

BIPOLE III TRANSMISSION PROJECT:

Moose and Woodland Caribou Sensitive Range Delineation and Mitigation Plans

Updated January 11, 2016

Introduction

Clause 20 of the Bipole III Transmission Project (the Project) *Environment Act* licence 3055 states:

The Licencee shall consult the Wildlife Branch of CWS regarding the design and implementation of mitigation measures for the protection of moose and caribou in known sensitive ranges along the transmission line right-of-way. A mitigation plan for these ranges shall be submitted to the Director for approval prior to clearing of the transmission right-of-way in known sensitive areas.

Manitoba Hydro has developed this mitigation plan to address the requirements of Clause 20 of the licence in cooperation with Wildlife Branch of Manitoba Conservation and Water Stewardship (MCWS). Manitoba Hydro has met several times with the Branch to define sensitive moose and woodland caribou areas and to develop mitigation measures for these species. Mitigation plans have been developed for two woodland caribou areas and four moose areas. Each area is described and mapped and mitigation measures prescribed. Input from Wildlife Branch has been instrumental in arriving at mitigation measures that will reduce potential impacts on the two species in the sensitive areas.

The original mitigation measures proposed in the Bipole III Environmental Impact Study (EIS) and subsequent documentation including a Commitments Table and draft Construction Phase Environmental Protection plans, were reviewed as part of the development of mitigation plans for sensitive zones (Appendix A). Some of the original mitigation measures were modified to add additional detail or clarity and have become part of the sensitive zone mitigation plan outlined below. In addition, new mitigation measures were also developed and included below for each of the sensitive zones identified in this plan. Mitigation measures listed in Appendix A will be included in Environmental Protection Program Plans for each construction zone as well as the specific mitigation developed for sensitive moose and caribou ranges provided below.

Vegetation Clearing Requirements

Since the development and approval of this document, Manitoba Hydro has further developed design standards for the Bipole III transmission line with regard to new construction clearing to maintain compliance with the North America Electric Reliability Corporation standard FAC-003-1 Transmission Vegetation Management. In 2012, The Reliability Standards Regulation under the Manitoba Hydro Act came into effect, which requires Manitoba Hydro to conform to the FAC-003-1 standard. Manitoba Hydro Transmission Line Design standards for the Bipole III transmission line to maintain compliance with this regulation has required the update of this document with clearing practices that meet vegetation clearance requirements from the initial new construction clearing until the first maintenance cycle in

approximately five years.

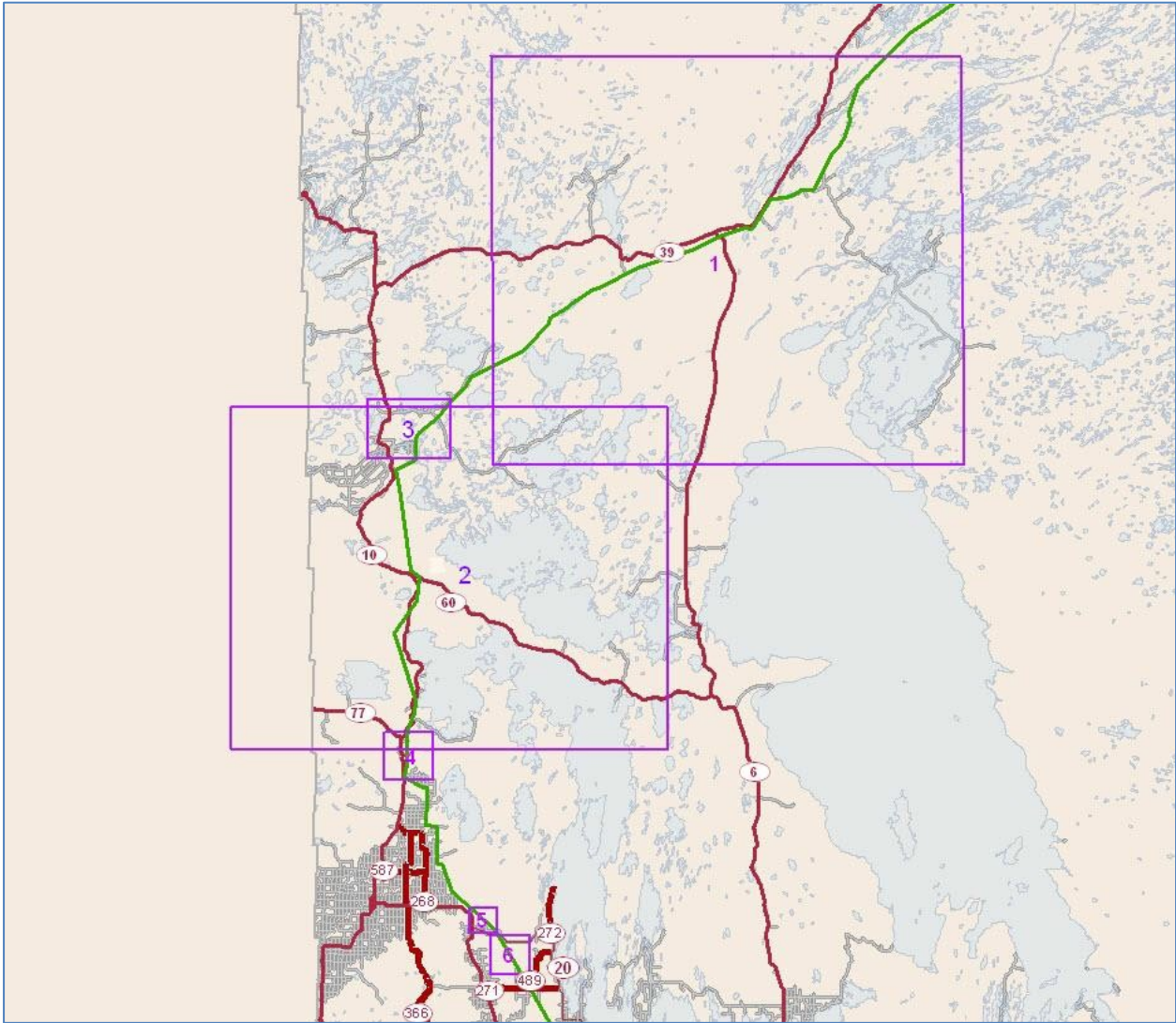
Sensitive Area Selection and Rationale

Through discussion and review with the Wildlife Branch of Manitoba Conservation and Water Stewardship (MCWS), a total of six sensitive areas were identified for woodland caribou and moose (2 woodland caribou and 4 moose). See Overview Map.

The criteria used in selecting sensitive areas included:

- areas identified in Clause 49 of the *Environment Act* Licence;
- documented woodland caribou ranges intersected by the transmission line;
- areas providing new access to humans and predators in moose ranges;
- areas currently under special moose management measures;
- areas where there is limited data for appraisal of moose population – GHA 19A,14A; and
- areas of high value for domestic use for moose hunting as identified through the Bipole III Transmission Project environmental review process.

The sensitive areas selected and corresponding mitigation plans are presented in the following pages.



Overview Map

Wabowden Woodland Caribou Range

Location: Near the intersection of PTH 6 and PTH 39 near Ponton (Figure 1).

Description: The Bipole III transmission line traverses an area of core habitats along PTH 6 and the adjacent rail line as shown in Figure 1.

Rationale for Selection: The area was deemed to be sensitive based on it being a known location of woodland caribou winter habitats. Woodland caribou is considered a threatened species under provincial and federal legislation.

