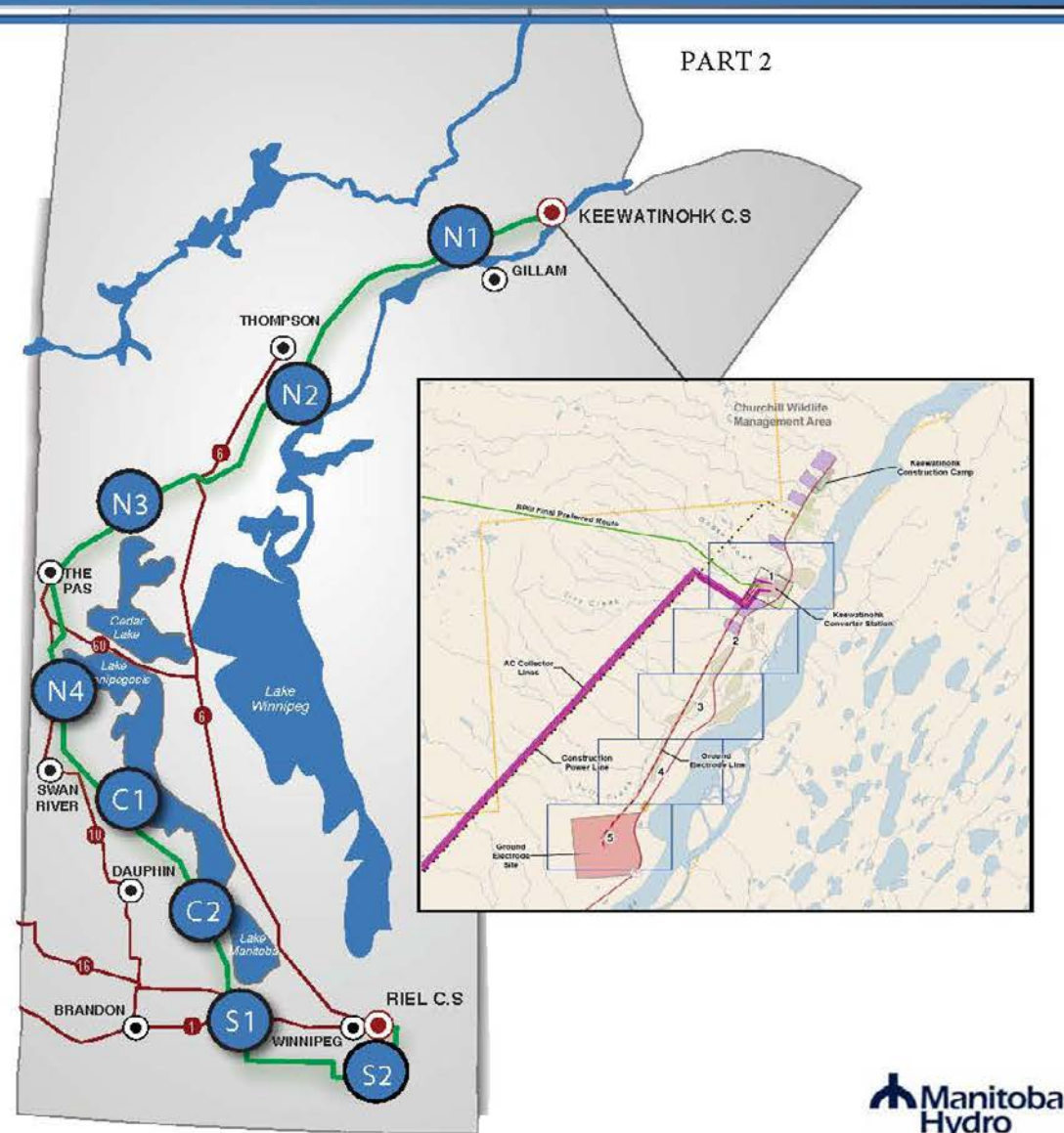
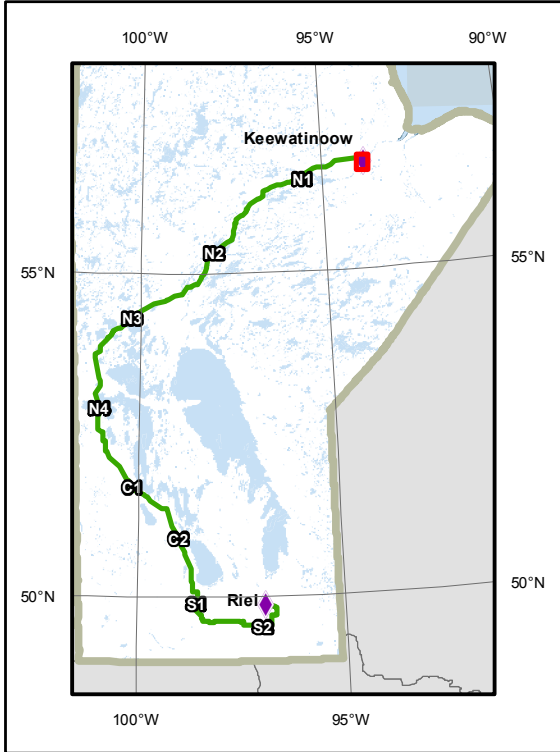
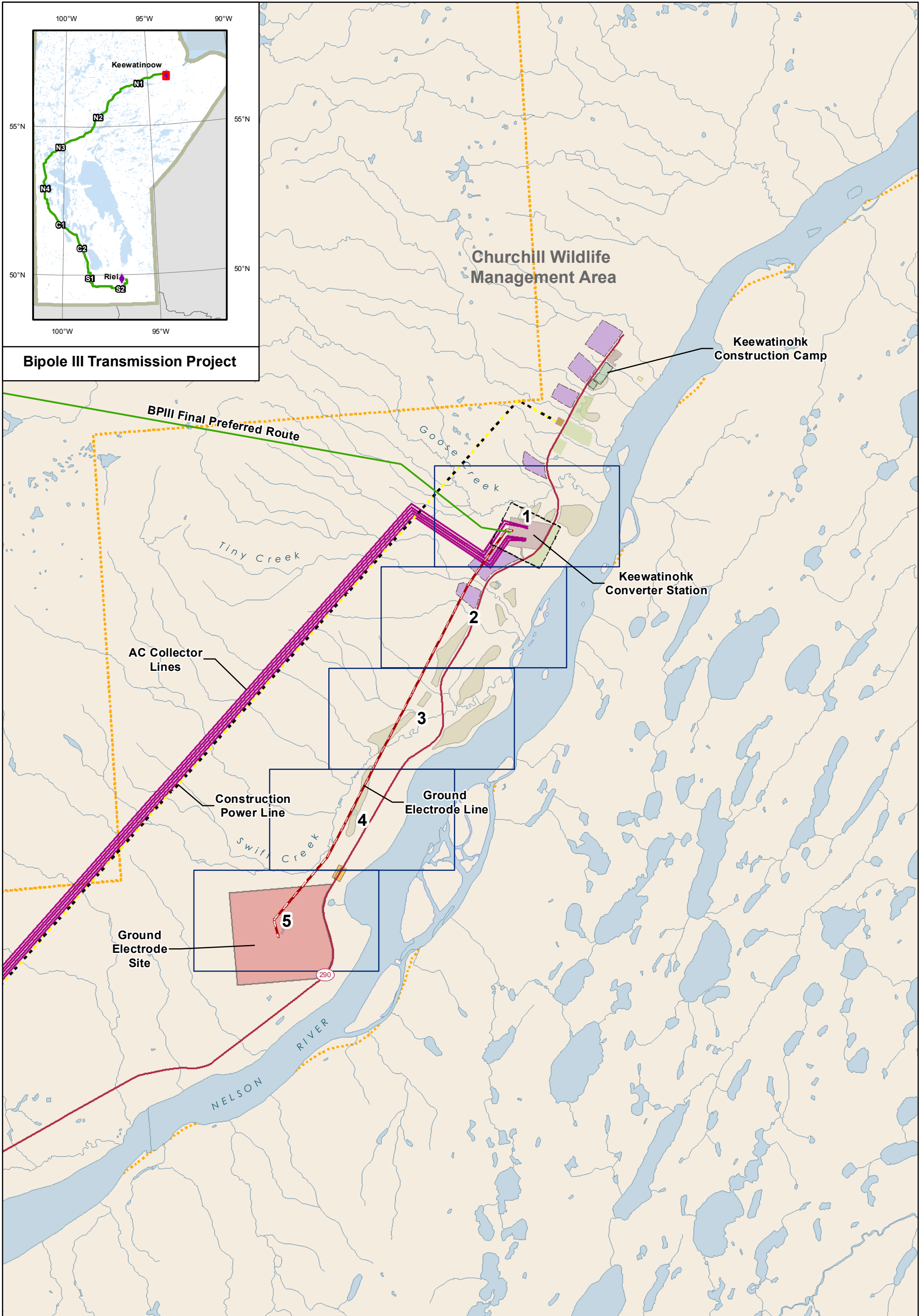


