December would probably be a good time (IQ-BLHT 2011²⁹). Some participants expressed concern that If AREVA were to succeed at building a road through the Baker Lake area, then access to traditional hunting grounds may be restricted (IQ-BLHT 2011³⁰).

3.9 Alternatives Assessment

The initial submission of the Project alternatives assessment can be found in Tier 3, Technical Appendix 2A. Alternatives were evaluated based on perceived public sensitivity, perceived public benefit, engineering, technical, and economic considerations.

The road options included in the alternatives assessment were as follows:

- North All-Season Road with Bridge
- North All-Season Road with Ferry
- Winter Road North Route
- Winter Road South Route
- South All-Season Road

²⁴ IQ-BLHT 2011: *Roads are easier to access but there is another problem: be aware that the road to Meadowbank produces a lot of dust in the summertime. Caribou feed on grass close to the road; this grass is full of dust. If you are going to build a road, try to minimize dust.*

²⁵ IQ-BLHT 2011: *If AREVA builds a road, there will be dust from the road in the summer time. This dust will collect on the grass on which the caribou feed, and may impact caribou health. This should be minimized.*

²⁶ IQ-BLHT 2011: *Traffic on Meadowbank road day in day out is affecting caribou. Road to Kiggavik will only add to this (e.g. caribou coming from west and south may be affected in their movements)*

²⁷ IQ-BLHT 2011: *If AREVA builds a road, it may cause changes to the caribou migration and limit hunter access.*

²⁸ IQ-BLHT 2011: *I suggested that maybe there should be 3-4 wildlife monitors at AREVA to monitor road if it is built.*

²⁹ IQ-BLHT 2011: *These monitors are most useful between June and December*

Overall, winter road north route was identified as the preferred alternative, scoring fairly closely to the winter road south route. Of the all-season routes, the north all-season route scored higher than the south all-season route, with the bridge and ferry options scoring equally. The bridge would provide improved access compared to a cable ferry, however, this coincides with increased hunting of caribou.

The alternatives assessment concluded that from a social and environmental perspective, a winter road is preferred over an all-season road.

3.10 DEIS

3.10.1 Removal of the South All-Season Road

The south all-season road was not included in the draft EIS. The removal of the south all-season road was consistent with Baker Lake HTO preferences for access roads as reflected in their 2010 resolution *supporting the use of northern all-weather access road over the southern all-weather access road because the south area of the lake is very shallow and a lot of times the small boats get stuck in that area*. (EN-BL NIRB April 2010).

The area for the south dock location was noted as very shallow, used in the spring as a migration route and used for fishing (EN-BL NIRB Apr 2010). Several hunters and Elders highlighted the fact that caribou are in the area where the south all-weather road is being proposed during the spring, summer and early fall. (IQ-JT Consulting 2011). Some hunters and Elders highlighted the fact that the area where the south all-weather road is being proposed is used by muskox. They were concerned that muskox might be driven further away from Baker Lake. (IQ-JT Consulting 2011). One hunter was concerned that this road option is being proposed near wetlands that geese utilize as habitat. He was concerned that this habitat might be destroyed during construction and was worried this might make goose hunting more difficult. (IQ-JT Consulting 2011)

Although some people were in favour of the south all-season road (EN-RB OH Nov 2010³⁰, EN-RB KIA Feb 2010³¹), the majority of Baker Lake residents were not in support of the south all-season road. The ground conditions in the vicinity were poor to moderate, and the road would include a 120m bridge. The decision to remove the south all-season road was based on input received from

³⁰ EN-RB OH Nov 2010: *My road preference would be the south route because it closely matches the wind direction and would be clear enough all winter. If AREVA builds a road, it may cause changes to the caribou migration and limit hunter access.*

³¹ EN-RB KIA Feb 2010: *I think the southern road should be selected*

community members, Elders, and Nunavut organizations and poor ground conditions. Reasons for removal of the south all-season road as an option included:

- The community of Baker Lake did not support the south all-season road
- At the Baker Lake HTO AGM in December 2009, the majority were opposed to the south all-season road. In January 2010, the board passed a motion to support these results
- South side of Baker Lake is shallow

3.10.2 Removal of the Thelon Bridge Option

At the time of the project proposal, the potential Thelon crossing was indicated to be either by bridge or by cable ferry. Community members noted that the *Thelon River is recognized as the Heritage River and this has to be considered.* (EN - BL CLC Feb 2007). Elders noted that *the Thelon River provides important access to hunting areas. The river is frequently used in the summer months* (IQ - BLE 2011) and *is used to access lakes for both camping and hunting (in particular Beverly Lake)* (IQ - BLE 2011).

