

Manitoba-Minnesota Transmission Project

Integrated Vegetation Management Plan

April 2019

Prepared by:

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Manitoba Hydro

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Document Owner

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Version – Final 1.0

List of Revisions

Number	Nature of revision	Section(s)	Revised by	Date

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Preface

Manitoba Hydro would like to acknowledge that this Project will be located in Treaty One Territory, the traditional territories of the Anishinabe, Cree, and Dakota people and the homeland of the Metis Nation.

This document presents the Integrated Vegetation Management Plan (the Plan) for the construction and operation of the Manitoba-Minnesota Transmission Project (the Project). It is intended to provide information and instruction to Manitoba Hydro employees as well as contractors, regulators and members of the public. The Plan provides regulatory context as well as general considerations and guidance pertinent to vegetation management in the Project area within Manitoba. More importantly it presents an integrated vegetation management approach to create and maintain a variety of habitats on the right of way (ROW) for traditional use and species of conservation concern plant species along with wildlife species including birds, specifically golden-winged warbler, pollinators, and mammals. Inspection and compliance along with monitoring and evaluation programs are described to confirm adherence to required actions including documentation and reporting.

Manitoba Hydro employees and contractors are encouraged to contact the onsite Manitoba Hydro Environmental Specialist/Environment Officer if they require information, clarification or support. Regulators and the Public are to direct any inquiries about this Plan to:

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1.0 Introduction

Manitoba Hydro, like all North American utilities, must manage vegetation in a cost effective manner while meeting regulatory requirements along the transmission line corridors that it owns and operates. Currently, Manitoba Hydro operates and maintains over 18,000 km of transmission facilities, with new development being proposed to meet Manitoba's energy requirements.

This Integrated Vegetation Management Plan (IVMP) is intended to be used by the Transmission Business Unit, its employees and contractors to guide the vegetation management work on the Dorsey International Power Line (D604I) rights of way.

1.1 Background

It is critically important to maintain the flow of electricity throughout the grid to ensure reliability for our customers and safety for Manitobans. Employing integrated vegetation management is key to preventing outages throughout the system. There are several reasons why an outage can occur and in North America, one of the common causes is trees. Trees can cause outages in two ways: 1) When all or part of the tree falls and lands on the conductor and 2) When a tree naturally grows within close proximity of the conductor, allowing electricity to arc from the conductor to the tree and move to the ground.

Trees have been responsible for significant outages on the North American Electric Power System over the last decade. In July 1996, 2.2 million customers were affected by a disruption of the Western Electrical Grid. In August of that same year, 7.5 million customers were affected by another disruption to the Western grid. In August 2003, 50 million customers in Canada and the United States were affected by an outage on the Northeast Electrical Grid. In each case, investigations of these outages found that the outage would have been prevented had the trees not been allowed to grow into close proximity of the transmission facilities.

1.2 Commitment to environmental protection and Indigenous engagement

Manitoba Hydro integrates environmentally responsible practices in all aspects of our business. Environmental protection can only be achieved with the involvement of Manitoba Hydro employees, consultants, contractors, Indigenous communities and

organizations and the public at all stages of the Project from planning and design through construction and operational phases.

The use of an IVMP is a practical and direct implementation of Manitoba Hydro's environmental policy and its commitment to responsible environmental and social stewardship. It is a proactive approach to manage potential effects of vegetation management activities on the environment.

Manitoba Hydro is committed to implementing this IVMP and requiring contractors to follow the terms of this and other applicable plans within the Environmental Protection Program.

Manitoba Hydro is committed to seeking input on this plan from Indigenous communities and organizations through the MMTP Monitoring Committee and the project First Nations and Metis Engagement Process.

To date Manitoba Hydro has heard extensive comments and concerns through its engagement processes, Clean Environment Commission Hearing as well as the National Energy Board proceedings related to the use of herbicides as part of its IVMP. Key comments and concerns heard from the Public and Indigenous communities to date include:

- The use of chemicals for managing vegetation along the transmission lines is of continued concern to the public and Indigenous communities
- There are beliefs held by some Indigenous communities that herbicides will have an overall negative effect that will preclude use of the land;
- The potential for runoff of herbicide and its effects on surface and ground water;
- Environmentally sensitive sites, such as locations of berry picking, medicinal plant harvesting, or sites where rare plants are found should be set aside as non-herbicide zones;
- Questions about the frequency of spraying, and the method and machinery used for spraying;
- Indigenous community members advise that chemicals pollute the lands, leach into the water system, get absorbed by plants and eaten by the birds and wildlife.
- Recommendation that Manitoba Hydro use 100 m or more as a minimum for the riparian buffer zone to reduce the risks of herbicides leaching into water;
- Notice of upcoming vegetation control programs with an opportunity for feedback; and
- Requirement for signage of when and where herbicides are applied.

Key mechanisms Manitoba Hydro is using in addressing the above comments and concerns are:

- Developing and sharing this plan to be open and transparent about how decisions are made with respect to herbicides when used as a component of an integrated vegetation management approach;
- Committing to landowner and Indigenous engagement in planning of herbicide treatments along the ROW through the MMTP Monitoring Committee and Public and First nation and Metis Engagement processes;
- Committing to following applicable Provincial and Federal acts and regulations pertaining to the application of herbicides;
- Identifying Environmentally Sensitive Sites (ESS) within Environmental Protection Plans such as riparian areas near watercourses or wetlands, or areas designated for the protection of Plant Species of Concern and Traditional Use Plant Species;
- Implementing at a minimum a 30 m riparian pesticide free buffers that exceeds all current regulatory requirements in Manitoba;
- Implementing a 30m pesticide free buffer for the protection of Plant Species of Concern and Traditional Use Plant Species ESS; and
- Posting of signage with application details within treatment area for 14 days following herbicide application.

Below is a summary and evidence of Manitoba Hydro's consultation with potentially affected persons, organizations, Indigenous communities, and federal and provincial authorities regarding the Integrated Vegetation Management Plan. Any feedback or concerns that were raised, steps that Manitoba Hydro has taken or will take to address those concerns can be found in Appendix A.

Draft environmental protection and management plans, including Integrated Vegetation Management Plan, were uploaded to the Project website and a web page was created in November 2018, including a fillable comment form to provide feedback (Appendix A).

Indigenous communities and organizations, landowners, interested parties and the public were notified, in October 2018, that Manitoba Hydro was seeking feedback on these plans. This was done through the Project website, MMTP Monitoring Committee website, e-campaign, and emails (Appendix A).

The construction environmental protection plan and associated management plans, including the Integrated Vegetation Management Plan have been discussed at MMTP Monitoring Committee meetings and posted to the MMTP Monitoring Committee

website. Paper copies of all draft plans were provided to community members at meetings. The management plan website was shared with communities via email and the plan was also posted on the MMTP Monitoring Committee website (Appendix A).

1.3 Integrated vegetation management approach

This document outlines the Integrated Vegetation Management Plan (IVMP) for the maintenance of the transmission line rights of way (ROW).

The basic principles of integrated vegetation management are to:

- Remove and/or control the tall-growing woody species wherever necessary;
- Encourage compatible low-growing plant communities that compete with and inhibit the establishment or spread of tall-growing species;
- Allow for “multiple-use” of ROWs by compatible alternatives;
- Respect traditional land uses, practices, and Indigenous rights; and
- Minimize adverse impacts on the environment.

Integrated Pest Management (IPM) is a decision-making process for managing pests (in this case vegetation that is incompatible with power lines) in an effective, economical and environmentally sound way. This IVMP is developed following an IPM planning approach that describes:

- A program for controlling vegetation populations along transmission rights-of-way using the principles of integrated vegetation management;
- The process for planning, selecting, using and evaluating treatment methods within that program;
- The methods of handling, preparing, mixing, applying and otherwise using herbicides within the program;
- The measures for mitigating environmental effects that may result from the vegetation management activities; and
- The procedures for ensuring NERC FAC-003 compliance, including prioritizing of hazardous vegetation conditions and emergencies.

1.4 Objective of the integrated vegetation management program

The long-term goal of the IVMP is the conversion of the right of way from dense stands of tall growing vegetation, into low-growing stable plant communities compatible with the safe and reliable operation of the Transmission System. Manitoba Hydro uses a variety of industry standard techniques to manage target vegetation on and off the ROW.

Specifically; the integrated vegetation management practices focus on vegetation that can have the potential to grow and/or fall, into or within the arcing distance of the transmission lines and or facilities. The natural regeneration of woody incompatible tree species must be controlled to maintain a safe and reliable transmission system.

The Program objectives are to:

- Maintain NERC compliance: To maintain the integrity of the transmission system to ensure that there are no outages due to interference and/or contact with the conductors from vegetation;
- Provide access to all structures in the transmission system for inspection and maintenance;
- Reduce the risk of fires and electric shock caused by flash overs;
- Utilize maintenance methods that are legal, safe, and economically feasible to the utility industry; and
- Develop and promote land use practices with land owners that discourage development of incompatible tree species (e.g. pastures, wildlife food plots and habitat, agriculture, etc.); and
- Create and maintain Golden-Winged warbler habitat per Golden-winged warbler Habitat Management Plan

Manitoba Hydro strives to achieve the program objectives with the consideration of environmental stewardship by:

- Encouraging a stable, low growing plant community;
- Selectively controlling only non-compatible species;
- Working to understand and address concerns around vegetation management from Indigenous communities and organizations and the public;
- Reducing environmental effects of vegetation maintenance operations; and
- Enhancing biodiversity.

Manitoba Hydro employs four primary methods of managing the ROW to achieve the above objectives:

- Selective control - Wherever possible, control methods target only tall-growing vegetation and retain, encourage or introduce desirable low-growing species, particularly shrubs and traditional use plants that are naturally present on the site, since this helps to suppress tall-growing species.