BIPOLE III TRANSMISSION PROJECT
 CONSTRUCTION ENVIRONMENTAL PROTECTION PLAN
 - Keewatinohk Ground Electrode Line Mapbook



Aboriginal Traditional Knowledge

Manitoba Hydro recognizes the unique relationship Aboriginal communities have with their areas of use and is appreciative to all the communities who took time to share information about their history and culture as well as their valued knowledge and perspectives with regards to the Bipole III study area and Project. The ATK that has been shared assisted Manitoba Hydro in: developing a greater understanding of the study area; identifying potential Project effects; planning and designing the Project; developing potential mitigation measures, some of which can be found throughout this document.



Bipole III Transmission Project



Coordinate System: UTM Zone 14N NAD83
 Data Source: MB Hydro, Stantec, ProvMB, NRCAN
 Date Created: February 12, 2015

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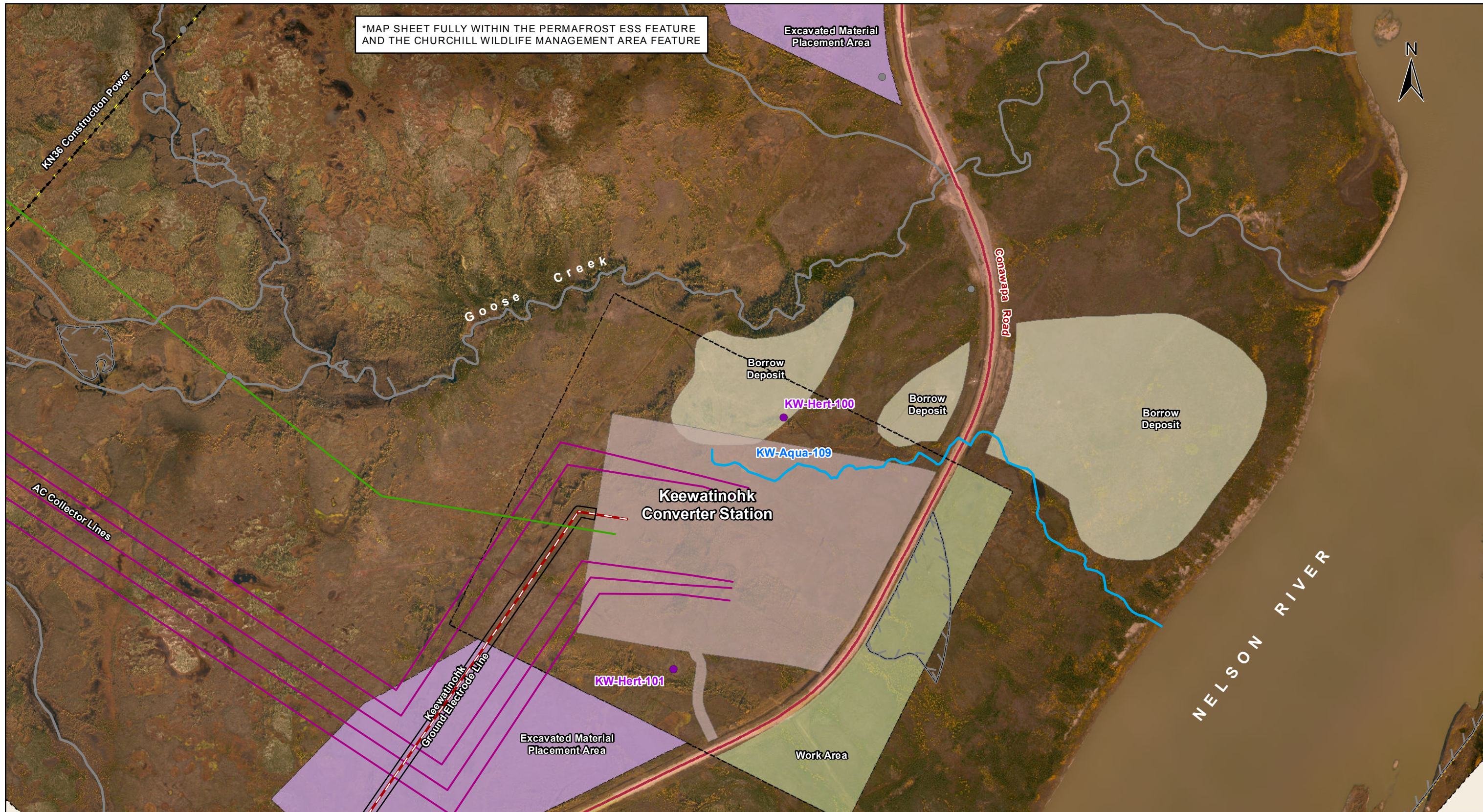
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Legend	
	Final Preferred Route
	Map Index Grid (1:10,000)
	AC Collector Line
	Ground Electrode Line
	Construction Power (KN36)
	Borrow Deposits
	Excavated Material Placement Area
	Ground Electrode
	Manitoba Hydro & Contractor Work Area
	Keewatinohk - Main Camp