A resident requested that AREVA build something other than a bridge (EN-BL KIA Feb 2010³²). An Elder noted that *a bridge over the Thelon River might prevent people from taking their boats up river to pick goose eggs.* (IQ - BL06 2008). *Several hunters and Elders were concerned that the bridge over the Thelon River would disturb caribou migrations, as caribou cross the Thelon River near the proposed bridge location.* (IQ-JT Consulting 2011). Community members were concerned that *the bridge at the Thelon would not last very long; and it would break in no time at all* (EN-BL CLC Apr 2008).

Table 3.10-1 provides a comparison between the bridge option and the cable ferry option.

Table 3.10-1: Comparison of North All-Season Road Options

	North All-Season with Bridge	North All-Season with Cable Ferry
Operating Window (Months)	12	8
Crossing of Thelon Required	Yes	Yes
Dock site location	Near Baker Lake	Near Baker Lake

³² EN-BL KIA Feb 2010: *Can they build something other than a bridge, like a docking area?*

Table 3.10-1: Comparison of North All-Season Road Options

	North All-Season with Bridge	North All-Season with Cable Ferry
Community Support	Some support, some opposed	Some support, some opposed
Employment Availability	Lowest of all road options, but year round	Higher than bridge, somewhat seasonal
Access to Hunting and Fishing Territories	Improved access to caribou and muskox hunting and fishing territories	Improved access to caribou and muskox hunting and fishing territories, but to a lesser extent than the bridge option
Access to Snowmobile routes	Somewhat decreased access	Somewhat decreased access
Government/Regulatory Concerns	concerns related to potential increased caribou hunting	Need to consider that Thelon is a heritage river, concerns related to potential increased caribou hunting
Changes to recreational activities / tourism	Aesthetics	Aesthetics
Impact to Archaeological site	There are several known archaeological sites in the area, mitigation will occur to the greatest extent possible	There are several known archaeological sites in the area, mitigation will occur to the greatest extent possible
Impact to caribou populations	Habitat availability changes and potential changes to harvest pressure	Habitat availability changes and potential changes to harvest pressure
Impact to bird populations	Possible peregrine nest displacement	Possible peregrine nest displacement
Impact to fresh water	Expected to be negligible	Expected to be negligible
Dust Impacts	Dust will be mitigated	Dust will be mitigated
Decommissioning	Decommissioning of Thelon bridge could be complex and costly	Decommissioning of cable ferry less complex than bridge
Overall cost	Highest due to cost of Thelon bridge	Higher than winter roads, less costly than bridge

In the DEIS, the bridge option was removed and the only all-season road option was the north all-season road with cable ferry. Although there was some community interest in the all-season road with a Thelon bridge (EN-WC NIRB May 2010³³, EN-BL CLC Mar 2010³⁴, EN-BL CLC Jul 2010³⁵) it

³³ EN-WC NIRB May 2010: *Not in favour of a cable ferry and rather would like to see a bridge build across the river (made of wood). Ferry would use fuel which might impact the river ecosystem.*

³⁴ EN-BL CLC Mar 2010: *I support the idea of a bridge over the Thelon*

was not included in the DEIS primarily due to the high estimated construction cost of the bridge associated with high decommissioning costs.

3.10.3 Selection of the South Winter Road as the Preferred Route

For the DEIS, the preferred road option was the south winter road. Initial feedback, was that the all-season road was preferred over the winter road. Over time concerns with dust became more prominent to residents of Baker Lake and there has been shifting support to favor the winter road. The use of a winter road as the preferred option minimizes the amount of dust generated on the road between Baker Lake and Kiggavik.

Another factor in the preference between the all-season road and the winter road was potential effects to caribou.