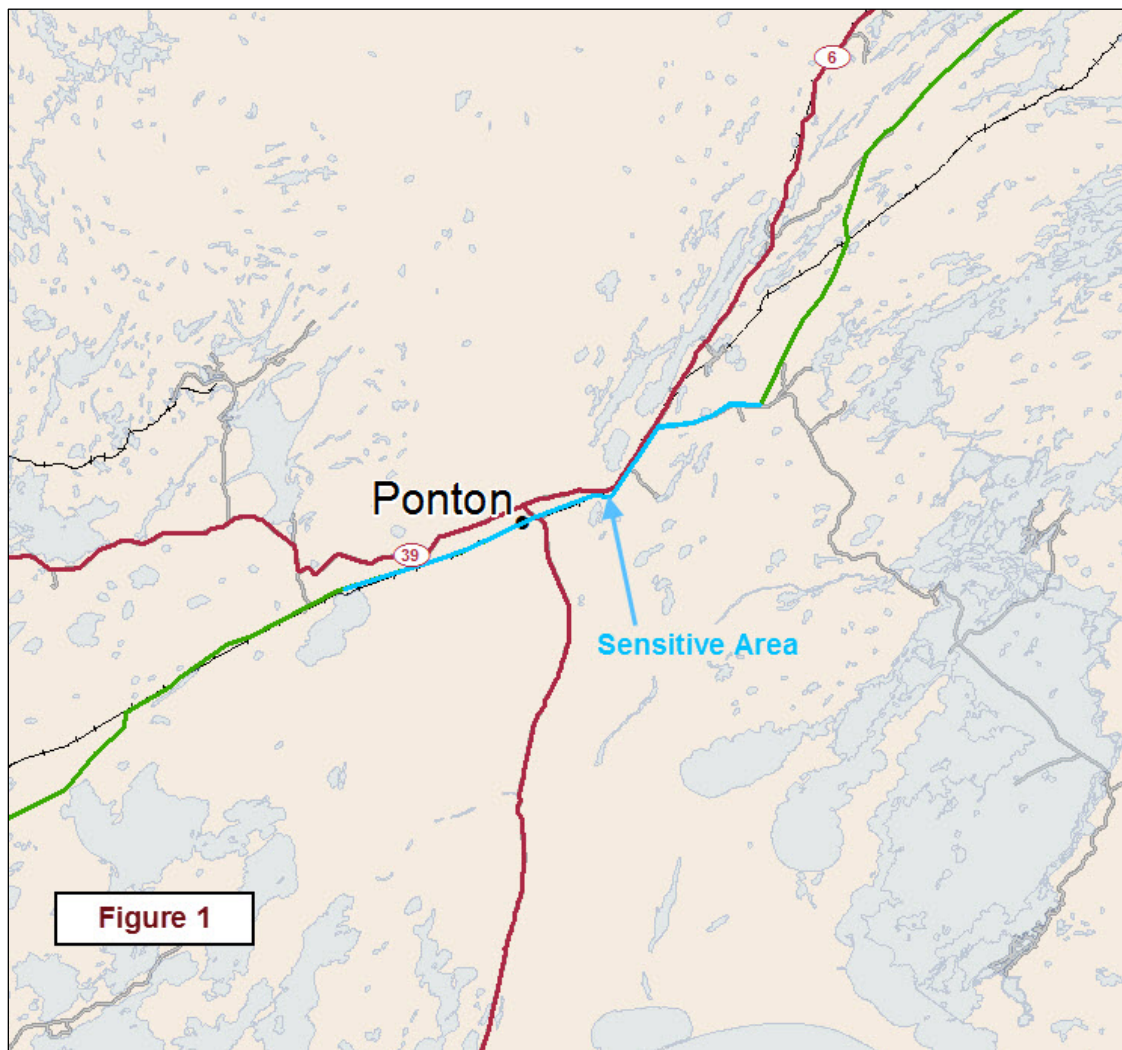


Table 1: Wabowden Woodland Caribou Sensitive Area Mitigation Measures (New mitigation measures or measures modified from those listed in Appendix A)

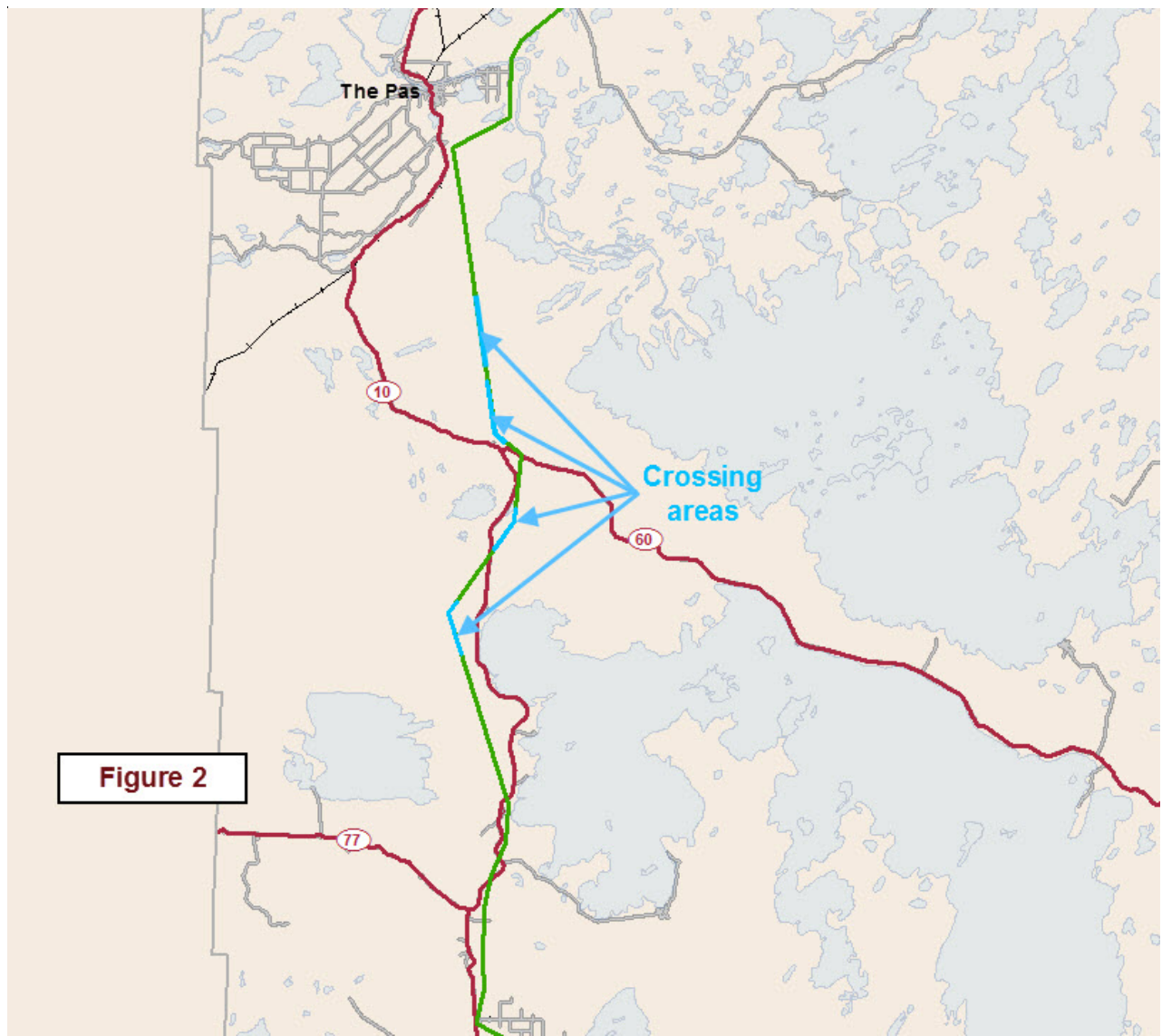
Mitigation Topic	Transmission Mitigation
ROW Access	Limiting recreational use and travel by ATVs and snowmobiles along the right-of-way in the core winter use areas and known potential calving areas. To reduce access, mitigation measures will be considered based on site inspection in conjunction with Wildlife Branch. Manitoba Hydro will not support development of designated motorized recreational trail use within areas described above if requested.
Access Roads and Trails	Manitoba Hydro access routes required for construction will be decommissioned in accordance with MCWS review and approval, unless required for operations.
Clearing	Right-of-way clearing within area identified in Figure 1 will not include shear blading except for areas for access, conductor stringing trails, and tower footprints. Selective cutting methods will only be used to remove danger trees that exceed a 40 degree Line of sight from 12m offset from centerline within the ROW and any trees outside the ROW, to maintain low tree, shrub and herb plant communities on the ROW.
Maintenance Trails	Maintenance trails to be maintained to reduce line of sight for hunters and predators.
Ground Inspection	Annual ground inspection of towers to occur late in winter season to avoid creating packed snow trails that facilitate predator use of the ROW.

The Bog Woodland Caribou Range

Location: South of The Pas in the vicinity of PTHs 10 and 60 (Figure 2).

Description: The Bipole III transmission line traverses an area of core habitats in this woodland caribou range. Crossing areas were identified by MCWS based on telemetry data of collared woodland caribou as shown in Figure 2.

Rationale for selection: These crossing areas were deemed to be sensitive as they are known locations of woodland caribou movement between summer and winter habitats. Woodland Caribou is considered a threatened species under provincial and federal legislation.



**Table 2: The Bog Woodland Caribou Crossing Area Mitigation Measures
(New mitigation measures or measures modified from those listed in Appendix A)**

Mitigation Topic	Transmission Mitigation
ROW Access	Limiting recreational use and travel by ATVs and snowmobiles along the right-of-way in the core winter use areas and known potential calving areas. To reduce access, mitigation measures will be considered based on site inspection in conjunction with Wildlife Branch. Manitoba Hydro will not support development of designated motorized recreational trail use within areas described above if requested.
Access Roads and Trails	Manitoba Hydro access routes required for construction will be decommissioned in accordance with MCWS review and approval, unless required for operations.
ROW Use	Manitoba Hydro will not support development of designated motorized recreational trail use within areas described above if requested.
Adjacent Transmission Line	Extension of wildlife crossing and vegetation management measures to the 230 kV line running adjacent to the Bipole III transmission line in this range. Location of specific measures on the 230kV line to be determined in conjunction with Wildlife Branch.
Clearing	<ul style="list-style-type: none"> • Right-of-way clearing within crossing areas identified in Figure 2 will use low ground disturbance methods except for areas for access, conductor stringing trails, and tower footprints where some level of ground disturbance is required. Full ROW clearing using low ground disturbance methods in those portions of the 4 caribou crossing areas where Lidar imagery Appendix B) indicates vegetative cover in excess of 10 meters in height. Note, full ROW clearing means removal of treed cover through low ground disturbance methods (including shearblading) that retain organic and lichen cover to the extent possible. • Selective removal of danger trees in the balance of the 4 caribou crossing areas where Lidar imagery (Appendix B) indicates vegetative cover generally being less than 10 meters in height. Selective removal in this context means any tree intersecting the 40° angle from the edge of the existing shearbladed centre line
Maintenance Trails	Maintenance trails to be maintained to reduce line of sight for hunters and predators.
Ground Inspection	Annual ground inspection of towers to occur late in winter season to avoid creating packed snow trails that facilitate predator use of the ROW.

Mitigation Topic	Transmission Mitigation
Highway Crossings	<p>At PTH 10 crossing a low tree and shrub vegetated buffer zone will be left at the edge of the ROW to reduce visibility and access on to the ROW from the highway. Due to the lack of understory (i.e. low tree and shrubs) no buffer is currently in place at the crossing at PTH 60; however, it will be managed to allow for natural re-vegetation establishment that will act as a future visible barrier during operations. If re-vegetation does not occur naturally Manitoba Hydro will plant compatible shrub species to create a vegetated buffer. A maintenance trail will still be needed on to the ROW from the highway.</p>

Tom Lamb Sensitive Moose Range

Location: In the Tom Lamb Wildlife Management Area (WMA) and GHA 8 NE of The Pas (Figure 3).

Length of ROW in Sensitive Moose Range: 19 km

Description: Bipole III transmission line traverses an area of bog in this area within GHA 8.

Rationale for selection: The range was deemed to be potentially sensitive and considered an area of interest due to dwindling moose numbers in the GHA and the importance of undisturbed moose refugia. Increased access was not considered a major issue in this area due to the open bog environment easily accessible during winter periods.