- Compatible use - Encourage activities and land uses on the ROW that will not conflict with transmission lines and that control or prevent the growth of tall trees, such as recreational or agricultural uses.
- Limited clearing required - Areas where limited vegetation exists (agricultural areas) or when trees at their mature height will never come within the “limits of approach” (minimum allowable distance between vegetation and the conductor) at the maximum “conductor sag” (degree to which the line could sag towards the ground) and does not impede with access to infrastructure. Limited clearing sites are those that will likely never require vegetation maintenance because they pose little threat to the safe operation of transmission lines.
- Altering existing vegetation - In rare cases where it is un-feasible to remove vegetation from along the edges of the ROW, existing vegetation can be modified by pruning or trimming to maintain clearances from transmission lines.

The advantages of successfully establishing a low-growing stable plant community include:

- Minimizes opportunities for tree species establishment and thereby reduces disruption and damage to the natural environment;
- Enhances biodiversity by increasing the number of low-growing forage species and enhancing the available wildlife habitat;
- Allows people and communities to use the ROW more effectively for berry-picking or medicinal plant gathering;
- Increases public safety by reducing the risk of tree contact to lines and thereby reducing the fire hazard;
- Increases operational reliability;
- Permits access and maintains lines of sight for maintenance;
- Reduces the total area requiring future treatment, and reduces herbicide use over time; and
- Reduces long-term vegetation maintenance costs.

1.5 Roles and responsibilities

Manitoba Hydro has the following personnel involved in the design and implementation of the IVMP:

- Vegetation Management Specialists
- Environmental Specialists
- Transmission Line Maintenance Managers

- Transmission Line Maintenance Coordinators
- Line Inspectors
- Live Line Journeymen
- Line Patrollers
- Contractors/consultants

All personnel involved with vegetation management meet Manitoba Hydro guidelines of qualification, supervision and/or training. Manitoba Hydro personnel working in the field will have passed at minimum, a 4-level, modular-based patroller training course that includes modules on vegetation issues (Patrollers), or will have lineman training that includes basic vegetation training (Line Inspectors and Live Line Journeymen) or be directly supervised by qualified employees. Completion of all training is documented in employee personnel files.

All other personnel working with the IVMP are qualified based on a combination of their education, their experience, and the nature of their position (Line Maintenance Managers, Line Maintenance Coordinators, Line Maintenance Services Engineers, and Vegetation Management Specialists).

Manitoba Hydro also hires consultants/contractors to assist with development and at times the implementation of integrated vegetation management work within the transmission right of way. The contract selection process ensures that consultants/contractors and their personnel are qualified and trained to work safely around high voltage lines. In addition, contractors work under the supervision of qualified Manitoba Hydro personnel while performing integrated vegetation management work.

1.6 Environmental considerations

There are numerous environmental sensitivities within and along the ROW, that have specific mitigation measures developed to protect them including retention of vegetation. These sites are called Environmentally Sensitive Sites (ESS) and will be identified in the Environmental Protection Plan map books.

A key consideration in the development of the initial clearing prescriptions as described in the Clearing Management Plan for the ROW was the concept of retaining low lying vegetation in the following prescribed areas:

- 30-85m riparian buffer zone on all creeks, streams, rivers and wetlands (the width of the riparian buffer is based on slope of land entering waterway as described in the Riparian Buffer Table in the EnvPP);

- Visual line of site buffers along select roads and trails;
- Environmentally Sensitive Sites with mitigation measure specifying vegetation retention (traditional use plant harvest areas, sensitive wildlife areas, etc.);
- Environmentally Sensitive Sites designated as Golden-winged Warbler (GWW) habitat; and
- Limited clearing areas.

1.6.1 The Right of Way Habitat Management Plan for Managing Critical Golden-winged Warbler Habitat during Construction and Operation

The Right of Way Habitat Management Plan for Managing Critical Golden-winged Warbler Habitat during Construction and Operation was developed with the goal that in sensitive areas of critical golden-winged warbler habitat, ROW vegetation will be selectively cleared and maintained using an integrated vegetation management approach to enhance long-term habitat suitability for golden-winged warbler.

Objective 3 of the plan is: “To apply operational vegetation maintenance prescriptions suitable for the enhancement of potential golden-winged warbler habitat, while abiding by legal requirements for the safe operation and maintenance of the Project.”

Manitoba Hydro has designed the transmission line to reduce vegetation clearing requirements for the safe operation of the line. In areas where guyed towers are used the ROW easement is 100m wide but will only be cleared and maintained to the full 100m width within the 100x80m guyed tower footprints. Between tower locations the ROW cleared width is reduced to 80m wide with the outer 10m of vegetation on either side of the ROW to remain intact with the exception of any danger trees requiring removal.

2.0 Regulatory Context

In Manitoba, vegetation management activities are primarily regulated through *The Crown Lands Act*, *The Environment Act*, *The Pesticide and Fertilizers Control Act* and their related regulations. Manitoba Hydro applies to Manitoba Sustainable Development for applicable work and pesticide use permits when vegetation management treatments are planned on the ROW. As a result of the above regulations, vegetation management activities are subject to compliance inspections by Manitoba Conservation or Environment Officers.

Additionally, by way of the Reliability Standards Regulation 25/2012 under *The Manitoba Hydro Act*, Manitoba Hydro must comply with North American Electric Reliability Corporation (NERC) standard FAC-003. The FAC-003 Transmission Vegetation Management Standard's purpose is:

"To maintain a reliable electric transmission system by using a defense- in-depth strategy to manage vegetation located on transmission rights of way (ROW) and minimize encroachments from vegetation located adjacent to the ROW, thus preventing the risk of those vegetation- related outages that could lead to Cascading."

Any additional measures prescribed in association with provincial or federal approvals for the transmission line will be addressed within the final version of this Plan.

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3.0 Integrated pest management

This IVMP utilizes the concept of integrated pest management and includes the following elements:

- Prevention;
- Identification;
- Monitoring;
- Treatment thresholds;
- Treatment options; and
- Evaluation

The most effective pest control (for the purposes of this plan “pest” refers to vegetation) is typically the result of an integrated approach, using a combination of strategies and methods and allowing natural processes to manage the pest. It balances the direct costs, and the social and environmental implications with the benefits of the pest control.

3.1 Prevention

Prevention is a key component of a vegetation management program with the goal of preventing vegetation that poses a risk to safety or reliability from developing or worsening. Preventative measures such as regular vegetation management cycles, hazard tree identification and integrated planning are aimed at stopping the initial growth and spread of incompatible vegetation.

Vegetation Management Cycles

- Designed to ensure public safety and reliability are maintained.
- Cycle times range from 2 to 10 years.
 - Where the growing season and soil conditions are not favorable, a cycle can be 10 years, while in the urban areas of southern Manitoba with high growth rates the cycle could be as short as 2 years.

Hazard Tree Identification

- Occurs during line patrols and includes criteria such as dead, dying or infirm trees due to physical conditions (snow/ice loading, lightening, etc) or forest health issues, (Dutch elm disease, stem decay, emerald ash borer).

Integrated Planning

- Setting and enforcing clearance specifications for new construction including ROW width and danger tree clearing standards.
- Development of a Clearing Management Plan for new construction that contains, clearing methods (mulch, salvage, blade, etc), designation of No Clearing Required areas, flora and fauna management areas and timber salvage when required.
- Compatible land use planning to incorporate agricultural crops, livestock grazing, recreational or industrial uses.

3.2 Identification

The primary target-vegetation to be controlled on transmission ROWs are trees that have the potential to reach or exceed the limits of approach to the line (see 3.4.2 for information on limits of approach).

The following species represent the majority of target trees growing along the ROW. Any plant that could interfere with access to and maintenance of transmission structures will also be controlled, such as thorny bushes and vines.

Table 1: Primary Target Species Along Transmission Lines

Common Name	Scientific Name
Conifers	
Pine	<i>Pinus spp.</i>
Spruce	<i>Picea spp.</i>
Fir	<i>Abies spp.</i>
Larch	<i>Larix spp.</i>
Deciduous	
Alder	<i>Alnus spp.</i>
Birch	<i>Betula spp.</i>
Aspen	<i>Populus tremuloides</i>

Poplar	<i>Populus spp.</i>
Maple	<i>Acer spp.</i>
Cherry	<i>Prunus spp.</i>
Willow*	<i>Salix spp.</i>
Oak	<i>Quercus spp.</i>
Ash	<i>Fraxinus spp.</i>
Elm	<i>Ulmus spp.</i>

*Although many willows only attain shrub size, several species attain tree size, are fast growing, and sucker from the root collar. Willow species are very hard to distinguish and for this reason, are targeted as a species to manage on the corridor.

3.2.1 Traditional use plants and species of conservation concern

There are hundreds of species of traditional use plants along with several species of conservation concern (SOCC) identified within the ROW. Areas where SOCC's or greater than 30% coverage of traditional use plants (none tree species) are present have been identified and included as Environmentally Sensitive Sites (ESS) within applicable environmental protection plans where they are buffered and mitigation developed to minimize their disturbance.

3.3 Monitoring

Manitoba Hydro's transmission inspection process is designed to conduct inspection of 100% of all the transmission lines $\geq 230\text{kV}$, and electric transmission corridors on an annual basis; this inspection encompasses vegetation inventory and may include facilities inspection (structures, conductors, and wires). Vegetation inspection data collected during line patrolling provides information needed to decide whether treatments are necessary, optimize timing of treatment, and the most suitable treatment method. During and/or following the inspection process all pertinent information and findings are entered into Manitoba Hydro's Transmission Geographic Information System (TGIS). All previous and prescribed vegetation management treatments and environmentally sensitive sites are

stored in TGIS. Within this central database, the annual maintenance activities including vegetation treatments are identified and tracked. Patrols may be conducted by ground or air, and are completed once per calendar year, no more than every 18 months, on every span in the 230kv and higher lines within the transmission system.