Community members would prefer the winter road to Kiggavik than the all weather road because although it would provide road use for the short term it might be better for the caribou in the long term. (EN-CH OH Nov 2010). Some residents used to support the north all weather road but now prefer the winter. (EN - BL OH Nov 2010) A resident thought they would use the north all weather road, but when thinking of the caribou and fish, prefer the winter road. (EN-BL OH Nov 2010)

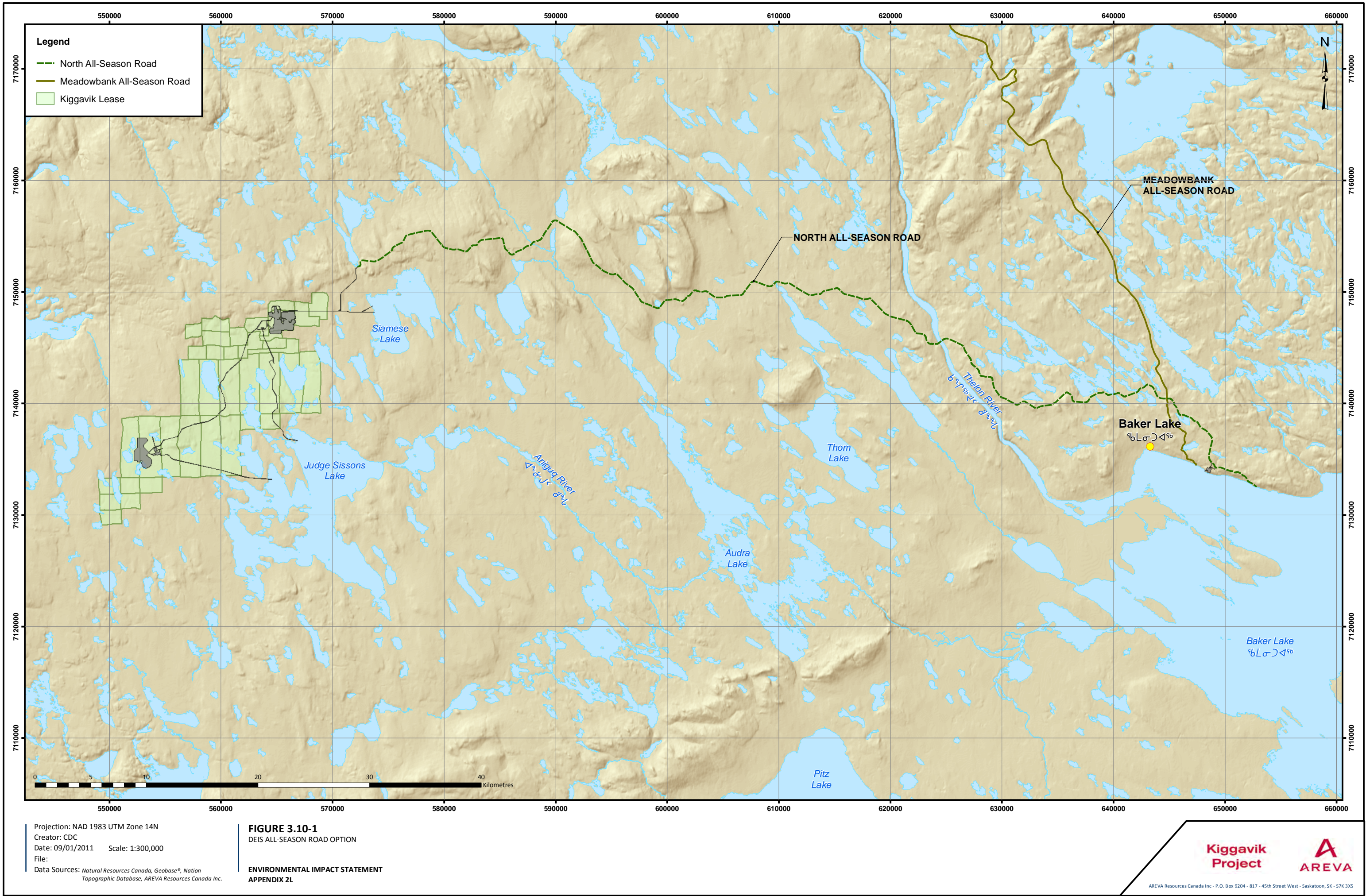
Some caribou biologists and management boards expressed opposition to the all-season road, due to its potential impacts to caribou should harvest locations and intensities change given the improved land access. The life cycle cost of the winter road is also expected to be lower than the life cycle cost of the all-season road. Due to the community preference, wildlife management concerns, and higher costs, the south winter road became the preferred road option for the draft EIS.

3.10.4 DEIS All-Season Road Option

For the draft EIS, only the north all-season road with a cable ferry was presented. The south all-season road and the north all-season road with a bridge were not included as options. The preferred option presented in the draft EIS was the south winter road and the all-season road would only be constructed if the winter road could not meet the cargo haulage needs of the Project.

