

# FortisBC (Electrical) Rights-of-Way Pest Management Plan

**PMP Confirmation #: 799-0013-15/20**



**Expires May 6, 2020**

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## **1.0 Introduction**

### **1.1 FortisBC Background**

FortisBC Inc. is an integrated regulated electric utility based in Kelowna, British Columbia. The Company serves approximately 161,000 customers throughout its service area in the West Kootenay, Okanagan and Boundary areas of the Province.

The Company is cognizant that the presence of pests can adversely impact infrastructure integrity that can threaten worker and public safety and can compromise system reliability. As part of the FortisBC Environmental Responsibility Policy, the Company is committed to the delivery of safe, reliable power in an environmentally responsible manner.

Compliance with environmental regulations is part of the Policy commitments and is a duty that FortisBC takes seriously. The British Columbia *Integrated Pest Management Act* requires that management of vegetation on specified industrial sites be approved under a single, comprehensive Pest Management Plan (PMP). The PMP ensures:

- Compliance with the provisions of the *Integrated Pest Management Act* and other applicable Federal, Provincial and regional laws and regulations;
- The responsible use of pesticides;
- The incorporation and use of integrated pest management; and,
- Public awareness of FortisBC's pest management programs.

The Company is cognizant that the presence of pests can adversely impact infrastructure integrity that can threaten worker and public safety and can compromise system reliability. In 2009, FortisBC developed a Pest Management Plan (PMP) to deal with vegetation issues on its rights-of-way including transmission and distribution corridors and access roads. FortisBC received authorization for this PMP under Confirmation Number 799-0007-10/15.

This PMP has been prepared to replace PMP No. 799-0007-10/15 that expired on May 6, 2015. The PMP uses the principles of integrated pest management and is designed to control and/or eradicate unwanted vegetation on FortisBC Rights-of-way. Noxious weeds and invasive plants are controlled by local weed committees and are not included under this PMP.

## **1.2 Geographic Boundaries of the Area to Which This Plan Applies** [IPMR Section 58(1)(a)]

This PMP applies to all FortisBC transmission line and distribution line rights-of-way throughout the FortisBC service area. Attached hereto and marked as Appendix 1 is a map describing the geographic boundaries of the area to which this plan applies.

## **1.3 Pest Management Plans**

Under the British Columbia *Integrated Pest Management Act* a PMP is defined as a plan that describes:

- A program, for managing pest populations or reducing damage caused by pests, based on integrated pest management; and,
- The methods of handling, preparing, mixing, applying and otherwise using pesticides within the program.

According to the Act the term pesticide means a microorganism or chemical or other material that is used to prevent, destroy, repel, or mitigate a pest.

FortisBC, its contractors and agents, will use this PMP when carrying out vegetation management activities on rights-of-way transmission lines and distribution lines throughout the FortisBC service area.

## **1.4 Person Responsible for Managing Pests** [IPMR Section 58(1)(b)(c)]

Within FortisBC, the person responsible for managing pests and the principal contact for information relating to this PMP is:

Brad Wright  
FortisBC Inc.  
1975 Springfield Road  
Kelowna, BC V1Y 7V7  
(250) 717 0804  
[Brad.Wright@FortisBC.com](mailto:Brad.Wright@FortisBC.com)

## **1.5 FortisBC Rights-of-Way**

Rights-of-way (ROW) addressed under this PMP include transmission corridors, distribution networks and access roads that are used to house utility infrastructure such as poles, power lines and some facilities such as substations.

Transmission corridors contain the largest voltage power lines in the FortisBC service area and include approximately 1,500 km of 60kV, 138kV, 170kV and 230kV lines. As well as moving power from the FortisBC hydroelectric generating sites on the Kootenay River, these lines are connected into the external power grid that supplies electricity throughout North America.

Distribution networks are the lower voltage lines that supply directly to the customer. ROWs for these lines can be similar but smaller to transmission corridors and are typically situated adjacent to existing road networks.

Access roads provide vehicular and worker entry to ROWs for routine operations and maintenance, safety inspections and emergency response.

Electricity is an essential part of each person's lives for economic, health, social and safety needs; therefore, a well defined ROW Pest Management Plan is critical for FortisBC to ensure reliable power supply to its customers. See Appendix I for ROW clearance specifications.

## 2.0 ROW Pest Management Using IPM Principles

Vegetation must be managed within and around FortisBC ROWs to:

- Eliminate vegetation with growth potential capable of contact with power lines; and,
- Remove hazards such as tree failure and wildfire potential to eliminate powerline contact.

### 2.1 The Principles of IPM

In order to ensure effective vegetation management on all of its ROW corridors, FortisBC has adopted the principles of IPM into company programming. IPM means a process for managing pest populations that includes the following activities:

- **Planning (prevention)** and managing ecosystems to prevent organisms from becoming pests;
- **Identifying** pest problems and potential pest problems;
- **Monitoring** populations of pests and beneficial organisms; damage caused by pests and environmental conditions;
- **Using injury (treatment) thresholds** in making treatment decisions,
- **Suppressing (pest treatment options and method selection)** pest populations to tolerable levels using strategies based on consideration of biological, physical, cultural, mechanical, behavioural and chemical controls in appropriate combinations and environmental and human health protection; and,
- **Evaluating** the effectiveness of pest management strategies.

## 2.2 Prevention [IPMR Section 58(2)(a)]

Preventative measures, such as regular vegetation management cycles, hazard tree identification and shared planning, are aimed at stopping the initial growth and spread of unwanted vegetation and are an integral part of an IPM program.