**Table 3: Tom Lamb Sensitive Moose Range Mitigation Measures
(New mitigation measures or measures modified from those listed in Appendix A)**

Mitigation Topic	Transmission Mitigation
ROW Use	Manitoba Hydro will not support development of designated motorized recreational trail use within areas described above if requested.
Clearing	Right-of-way clearing within area identified in Figure 3 will not include shear blading except for areas for access, conductor stringing trails, and tower footprints. Selective cutting methods will only be used to remove danger trees outside the ROW and any trees within the ROW in excess of 5m (Clearing diagram Appendix B), to maintain low tree, shrub and herb plant communities
Access Roads and Trails	Manitoba Hydro access routes required for construction will be decommissioned in accordance with MCWS review and approval, unless required for operations. Access approaches from Moose Lake Road will be decommissioned.

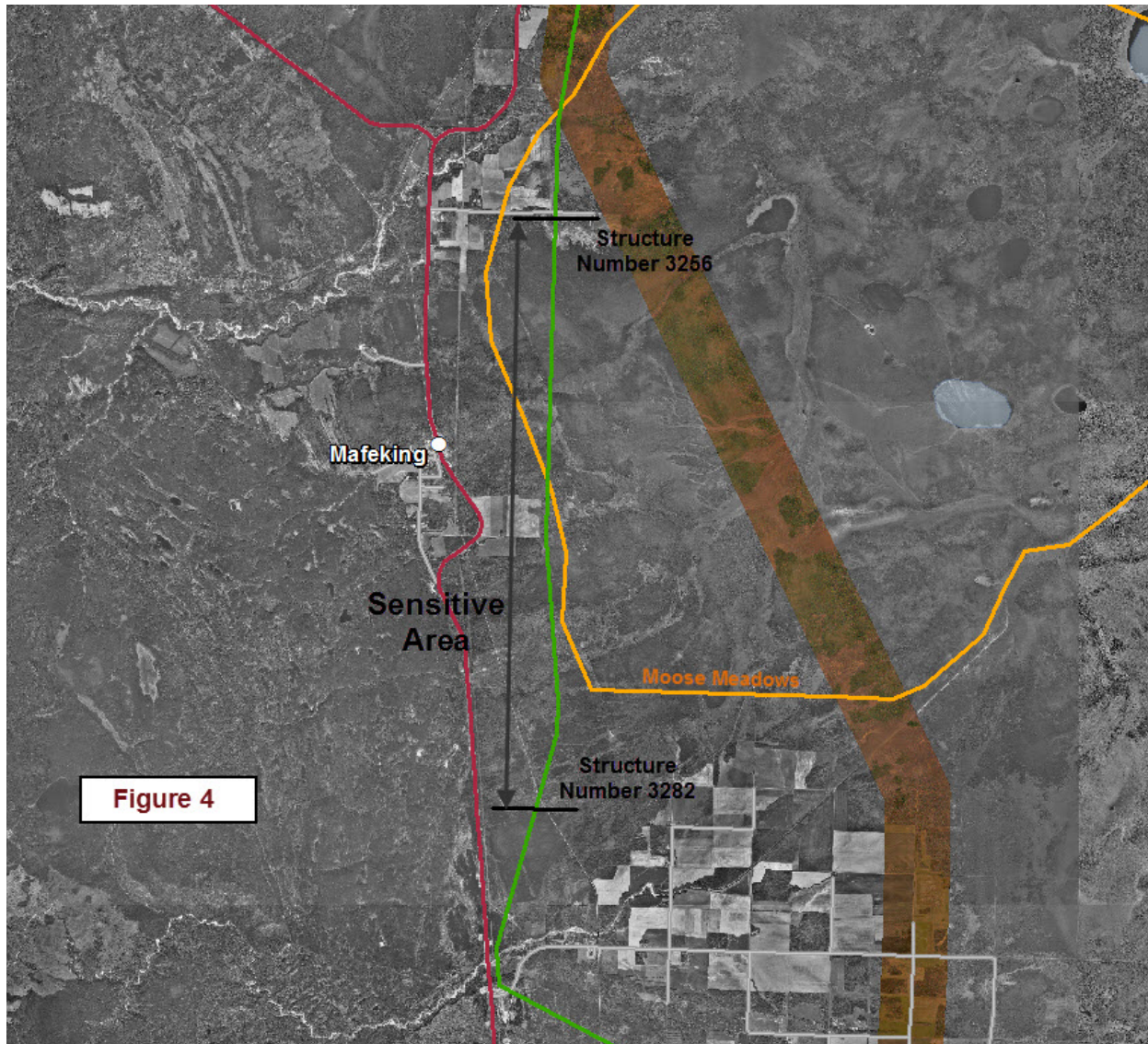
Moose Meadows Sensitive Moose Range

Location: From Bellsite to north of Mafeking and south of the PTH 10 and 77 junction (Figure 4).

Length of ROW in Sensitive Moose Range: 12 km

Description: Bipole III transmission line traverses an area adjacent to the moose meadows area in a zone of mature forest.

Rationale for selection: The range was deemed to be sensitive based on it being in close proximity to the moose meadows area - a winter refuge for moose in a GHA currently closed to moose hunting. A route adjustment was already made in this area to mitigate potential impacts on moose related to increased access.



**Table 4: Moose Meadows Sensitive Moose Range Mitigation Measures
(New mitigation measures or measures modified from those listed in Appendix A)**

Mitigation Topic	Transmission Mitigation
ROW Use	Manitoba Hydro will not support development of designated motorized recreational trail use within areas described above if requested.
Clearing	Right-of-way clearing within area identified in Figure 4 will not include shear blading except for areas for access, conductor stringing trails, and tower footprints. Selective cutting methods will be used to remove danger trees outside the ROW and any trees within the ROW in excess of 5m (Clearing diagram Appendix B), to maintain low tree, shrub and herb plant communities
Maintenance Trails	Slash piles will be stockpiled every 400m in a staggered formation across the ROW during initial clearing in mature treed areas and other areas where possible, except on centerline trail. Piles will be placed adjacent to the centerline trail until after construction, at which time they will be moved on to the trail to reduce line of sight along the trail and in a manner that provides maintenance access. This is to be done to the satisfaction of the supervising officer and Regional Wildlife staff.
Ground Inspection	Annual ground inspection of towers to occur late in winter season to avoid creating packed snow trails that facilitate predator use of the ROW.
Access Roads and Trails	Manitoba Hydro access routes required for construction will be decommissioned in accordance with MCWS review and approval, unless required for operations.

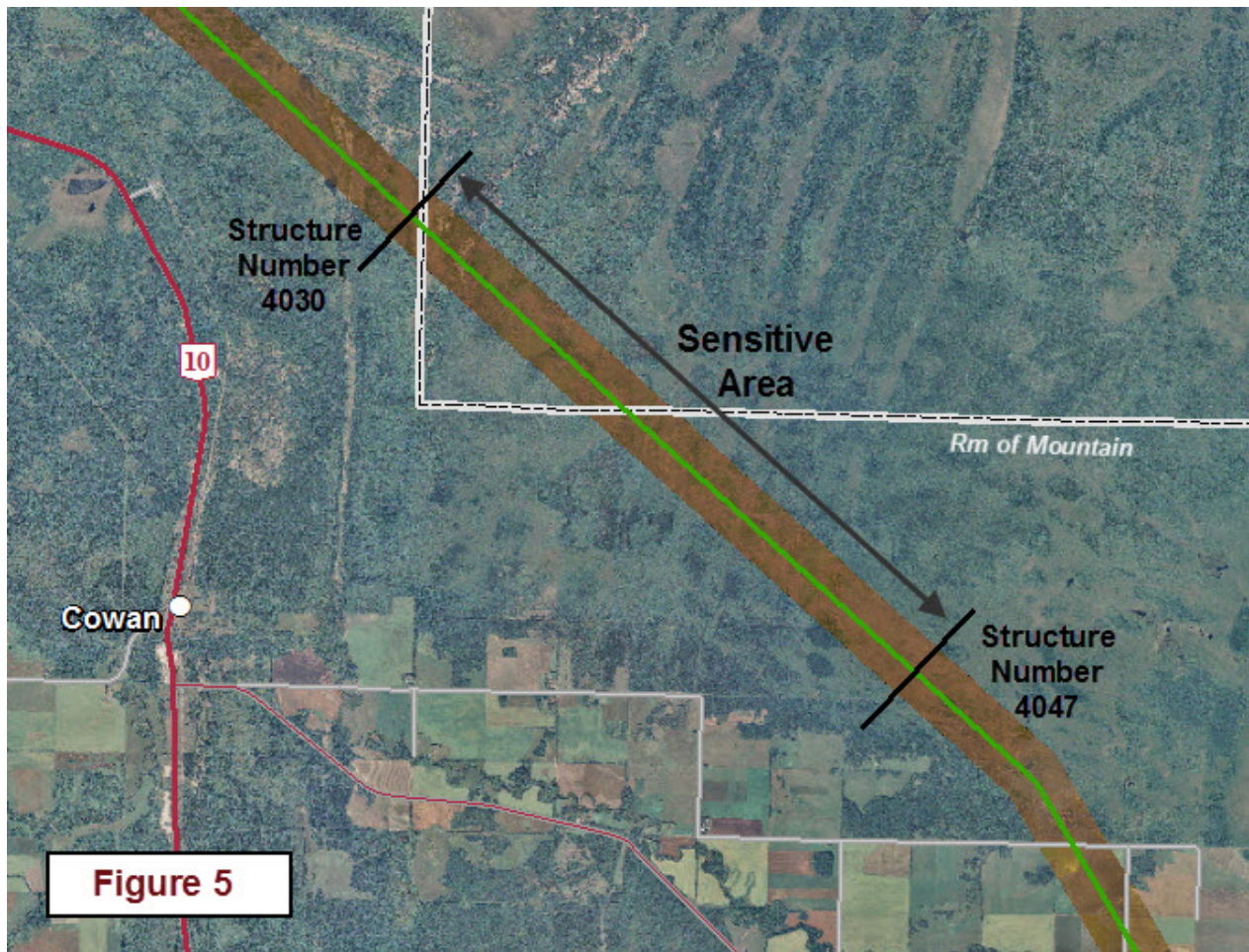
GHA 14A Sensitive Moose Range

Location: North East of Duck Mountain and (Figure 5).