The all-season road option presented in the DEIS is shown in Figure 3.10-1 below.

³⁵ EN-BL CLC Jul 2010: *I'd be happy with the propose bridge unless they are going to find another spot for it*



4 DEIS to FEIS

4.1 Comments on DEIS Road Options

After submission of the DEIS, AREVA continued to receive feedback on the road options remaining through various means including:

- November 2012 Open House Tour
- DEIS Information Requests
- DEIS Technical Comments
- Spring 2013 Technical Meeting and NIRB pre-hearing conference (PHC)

Feedback received indicated that there was confusion about the road options, which options were preferred, and the number of roads expected to be built. This confusion may have persisted because figures continued to illustrate the remaining access road options and the full assessment of a secondary option. (EN-BL OH Oct 2012³⁶) Interveners requested confirmation of the preferred routing, clarification of which roads are expected to be constructed, and how long the all-season road might remain as an option. Some residents expressed that *winter roads are important* (EN-CH HL Nov 2012), and others were unsure if a winter road would suit the Project's needs (EN-BL OH Nov 2013³⁷). It was unclear why two winter road options were presented when only one winter road would be constructed (EN-BL CLARC Apr 2013³⁸). Some thought AREVA *should decide now on the road option* (EN-BL OH Oct 2012).

The DEIS Winter Road Report and All-Season Road Report were inconsistent with the road options presented in Tier 2, Volume 2, Section 10.4 because they reflected a time when additional alternatives had not yet been removed from consideration. For the all-season road report, both the south route and the north route were included. The north route showed the bridge option only and did not include a cable ferry option. These documents continue to provide a history of the Project.

³⁶ EN-BL OH Oct 2012: *You still have two all-season road options. You need to update your maps so you don't confuse people* ³⁷ EN-BL OH Nov 2013: *Will a winter road be enough?*

³⁷ EN-BL OH Nov 2013: *Will a winter road be enough?*

³⁸ EN-BL CLARC Apr 2013: *Why are there two winter road options?*

4.2 November 2013 Open House Tour

Given the regulatory and community guidance to narrow the winter road options remaining, AREVA evaluated the two winter routes and decided to advance with the south winter road as the preferred option and only winter road option. The all-season road remains as a secondary option for full assessment and approval. This was done to simplify the road options presented as there would be no need to construct two winter roads.

In conjunction with removing the north winter road option, the routing of the roads was altered slightly to coincide with the preferred dock site location (Dock Site #1). As the preferred dock site was not finalized at the time the road routing was completed. The revised all-season road routing is shown in Figure 4.2-1