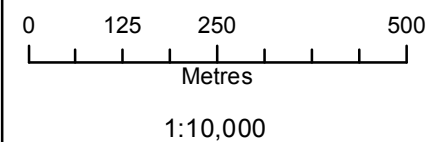
**Bipole III Transmission Line Project
 Construction Environmental Protection Plan
 Ground Electrode Line
 Key Map Index**

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*MAP SHEET FULLY WITHIN THE PERMAFROST ESS FEATURE AND THE CHURCHILL WILDLIFE MANAGEMENT AREA FEATURE



Coordinate System: UTM Zone 14N NAD83
 Data Source: MB Hydro, ProvMB, NRCAN
 Date Created: February 12, 2015
 Version: Draft



Land Base

- Transmission Line
- Highway
- Major Road
- Local Road
- Winter Road
- Railway (Operational)
- Railway (Discontinued)
- ⊠ Mining
- Provincial Forest

Project Infrastructure

- BPIII Final Preferred Route
- Ground Electrode Line
- Construction Power Line
- Borrow Deposits
- Excavated Material Placement Area
- Keewatinohk Converter Station
- Ground Electrode

- Manitoba Hydro & Contractor Work Area
- Access Road
- Security Gatehouse
- Sensitive Sites**
- Point Features
- Linear Features
- ⊠ Area Features

ESS Features

- Heritage**
- Archaeological
- Water**
- Water Crossing



**Bipole III Transmission Project
 Construction Environmental Protection Plan
 Ground Electrode Site
 Environmentally Sensitive Site Locations**

Draft: For Discussion Purposes Only

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ESS Group : Conservation

Sec ID	ESS ID	ESS Name	Location
CP	CP-LUse-100	Churchill Wildlife Management Area	Entire Extent of Map 1

Potential Effects:

Within the Churchill Wildlife Management Area

Specific Mitigation:

- Must not place food for the purpose of attracting, feeding or holding polar bears
- All project staff must record all polar bears encountered/observed on a daily basis, any observations of polar bears or polar bear tracks must be reported to the MH Site Environmental Officer or MH Environmental Inspector
- All garbage must be stored in bear proof containers or within electric fencing and removed from Wildlife Management Area
- Clearing within the ROW will be kept to a minimum and with non -non-hazard trees removed. Any trees that are cleared must be cut, piled and burned under safe conditions
- Carry out construction activities on well frozen ground in wetlands

ESS Group : Archaeological

Sec ID	ESS ID	ESS Name	Easting	Northing	UTM Zone
KW	KW-Hert-100	Registered Archaeological Site	815541	6291342	14N
KW	KW-Hert-101	Registered Archaeological Site	815242	6290660	14N

Potential Effects:

Potential disturbance to Heritage Resource

Specific Mitigation:

- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion
- Identify and flag prior to start of work
- Conduct site investigation with Archaeologist post clearing and prior to construction
- Minimize surface disturbance around the site to the extent possible
- Inspect excavated materials or surface disturbance for heritage resources and report any finds to Environmental Inspector
- Implement additional mitigation from site investigation

ESS Group : Water Crossing

Sec ID	ESS ID	ESS Name	Channel Width (m)	Wet Width (m)	Fish Habitat Class	Habitat Sensitivity
KW	KW-Aqua-109	Unnamed Tributary of Nelson River	N/A	N/A	Marginal	Low

Potential Effects:

Infilling of fish habitat; Increased erosion and sedimentation of streams from construction of station

Specific Mitigation:

- No instream work or fording between September 1 and July 15

ESS Group : Permafrost

Sec-Seg ID	ESS ID	ESS Name
KGEL	N/A	Permafrost (unmapped)