Length of ROW in Sensitive Moose Range: 8 km

Description: Bipole III transmission line traverses an area of relatively inaccessible moose winter habitat east of Duck Mountain.

Rationale for selection: The range was deemed to be sensitive based on it being an area of winter use by moose in an area of limited remote habitat north east of the Duck Mountains



**Table 5: GHA 14A Sensitive Moose Range Mitigation Measures
(New mitigation measures or measures modified from those listed in Appendix A)**

Mitigation Topic	Transmission Mitigation
ROW Use	Manitoba Hydro will not support development of designated motorized recreational trail use within areas described above if requested.
Clearing	Right-of-way clearing within area identified in Figure 5 will not include shear blading except for areas for access, conductor stringing trails (24m), and tower footprints. Selective cutting methods will be used to remove danger trees outside the ROW and any trees within the ROW in excess of 5m (Clearing diagram Appendix B), to maintain low tree, shrub and herb plant communities
Maintenance	Maintenance trails to be maintained to reduce line of sight for hunters and predators.
Ground Inspection	Annual ground inspection of towers to occur late in winter season to avoid creating packed snow trails that facilitate predator use of the ROW.
Access Roads and Trails	Manitoba Hydro access routes required for construction will be decommissioned in accordance with MCWS review and approval, unless required for operations.

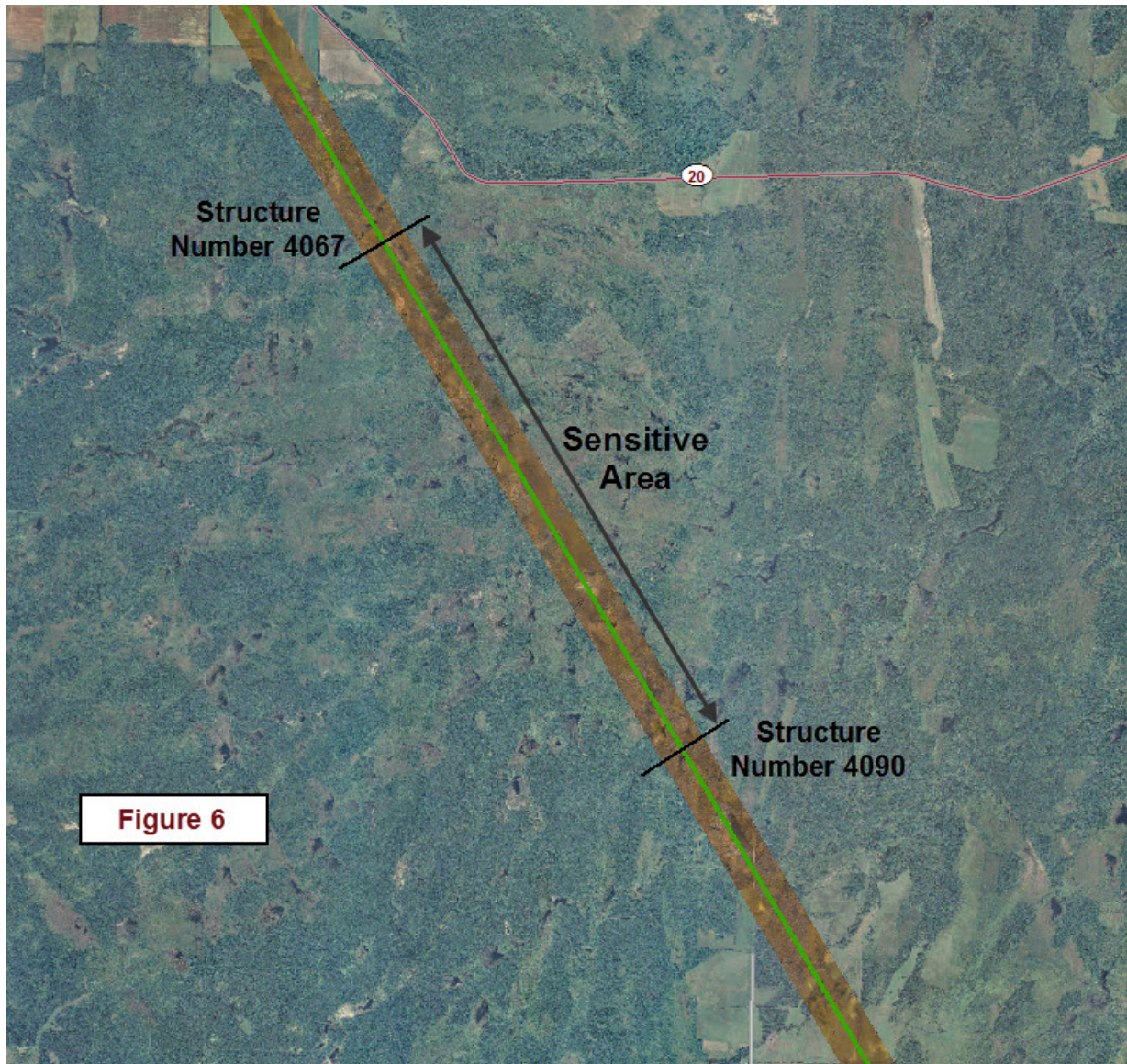
GHA 19A Sensitive Moose Range

Location: Southeast of Cowan and east of Pine River in GHA 19A (Figure 6).

Length of ROW in Sensitive Moose Range: 8 km

Description: Bipole III transmission line traverses an area of forest and wetland in a relatively inaccessible area east of Duck Mountain.

Rationale for selection: The range was deemed to be sensitive based on it being an area of winter use by moose coming off of the Duck Mountains in a previously inaccessible area. Moose population in GHA 19A is under pressure. This area is also subject to Bipole III *Environment Act* licence clause 49 which prescribes specific mitigation measures for moose protection in a portion of GHA 19A.



**Table 6: GHA 19A Sensitive Moose Range Mitigation Measures
(New mitigation measures or measures modified from those listed in Appendix A)**

Mitigation Topic	Transmission Mitigation
ROW Use	Manitoba Hydro will not support development of designated motorized recreational trail use within areas described above if requested.
Clearing	<ul style="list-style-type: none"> • Construction access trail clearing width will be limited to 12m wherever possible, and not to exceed a maximum of 24m in width. • Shear-blade clearing of low-growth vegetation such as willows will be avoided where possible. • Guyed tower heights have been designed to allow 15m tall treed vegetation to be retained during initial clearing. These taller towers result in the guy wire anchors being installed outside of the ROW. This exceedance of ROW was previously approved on June 4, 2014 (Appendix C) • Maximum allowable tree height not to exceed 15m
Ground Inspection	Annual ground inspection of towers to occur late in winter season to avoid creating packed snow trails that facilitate predator use of the ROW.
Access Roads and Trails	<p>Manitoba Hydro access routes required for construction will be decommissioned in accordance with MCWS review and approval, unless required for operations.</p> <p>Between tower locations, the access route will skirt along opposing edges of the right-of-way or will otherwise meander within the right-of-way limits to avoid introducing sightlines conducive to hunting or predatory conditions.</p> <p>Additional access and sightline barriers can be introduced within and especially near the outer extents of the 8 kilometer long section in question. Such features will be designed and installed in consultation and collaboration with regional Manitoba Conservation staff.</p> <p>Clearing widths must be limited to 12m along the subject access trail during operations and maintenance of the development.</p>

Appendix A:

Mitigation Measures Reviewed from Original Bipole III Documentation

Table A-1: Woodland Caribou Related Mitigation Measures

(Source: Bipole III Commitments Table and draft Construction Phase Environmental Protection Plans)

Mitigation Topic	Transmission Mitigation
Boreal Woodland Caribou	Timing of construction (winter) will mitigate sensory disturbance on females during calving and calf rearing in calving areas.
Boreal Woodland Caribou	Natural low tree cover in the Wabowden and Bog ranges will be maintained in core winter use areas and known and potential calving areas to maintain natural functional structure to encourage ongoing use by boreal woodland caribou. Boreal woodland caribou in the Wabowden area have demonstrated movement north and south of the FPR. Natural vegetation corridors for wildlife will be developed on the FPR in strategic locations through the maintenance of naturally low vegetations such as black spruce and tamarack. Strategic locations will be determined through the analysis of current telemetric data and in consultation with Manitoba Conservation.
Boreal Woodland Caribou	In the Wabowden range, robust and effective access control to the right-of-way from PTH #6 will be applied near core use areas. This will be based on site specific conditions and methods that halt or limit ATV and snowmobile traffic. Methods include gates (during construction) and the spreading of debris, ditching and trenching (post construction). Natural vegetation will be encouraged and where necessary planting of trees will occur to discourage future snowmobile and ATV access into core winter and summer use areas.
Boreal Woodland Caribou	Future maintenance along the right-of-way during operations will involve helicopter access and minimize snow packing in the Wabowden Range. In other areas development of Manitoba Hydro snowpack trails will be limited in core winter areas to minimize potential predator effects into core areas and potential illegal hunting activities.
Boreal Woodland Caribou	Limiting recreational use and travel by ATVs and snowmobiles along the right-of-way in the core winter use areas and known potential calving areas (Bipole III Caribou Technical Report 2011) will be encouraged to reduce sensory disturbances and minimize functional habitat loss.