4.3 Assessment and Approval

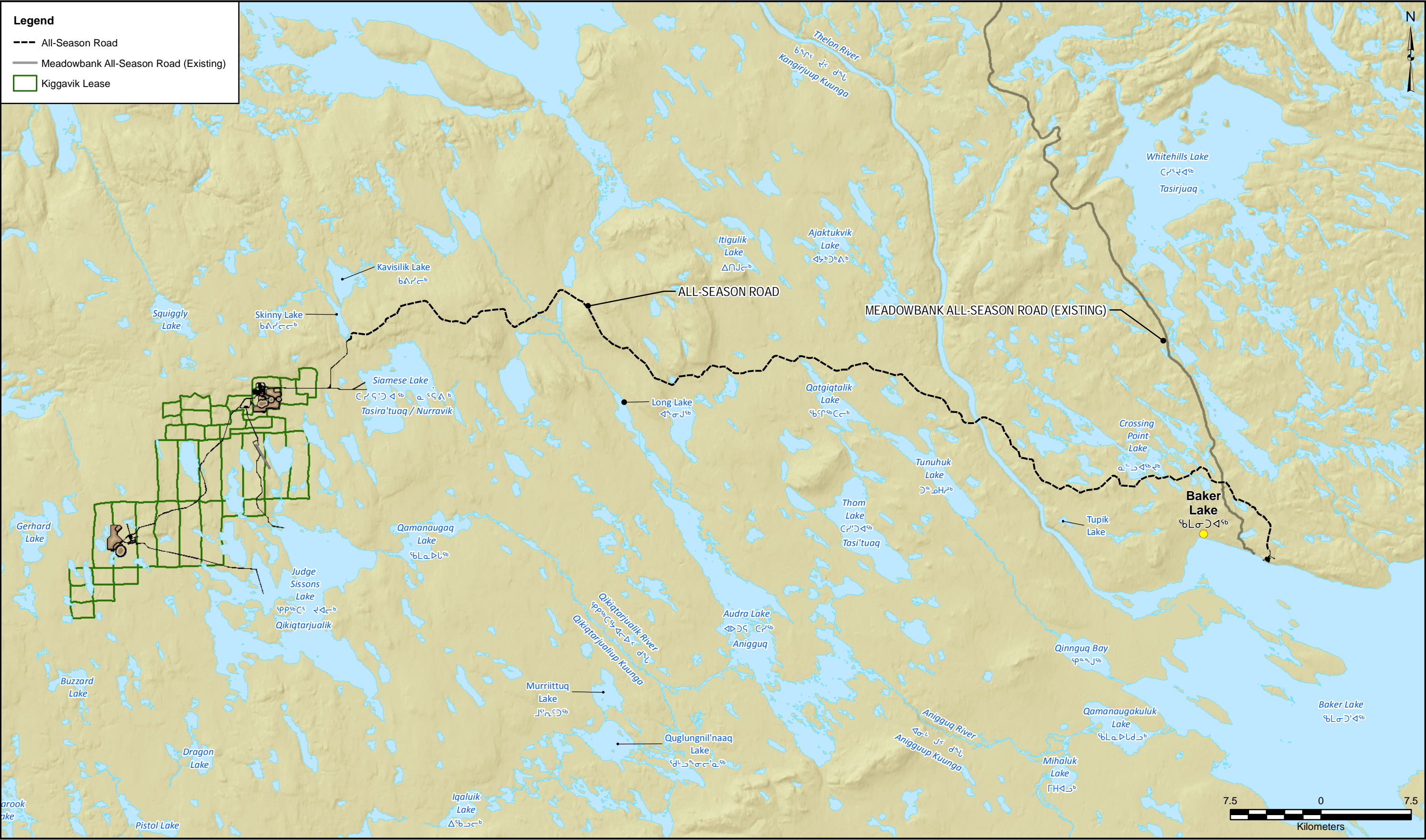
The process used to remove access road alternatives for the proposed Kiggavik Project demonstrates use of environmental assessment as a planning tool that allowed for the influence of environmental and community considerations to be reflected in project design. Removal of alternatives was based on environmental, technical, economic and social considerations and community preference strongly influenced removal of some alternatives.

The inclusion of a second access road option in the assessment demonstrates transparency and a conservative approach to project development as the effects assessment will include the assessment of potential effects for an additional road that may never be constructed. The assessment includes both options providing confidence to reviewers that the actual effects to be observed with only the winter road, or additionally the all-season road should it be required in the future, will be within the approved assessment of effects.

The all-season road will be constructed if the winter road is insufficient for meeting the logistical needs of the Project. Prior to potential construction of an all-season road, the need for the all-season road will be evaluated based on the following:

- A review of past performance of the winter road for meeting the logistical requirements of the operation;
- potential and available modifications to winter road management that may extend the operational window for the winter road;
- other potential operational adjustments that may allow the winter road access to remain adequate during operations;

- engagement with Baker Lake residents including the Baker Lake Hunter and Trapper Organization and surface rights administrators for right-of-way agreements;
- an evaluation of the most recent wildlife data would be conducted to validate and possibly refine FEIS effects predictions of an all-season road; and
- updated design and updated construction, operational, and decommissioning costs of an all-season road.



Projection: NAD 1983 UTM Zone 14N
Compiled: TL
Date: 9/17/2014
Scale: 1:300,000
Data Sources: Natural Resources Canada, Geobase®, Nation
Topographic Database, AREVA Resources Canada
Inc.

FIGURE 4.3-1
FEIS ALL-SEASON ROAD OPTION

ENVIRONMENTAL IMPACT STATEMENT
APPENDIX 2L

File: Q:\SHEQ\GIS\KIGGAVIK\2014\EIS\Volume 2 - Project Description\Volume 2 - Tier 3\Appendix 2L - All Season Road Report\MXD\Figure 4.2-1 FEIS All Season Road Option.mxd

5 References

AREVA Resources Canada (2008). The Kiggavik Project – Project Proposal. Submitted to the Nunavut Impact Review Board. November, 2008.