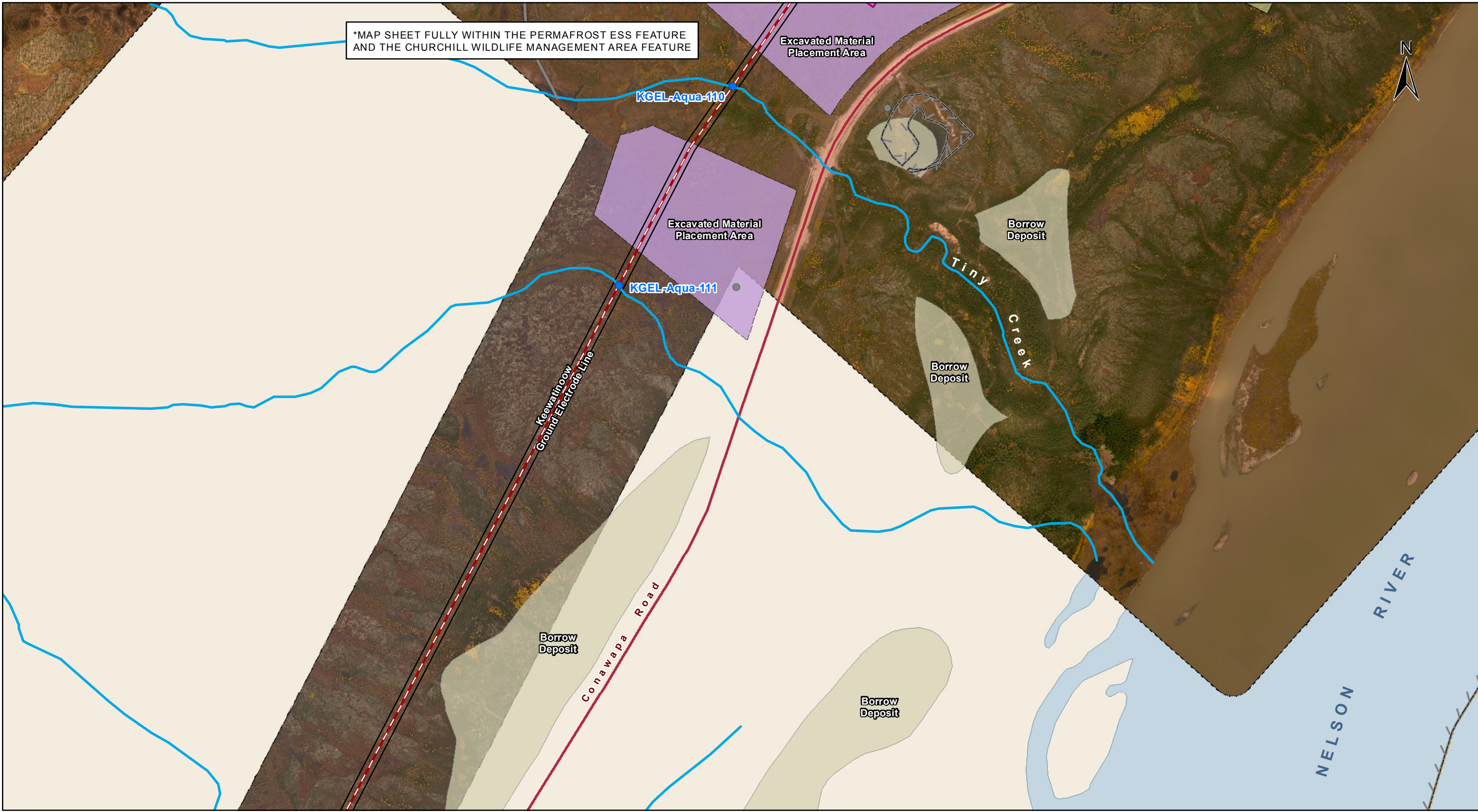
Potential Effects:

Melting or loss of permafrost due to disturbance of the active layer

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage and rutting.
- Use existing trails, roads or cut lines whenever possible as access routes
- Maintain shrub and herbaceous vegetation to the extent possible
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan

*MAP SHEET FULLY WITHIN THE PERMAFROST ESS FEATURE AND THE CHURCHILL WILDLIFE MANAGEMENT AREA FEATURE



Coordinate System: UTM Zone 14N NAD83
 Data Source: MB Hydro, ProvMB, NRCAN
 Date Created: February 12, 2015
 Version: Draft

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|---|---|--|
| <p>Land Base</p> <ul style="list-style-type: none"> Transmission Line Highway Major Road Local Road Winter Road Railway (Operational) Railway (Discontinued) Mining Provincial Forest | <p>Project Infrastructure</p> <ul style="list-style-type: none"> BPIII Final Preferred Route Ground Electrode Line Construction Power Line Borrow Deposits Excavated Material Placement Area Keewatinohk Converter Station Ground Electrode | <p>Sensitive Sites</p> <ul style="list-style-type: none"> Manitoba Hydro & Contractor Work Area Access Road Security Gatehouse Point Features Linear Features Area Features |
|---|---|--|

- ESS Features**
- Water**
- Water Crossing
 - Water Crossing

**Bipole III Transmission Project
 Construction Environmental Protection Plan
 Ground Electrode Site
 Environmentally Sensitive Site Locations**

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ESS Group : Conservation

Sec ID	ESS ID	ESS Name	Location
CP	CP-LUse-100	Churchill Wildlife Management Area	Entire Extent of Map 2

Potential Effects:

Within the Churchill Wildlife Management Area

Specific Mitigation:

- Must not place food for the purpose of attracting, feeding or holding polar bears
- All project staff must record all polar bears encountered/observed on a daily basis, any observations of polar bears or polar bear tracks must be reported to the MH Site Environmental Officer or MH Environmental Inspector
- All garbage must be stored in bear proof containers or within electric fencing and removed from Wildlife Management Area
- Clearing within the ROW will be kept to a minimum and with non -non-hazard trees removed. Any trees that are cleared must be cut, piled and burned under safe conditions
- Carry out construction activities on well frozen ground in wetlands

ESS Group : Water Crossing

Sec ID	ESS ID	ESS Name	Easting	Northing	Channel Width (m)	Wet Width (m)	Fish Habitat Class	Habitat Sensitivity
KGEL	KGEL-Aqua-110	Tiny Creek	814264	6290048	N/A	N/A	Important	Moderate
KGEL	KGEL-Aqua-111	Unnamed Tributary of Nelson River	813955	6289508	N/A	N/A	Marginal	Moderate

Potential Effects:

Habitat loss and contamination from structure foundations & installations; increased erosion & sedimentation of streams; Damage to stream banks; Loss of riparian vegetation; Fish habitat disturbances and impeded fish movement; Rutting of floodplain

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage, rutting and erosion
- Use existing trails, roads or cut lines whenever possible as access routes
- Identify and flag buffer areas prior to start of work
- Riparian Buffers shall be a minimum of 30m and increase in size based on slope of land entering waterway. Within these buffers shrub and herbaceous understory vegetation will be maintained along with trees that do not violate Manitoba Hydro Vegetation Clearance Requirements.
- 7m no machine zone will restrict equipment in close proximity to the waterbody except at the trail crossing.