3.3.1 Patrol Information

The following aspects are considered when patrolling the lines to determine vegetation work timing and method:

- Tree heights and priority of vegetation to be managed;
- Proximity of vegetation to limits of approach;
- Imminent threats, i.e., dead, dying, and leaning trees, and root rot pockets (on the ROW and along the edge);
- General condition of off-ROW danger tree strip;
- Width of the ROW edge (narrowing or encroachments);
- The relative density of deciduous or coniferous target trees, expressed in percentage cover of the site;
- Compatible vegetation that could be retained;
- Terrain characteristics that help determine the appropriate work method, such as steep slopes;
- Terrain features such as topographical features, eroded or erosion-prone areas, bare-ground areas, and hazards such as large rocks and stumps;
- Special conditions, such as compatible land use issues, property encroachments, and other concerns;
- The environmental conditions and features of the treatment area, such as riparian issues, wildlife issues, and other environmental concerns;
- Damage to structures and lines; and
- Road access conditions, including gates, locks, road surface, culvert conditions, etc., and other factors that will dictate the types of equipment that can be brought onto the site.

The following information is collected during patrols:

- Evaluation on the efficacy of previously undertaken vegetation management;
- Areas where vegetation management must be conducted;
- Areas that can be deferred for future vegetation management
- Areas of noxious or invasive weeds;

- Methods to be used in each of these identified areas; and
- Relative priority of the work.

3.4 Treatment thresholds

The action thresholds on and or off the ROW that necessitate vegetation management are:

- The presence of incompatible species of vegetation that could grow into the conductors or limits of approach, or NERC Minimum Vegetation Clearances from inside and/or outside of the ROW;
- The presence of tall growing trees that could fall into or onto the conductors from inside and/or outside the ROW; and
- Vegetation blocking access to the transmission infrastructure.

3.4.1 Clearance requirements

To determine when vegetation must be controlled at a particular site, the following factors related to the clearance requirements for the transmission line will be evaluated:

- Limits of approach;
- Maximum conductor sag;
- Growth rate and mature vegetation height;
- Unusual terrain features that may result in a low conductor to ground clearance; and
- Maximum conductor swing.

Lines can also be threatened by trees growing adjacent to the ROW. Therefore, another aspect in determining action thresholds is identifying and rating hazard and danger trees along the edges of the ROW (the trees most likely to fall into the lines).

Manitoba Hydro's minimum tree to conductor clearances under all rated operating conditions are those set forth in Manitoba Hydro Transmission Line Design Guideline No. MH-TLD-GL-001, (See Table 2)

Table 2: Minimum Vegetation to Transmission Conductor Clearances.

Line Voltage	Minimum Clearance (meters)
500 kV	4.0

3.5 Timing and treatment selection criteria

Criteria used to select the treatment method are based on numerous factors including:

- Current and adjacent land use;
- Land ownership;
- Landowner permission;
- Effectiveness of previous treatments;
- Presence of identified Environmentally Sensitive Sites such as riparian areas, traditional use plant areas, species of conservation concern
- Site conditions such as soil type, species, terrain, stem density;
- Proximity of known organic farms, water sources, bodies of water and environmentally sensitive sites;
- The possibility of adverse impacts to wildlife, fish, surrounding land, workers and adjacent residents;
- Safety of workers and the public;
- Security;
- Timing of treatment including reduced risk timing windows for treatment options, such as riparian areas due to fish spawning windows, or concerns around bird nesting areas, seasons, weather conditions;
- Cost and availability of treatment options;
- Regulatory requirements;
- Site accessibility; and
- The consequences of no treatment.

3.6 Treatment options

To prevent vegetation related electrical flashover, and/or outages, trees on and off the ROW must not be permitted to grow or fall within the clearance standards as specified in Table 2. Right of way design criteria (permissible tree heights and cleared width ROW) account for maximum designed conductor sag and sway.

Control practices include a combination of the following:

- Manual and mechanical clearing;
- Alternative treatments or land uses; or
- Herbicide.

Vegetation control on Manitoba Hydro's ROWs are achieved primarily through mechanical control (wheeled or tracked prime movers with drum or rotary cutters, mulcher, feller-bunchers, bulldozers with modified brush blades, etc.), herbicides, and manual control (chain saws, brush saws, and brush axes).

3.6.1 Manual and mechanical treatment methods

This section describes the various manual and mechanical vegetation management techniques that Manitoba Hydro uses on transmission ROWs including brushing, mowing, girdling, blading, and pruning. The following sections will provide further details on the techniques including:

- Description of the technique;
- Selection criteria for techniques; and
- Benefits and limitations of the technique.

3.6.1.1 Brushing

Brushing is the most commonly used manual vegetation management technique on transmission lines, and is sometimes combined with the herbicide cut-surface method.

Description of techniques

Brushing is the removal of individual stems that will eventually grow into transmission lines by hand tools, such as chainsaws or circular brush saw. Tall-growing tree species are cut down within a few inches of the ground line. Brushing is focused on target species, preserving the maximum amount of low-growing species.



Selection criteria

Brushing is the preferred method in the following situations:

- In areas with a well-established low-growing plant community;
- In combination with mowing;
- In difficult terrain with limited machine access, e.g., around guy wires, steep slopes, and riparian areas; or

- In areas where environmental or social concerns warrant.

Although generally confined to ROWs, brushing may be extended beyond the ROW edge to improve long-term line security by removing hazard trees that could fall onto the line from the edge.

Brushing is not preferred in the following circumstances:

- For high densities of target trees (>10,000 stems /ha conifer and >20,000 stems/ha of deciduous);
- Areas where mowing is a suitable alternative;
- Areas with high aesthetic concerns;
- Areas with a high fire risk; and
- Areas where trees are of a size (approx. 5m tall) that when cut will leave debris levels that exceed 1 meter in height.

Advantages of brushing

- Brushing allows the immediate removal of target vegetation, with complete retention of low-growing compatible species;
- Conifer trees cut below the lowest branch are permanently controlled;
- Brushing allows spot treatment with herbicides to prevent stumps from re-sprouting;
- Brushing protects areas close to fish-bearing streams and other environmentally sensitive areas, since it can be done without causing excessive erosion or damage to the streambed; and
- Brushing is beneficial in areas where target vegetation is widely scattered.

Limitations of brushing

- Brushing is labour intensive and can be dangerous to workers in steep terrain;
- Brushing is more difficult in dense vegetation;
- It can increase the fire risk if there is a buildup of debris;
- In the absence of follow-up herbicide treatment, deciduous stumps can re-sprout repeatedly (into coppices) each time they are cut, resulting in increased stem densities, growth rates, clearing costs, and shortened treatment cycles in subsequent years; and
- Aesthetics of brushing may be a public concern due to the buildup of debris.

3.6.1.2 Mowing

Mowing technique is used to where there are tall and/or high-density target species or to control grass height and weeds in urban areas.

Description of techniques

Mowing is the cutting of target vegetation with wheeled or track-mounted heavy-duty rotary or flail cutters. A heavy-duty tractor or excavator is equipped with the cutting head and driven over the ROW to cut target vegetation.



Selection criteria

Mowing is the preferred method where the terrain allows, and in areas:

- To control grass height on Urban ROW's
- With high densities of target trees (>10,000 stems /ha conifer and/or >20,000 stems/ha of deciduous); and
- Where trees are of a size (approx. 5m tall) that when cut will leave debris levels that exceed 1 meter in height.

In general, mowing is not the preferred method in the following areas:

- Where low-growing compatible species are well-established and there are low stem densities of target vegetation;
- In areas with a dense understory of low-growing compatible species and high stem densities of target vegetation (an excavator machine with mulching or mowing head should be used);
- In areas with rocks that can cause excessive damage to cutting heads (unless an excavator with an articulating mower is used);
- In areas that are developed or have high public use because of the risk of flying debris when mowing;
- In unfrozen boggy or wet areas where excessive rutting and soil compaction and damage could occur;
- On steep slopes; or
- In riparian areas.

Advantages of mowing

- Mowing mulches the vegetation into smaller pieces that readily biodegrade, which reduces fuel loading fire hazards;
- Mowing is seasonally effective, inhibiting growth from spring through late summer. This is important in areas where herbicide follow-up treatment is not possible;
- In non-selective mowing (Hydro-axe or Kershaw), all vegetation is cut to ground, leaving a level ROW and facilitating future herbicide applications that use mechanical delivery systems;
- In mowing directed only towards target vegetation (hydraulic excavator, rotary disc, or flail), the ROW retains biodiversity and existing low ground cover;
- Target vegetation can be removed faster and more economically than other methods;
- Work progress and workmanship are clearly visible; and
- Using machines is generally less hazardous to the operator than using hand-held equipment.

Limitations of mowing

- Mowing is not generally suitable in riparian areas, and should not be used there unless a site-specific riparian prescription has been produced and approved;
- Mowing can promote heavier regrowth of deciduous vegetation;
- Mowing is often limited by terrain, such as large rocks, stumps, and bodies of water;
- In wet terrain, machines cannot operate effectively and could damage the environment;
- Mowing mulches the brush using a high-speed, mowing/flailing action, which can leave ROWs unsightly, hazardous, and subject to public complaints;
- Mowing may result in rutting, track marks, or degradation of the ROW surface; and
- Mowing should not be used on slopes greater than 30% because most machines are unsafe to operate.

3.6.1.3 Girdling

The girdling procedure is usually limited to single-stemmed, deciduous trees on transmission lines, but can also be carried out on some conifer species when required.

Description of techniques

Girdling involves cutting one or more strips of bark from around the entire tree trunk with a special girdling tool or other hand tool. The bark strips are removed along with other tissue down to the sapwood. After the bark has been severed, the tree is left to die. The above-ground parts continue to grow, but the roots starve and the tree slowly dies. Only girdling and herbicide applications will kill deciduous species. They will re-sprout if mowed or slashed.