Mitigation Topic	Transmission Mitigation
Boreal Woodland Caribou	Ancillary access and other project footprints (staging areas) will be located to avoid core use areas and reduce potential disturbance, functional habitat loss, and temporary range fragmentation. Areas temporarily cleared for Project construction will be rehabilitated through the planting of native vegetation to facilitate a quick recovery to natural low growing vegetation that will provide security cover to encourage animal movement across the right-of-way in future.
Boreal Woodland Caribou	Long term monitoring of the boreal caribou ranges intersected by the Project will continue and include population monitoring, and assessment of recruitment and mortality. Data will be gathered through satellite collaring and assessments will be conducted on sensory disturbance and avoidance of the right-of-way and overall range fragmentation. (See latest Biophysical Monitoring Plan for updates to this mitigation measure)
Boreal Woodland Caribou	Monitoring of wolves will be conducted in all boreal woodland caribou ranges intersecting the Project using aerial surveys and satellite tracking studies to determine use of the right-of-way and increased predation. (See latest Biophysical Monitoring Plan for updates to this mitigation measure)
Boreal Woodland Caribou	Studies will be initiated on the effects of black bears and the potential effects of the right-of-way on bear activity and predation in calving areas near the right-of-way in the Wabowden range. (See latest Biophysical Monitoring Plan for updates to this mitigation measure).
Boreal Woodland Caribou	Maintenance of low tree cover and the development of natural vegetation corridors will also minimize predator flow through these critical habitats and discourage human use of the right-of-way for snowmobile travel and other uses. Emphasis will be placed on the Wabowden range in core use areas natural vegetation corridors will also be implemented in The Bog range.
Access Roads and Trails (PC-1)	Access roads and trails no longer required will be decommissioned and rehabilitated in accordance with the Rehabilitation and Vegetation Management Plan.
Access Roads and Trails (PC-1)	Existing access roads, trails or cut lines will be used to the extent possible. Permission to use existing resource roads (i.e. forestry roads (North/South Jonas roads) will be obtained.
Access Roads and Trails (PC-1)	MCWS Work Permits will be obtained prior to the commencement of the project.
Access Roads and Trails (PC-1)	Public use of decommissioned access routes will be controlled through the Access Management Plan.
Access Roads and Trails (PC-1)	Public use of project controlled access roads and trails during construction will be controlled through the Access Management Plans.

Access Roads and Trails (PC-1)	Access roads and trails required for future monitoring, inspection or maintenance will be maintained in accordance with the Access Management Plan.
Access Roads and Trails (PC-1)	Vegetation control along access roads and trails will be in accordance with Rehabilitation and Vegetation Management Plan.

Mitigation Topic	Transmission Mitigation
Access Roads and Trails (PC-1)	Access roads and trails will be constructed to a minimum length and width to accommodate the safe movement of construction equipment.
Access Roads and Trails (PC-1)	Access roads and trails will be located, constructed, operated and decommissioned in accordance with contract specifications.
Access Roads and Trails (PC-1)	Bypass trails, sensitive sites and buffer areas will be clearly marked prior to clearing.
Access Roads and Trails (PC-1)	Contractor will be restricted to established roads and trails, and cleared construction areas in accordance with the Access Management Plan.
Construction Camps (PC-3)	Feeding or harassment of any wildlife is prohibited.
Construction Camps (PC-3)	Hunting and uncontrolled Fishing will not be permitted within the project footprint.
Management Measures (MM)	All licenses, permits, contracts, project specifications, guidelines and other applicable documents will be in the possession of both the Contractor and Manitoba Hydro prior to commencement of work.
Management Measures (MM)	Relevant documents including licenses, permits, approvals, legislation, guidelines, environmental protection plans, orthophotos maps, etc will be made available to all project participants.
Management Measures (MM)	The Contractor will obtain all licenses, permits, contracts and approvals other than those that are Manitoba Hydro's responsibility prior to project start-up.
Management Measures (MM)	Manitoba Hydro will meet the Contractor at the beginning of each new contract to review environmental protection requirements including mitigation measures, inspections and reporting.
Rights-of-Way (PC-8)	Access to transmission line rights-of-way for clearing and construction will utilize existing roads and trails to the extent possible.
Rights-of-Way (PC-8)	Access to transmission line rights-of-way will be closed, signed and/or controlled in accordance with an Access Management Plan.
Rights-of-Way (PC-8)	Additional clearing outside established rights-of-way will be approved by the Construction Supervisor/Site Manager prior to clearing and may require an amendment to contract specifications.
Rights-of-Way (PC-8)	Clearing and disturbance will be limited to defined rights-of-way and associated access routes to the extent possible.
Rights-of-Way (PC-8)	Clearing of rights-of-way will occur under frozen or dry ground conditions during established timing windows to minimize rutting and erosion where applicable.
Rights-of-Way (PC-8)	Disturbed areas along transmission line rights-of-way will be rehabilitated in accordance with site Rehabilitation and Vegetation Management Plan.
Rights-of-Way (PC-8)	Environmentally sensitive sites, features and areas will be identified and mapped prior to clearing.
Wildlife Protection (EC-9)	Any wildlife killed or injured by vehicles will be reported to Manitoba Conservation.

Mitigation Topic	Transmission Mitigation
Wildlife Protection (EC-9)	No firearms will be permitted at construction sites.
Wildlife Protection (EC-9)	Orientation for Contractor and Manitoba Hydro employees will include awareness of environmental protection measures for wildlife and wildlife habitat.
Wildlife Protection (EC-9)	Problem wildlife will be reported immediately to Manitoba Conservation and Water Stewardship.
Wildlife Protection (EC-9)	Trails through or near important habitat types will be managed in accordance with the Access Management Plan.
Wildlife Protection (EC-9)	Vehicles will not exceed posted speed limits and wildlife warning signs may be installed in high density areas and at known crossings locations as a result of wildlife monitoring.
Wildlife Protection (EC-9)	Wildlife and wildlife habitat will be protected in accordance with provincial and federal legislation and provincial and federal guidelines,
Wildlife Protection (EC-9)	Wildlife will not be fed, befriended or harassed at construction areas.
Wildlife Protection (EC-9)	Understory vegetation will be managed at access routes to limit line of sight.
Wildlife Protection (EC-9)	New by-pass trails and access routes will be sited where possible to utilize existing natural terrain features and existing vegetation to minimize line of site.
Wildlife Protection (EC-9)	Boundaries of important wildlife habitats will be flagged by prior to commencement of construction.
Wildlife Protection (EC-9)	Clearing will occur during late fall and winter to the extent possible to avoid the spring/summer nesting season for birds and parturition times for mammal species and breeding windows for frog species
Wildlife Protection (EC-9)	Construction activities will not be carried out during prescribed timing windows for wildlife species.
Wildlife Protection (EC-9)	Hunting and harvesting of wildlife by project staff will not be permitted while working on the project sites.

Table A-2: Moose Sensitive Range Mitigation Measures

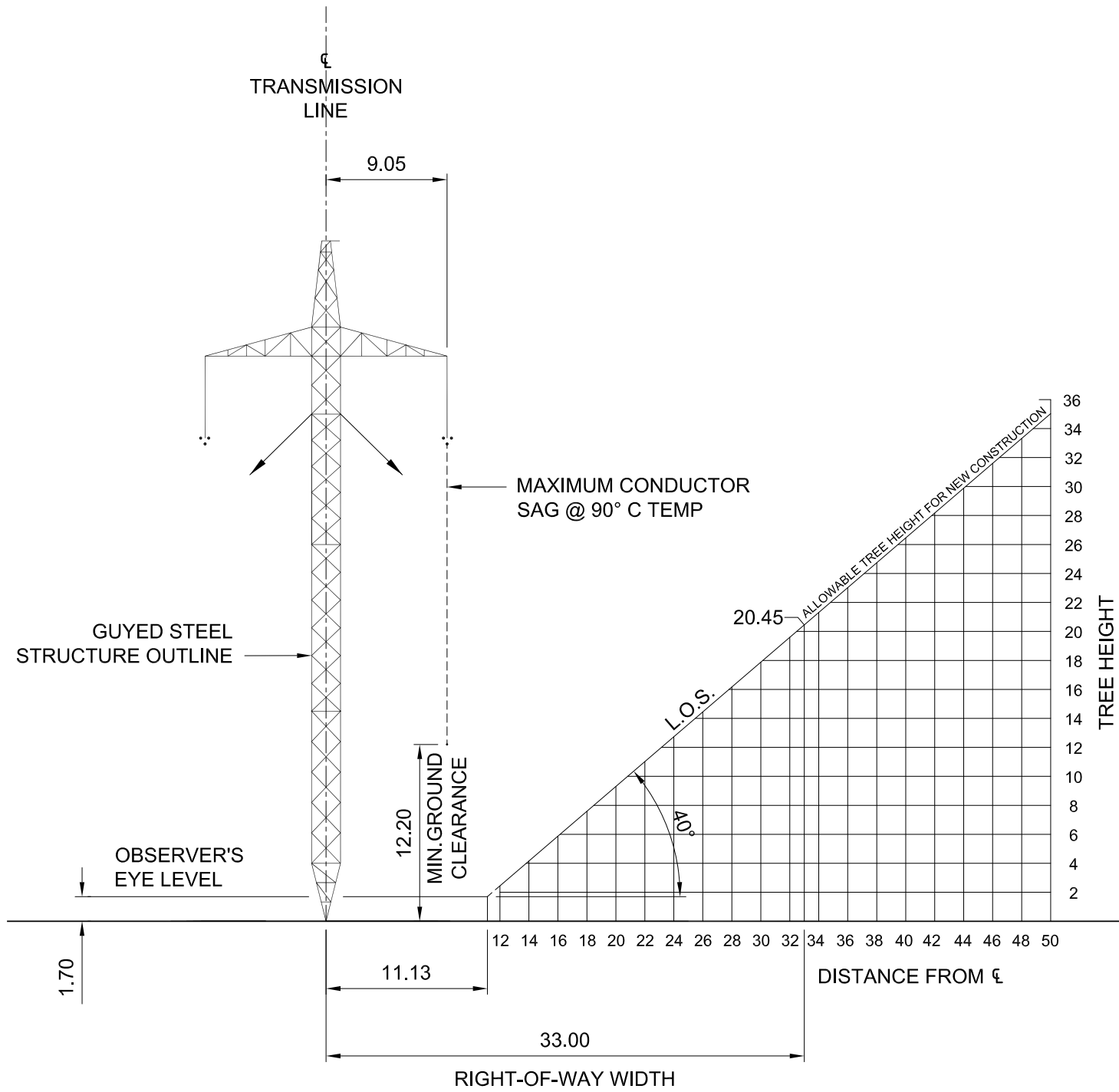
(Source: Bipole III Commitments Table and draft Construction Phase Environmental Protection Plans)