ESS Group : Permafrost

Sec-Seg ID	ESS ID	ESS Name
KGEL	N/A	Permafrost (unmapped)

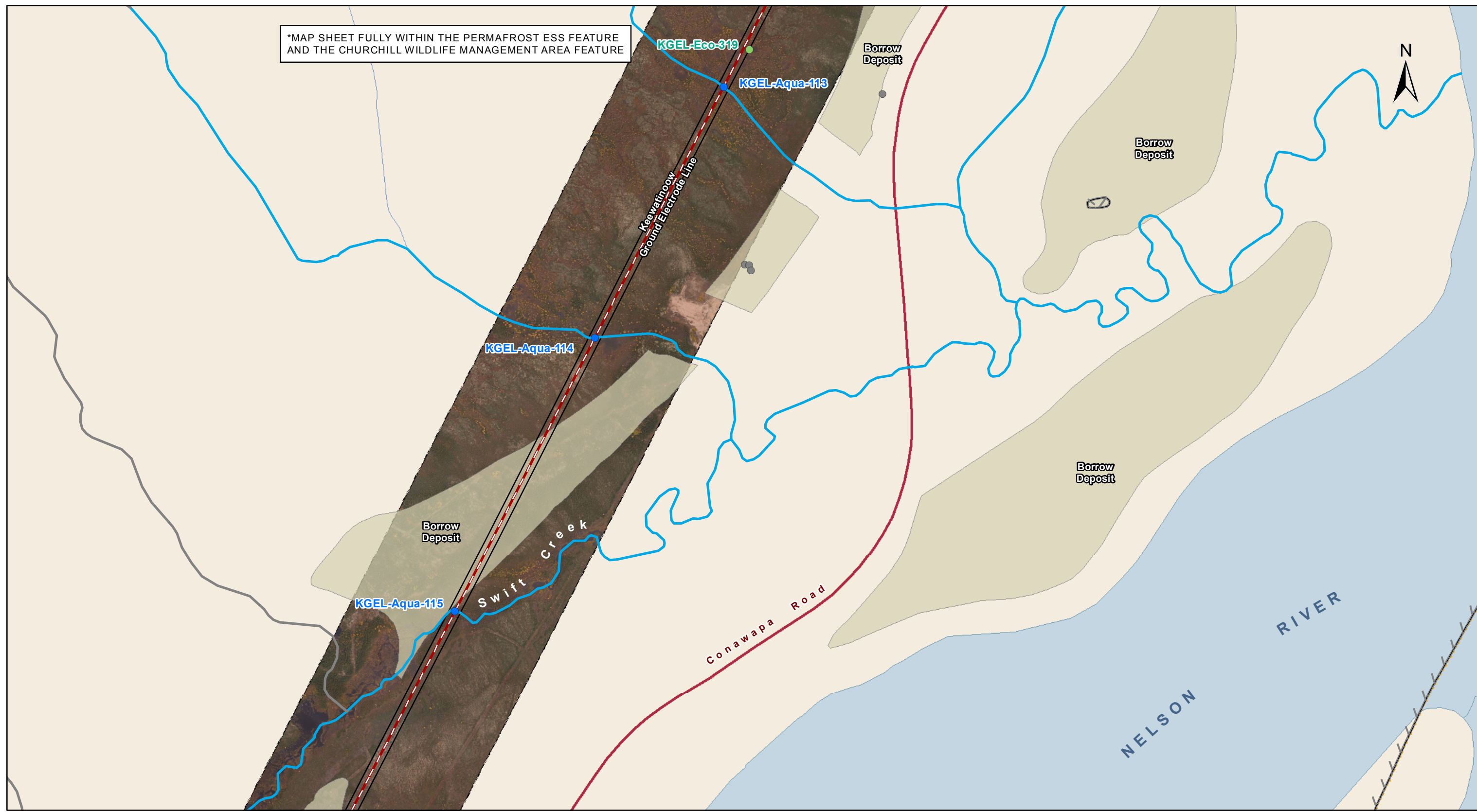
Potential Effects:

Melting or loss of permafrost due to disturbance of the active layer

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage and rutting.
- Use existing trails, roads or cut lines whenever possible as access routes
- Maintain shrub and herbaceous vegetation to the extent possible
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan

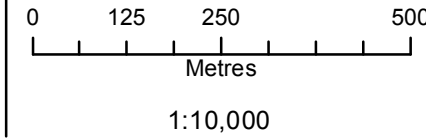
*MAP SHEET FULLY WITHIN THE PERMAFROST ESS FEATURE AND THE CHURCHILL WILDLIFE MANAGEMENT AREA FEATURE



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Coordinate System: UTM Zone 14N NAD83
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 Date Created: February 12, 2015
 Version: Draft



- Land Base**
- Transmission Line
 - Highway
 - Major Road
 - Local Road
 - Winter Road
 - Railway (Operational)
 - Railway (Discontinued)
 - ⊠ Mining
 - ▭ Provincial Forest

- Project Infrastructure**
- BP/III Final Preferred Route
 - Ground Electrode Line
 - Access Road
 - Construction Power Line
 - ▭ Borrow Deposits
 - ▭ Excavated Material Placement Area
 - ▭ Keewatinohk Converter Station
 - ▭ Ground Electrode

- Sensitive Sites**
- ▭ Manitoba Hydro & Contractor Work Area
 - ▭ Access Road Security Gatehouse
 - Point Features
 - Linear Features
 - ▭ Area Features

- ESS Features**
- Ecosystem**
- Species of Concern
- Water**
- Water Crossing
- Water**
- Water Crossing