Selection criteria

- Girdling is most often used in riparian areas or other environmentally- sensitive sites;
- Girdling is generally not used on trees of small diameter, since they may break at the girdle, causing the tree to re-sprout;
- Girdling is not acceptable in areas where the target vegetation will reach limits of approach within two growing seasons;
- Girdling should not be used for stem densities of over 15,000 stems per hectare because it is not practical, effective, or cost-effective. Also, the amount of standing dead stems may create a fire hazard;
- Girdling is not acceptable in situations where tree failure could lead to worker or public injury or property damage;
- Conifers are never girdled unless they are part of a riparian prescription; and
- Girdling is effective on alder, birch, and willow species. Girdling is not as effective on northern black cottonwood and small-diameter aspen poplar because of prolific re-sprouting.

Advantages of girdling

- Girdling promotes retention of vegetation cover and increased site stability due to root structure retention;
- Girdling may have greater public acceptance than herbicide use;
- Girdling is not limited by difficult terrain;

- Girdling is flexible, because individual stems and species can be removed or left on a tree-by-tree basis; and
- Girdling creates habitat for small mammals and birds.

Limitations of girdling

- Girdling cannot be used effectively over large areas or in dense brush, because it becomes too laborious and costly;
- Close inspection and careful work are required to ensure adequate depth and width of the girdles is maintained;
- Tools are not effective on large stems with thick bark;
- If stems have many live branches below breast height (1.3m above ground), additional work with hand tools will be required to remove the branches;
- The dead trees remain standing for 2–3 years, which may be objectionable in highly visible areas;
- The use of hand tools may be hazardous to workers;
- Blowdown of dead trees may pose a safety problem alongside well-travelled areas, or to workers re-entering the area; and
- Workers must be experienced girdlers, since poor girdling results in re-sprouts or premature blowdown with re-sprouts.

3.6.1.4 Blading

Blading is generally confined to remote areas with a high density of target vegetation, where winter access is required.

Description of techniques

Blading is the mechanical grubbing and grading of the transmission ROW using excavators or bulldozers to remove all existing vegetation.



Selection criteria

Blading is an acceptable method in the following situations:

- To clear land for economically viable and sustainable grazing or agriculture;
- To create a shift to low-growing vegetation species in areas with a high density of target vegetation; and
- To maintain inaccessible portions of ROWs due to frozen ground access requirements.

Advantages of blading

- Blading clears the site completely of vegetation and stumps, leaving it prepared for reseeding with desirable vegetation (i.e., to create new and enhanced habitat) or conversion to compatible use;
- Benefits the property owner by providing a better use of the land base, such as for pastureland; and
- Using heavy equipment is generally less hazardous to the operator than using hand-held equipment.

Limitations of blading

- Blading is only a temporary measure since it exposes bare soil, thereby opening the area for infiltration by unwanted species, including noxious or invasive weed species;
- Root-suckering species and re-sprouting species are not totally removed by blading, thereby increasing multi-stemmed regeneration of unwanted species; and
- Blading leaves the area temporarily exposed to the elements, resulting in possible erosion.

3.6.1.5 Pruning

Pruning is the removal of branches or limbs in order to direct and control tree growth away from transmission lines.

Description of techniques

The term pruning generally implies the use of proper arboricultural practices. It is not trimming, which refers to the cutting back of vegetation to a uniform distance; and it is not topping, which refers to cutting tree limbs back to a stub, bud, or a lateral branch.

Pruning is the only suitable vegetation management method for areas where tree removal is not a feasible option, generally topping of trees is not a recommended practice.



Selection criteria

In most instances, Manitoba Hydro does not support pruning trees on transmission lines because of the clearances that must be maintained between the lines and the trees.

Trees should be removed at ground level. However, pruning may be the best management technique in the following circumstances:

- Where it is cost-effective compared to tree removal;
- Where the main stem is not on the ROW, but branches encroach on the ROW; and
- Where trees are required for wildlife habitat or to protect riparian areas.

Tree removal will be carried out if pruning operations cannot provide both adequate clearance and healthy, aesthetically acceptable trees.

Advantages of pruning

- Trees are not removed and still provide aesthetic and other functions;
- Pruning influences the direction of branch growth so that trees can be directed away from conductors;
- Pruning can minimize adverse effects on tree health, and over time, reduce line clearing workload and risk from unhealthy trees; and
- A pruned tree provides wildlife habitat and retains aesthetics, as opposed to a removed tree.

Limitations of pruning

- Pruning is usually costlier than removal because trees may need to be pruned repeatedly;
- Pruning requires a skilled, experienced arborist. Improper pruning techniques can seriously damage trees and result in unhealthy, unsightly, or hazardous trees that may require off-cycle remedial work; and

- Pruned trees remain in proximity to transmission lines and have hazard potential, while removed trees do not.

3.6.2 Alternative treatments/land uses

There is increasing public demand for secondary uses of transmission ROWs. Manitoba Hydro is supportive of these secondary uses provided that they are compatible with the safe operation and maintenance of the line.

3.6.2.1 Description of techniques

Alternative treatment methods include:

- Agriculture and livestock grazing;
- Native grass and seed production; or
- Recreational corridors or public greenways.

Selection criteria

In most instances, Manitoba Hydro investigates with adjacent or eased landowners compatible alternative treatments/land uses; where a landowner has committed to the treatment through an agreement, and the use/associated development is considered compatible.

Advantages of alternative treatments/ land uses

- Produce natural low growing vegetation;
- Reduce or eliminate tall growing vegetation by out-competing them for space, light and nutrients;
- May reduce the need for herbicide application;
- May reduce vegetation management costs; and
- Enhance wildlife habitat.

Limitations of alternative treatments/land uses

- May require continuous grass mowing;
- May require prescribed burning;
- Requires co-operating landowners; and
- May reduce access to infrastructure during maintenance and patrols.

3.7 Herbicides as part of an integrated vegetation management plan

The safe and cautious use of herbicides is an essential part of maintaining a safe and reliable transmission system in a financially and environmentally responsible manner. Herbicide use accounts for less than a quarter of Manitoba Hydro's vegetation management program. The use of herbicides is strictly controlled by regulations and Manitoba Hydro application practices.

A repetitive cycle of only manual/mechanical treatments promotes suckering of some tree species dramatically increasing the density of tall growing species, essentially creating a larger vegetation management challenge over time. Manitoba Hydro's Integrated Vegetation Management program only uses herbicides in conjunction with its manual/mechanical control methods on a site –specific basis to establish a stable, low growing plant community. The use of herbicides can dramatically increase the time periods (cycles) between vegetation management activities, which reduces overall disturbance to people and wildlife. Herbicides are applied in accordance with applicable provincial and federal laws and regulations, and are registered with the Pest Management Regulatory Agency (PMRA) of Health Canada.

Why does Manitoba Hydro even consider using herbicides instead of just doing mechanical and manual methods for tree control?

Fire risk

Tree cutting or brushing operations using chainsaws may build up vegetative debris on rights-of-way over time, which increases the "fuel load," or risk of fire.

Frequent disturbances

Reliance on mechanical methods requires more frequent intrusions onto the site, which increases the disturbance to wildlife and the environment due to repeated entries for mechanical treatment. This is because treatments like mowing or blading lead to shortened maintenance cycles due to rapid re-sprouting and increased density of deciduous vegetation.

In contrast, herbicides provide more selective long-term control, reducing the need for frequent manual or mechanical treatments.

Increased regrowth and density

Without the complementary use of herbicides, continuous mechanical cutting results in increased stem (tree) density and decreased control and effectiveness over time. Trees such as alder, birch, aspen, and maple re-sprout quickly from cut stumps, resulting in even higher densities of tall- growing trees after repeated mowing or slashing. Follow-up use of herbicides prevents this re-sprouting and greatly extends the duration of vegetation control.

Continuous mowing on a right-of-way also increases the root mass from cut stumps and root stocks. This leaves roots to regrow vigorously each spring.

Environmental risks

There is greater potential for mowing or slashing to destroy bird nests and habitat for burrowing animals, compared to herbicide applications.

Mechanical methods often use heavy equipment that is more likely to damage non-target vegetation and the natural environment.

Heavy mechanical equipment can cause rutting, track marks, or degradation of the ground surface.

Mechanical equipment has a higher inherent carbon footprint from fuel consumption and emissions.

Safety hazards

The use of hand tools and mechanized equipment can be hazardous. The risk of accident and injury among workers is far greater when using mechanical means of controlling vegetation than when applying herbicides.

Some equipment may be impractical to use in remote or inaccessible areas, as well as dangerous in some terrain, such as on land with steep slopes or large rocks.

Increased slash and root mass from the sole use of mechanical methods creates physical hazards for wildlife, people, and equipment, and impedes service vehicle access.

3.8 Herbicides

Some herbicide products may have the identical active ingredient but a different trade name and a different Pesticide Control Product (PCP) number issued by the federal Pest Management Regulatory Agency (PMRA). These herbicides are considered equivalent and can be used under this IVMP. Below is a current list of herbicides Manitoba Hydro may

consider for use on the ROW for tree control. In the future, as new products are developed and/or adopted for use by Manitoba Hydro, will be added through revisions to this plan.

3.8.1.1 Tree control herbicides

Triclopyr

The active ingredient is effective for control of deciduous trees and brush. It provides an effective alternative to glyphosate for control of certain tree species, such as aspen poplar and trembling aspen. Triclopyr is a selective herbicide, has very little soil residual activity, rainfast in 6 hours and rapidly degrades within 2 days by soil microorganisms and sunlight. It generally takes 8-18 days to break down in soil depending on soil type, moisture, and temperature. The herbicide tends to stay in the upper 30 cm of the surface soil layers following rainfall where it undergoes degradation.

Aminocyclopyrachlor / Metsulfuron methyl

The combination of these two active ingredients (Aminocyclopyrachlor and metsulfuron methyl) produce a selective, post-emergent herbicide that is rainfast within 4 hours and has a 120-180 day breakdown period.