Mitigation Topic	Transmission Mitigation
Moose	In the northern areas disturbances from construction activities will occur during winter which will avoid the sensitive parturition period near potential moose calving sites such as bogs and wetlands.
Moose	Hunting by Project personnel will be prohibited and firearms restricted in work camps and use of access roads for the Local Study Area by hunters limited during construction to minimize moose mortality.
Moose	Pre-construction surveys will be conducted to identify and locate mineral licks, and specific protection prescriptions developed based on site and environmental conditions.
Access Roads and Trails (PC-1)	Access roads and trails no longer required will be decommissioned and rehabilitated in accordance with the Rehabilitation and Vegetation Management Plan.
Access Roads and Trails (PC-1)	Existing access roads, trails or cut lines will be used to the extent possible. Permission to use existing resource roads (ie forestry roads (North/South Jonas roads) will be obtained.
Access Roads and Trails (PC-1)	MCWS Work Permits will be obtained prior to the commencement of the project.
Access Roads and Trails (PC-1)	Public use of decommissioned access routes will be controlled through the Access Management Plan.
Access Roads and Trails (PC-1)	Public use of project controlled access roads and trails during construction will be controlled through the Access Management Plans.
Access Roads and Trails (PC-1)	Access roads and trails required for future monitoring, inspection or maintenance will be maintained in accordance with the Access Management Plan.
Access Roads and Trails (PC-1)	Vegetation control along access roads and trails will be in accordance with Rehabilitation and Vegetation Management Plan.
Access Roads and Trails (PC-1)	Access roads and trails will be constructed to a minimum length and width to accommodate the safe movement of construction equipment.
Access Roads and Trails (PC-1)	Access roads and trails will be located, constructed, operated and decommissioned in accordance with contract specifications.
Access Roads and Trails (PC-1)	Bypass trails, sensitive sites and buffer areas will be clearly marked prior to clearing.
Access Roads and Trails (PC-1)	Contractor will be restricted to established roads and trails, and cleared construction areas in accordance with the Access Management Plan.
Management Measures (MM)	All licenses, permits, contracts, project specifications, guidelines and other applicable documents will be in the possession of both the Contractor and Manitoba Hydro prior to commencement of work.

Mitigation Topic	Transmission Mitigation
Management Measures (MM)	Relevant documents including licenses, permits, approvals, legislation, guidelines, environmental protection plans, orthophotos maps, etc will be made available to all project participants.
Management Measures (MM)	The Contractor will obtain all licenses, permits, contracts and approvals other than those that are Manitoba Hydro's responsibility prior to project start-up.
Management Measures (MM)	Manitoba Hydro will meet the Contractor at the beginning of each new contract to review environmental protection requirements including mitigation measures, inspections and reporting.
Rights-of-Way (PC-8)	Access to transmission line rights-of-way for clearing and construction will utilize existing roads and trails to the extent possible.
Rights-of-Way (PC-8)	Access to transmission line rights-of-way will be closed, signed and/or controlled in accordance with an Access Management Plan.
Rights-of-Way (PC-8)	Additional clearing outside established rights-of-way will be approved by the Construction Supervisor/Site Manager prior to clearing and may require an amendment to contract specifications.
Rights-of-Way (PC-8)	Clearing and disturbance will be limited to defined rights-of-way and associated access routes to the extent possible.
Rights-of-Way (PC-8)	Clearing of rights-of-way will occur under frozen or dry ground conditions during established timing windows to minimize rutting and erosion where applicable.
Rights-of-Way (PC-8)	Disturbed areas along transmission line rights-of-way will be rehabilitated in accordance with site Rehabilitation and Vegetation Management Plan.
Rights-of-Way (PC-8)	Environmentally sensitive sites, features and areas will be identified and mapped prior to clearing.
Wildlife Protection (EC-9)	Any wildlife killed or injured by vehicles will be reported to Manitoba Conservation.
Wildlife Protection (EC-9)	No firearms will be permitted at construction sites.
Wildlife Protection (EC-9)	Orientation for Contractor and Manitoba Hydro employees will include awareness of environmental protection measures for wildlife and wildlife habitat.
Wildlife Protection (EC-9)	Problem wildlife will be reported immediately to Manitoba Conservation and Water Stewardship.
Wildlife Protection (EC-9)	Trails through or near important habitat types will be managed in accordance with the Access Management Plan.
Wildlife Protection (EC-9)	Vehicles will not exceed posted speed limits and wildlife warning signs may be installed in high density areas and at known crossings locations as a result of wildlife monitoring.
Wildlife Protection (EC-9)	Wildlife and wildlife habitat will be protected in accordance with provincial and federal legislation and provincial and federal guidelines,

Mitigation Topic	Transmission Mitigation
Wildlife Protection (EC-9)	Wildlife will not be fed, befriended or harassed at construction areas.
Wildlife Protection (EC-9)	Understory vegetation will be managed at access routes to limit line of sight.
Wildlife Protection (EC-9)	New by-pass trails and access routes will be sited where possible to utilize existing natural terrain features and existing vegetation to minimize line of site.
Wildlife Protection (EC-9)	Boundaries of important wildlife habitats will be flagged by prior to commencement of construction.
Wildlife Protection (EC-9)	Clearing will occur during late fall and winter to the extent possible to avoid the spring/summer nesting season for birds and parturition times for mammal species and breeding windows for frog species.
Wildlife Protection (EC-9)	Construction activities will not be carried out during prescribed timing windows for wildlife species.
Wildlife Protection (EC-9)	Hunting and harvesting of wildlife by project staff will not be permitted while working on the project sites.

Appendix B:
LIDAR Maps and Analysis



NOTES:

1. CLEARING METHOD SHOWN APPLIES ONLY TO THE FOLLOWING SITES AS INDICATED ON THE BIPOLE III ENVIRONMENTAL PROTECTION PLAN(S):
 - N2-WILD-200
 - N3-WILD-200
2. READ DISTANCE FROM ϵ TRANSMISSION LINE ON HORIZONTAL AXIS AND ALLOWABLE TREE HEIGHT FROM VERTICAL AXIS.
3. ALL DIMENSIONS SHOWN IN METRES.
4. BASED ON OBSERVER'S EYE LEVEL AT 1.70 METRES, TAKE A POSITION 11.13 METRES FROM THE ϵ AND FIND 40° LINE OF SIGHT (L.O.S.). REMOVE ALL TREES WHICH EXTEND ABOVE THIS 40° LINE OF SIGHT.
5. DESIGN PARAMETERS:

RULING SPAN: 488m	MAXIMUM SPAN: 520m
WIND/WEIGHT SPAN RATIO 1:1	
OPERATING LIMIT: 1.2m CLEARANCE @ 90% DESIGN WIND (1201 Pa)	
SWITCHING SURGE LIMIT: 2.5m CLEARANCE @ CIGRE 1% WIND (254 Pa)	

00	2015-09-01	ISSUED FOR CONSTRUCTION	L.G.		
REV.	DATE	DESCRIPTION	BY	CKD.	APP.
		DRAWN: L.G.	CHECKED:	SCALE: 1:400	
		DESIGNED: R.N.R.	DATE: 2015-09-01	VOLTAGE: ± 500 kV	
		KEEWATINOOW-RIEL BIPOLE III TRANSMISSION LINE			
AUTHENTICATION FOR CURRENT REVISION		CROSS-SECTION SHOWING CLEARING REQUIREMENTS FOR GUYED TOWER FOR CONSTRUCTION PURPOSES WITHIN SPECIFIC CARIBOU SITES			
DRAWING NUMBER			SHEET	REVISION	
1-37080-DB-12100-0006			0001	00	

NETWORK No. 239224

DRAFT

ISO A3 (297 x 420)

Bipole III Transmission Project

Project Infrastructure

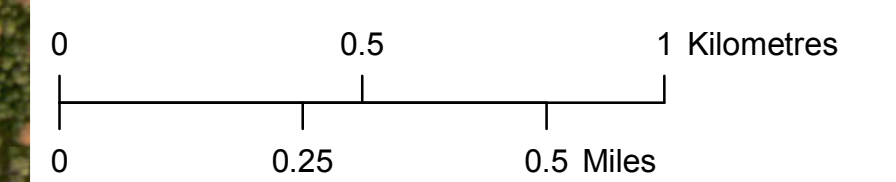
- Structure Spotting
- BPIII Final Preferred Route Segment N4

Vegetation Height (metres)

- 26 - 27
- 25 - 26
- 24 - 25
- 23 - 24
- 22 - 23
- 21 - 22
- 19 - 20
- 18 - 19
- 17 - 18
- 16 - 17
- 15 - 16
- 10 - 15
- 5 - 10