EBA Engineering Consultants Limited (2007), Pre-Feasibility Study Access Roads, Bridge and Mine Site Pad Kiggavik Sissons Uranium Mine Project, September 2014

IQ and Engagement References

AR OH (Arviat Open House). November 2010. From “Part 5 – Kivalliq Community Information Sessions (Round 2, 2010)” December 2011; in Technical Appendix 3A: Public Engagement Documentation, Part 5.

Baker Lake Hunters and Trappers Organization. 2011. *Preliminary Report on the Inuit Qaujimagatuganit*. Prepared by JT Consulting. March 13, 2011.

BL CLARC (Baker Lake Community Lands and Resources Committee). April 2013. Notes from a project update meeting. April 26, 2013; in Technical Appendix 3A: Public Engagement Documentation, Part 2.

BL CLC (Baker Lake Community Liaison Committee). February 2007. Meeting Notes. February 13, 2007; in Technical Appendix 3A: Public Engagement Documentation, Part 1.

BL CLC (Baker Lake Community Liaison Committee). March 2007. Meeting Notes. March 30, 2007; in Technical Appendix 3A: Public Engagement Documentation, Part 1

BL CLC (Baker Lake Community Liaison Committee). February 2008. Meeting Notes. February 28, 2008; in Technical Appendix 3A: Public Engagement Documentation, Part 1.

BL CLC (Baker Lake Community Liaison Committee). April 2008. Meeting Notes. April 22, 2008; in Technical Appendix 3A: Public Engagement Documentation, Part 1.

BL CLC (Baker Lake Community Liaison Committee). May 2008. Meeting Notes. May 28, 2008; in Technical Appendix 3A: Public Engagement Documentation, Part 1.

BL CLC (Baker Lake Community Liaison Committee). March 2009. Meeting Notes. March 27, 2009; in Technical Appendix 3A: Public Engagement Documentation, Part 1.

- BL CLC (Baker Lake Community Liaison Committee). August 2009. Meeting Notes. August 18, 2009; in Technical Appendix 3A: Public Engagement Documentation, Part 1.
- BL CLC (Baker Lake Community Liaison Committee). February 2010. Meeting Notes. February 3, 2010; in Technical Appendix 3A: Public Engagement Documentation, Part 1
- BL CLC (Baker Lake Community Liaison Committee). March 2010. Meeting Notes. March 17, 2010; in Technical Appendix 3A: Public Engagement Documentation, Part 1.
- BL CLC (Baker Lake Community Liaison Committee). October 2010. Meeting Notes. October 26, 2010; in Technical Appendix 3A: Public Engagement Documentation, Part 1.
- BL CLC (Baker Lake Community Liaison Committee). May 2011. Meeting Notes. May 27, 2011; in Technical Appendix 3A: Public Engagement Documentation, Part 1.
- BL HS (Baker Lake High School). November 2010. Notes from discussions at Jonah Amitna'aq High School. November 2, 2010; in Technical Appendix 3A: Public Engagement Documentation, Part 2.
- BL HTO (Baker Lake Hunters and Trappers Organization). March 2009. Meeting Notes. March 4, 2009; in Technical Appendix 3A: Public Engagement Documentation, Part 2.
- BL KIA (Baker Lake – Kivalliq Inuit Association). February 2010. From “Results of the 2010 KIA Community Engagement Tour for the Proposed Kiggavik Project, Kivalliq Inuit Association April 2010”; in Technical Appendix 3A: Public Engagement Documentation, Part 12.
- BL NIRB (Baker Lake - Nunavut Impact Review Board). April 2010. From “Public Scoping Meetings Summary Report, April 25-May 10, 2010, for the NIRB’s Review of AREVA Resources Canada Inc’s Kiggavik Project (NIRB File No. 09MN003)”; in Technical Appendix 3A: Public Engagement Documentation, Part 11.
- BL OH (Baker Lake Open House). November 2010. From “Part 5 – Kivalliq Community Information Sessions (Round 2, 2010)” December 2011; in Technical Appendix 3A: Public Engagement Documentation, Part 5.
- BL OH (Baker Lake Open House). October 2012. From “Kivalliq Community Information Sessions 2012 Report.” May 2013; in Technical Appendix 3A: Public Engagement Documentation, Part 6.