**Bipole III Transmission Project
 Construction Environmental Protection Plan
 Ground Electrode Site
 Environmentally Sensitive Site Locations**

Draft: For Discussion Purposes Only

ESS Group : Conservation

Sec ID	ESS ID	ESS Name	Location
CP	CP-LUse-100	Churchill Wildlife Management Area	Entire Extent of Map 3

Potential Effects:

CP-LUse-100: *Within the Churchill Wildlife Management Area*

Specific Mitigation:

- Must not place food for the purpose of attracting, feeding or holding polar bears
- All project staff must record all polar bears encountered/observed on a daily basis, any observations of polar bears or polar bear tracks must be reported to the MH Site Environmental Officer or MH Environmental Inspector
- All garbage must be stored in bear proof containers or within electric fencing and removed from Wildlife Management Area
- Clearing within the ROW will be kept to a minimum and with non -non-hazard trees removed. Any trees that are cleared must be cut, piled and burned under safe conditions
- Carry out construction activities on well frozen ground in wetlands

ESS Group : Water Crossing

Sec ID	ESS ID	ESS Name	Easting	Northing	Channel Width (m)	Wet Width (m)	Fish Habitat Class	Habitat Sensitivity
KGEL	KGEL-Aqua-113	Unnamed Tributary of Swift Creek	813105	6287867	N/A	N/A	Important	Moderate
KGEL	KGEL-Aqua-114	Unnamed Tributary of Swift Creek	812755	6287185	N/A	N/A	Marginal	Moderate
KGEL	KGEL-Aqua-115	Swift Creek	812374	6286440	N/A	N/A	Marginal	Moderate

Potential Effects:

Habitat loss and contamination from structure foundations & installations; increased erosion & sedimentation of streams; damage to stream banks; loss of riparian vegetation; fish habitat disturbances and impeded fish movement; rutting of floodplain.

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage, rutting and erosion
- Use existing trails, roads or cut lines whenever possible as access routes
- Identify and flag buffer areas prior to start of work
- Riparian Buffers shall be a minimum of 30m and increase in size based on slope of land entering waterway. Within these buffers shrub and herbaceous understory vegetation will be maintained along with trees that do not violate Manitoba Hydro Vegetation Clearance Requirements.
- 7m no machine zone will restrict equipment in close proximity to the waterbody except at the trail crossing.

ESS Group : Species of Concern

Sec ID	ESS ID	ESS Name	Easting	Northing	UTM Zone
KGEL	KGEL-Eco-319	Species of Concern (plant)	813174	6287968	14N

Potential Effects:

Loss of plants of conservation concern from clearing and construction activities.

Specific Mitigation:

- Identify and flag prior to start of work
- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion
- Provide 5m vegetated (shrub and herbaceous) buffer around site
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible

ESS Group : Permafrost

Sec-Seg ID	ESS ID	ESS Name
KGEL	N/A	Permafrost (unmapped)

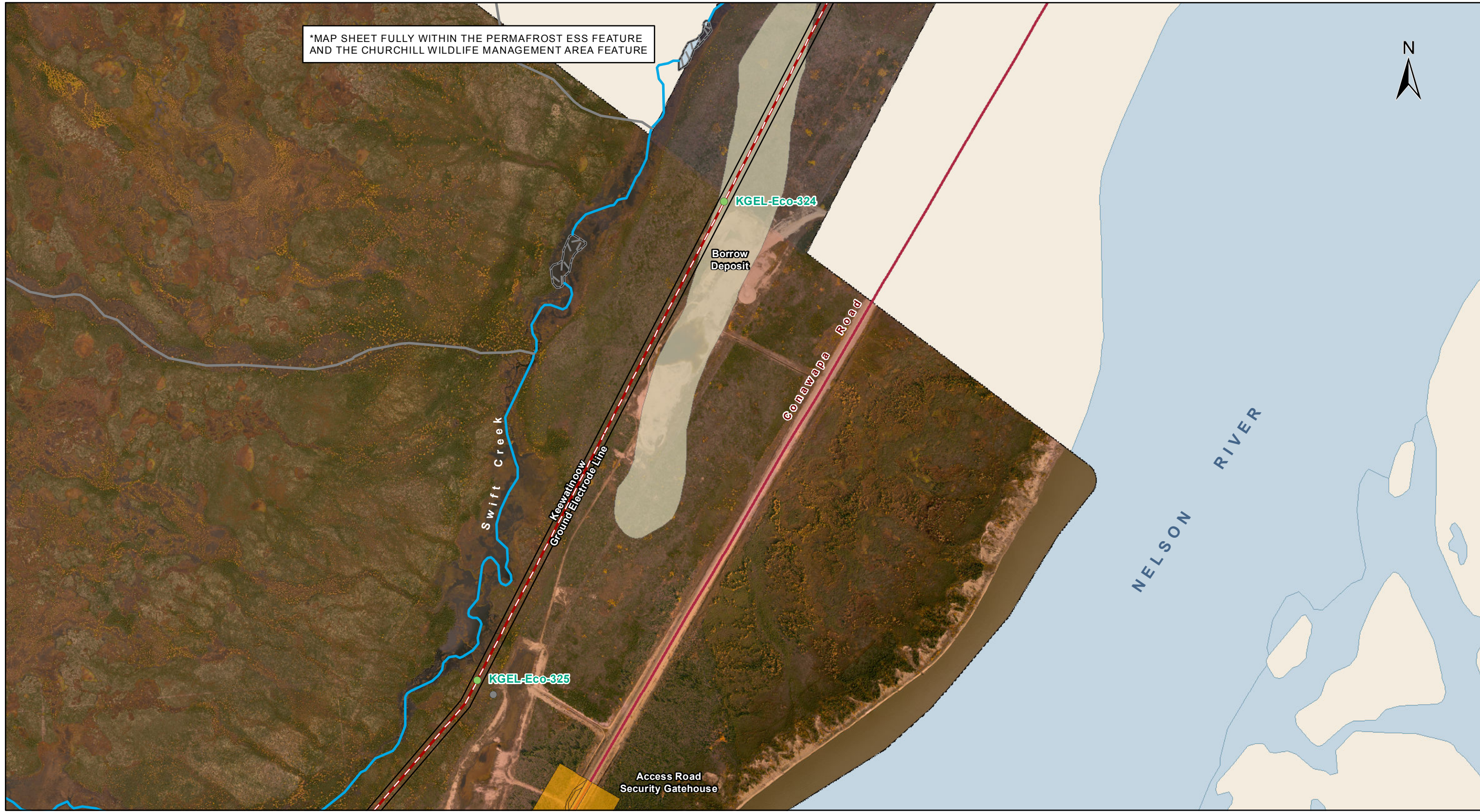
Potential Effects:

Melting or loss of permafrost due to disturbance of the active layer

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage and rutting.
- Use existing trails, roads or cut lines whenever possible as access routes
- Maintain shrub and herbaceous vegetation to the extent possible
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan

*MAP SHEET FULLY WITHIN THE PERMAFROST ESS FEATURE AND THE CHURCHILL WILDLIFE MANAGEMENT AREA FEATURE



Coordinate System: UTM Zone 14N NAD83
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 Date Created: February 12, 2015
 Version: Draft

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| <p>Land Base</p> <ul style="list-style-type: none"> — Transmission Line — Highway — Major Road — Local Road — Winter Road — Railway (Operational) — Railway (Discontinued) — Mining — Provincial Forest | <p>Project Infrastructure</p> <ul style="list-style-type: none"> — Bipole III Final Preferred Route — Ground Electrode Line — Construction Power Line — Borrow Deposits — Excavated Material Placement Area — Keewatinohk Converter Station — Ground Electrode | <p>Sensitive Sites</p> <ul style="list-style-type: none"> — Manitoba Hydro & Contractor Work Area — Access Road Security Gatehouse — Point Features — Linear Features — Area Features |
|---|--|---|

- ESS Features**
- Ecosystem**
- Species of Concern
- Water**
- Water Crossing

**Bipole III Transmission Project
 Construction Environmental Protection Plan
 Ground Electrode Site
 Environmentally Sensitive Site Locations**

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ESS Group : Conservation

Sec ID	ESS ID	ESS Name	Location
CP	CP-LUse-100	Churchill Wildlife Management Area	Entire Extent of Map 4

Potential Effects:

Within the Churchill Wildlife Management Area

Specific Mitigation:

- Must not place food for the purpose of attracting, feeding or holding polar bears
- All project staff must record all polar bears encountered/observed on a daily basis, any observations of polar bears or polar bear tracks must be reported to the MH Site Environmental Officer or MH Environmental Inspector
- All garbage must be stored in bear proof containers or within electric fencing and removed from Wildlife Management Area
- Clearing within the ROW will be kept to a minimum and with non -non-hazard trees removed. Any trees that are cleared must be cut, piled and burned under safe conditions
- Carry out construction activities on well frozen ground in wetlands

ESS Group : Species of Concern

Sec ID	ESS ID	ESS Name	Easting	Northing	UTM Zone
KW	KW-Eco-324	Species of Concern (plant)	811816	6285361	14N

Potential Effects:

Loss of plants of conservation concern from clearing and construction activities.

Specific Mitigation:

- Non-mitigable due to complete removal of all vegetation cover for site.

ESS Group : Species of Concern

Sec ID	ESS ID	ESS Name	Easting	Northing	UTM Zone
KW	KW-Eco-325	Species of Concern (plant)	811147	6284064	14N

Potential Effects:

Potential loss of plants of conservation concern from clearing, construction, maintenance and decommissioning activities.

Specific Mitigation:

- Identify and flag prior to start of work
- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion
- Provide 5m vegetated (shrub and herbaceous) buffer around site

- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible

ESS Group : Permafrost

Sec-Seg ID	ESS ID	ESS Name
KGEL	N/A	Permafrost (unmapped)

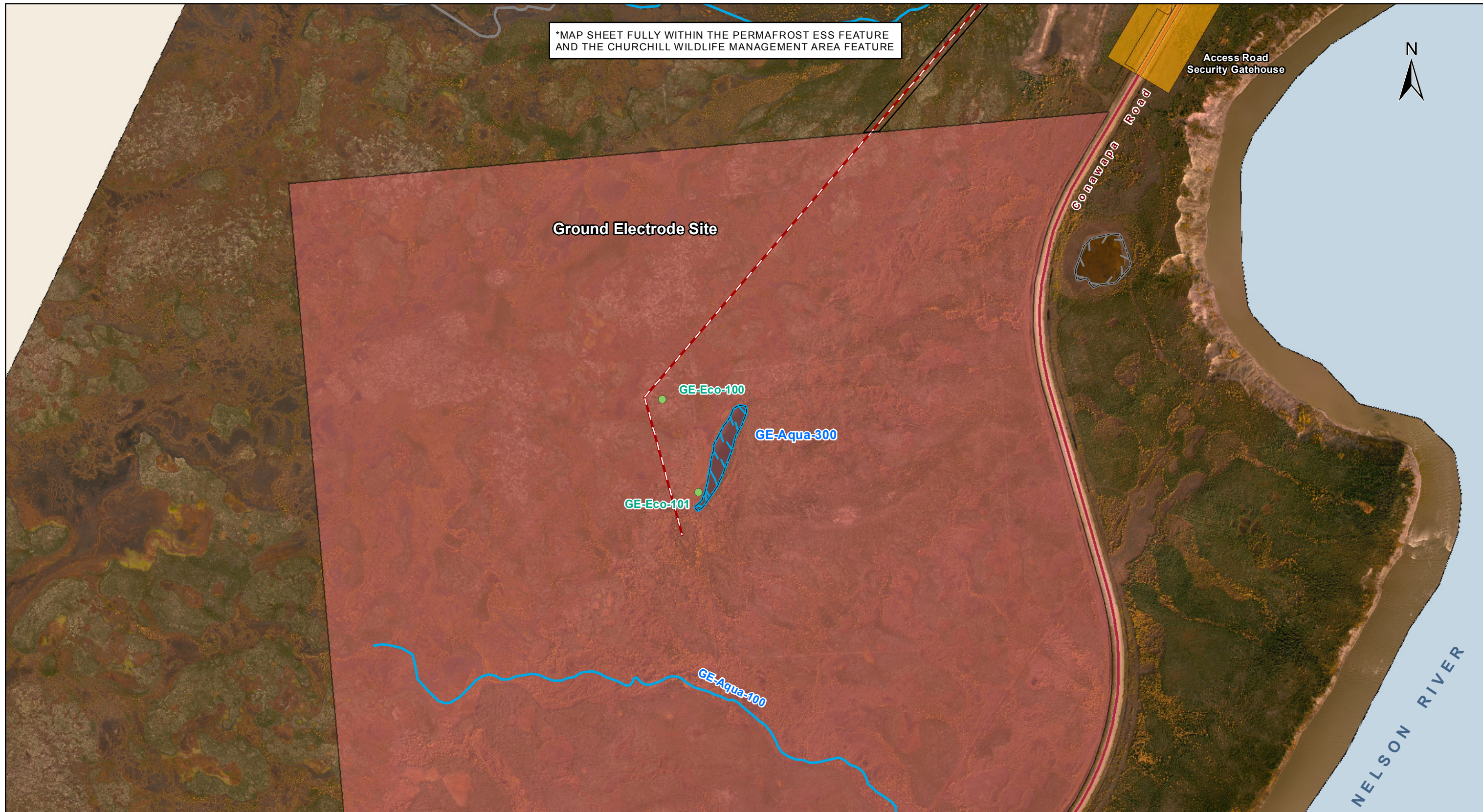
Potential Effects:

Melting or loss of permafrost due to disturbance of the active layer

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage and rutting.
- Use existing trails, roads or cut lines whenever possible as access routes
- Maintain shrub and herbaceous vegetation to the extent possible
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan

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Ground Electrode Site

GE-Eco-100

GE-Aqua-300

GE-Eco-101

GE-Aqua-100

Access Road
Security Gatehouse

Gonawapa Road



NELSON RIVER



Coordinate System: UTM Zone 14N NAD83
Data Source: MB Hydro, ProvMB, NRCAN
Date Created: February 12, 2015
Version: Draft

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|---|---|---|
| <p>Land Base</p> <ul style="list-style-type: none"> Transmission Line Highway Major Road Local Road Winter Road Railway (Operational) Railway (Discontinued) Mining Provincial Forest | <p>Project Infrastructure</p> <ul style="list-style-type: none"> BPIII Final Preferred Route Ground Electrode Line Construction Power Line Borrow Deposits Excavated Material Placement Area Keewatinohk Converter Station Ground Electrode | <p>Manitoba Hydro & Contractor Work Area</p> <p>Access Road Security Gatehouse</p> <p>Sensitive Sites</p> <ul style="list-style-type: none"> Point Features Linear Features Area Features |
|---|---|---|

- ESS Features**
- Ecosystem**
- Species of Concern
- Water**
- Water Crossing
- Soils and Terrain**
- Water Crossing

**Bipole III Transmission Project
Construction Environmental Protection Plan
Ground Electrode Site
Environmentally Sensitive Site Locations**

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ESS Group : Conservation

Sec ID	ESS ID	ESS Name	Location
CP	CP-LUse-100	Churchill Wildlife Management Area	Entire Extent of Map 5

Potential Effects:

Within the Churchill Wildlife Management Area

Specific Mitigation:

- Must not place food for the purpose of attracting, feeding or holding polar bears
- All project staff must record all polar bears encountered/observed on a daily basis, any observations of polar bears or polar bear tracks must be reported to the MH Site Environmental Officer or MH Environmental Inspector
- All garbage must be stored in bear proof containers or within electric fencing and removed from Wildlife Management Area
- Clearing within the ROW will be kept to a minimum and with non -non-hazard trees removed. Any trees that are cleared must be cut, piled and burned under safe conditions
- Carry out construction activities on well frozen ground in wetlands

ESS Group : Species of Concern

Sec ID	ESS ID	ESS Name	Easting	Northing	UTM Zone
GE	GE-Eco-100	Species of Concern (plant)	810005	6282643	14N
GE	GE-Eco-101	Species of Concern (plant)	810104	6282391	14N

Potential Effects:

Loss of plants of conservation concern from clearing and construction activities.

Specific Mitigation:

- Identify and flag prior to start of work
- Carry out construction activities on frozen or dry ground to minimize surface damage, rutting and erosion
- Provide 5m vegetated (shrub and herbaceous) buffer around site
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible

ESS Group : Water Crossing

Sec ID	ESS ID	ESS Name	Easting	Northing	Channel Width (m)	Wet Width (m)	Fish Habitat Class	Habitat Sensitivity
GE	GE-Aqua-100	Unnamed Tributary of Nelson River	-	-	N/A	N/A	Marginal	Low

Potential Effects:

Instream works & diversion effects; increased erosion and sedimentation of stream; contamination of a watercourse from leaching of embedded coke; stream crossing effects.

Specific Mitigation:

- Environmental Officer will conduct monitor Total Suspended Solids (TSS) monitoring when construction occurs under wetted conditions when installing electrode rings.
- No instream work or fording between April 15 and July 15
- Construction will be postponed under adverse weather (i.e., storm events), to minimize potential sediment introduction into the aquatic environment.
- Coke may be rinsed or leached (aged), will be stored >100 m from the ordinary high water mark, & will be adequately contained & protected from wind & rain to prevent entry of fine particulates into streams through runoff or dust deposition
- Appropriate erosion and sediment control measures will be implemented to mitigate sediment introduction into watercourses.

ESS Group : Permafrost

Sec-Seg ID	ESS ID	ESS Name
KGEL	N/A	Permafrost (unmapped)

Potential Effects:

Melting or loss of permafrost due to disturbance of the active layer

Specific Mitigation:

- Carry out construction activities on frozen ground to minimize surface damage and rutting.
- Use existing trails, roads or cut lines whenever possible as access routes
- Maintain shrub and herbaceous vegetation to the extent possible
- Remove trees by low-disturbance methods
- Confine vehicle traffic to established trails to the extent possible
- Implement erosion protection before commencing construction in accordance with Erosion/Sediment Control Plan