Aminopyralid / Metsulfuron-methyl

The combination of these two active ingredients (Aminopyralid / Metsulfuron-methyl) has received a “Reduced Risk” status from the Pesticide Management Regulatory Agency based on their unique low toxicological, ecotoxicological and environmental fate effects. It is rainfast within 4 hours and has a half-life of 35 days to breakdown. This product is

3.9 Description of herbicide treatment methods

This section describes the basal bark, cut surface, mechanized cut surface, selective foliar, broadcast foliar, and injection treatment methods and discusses selection criteria and the advantages and limitations of each.

3.9.1 Basal bark

Basal bark treatment involves applying herbicide onto the bark of the target tree at the lower part of the stem.

Description of technique

The herbicide penetrates the bark into the cambium layer and diffuses throughout the tree and the roots, to prevent re-sprouting. It is applied with a low-volume backpack or hand-held sprayers with a positive shut-off system.



Selection criteria

- This treatment is best used on small deciduous trees under approx. 4m in height; and
- At very high stem densities, basal treatment may not be practical, effective, or cost-effective. Also, the amount of standing dead stems may create a fire hazard.

Advantages of basal bark

- It is less labour intensive than manual brushing and girdling;
- It is suitable for sensitive areas including riparian, or remote and difficult-to-access areas;
- It treats only targeted individual stems and so is appropriate for areas with low densities of target trees;
- It removes the canopy over a three-year period, allowing a low-growing plant community to establish;
- The potential for spray drift is reduced;
- There is minimal risk of herbicide exposure to workers or the public due to the targeted nature of the treatment; and
- A small amount of product is applied per hectare.

Limitations of basal bark

- Dead foliage may be objectionable.
- In areas of low clearance, surviving treated stems may continue to grow.

3.9.2 Cut surface

Cut surface is a directed technique, which reduces the impact on non-target species. It also minimizes herbicide use and optimizes natural control.

Description of technique

This method (also called cut-and-treat) is used in conjunction with brushing in deciduous stands. The tree is cut as low as possible to the ground, and herbicide is applied by backpack sprayer or brush to the cut surface of the stump to limit re-sprouting.



Selection criteria

- The cut surface treatment is used in areas where basal bark treatment is not optimal, such as where standing dead trees are an aesthetic concern (e.g., alongside roadways), or in low conductor-to-ground situations; and
- Cut surface treatment is highly effective on most species that do not sucker from their roots.

Advantages of cut surface

- Cut surface treatment can be used in any terrain;
- No standing dead foliage remains, making this technique desirable in highly visible areas;
- There is minimal risk of herbicide exposure to workers or the public due to the directed nature of the treatment;
- Herbicide is limited to the stump surface, resulting in minimal impact on fish, wildlife, or the environment; and
- It removes the canopy, but increases low-growing forage for wildlife.

Limitations of cut surface

- Improper application can result in unsuccessful treatment, and may require re-application of the herbicide;

- Treatment results in reduced forage and cover in the short term; and
- It is a labour intensive method and not cost-effective for dense stands.

3.9.3 Mechanized cut surface

Mechanized cut surface is when the tree is cut by a mower and herbicide is applied to the surface of the cut stump at the same time.

Description of technique

This treatment method uses a wiper or wetted blade mounted on the underside of a mowing deck, to apply herbicides onto the cut surfaces of the target trees.



Selection criteria

- Mechanized cut surface treatment is highly effective on most species that do not sucker from their roots;
- Use in rural/urban areas where risk of damage to herbicide drift greater; and

Advantages of mechanized cut surface

- Mechanized cut surface is an efficient method for managing the re-sprouts of high-density target vegetation;
- No standing dead foliage remains, making this technique desirable in highly visible areas;
- There is minimal risk of herbicide exposure to workers or the public due to the directed nature of the treatment;
- Herbicide is limited to the stump surface, resulting in minimal impact on fish, wildlife, or the environment;
- It removes the canopy, but increases low-growing forage for wildlife; and
- It targets specific vegetation, with adjustable application rates and dosages.

Limitations of mechanized cut surface

- It is not as selective as backpack basal application;
- Buffer zones may be required to protect pesticide-free zones, depending on wind direction and topography;
- Caution must be exercised to avoid treating areas where desirable species may be affected;
- There may be a short-term decrease in vegetation forage species;
- Mechanized cut surface is often limited by terrain, such as steep slopes, large rocks, stumps, and bodies of water;
- In wet terrain, machines cannot operate effectively;
- Mechanized cut surface may result in rutting, track marks, or degradation of the ROW surface; and
- It should not be used on slopes greater than 30% because most machines are unsafe to operate.

3.9.4 Selective foliar

Manual foliar treatment uses backpack sprayers to apply herbicide to the foliage (leaves) of the vegetation.

Description of technique

Selective foliar treatment sprays herbicides onto the foliage of individual trees or small clusters of trees, using a hand held nozzle directed by the operator to selectively treat target species, this could be a manually-operated, low-volume, pressurized backpack or a high pressure/volume hose and handgun with a positive shut-off system.



Selection criteria

- If target vegetation is below 1.5m in height, it allows for better coverage, and will reduce the potential for operators to overreach;

- It is often used to treat re-sprouts one to two years after the area has been mowed or brushed;
- At very high stem densities or large areas, backpack foliar treatment may not be practical, effective, or cost-effective; and
- It is the preferred treatment for noxious and invasive weed control.

Advantages of selective foliar

- Selective foliar is the most efficient method for managing the re-sprouts of low-density target vegetation; and
- Specific target vegetation is treated, through direct control of nozzle by applicators trained in target species identification, minimizing non-target application.

Limitations of selective foliar

- Buffer zones may be required to protect pesticide-free zones, depending on wind direction and topography;
- The recommended treatment height of target species is 3m or less;
- Caution must be exercised to avoid treating areas where non-target species may be affected.

3.9.5 Broadcast foliar

Broadcast foliar treatment uses vehicle mounted sprayers to apply herbicide to the foliage of the vegetation.

Description of technique

This treatment method uses a fixed nozzle or boom-directed nozzle mounted on a vehicle such as a skidder, flex-trac, or an ATV, to spray herbicides onto the foliage of target trees. This method often uses a Radiarc nozzle.



Selection criteria for broadcast foliar

- This method is optimally used on areas that have been previously mowed or hand-slashed to reduce re-sprouts;
- It is often used to treat re-sprouts one to two years after the area has been mowed or slashed; and
- It is recommended for use when there is a high density of target cover at a uniform height. This will reduce the potential for spray runoff to the ground.

Advantages of broadcast foliar

- Broadcast foliar is an efficient method for managing the re-sprouts of high-density target vegetation;
- It targets specific vegetation, with adjustable application rates and dosages; and
- The Radiarc nozzle reduces the amount of herbicide used as optimal sized droplets for the weather conditions are produced, providing coverage of the foliage with limited runoff or drift caused by too large or too small of droplets.

Limitations of broadcast foliar

- Both target and non-target species are treated;
- There is more potential for drift than a selective foliar application;
- Buffer zones may be required to protect pesticide-free zones, depending on wind direction and topography;
- Caution must be exercised to avoid treating areas where desirable species may be affected;
- Broadcast foliar is often limited by terrain, such as steep slopes, large rocks, stumps, and bodies of water;
- In wet terrain, machines cannot operate effectively;
- Broadcast foliar equipment due to its size may result in rutting or disturbance of the ROW; and
- It should not be used on slopes greater than 30% because most machines are unsafe to operate.

3.9.6 Injection techniques

Injection techniques utilize a lance or hatchet to inject herbicide into the cambium layer of the bark of a tree.

Description of technique

There are two injection techniques used: mechanical injection and hack-and-squirt. In mechanical injection, a small capsule containing glyphosate is injected into the stem of the target tree or stump by means of a battery- powered drill or automatic loading lance. The herbicide is slowly released into the sapwood. Hack-and-squirt uses a small axe, machete, or hatchet to cut through the thick bark and into the sapwood. Glyphosate is then squirted into the cut with a bottle.



Selection criteria

- An injection technique should be used when the cut surface method cannot be done;
- It should not be used when there is a risk to line security because the trees do not die immediately;
- It is effective on re-sprouting stumps, provided the capsules are applied to live tissue;
- It can be used in areas of limited access;
- It may also be a good choice around riparian areas;
- Larger-diameter trees are not effectively controlled by injection;
- It is not effective on aspen poplar; and
- Blowdown of dead trees may pose a safety problem alongside well- travelled areas, or to workers re-entering the area.

Advantages of injection technique

- Injection techniques are highly selective and injury to surrounding species is uncommon;
- It is effective on certain species, such as red alder, and for larger trees that cannot be managed with basal applications;
- It is not limited by terrain;
- It is easily learned and safe for the applicator;

- Herbicide use is minimal and self-contained. The potential for worker and public exposure is reduced;
- It reduces the possibility of environmental contamination because it is so directed (although shell casings may be left onsite);
- It removes the canopy, but increases low-growing forage for wildlife; and
- It can be done at any time during the year.

Limitations of injection technique

- In highly visible areas, dead foliage of standing trees may be objectionable;
- Capsules are not bio-degradable;
- There is higher risk of line clearances being compromised because trees continue to grow after treatment, and trees may be occasionally missed for treatment.
- The method is labour intensive; and
- Capsules are not readily available.

4.0 Environmental protection

To address environmental protection requirements this plan is supported by the following documents that outline protection measures, buffers and setbacks, best practices, guidelines and regulatory requirements:

- Environmental Protection Plans
- ANSI A300 Standards for Tree Care and Operations
- Manitoba stream crossing guidelines for the protection of fish and fish habitat
- Timber Harvesting Practices for Forestry Operations in Manitoba (MB Conservation)
- Forest Management Guidelines for Riparian Management Areas (MB Conservation)
- Pesticide Application Requirements For Manitoba Hydro Employees And Contractor

4.1 Sensitive Areas

The integrated vegetation management plan is a guideline that identifies the typical management of vegetation along the transmission ROW, however there may be specific areas that have been identified as sensitive (environmentally, culturally or socially) where special management of vegetation may apply. These areas will be identified as ESS in the applicable Environmental Protection Plan.