- BL OH (Baker Lake Open House). November 2013. From “Kivalliq Community Information Sessions 2013 Report.” May 2014; in Technical Appendix 3A: Public Engagement Documentation, Part 7.
- BL04 (Baker Lake Interview 04). 2008. Summary of individual Elder IQ interview conducted by Hattie Mannik in Baker Lake, 2008; in Technical Appendix 3B: Inuit Qaujimajatuqangit Documentation, Attachment B
- BL06 (Baker Lake Interview 06). 2008. Summary of individual Elder IQ interview conducted by Hattie Mannik in Baker Lake, 2008; in Technical Appendix 3B: Inuit Qaujimajatuqangit Documentation; Attachment B.
- BL10 (Baker Lake Interview 10). 2008. Summary of individual Elder IQ interview conducted by Hattie Mannik in Baker Lake, 2008; in Technical Appendix 3B: Inuit Qaujimajatuqangit Documentation, Attachment B.
- BLE (Baker Lake Elders). 2011. Summary of community review meeting conducted by Mitchell Goodjohn with ten Elders. February 17, 2011; in Technical Appendix 3B: Inuit Qaujimajatuqangit Documentation, Attachment B
- BLHT (Baker Lake Hunters and Trappers). 2011. Summary of community review meeting conducted by Mitchell Goodjohn with eight representatives of the Baker Lake Hunters and Trappers Organisation. February 16, 2011; in Technical Appendix 3B: Inuit Qaujimajatuqangit Documentation, Attachment B.
- CH HL (Coral Harbour Hamlet Leaders). November 2012. Meeting Notes. November 1, 2012); in Technical Appendix 3A: Public Engagement Documentation, Part 2.
- CH OH (Coral Harbour Open House). November 2010. From “Part 5 – Kivalliq Community Information Sessions (Round 2, 2010)” December 2011; in Technical Appendix 3A: Public Engagement Documentation, Part 5.
- CI KIA (Chesterfield Inlet – Kivalliq Inuit Association). February 2010. From “Results of the 2010 KIA Community Engagement Tour for the Proposed Kiggavik Project, Kivalliq Inuit Association April 2010”; in Technical Appendix 3A: Public Engagement Documentation, Part 12.
- CI01 (Chesterfield Inlet Interview 01). 2009. Summary of IQ interview conducted by Mitchell Goodjohn with a family of three hunters. May 6, 2009; in Technical Appendix 3B: Inuit Qaujimajatuqangit Documentation, Attachment C.

CI03 (Chesterfield Inlet Interview 03). 2009. Summary of IQ interview conducted by Mitchell Goodjohn with two Elders. May 6, 2009; in Technical Appendix 3B: Inuit Qaujimajatuqangit Documentation, Attachment C.

GeoVector Management Inc. 2008. Thelon and Kazan Rivers Background Study, Management Planning Assessment, Final. Prepared for the Kivalliq Inuit Association.

GNDOE (Government of Nunavut Department of Environment) May 2012. Notes from a meeting in Arviat with the Regional Biologist. May 25, 2012; in Technical Appendix 3A: Public Engagement Documentation, Part 2.

KIV OH (Kivalliq Communities Open House). October 2009. From “Part 4 – Kivalliq Community Information Sessions (Round 1, 2009)” December 2011; in Technical Appendix 3A: Public Engagement Documentation, Part 4

RB NIRB (Repulse Bay - Nunavut Impact Review Board). April 2010. From “Public Scoping Meetings Summary Report, April 25-May 10, 2010, for the NIRB’s Review of AREVA Resources Canada Inc’s Kiggavik Project (NIRB File No. 09MN003)” in Technical Appendix 3A: Public Engagement Documentation, Part 11.

RB OH (Repulse Bay Open House). November 2010. From “Part 5 – Kivalliq Community Information Sessions (Round 2, 2010)” December 2011; in Technical Appendix 3A: Public Engagement Documentation, Part 5.

RI RLC (Rankin Inlet - Regional Liaison Committee). February 2009. Regional Liaison Committee Meeting Notes. February 24-26, 2009; in Technical Appendix 3A: Public Engagement Documentation, Part 2.

RIYA (Rankin Inlet Young Adults). 2009. Excerpt from socio-economic focus group conducted by Susan Ross and Linda Havers. April 2, 2009; in Technical Appendix 3B: Inuit Qaujimajatuqangit Documentation, Attachment D.

WCCR 2011 (Whale Cove Community Review). 2011. Summary of IQ focus group conducted by Barry McCallum with six traditional land and resource users from the Whale Cove HTO. March 21, 2011; in Technical Appendix 3B: Inuit Qaujimajatuqangit Documentation, Attachment F