- Community
- 2015 Forest Fires
- MCWS Caribou Sensitive Area

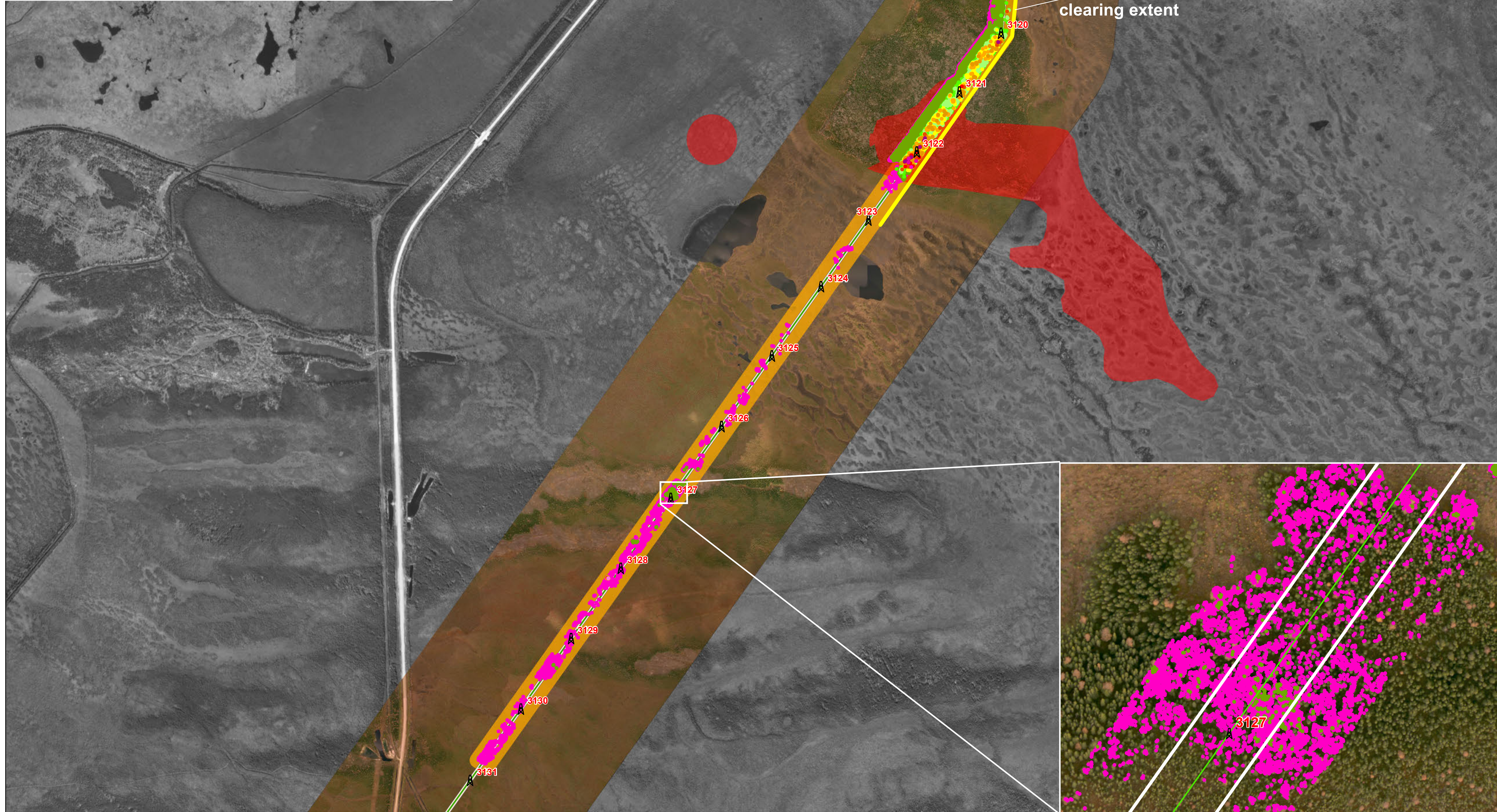
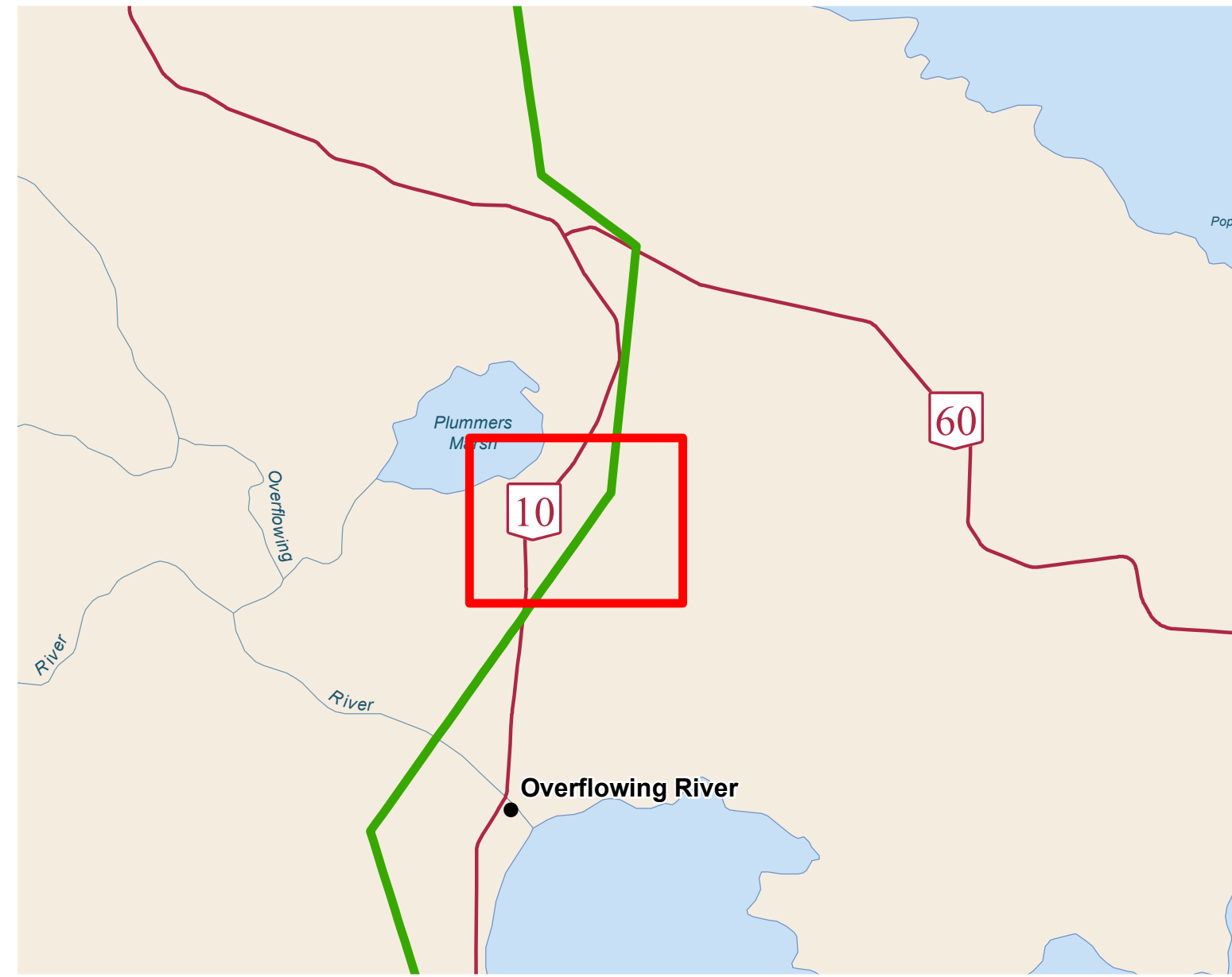
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1:12,500

Caribou Crossings Revised Mitigation Plan

Draft: For Discussion Purposes Only



Bipole III Transmission Project

Project Infrastructure

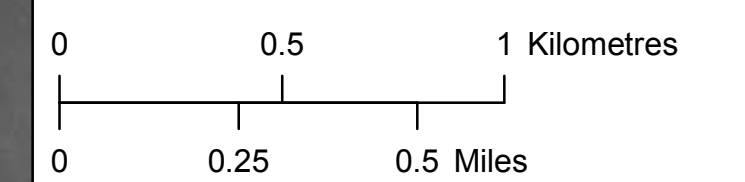
- Structure Spotting
- BPIII Final Preferred Route Segment N4

Vegetation Height (metres)

- 26 - 27
- 25 - 26
- 24 - 25
- 23 - 24
- 22 - 23
- 21 - 22
- 19 - 20
- 18 - 19
- 17 - 18
- 16 - 17
- 15 - 16
- 10 - 15
- 5 - 10

- Community
- 2015 Forest Fires
- MCWS Caribou Sensitive Area

Coordinate System: UTM Zone 14 N, NAD 83
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 Date Created: September 18, 2015



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Caribou Crossings Revised Mitigation Plan

Draft: For Discussion Purposes Only



Bipole III Transmission Project

Project Infrastructure

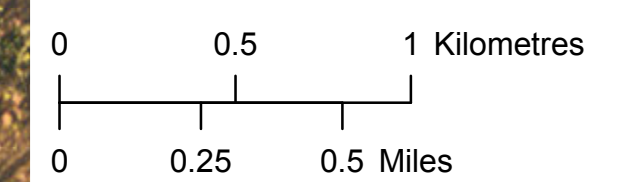
- Structure Spotting
- BPIII Final Preferred Route Segment N4

Vegetation Height (metres)

- 26 - 27
- 25 - 26
- 24 - 25
- 23 - 24
- 22 - 23
- 21 - 22
- 19 - 20
- 18 - 19
- 17 - 18
- 16 - 17
- 15 - 16
- 10 - 15
- 5 - 10