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5.0 Decision making framework for herbicide use

Due to regulations and easement agreements, the decision to use herbicides is complex and takes into account a variety of factors, one of which is land tenure. Below is the decision making framework for herbicide treatment for tree control on Crown land, herbicides may be used as a treatment method for an area if the answer is “yes” to any of the questions below:

- Is the area outside of a 30 m “no herbicide buffer” to those Environmentally Sensitive Sites (ESS) that are sensitive to herbicide application, including riparian areas near watercourses or wetlands and areas designated for the protection of plant species of concern and traditional use plant species?
- There are no known organic farms within the treatment area?
- Is the vegetation management objective to create critical habitat for Golden winged-warbler and being affected by dense re-sprouting of tree species?
- Is the area accessible in summer for foliar application?
- Has tree density (>1000s of stems per/hectare) and distribution reached levels that other management options are not economically feasible to control the vegetation (i.e. re-sprouting species such as poplar)?
- Have notifications been made through the First Nations and Metis Engagement process and Pesticide Use Permit Notification process?
- Have modifications to the treatment program (herbicide, location, timing, method) been considered to address concerns received from notification process?

Manitoba Hydro designed the above framework to be utilized by vegetation management specialists as the decision to use any particular treatment method is not as simplistic as yes or no, but must balance numerous environmental factors, many of which are site specific.

5.1 Private land

Manitoba Hydro seeks permission from private land owners to apply herbicides for weed or tree control, if permission is not granted manual or mechanical methods are utilized.

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6.0 Communication

6.1.1 Landowner and Indigenous Engagement

Manitoba Hydro is committed to seeking input on this plan, and any herbicide treatments proposed under this plan on Crown land, from Indigenous communities and organizations through the MMTP Monitoring Committee and the project First Nations and Metis Engagement Process. Landowners will be contacted to discuss vegetation management treatments when they are proposed to occur on their property.

6.1.2 Notice of intent

Manitoba Hydro advertises all planned herbicide treatments on transmission ROW's for the upcoming year in the Winnipeg Free Press and local newspapers as part of the Manitoba Sustainable Development Pesticide Use Permit Application requirements. Indigenous communities, the public and other organizations may submit comments to Manitoba Sustainable Development's Environmental Approvals Branch for consideration when reviewing Manitoba Hydro's application.

6.1.3 Posting of treatment notices

Prior to herbicide treatment, signs will be posted in locations so that they are clearly visible and legible within the treatment area and/or at the access routes to the transmission ROW. The signs shall remain posted for 14 days following herbicide application and contain the date of application, herbicide used and contact information.

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7.0 Monitoring and Follow-Up

After vegetation management work has been completed at a site, information is collected to evaluate the effectiveness of the treatment, and measure the results against the treatment objectives.

The purpose of monitoring treatments is to:

- Evaluate achievement of treatment objectives;
- Review application technique implemented and alternatives;
- Investigate if any negative environmental impacts occurred and take corrective action where necessary; and
- Adapt future vegetation management prescriptions based on knowledge acquired.

Evaluation of the site will require that records of treatment results, effectiveness, and impacts be kept. Data collected during evaluations will consist of qualitative and quantitative observations. These observations may be documented by photographs, field notes, and in some cases representative sample plot measurements.

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8.0 Reporting

Manitoba Hydro reports all herbicide usage annually to Manitoba Sustainable Development as part of the reporting obligations of the Pesticide Use Permit. Manitoba Hydro will also be conducting reviews, and reporting to the Manitoba Sustainable Development - Director of the Environmental Approvals Branch, on the results of integrated vegetation management practices implemented on the Dorsey International Power Line right-of-way of the Development 5 and 10 years after the completion of construction and as determined by the Director thereafter.

8.1 Records Management

Information is a very important element of the IVMP. The implementation of good record management helps ensure that Manitoba Hydro is compliant with any legal requirements and can improve the way various activities are conducted. Any records associated with the IVMP will be filed, retrieved and maintained in the Transmission GIS or the Property Management database.

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Appendix A

Summary of Consultation

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Appendix A: Summary of consultation

Introduction

Below is a summary and evidence of Manitoba Hydro's consultation with potentially affected persons, organizations, Indigenous communities, and federal and provincial authorities regarding the Integrated Vegetation Management Plan (the Plan), including any concerns that were raised, steps that Manitoba Hydro has taken or will take to address those concerns.

Consultation

Draft environmental protection and management plans, including this Plan were uploaded to the Project website and a web page was created in October 2018, including a fillable comment form to provide feedback.

As Manitoba Hydro completed draft plans, Indigenous communities and organizations, landowners, interested parties and the public were notified. Input was sought between May of 2018 until present. Manitoba Hydro sought feedback on this Plan in November of 2018. This was done through the Project website, MMTP Monitoring Committee website, e-campaign, emails, and letters to landowners.

As noted above, the Project website was shared with communities via email and the Plan was also posted on the MMTP Monitoring Committee website.

Concerns raised and steps taken to address concerns

Manitoba Hydro received feedback on this Plan from a MMTP Monitoring Committee Representative Dakota Tipi First Nation (Table 1), Peguis First Nation (Table 2), and a MMTP Monitoring Committee Representative from Peguis First Nation (Table 3).

Manitoba Hydro reviewed the feedback, updated the plan where appropriate including the list of revisions table and provided commenters with a table including their comments and Manitoba Hydro's responses. As a result of this no further feedback has been received from these communities/organizations with regard to this Plan.

Table 1 Comments from a MMTP Monitoring Committee Representative from Dakota Tipi First Nation

Section	Comments from Dakota Tipi First Nation	Manitoba Hydro response, steps taken and rationale
Overall	I reviewed the cultural and heritage resources protection plan, I'm very satisfied with hydro respect and transparent aspect to the plan, as well with the other 10 plans, Dakota Tipi first nation and myself look forward to a respectful positive outcome for all living spirits that will be involved in the construction of the MMTP project	Manitoba Hydro also looks forward to continuing to work with Dakota Tipi First Nation and thanks the Committee Representative for their review of the plans

Table 2 Comments sent via Peguis First Nation

Section	Comments sent via Peguis First Nation	Manitoba Hydro response, steps taken and rationale
Section 3.1 prevention	Under “Integrated Planning” this report states “Development of a Clearing Management Plan for new construction that contains, clearing methods (mulch, salvage, blade, etc) designation of No Clearing Required areas, flora and fauna management areas and timber salvage when required.” Do these methodologies include grubbing or other sub-surface work?	No
	If so, will the project archaeologist be testing these areas prior to the commencement of construction or clearing? If not, why not?	
Section 3.6	“Control practices include a combination of the following: Manual or	No

Section	Comments sent via Peguis First Nation	Manitoba Hydro response, steps taken and rationale
treatment options	<p>mechanical clearing ...”</p> <p>Do these methodologies include grubbing or other sub-surface work?</p>	
	<p>If so, will the project archaeologist be testing these areas prior to the commencement of construction or clearing? If not, why not?</p> <p>“Vegetation control on Manitoba Hydro’s ROWs are achieved primarily through mechanical control (wheeled or tracked prime movers with drum or rotary cutters, Bulldozers with modified brush blades, etc...)”</p> <p>Using bulldozers or other wheeled or tracked machines has the potential to disturb or destroy archaeological sites or artifacts.</p> <p>Will the project archaeologist be testing these areas prior to the commencement of clearing and subsequent construction? If not, why not?</p>	<p>Manitoba Hydro and project Archaeologist are in the process of completing an HRIA in coordination with HRB to clear archaeologically, any identified cultural and heritage sensitive sites prior construction at that site.</p>
Section 3.6.1.4 blading	<p>Blading is the mechanical grubbing and grading of the transmission ROW using excavators or bulldozers to remove all existing vegetation.”</p> <p>Blading will damage any sub-surface archaeological sites or artifacts. Will the project archaeologist be testing these areas prior to commencement of blading and subsequent construction? If not, why not?</p>	<p>Manitoba Hydro and project Archaeologist are in the process of completing an HRIA in coordination with HRB to clear archaeologically, any identified cultural and heritage sensitive sites prior construction at that site.</p>

Table 3 Comments from a MMTP Monitoring Committee Representative from Peguis First Nation















Section	MMTP Monitoring Committee representative comments from Peguis First Nation	Manitoba Hydro response, steps taken and rationale
<p>Page 6 – 1.2 Commitment to environmental protection and indigenous engagement:</p>	<p>Statement “To date MBH has heard extensive comments and concerns through its engagement processes, Clean Environment Commission Hearing as well as the National Energy Board proceedings related to the use of herbicides as part of the IVMP”.</p> <p>Question/Concern: Why does MBH use a different form of herbicide they say is not harmful? Why not stop using herbicides altogether?</p>	<p>All herbicides by their nature are harmful to plants, Manitoba Hydro selects herbicides that are selective to the types of vegetation that are affected minimizing damage to non-target vegetation such as grasses. Through an integrated vegetation management approach when herbicide use is prescribed, Manitoba Hydro selects the proper application method, herbicide and rate of application along with numerous other environmental and safety measures to minimize harm to the environment.</p> <p>As described by the Commission in the CEC Report (pg 134). Herbicides are an important tool in integrated vegetation management to reduce impacts to the environment during maintenance events. Using purely mechanical and manual methods would likely require more regular clearing. This would lead to greater greenhouse gas emissions, the destruction of</p>

Section	MMTP Monitoring Committee representative comments from Peguis First Nation	Manitoba Hydro response, steps taken and rationale
		<p>ground-based nests and increased disturbance of wildlife. The key is to ensure the right methods are being applied in the right locations with the minimum volumes of herbicide applied to achieve acceptable control.</p>

Draft environmental protection and management plans, were uploaded to the Project website and a web page was created in October 2018, this Plan was added to the website November 2018. A recent screen shot of the Manitoba Hydro Project Website is below (Figure A).

Environmental protection and management – draft plans

The draft plans are used as guides for contractors and field personnel during the construction of MMTP. They ensure environmental legislation requirements are met and the environment is protected.