- Community
- 2015 Forest Fires
- MCWS Caribou Sensitive Area

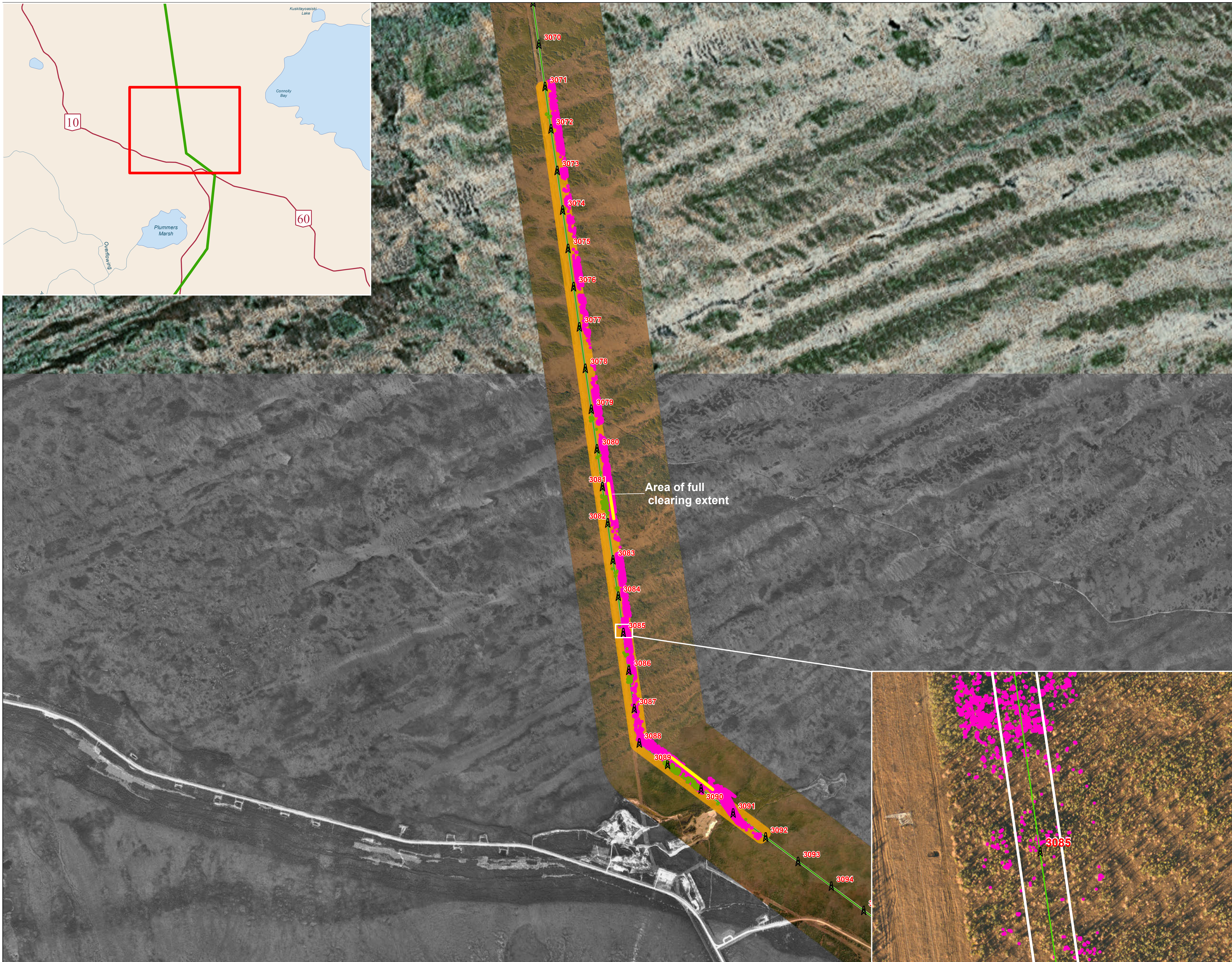
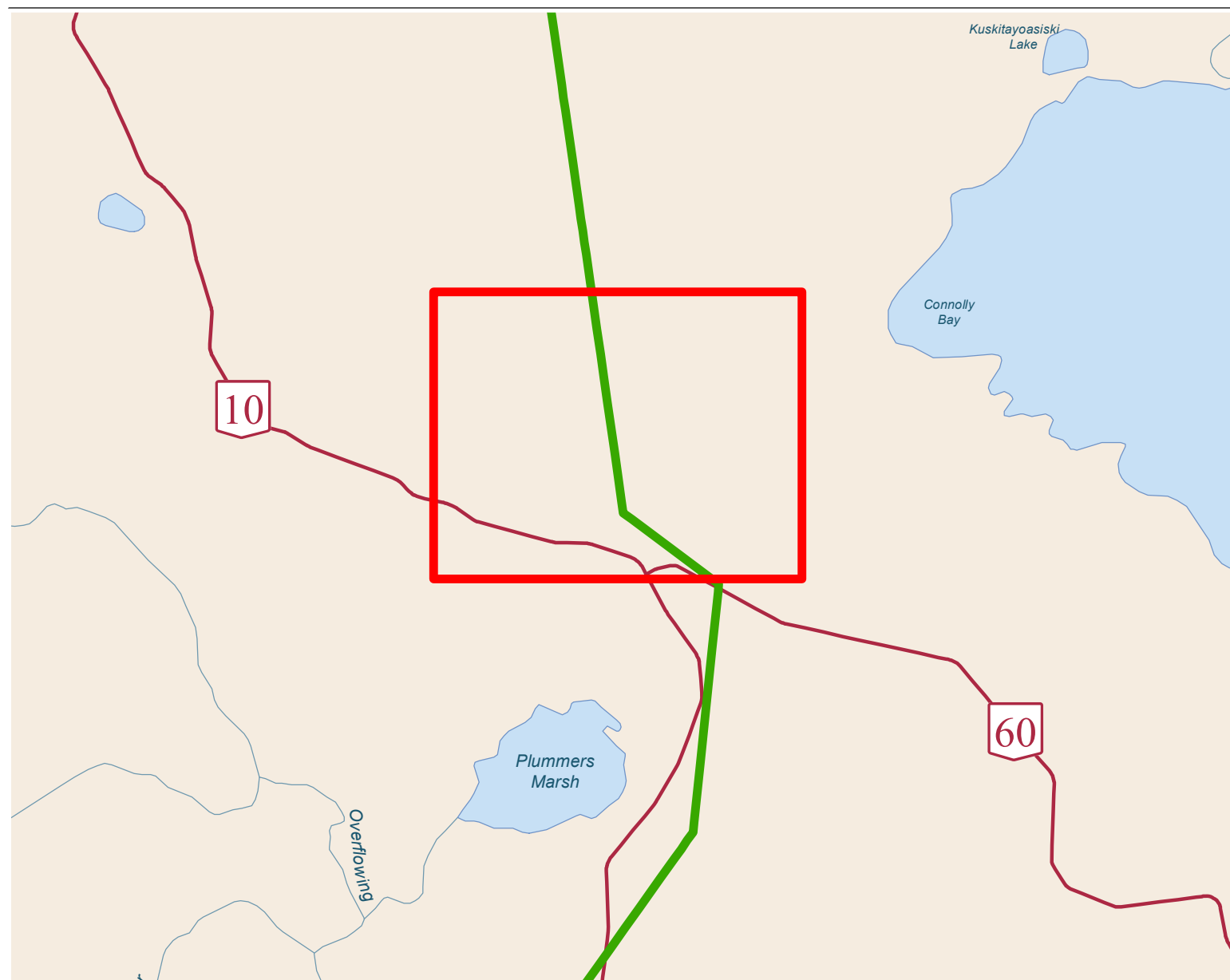
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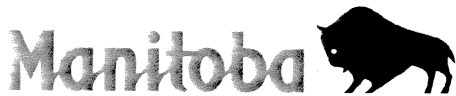
Caribou Crossings Revised Mitigation Plan

Draft: For Discussion Purposes Only



ESS-Name	Tower Start	Tower end	Prescription
N4-WILD-200			Full ROW Clearing area was burned
N4-WILD-201	3071	3081	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
	3081	3082	Full ROW clearing
	3082	3089	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
	3089	3090	Full ROW clearing
	3090	3092	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
N4-Wild-202	3116	3119	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
	3119	3123	Full ROW clearing
	3123	3126	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
	3126	3128	Full ROW clearing
	3128	3131	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
N4-Wild-203			
	3151	3152	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
	3152	3153	Full ROW clearing
	3153	3156	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
	3156	3157	Full ROW clearing
	3157	3158	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
	3158	3160	Full ROW clearing
	3160	3164	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
	3164	3165	Full ROW clearing
	3165	3167	Full centerline width clearing and 40% LOS danger tree clearing from edge of centerline trail
	3167	3169	Full ROW clearing

**Appendix B:
ROW Width Approval**



Conservation and Water Stewardship

Environmental Stewardship Division
Environmental Approvals Branch
123 Main Street, Suite 160, Winnipeg, Manitoba R3C 1A5
T 204 945-8321 F 204 945-5229
www.gov.mb.ca/conservation/eal

File: 5433.00

June 4, 2014

Shannon Johnson
Manitoba Hydro
820 Taylor Avenue
Winnipeg MB R3M 3T1

Dear Ms. Johnson:

Re: Bipole III Transmission Project – Environment Act Licence No. 3055

This is in regard to your letter dated May 7, 2014 requesting approval to widen the Bipole III transmission line right-of-way in certain locations to allow for the construction of guyed tower anchors in segments N1, N2, N3, N4, C1, and C2. Your subsequent letter dated May 15, 2014 clarifying how these areas will be cleared is acknowledged.

The Environmental Approvals Branch is processing this request as a minor alteration to Environment Act Licence No. 3055, pursuant to clause 14(2)(b) of *The Environment Act*. It has been determined that the potential environmental effects from the widening of the right-of-way in these areas are insignificant and can be accommodated by the existing limits, terms and conditions of Environment Act Licence No. 3055.

In accordance with Section 14(2) of *The Environment Act*, I hereby grant approval to Manitoba Hydro to implement the proposed alteration as described in your letters of May 7 and 15, 2014.

If you have any questions regarding this matter, please contact Ms. Elise Dagdick of this office at (204) 619-0709.

Yours truly,

Tracey Braun, M.Sc.
Director

- c: Lori Stevenson, Director, Lands Branch
Don Labossiere, Director, Environmental Compliance and Enforcement
Perry Stonehouse, Regional Director, Western Region
Wayde Roberts, Regional Director, Northwest Region
Pierce Roberts, Regional Director, Northeast Region
Public Registries