-  [Clearing Management Plan \(Draft\)](#) (PDF, 882 KB)
-  [NEW Blasting Management Plan \(Draft\)](#) (PDF, 382 KB)
-  [Erosion and Sediment Control Plan \(Draft\)](#) (PDF, 8.8 MB)
-  [Golden Winged-Warbler Habitat Management Plan \(Draft\)](#) (PDF, 741 KB)
-  [Cultural and Heritage Resources Protection Plan \(Draft\)](#) (PDF, 5.8 MB)
-  [Navigation and Navigation Safety Plan \(Draft\)](#) (PDF, 5.5 MB)
-  [Waste and Recycling Management Plan \(Draft\)](#) (PDF, 3.2 MB)
-  [NEW Construction Emergency Response Plan \(Draft\)](#) (PDF, 1.2 MB)
 - [NEW Dorsey Converter Station Emergency Response Plan \(Draft\)](#) (PDF, 1.7 MB)
 - [NEW Glenboro Station Emergency Response Plan \(Draft\)](#) (PDF, 1.3 MB)
 - [NEW Riel Converter Station Emergency Response Plan \(Draft\)](#) (PDF, 3 MB)
-  [Rehabilitation and Invasive Species Management Plan \(Draft\)](#) (PDF, 7.3 MB)
-  [Biosecurity Management Plan \(Draft\)](#) (PDF, 2.2 MB)
-  [Construction Access Management Plan \(Draft\)](#) (PDF, 86.4 MB)
-  [Construction Environmental Protection Plan \(Draft\)](#) (PDF, 55.8 MB)
-  [Environmental Monitoring Plan \(Draft\)](#) (PDF, 2 MB)
-  [Integrated Vegetation Management Plan \(Draft\)](#) (PDF, 815 KB)

If you would like to provide us with your feedback on these draft plans, [complete and submit this form](#).

If you cannot view these documents or you need accessible formats, [contact us](#).

We will be adding new and updated plans as we incorporate feedback. Sign up to get notified of these changes:

Email

Figure A screen shot of Manitoba Hydro project page website

A fillable comment form to provide feedback was created in October 2018. A screen shot of the fillable comment sheet can be found below (Figure B).

Environmental protection and management – draft plans feedback

First name

Last name

Address

Phone

Email

Do you represent an Indigenous community or organization?

☐

Yes

☐

No

Draft plan(s) you reviewed (select all that apply):

☐

Access Management|

- ☐ Biosecurity Management
- ☐ Clearing Management
- ☐ Construction Environmental Protection
- ☐ Cultural and Heritage Resources Protection
- ☐ Environmental Monitoring
- ☐ Erosion and Sediment Control
- ☐ Golden Winged-Warbler Habitat Management

For each plan you selected above, share your comments, concerns, and suggestions for how your concerns might be addressed.

Submit

Figure B Fillable comment form to provide feedback

Draft environmental protection and management plans were uploaded to the MMTP Monitoring Committee website in October 2018. A screen shot of the MMTP Monitoring Committee website is below (Figure C).

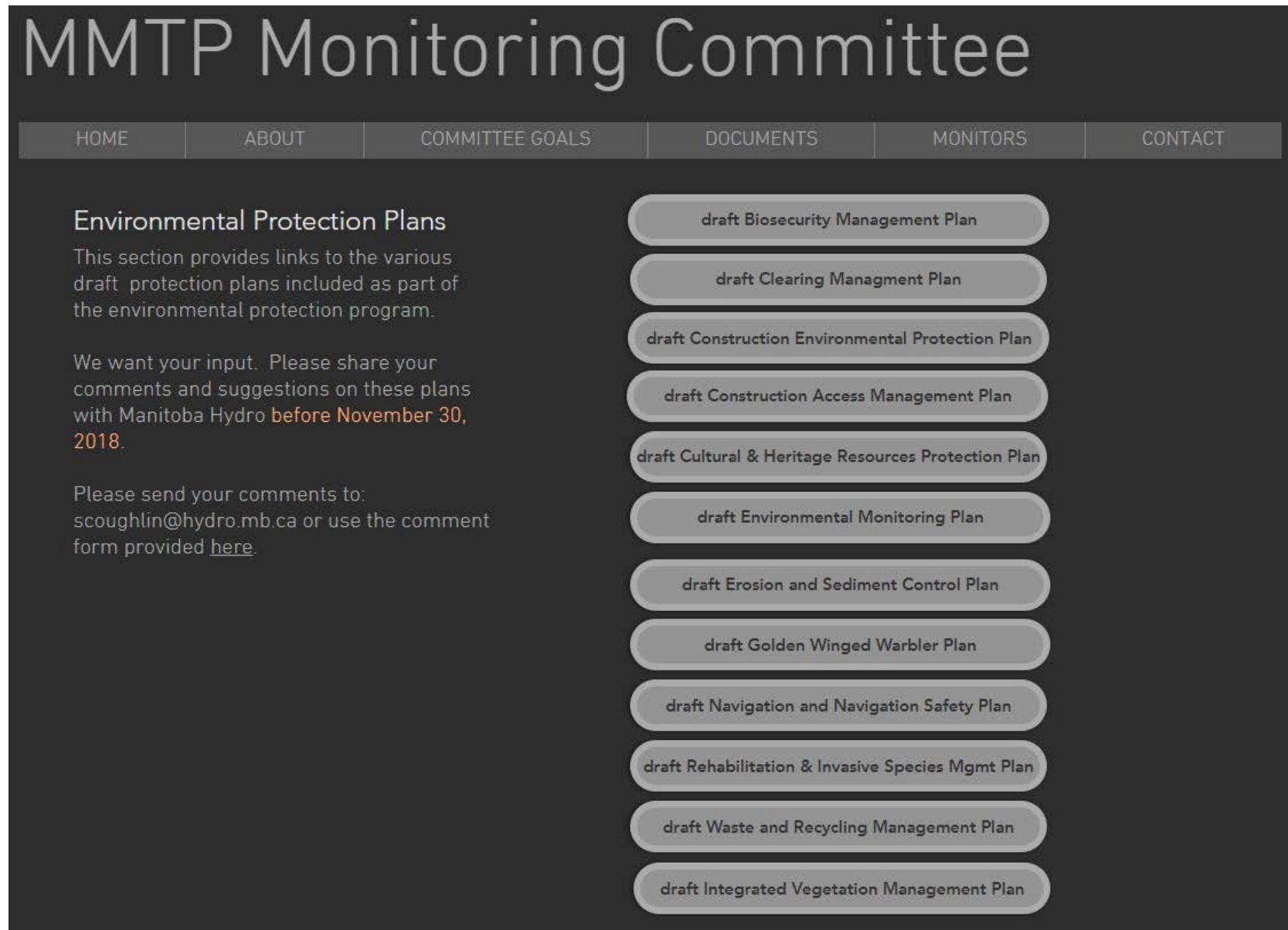


Figure C MMTP Monitoring Committee website screenshot

Below is a screen shot of the e-campaign that was sent to 825 recipients (Figure D.

The screenshot shows an email header with the Manitoba Hydro logo and the title "Manitoba-Minnesota Transmission Project update". The main content is titled "Environmental protection and management – draft plans" and includes three paragraphs of text with hyperlinks. A "Contact us" section follows with a bulleted list of contact options. The footer contains a grey bar with social media icons, a paragraph about email delivery, a link to unsubscribe, contact information, and copyright details.

Manitoba Hydro **Manitoba-Minnesota Transmission Project update**

Environmental protection and management – draft plans

We are looking for feedback on draft environmental protection and management plans for the Manitoba-Minnesota Transmission Project (MMTP). The [plans are available for your review](#).

We invite you to share your feedback on these draft plans. To do so, [complete and submit this form](#) before November 30, 2018.

We will be adding new and updated plans to the website as we incorporate feedback. [Sign up](#) to get notified of these changes.

Contact us

- Email the [Manitoba-Minnesota Transmission Project](#).
- Phone 204-360-7888 or toll-free 1-877-343-1631.
- Visit our [project website](#).

To ensure our email always reaches your inbox, add info@mbhydromail.ca to your address book. This email was intended for mallain@quadrantgeomatics.com.
[Unsubscribe](#) from this email.

Contact us at customerservice@hydro.mb.ca or call toll-free at 1-888-624-9376.

Manitoba Hydro, 360 Portage Ave., Winnipeg, MB R3C 0G8
204-480-5900 | www.hydro.mb.ca

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Available in accessible formats upon request.





   

Figure D e-campaign screenshot

Below is the content from the letter sent to landowners (Figure E).



2018 10 24

«Landowner»
«Owner_address»
«City», MB «POSTAL_CODE»

Manitoba-Minnesota Transmission Project: Draft environmental protection and management plans

«Landowner»,

As part of planning for the Manitoba-Minnesota Transmission Project (MMTP), Manitoba Hydro is seeking feedback on draft environmental protection and management plans. The following is a link to the document library that contains these plans: https://www.hydro.mb.ca/projects/mb_mn_transmission/document_library.shtml.

The information you have shared regarding your land through discussions with me, Manitoba Hydro property agents, or with our Environment Officer Evan Johansson, have and will inform the details of these plans.

We would like to hear your feedback regarding these plans in a manner that works best for you. The website has a link to a comment form for the plans. Please feel free to call me at «Liaison_phone_number» to share your feedback directly or to set up a site meeting with Evan Johansson please call 204-360-3731, if you have not had the opportunity to do so. We are accepting feedback until November 30, 2018.

We will be adding new and updated plans to the website as we incorporate feedback. I encourage you to visit the Project website (www.hydro.mb.ca/mmtp) for more information or to sign up for project updates.

Please note that Manitoba Hydro will not be moving forward with construction until it has received regulatory approvals.

Yours truly,

«Liaison»

360 Portage Avenue (3) • Winnipeg Manitoba Canada • R3C 0G8
Telephone / N° de téléphone : 1-877-343-1631
MMTP@hydro.mb.ca

Figure E Content from the letter sent to landowners

Below is a screen shot of an email sent to the MMTP Monitoring Committee (Figure F).

From: Coughlin, Sarah
Sent: Friday, October 19, 2018 5:31 PM
To:

[REDACTED]
[REDACTED]
Cc: [REDACTED]
[REDACTED]
Subject: RE: MMTP Monitoring Committee Meeting October 10, 2018

Please find attached draft minutes for the October 10, 2018 MMTP Monitoring Meeting. Please submit any changes/comments by October 31, 2018 and mark your calendars for **November 14, 2018** - the next MMTP Monitoring Meeting at Dakota Tipi First Nation offices near Portage la Prairie, Manitoba. [REDACTED]

[REDACTED]
[REDACTED]
[REDACTED]
[REDACTED]

At the October 10, 2018 meeting the group was asked to provide comment on a series of draft environmental management and protection plans. Manitoba Hydro is seeking comments on these draft plans from MMTP Monitoring Committee members. Attached you'll find a short description of each to help determine if the plan is of interest to you. Each of these draft plans guides contractors and field personnel while constructing the Manitoba-Minnesota Transmission Project in a manner that meets environmental legislation requirements and protects the environment. We'd like to hear comments or concerns in a manner that works best for you. Please feel free to call me at (204)360-3016 to share your comments directly or to set up a meeting with us. You can also visit our project website at [where a comment form has been provided for the plans](https://www.hydro.mb.ca/projects/mb_mn_transmission/document_library.shtml). We are accepting comments until November 30, 2018. The draft plans are linked here:
https://www.hydro.mb.ca/projects/mb_mn_transmission/document_library.shtml

Thank you and I look forward to seeing you on November 14!

Sarah Coughlin
Senior Environmental Specialist
Licensing & Environmental Assessment
Transmission, Manitoba Hydro
360 Portage Ave, Winnipeg, MB
w (204) 360-3016
c (204) 918-9848
scoughlin@hydro.mb.ca

Figure F Screen shot of an email sent to the MMTP Monitoring Committee

Below is a follow-up email sent to the MMTP Monitoring Committee (Figure G).

From: Coughlin, Sarah

Sent: Thursday, November 01, 2018 11:30 AM

Cc: MMTP

Subject: Manitoba Minnesota Transmission Project Draft Environmental Protection Plan Review

Good morning. As part of our ongoing engagement on the Manitoba Minnesota Transmission Project we would like to notify you that we have posted Draft Environmental Protection and Management Plans on the Project website (https://www.hydro.mb.ca/projects/mb_mn_transmission/document_library.shtml) and are looking to gather feedback on these plans by November 30th.

Please note that notification that these plans have been posted is also being shared with landowners, participants of the MMTP Monitoring Committee, and those that have signed up for e-blast notifications so you may have already received this notice through another communication avenue.

Each of these draft plans, guides contractors and field personnel while constructing the Manitoba-Minnesota Transmission Project in a manner that meets environmental legislation requirements and protects the environment. It is noted below where the plan is new or updated since provided initially through the regulatory process:

- draft Environmental Monitoring Plan (updated)
- draft Construction Environmental Protection Plan (updated)
- draft Cultural and Heritage Resources Protection Plan (updated)
- draft Biosecurity Management Plan (new draft plan)
- draft Clearing Management Plan (new draft plan)
- draft Right-of-Way Habitat Management Plan for Managing Critical Golden-winged Warbler Habitat during Construction and Operation(no change)
- draft Erosion and Sediment Control Plan (new draft plan)
- draft Navigational Safety Plan Summary (new draft plan)
- draft Rehabilitation and Invasive Species Management Plan (updated)
- draft Waste and Recycling Management Plan (new draft plan)
- draft Access Management Plan (updated)

Feel free to contact me ((204)360-3016) should you have feedback you would like to provide, or you are welcome to make use of the comment forms that are available on the website as well.

We look forward to hearing your feedback or responding to questions about this notification.

Sarah Coughlin

Senior Environmental Specialist

Licensing & Environmental Assessment

Transmission, Manitoba Hydro

360 Portage Ave, Winnipeg, MB

w (204) 360-3016

c (204) 918-9848

scoughlin@hydro.mb.ca

Figure G Follow-up email sent to the MMTP Monitoring Committee

Below is a screen shot of an email sent to interested parties (Figure H) and a list of the interested parties (Table 4)

As part of our ongoing engagement on the Manitoba Minnesota Transmission Project we would like to notify you that we have posted Draft Environmental Protection and Management Plans on the Project website (https://www.hydro.mb.ca/projects/mb_mn_transmission/document_library.shtml) and are looking to gather feedback on these plans by November 30th. You are receiving this email as you were a participant in the Clean Environment Commission Hearings and the National Energy Board hearing process for the Project.

(please note that notification that these plans have been posted is also being shared with landowners, participants of the MMTP Monitoring Committee, and those that have signed up for e-blast notifications so you may have already received this notice through another communication avenue)

Most of these draft plans were shared prior to, or during, the hearing processes. It is noted below where the plan is new since the hearing process, or updated since that time. Each of these draft plans, guides contractors and field personnel while constructing the Manitoba-Minnesota Transmission Project in a manner that meets environmental legislation requirements and protects the environment.

- draft Environmental Monitoring Plan (updated)
- draft Construction Environmental Protection Plan (updated)
- draft Cultural and Heritage Resources Protection Plan (updated)
- draft Biosecurity Management Plan (new draft plan)
- draft Clearing Management Plan (new draft plan)
- draft Right-of-Way Habitat Management Plan for Managing Critical Golden-winged Warbler Habitat during Construction and Operation(no change)
- draft Erosion and Sediment Control Plan (new draft plan)
- draft Navigational Safety Plan Summary (new draft plan)
- draft Rehabilitation and Invasive Species Management Plan (updated)
- draft Waste and Recycling Management Plan (new draft plan)
- draft Access Management Plan (updated)

Feel free to contact me (204-360-7677) or Sarah Coughlin (204-360-3016) should you have feedback you would like to provide, or you are welcome to make use of the comment forms that are available on the website as well.

We look forward to hearing your feedback.

Kind regards,

Maggie Bratland

Figure H Sample email sent to interested parties

Table 4 Manitoba Hydro's list of interested parties for the Project includes the following organizations

Interested parties list
Beausejour Community Planning Services
Beef Producers of Manitoba
Bird Atlas
Canadian Parks and Wilderness Society (CPAWS)
City of Steinbach
City of Winnipeg
Consumers Association of Canada
Cooks Creek Conservation District
Dairy Farmers of Manitoba
DOA Outfitters

Interested parties list

Ducks Unlimited

Forest Industry Association of Manitoba

Green Action Centre

HyLife, Land Manager

Integrated Resource Management Team (Eastern Region)

Keystone Agricultural Producers

La Salle Redboine Conservation District

Local Urban District of Richer, Committee Member-Chairperson

Macdonald-Ritchot Planning District

Manitoba Indigenous and Northern Relations

Manitoba Aerial Applicators

Manitoba Agriculture (Land Use)

Manitoba Agriculture (Agri-Resource Branch)

Manitoba Association of Cottage Owners

Manitoba Bass Anglers (MBA)

Manitoba Canoe & Kayak Centre - Winnipeg

Manitoba Chamber of Commerce

Manitoba Chicken Producers

Manitoba Climate Change and Air Quality

Manitoba Crown Lands

Manitoba Fly Fishing Association (MFFA)

Manitoba Forestry Association

Manitoba Groundwater Management

Manitoba Habitat Heritage Corporation

Manitoba Historic Resources Branch

Manitoba Infrastructure

Manitoba Infrastructure Highway Engineering

Manitoba Infrastructure Highway Regional Operations

Office of Fire Commissioner

Manitoba Lodges and Outfitters Association

Manitoba Paddling Association

Manitoba Parks and Regional Services - Parks and Protected Spaces

Manitoba Petroleum Branch

Manitoba Pork Council (Industry Services Co-ordinator)

Manitoba Protected Areas Initiative

Manitoba Public Health

Manitoba Resource Development Division Growth, Enterprise and Trade

Manitoba Sustainable Development

Manitoba Sustainable Development (Aboriginal Relations)

Manitoba Sustainable Development (Office of Drinking Water)

Interested parties list

Manitoba Sustainable Development (Water Control Works and Drainage Licensing)

Manitoba Sustainable Development (Water Quality Management)

Manitoba Trails Association

Manitoba Trappers Association

Manitoba Sustainable Development (Fish and Wildlife)

Manitoba Water Use Licensing

Manitoba Woodlot Association

Maple Leaf Agri-Farms

Nature Conservancy of Canada

Organic Producers Association of Manitoba Co-Operatives Inc.

Paddle Manitoba

Portage la Prairie Community Planning Services

REDBOINE BOATING CLUB

Rural Municipality of Glenboro South - Cypress

Rural Municipality of Headingley

Rural Municipality of La Broquerie

Rural Municipality of McDonald

Rural Municipality of Piney

Rural Municipality of Ritchot

Rural Municipality of Rosser

Rural Municipality of Springfield

Rural Municipality of Ste. Anne

Rural Municipality of Stuartburn

Rural Municipality of Tache

Ruth Marr Consulting

Save the Seine

Seine-Rat River Conservation District

Sharp-Tails Plus Foundation

Sno-Man Inc

South East Snoriders

Southwood Golf & Country Club

St. Norbert Ward - Winnipeg

St. Vital Ward - Winnipeg

Steinbach Community Planning Services

Steinbach Game & Fish Gun Range Inc

Town of St. Pierre Jolys

Town of Ste. Anne

Trails Manitoba

TransCanada Pipelines Limited

Interested parties list
Travel Manitoba
Village of Glenboro
Wa Ni Ska Tan
Walleye Anglers Association of Manitoba (WAAM)
Wilderness Society
Winnipeg Rowing Club