Under its prevention program, FortisBC conducts regular patrols. Information such as hazard tree identification, vegetation management requirements, clearances and anticipated cycle times is gathered during these patrols. From this information FortisBC is able to establish regular vegetation management cycles and hazard tree removal schedules.

Using the results of inspection information and available information on average growth rates for the various species of trees in each area, a plan is designed so that each area is managed on an appropriate and regular cycle (e.g., every 3 years). Where feasible preventative measures are incorporated into corridor designs prior to construction, or may be implemented during infrastructure upgrades. In some instances, these measures may reduce the need for future maintenance requirements of pesticide and non-pesticide control methods. Descriptions of the preventative methods of vegetation management that will be used under this PMP are shown in Table 1.

**Table 1 Description of Preventative Methods of Vegetation Management**

<b>Prevention Methodology</b>	<b>Description</b>
<b>Vegetation Management Cycles</b>	<ul style="list-style-type: none"> <li>• Designed to ensure public safety and system reliability are maintained.</li> <li>• Cycle times normally 3 years.</li> <li>• In wet areas where the vegetation is fast growing, such as the interior rain forest of the West Kootenay region, a cycle may be reduced to 2 years. In drier areas, such the Okanagan and Similkameen Valleys, cycle times may be extended to 4 years, especially for areas with slow growing vegetation. In some urban areas heavily affected by homeowner irrigation, the cycle may be a 4 year / 2 year combination, where selected locations are managed every 2 years.</li> <li>• Several FortisBC transmission corridors traverse different biogeoclimatic zones; therefore, the vegetation management cycle may not be consistent throughout the length of line.</li> </ul>
<b>Hazard Tree Identification</b>	<ul style="list-style-type: none"> <li>• Critical and ongoing activity.</li> <li>• Criteria include dead, dying or infirm trees due to physical conditions (wind shock, snow loading, lightening, weakened root structure, etc.) or forest health issues (fir bark beetle, mountain pine beetle, birch worm, spruce bud worm, etc.).</li> </ul>
<b>Shared Planning</b>	<ul style="list-style-type: none"> <li>• Setting and enforcing clearance specifications for new construction, for customer owned facilities and secondary conductors are examples of preventative measures designed to reduce the likelihood of electrical outages by reducing the incidence of line contacts.</li> </ul>

## 2.3 Pest Identification *[IPMR Section 58(2)(b)(ii)]*

Unwanted vegetation has the potential to adversely impact FortisBC's facilities and infrastructure and to threaten the safety of employees and the public.

Accurate identification of unwanted vegetation on or adjacent to FortisBC ROWs enable the company to better understand growth rates and characteristics, predict locations and whether or not control is warranted or desirable. By understanding the pests along its ROW corridors, FortisBC has a better appreciation of the types of control methods needed/available, and the appropriateness of application. In some cases pest species may be easily controlled by non-chemical methods, yet others may only be effectively managed through a combination of non-chemical and chemical methods. Re-sprouting of certain deciduous tree species, for example, are best controlled by manual cutting followed by the application of a pesticide (i.e. a herbicide) to the freshly cut stump.

### 2.3.1 Growth Stages of Plants

Table 2 describes the four stages of development typical of most plants:

**Table 2 The Four Stages of Development Typical of Most Plants**

<b>Plant Development Stage</b>	<b>Characteristics</b>	<b>Effectiveness of Chemical Treatment</b>
Seedling	<ul style="list-style-type: none"> <li>• Seed leaves and the first true leaves may be present</li> <li>• Plants are small and easily controlled by both chemical and non-chemical methods</li> </ul>	<ul style="list-style-type: none"> <li>• Good.</li> <li>• Less waxy coating allows better penetration of leaf surface.</li> <li>• Younger plants have small roots systems near the soil surface.</li> <li>• Small size of the plants requires less herbicide</li> <li>• Less likelihood of unsightly patches of dead weeds or brush.</li> </ul>
Vegetative	<ul style="list-style-type: none"> <li>• Rapid growth of stems, foliage and roots.</li> <li>• Rapid uptake of water and nutrients,</li> <li>• Greater movement of water and nutrients throughout the plant</li> </ul>	<ul style="list-style-type: none"> <li>• Very effective</li> </ul>

Reproductive	<ul style="list-style-type: none"> <li>• Flowering and seed production stage</li> <li>• Uptake of water and nutrients is reduced</li> <li>• Plant growth is limited.</li> <li>• Water and nutrients directed to the reproductive parts, including flowers, fruit and seeds.</li> <li>• Movement of plant food to the roots is reduced</li> </ul>	<ul style="list-style-type: none"> <li>• Herbicide use is less effective</li> <li>• As plants become larger, the leaves are more difficult to penetrate, and their roots are deeper and have more stored food.</li> </ul>
Senescent (Mature)	<ul style="list-style-type: none"> <li>• Little or no plant growth</li> <li>• Movement of water, nutrients and any chemical treatment is very slow.</li> </ul>	<ul style="list-style-type: none"> <li>• Ineffective</li> </ul>

### 2.3.2 Vegetation Classification

ROW vegetation can be grouped into several broad categories according to their growth form. Categories include grasses, sedges, broadleaves (forbs), ferns, vines and woody plants (brush, trees, shrubs). Woody plants and vines are the only problem vegetation on ROWs and are described in the Table 3 below:

**Table 3 Problem Vegetation and Their Characteristics**

<b>Problem Vegetation</b>	<b>Characteristics</b>
<b>Vines</b>	<ul style="list-style-type: none"> <li>• Can be either woody or herbaceous.</li> <li>• Often have persistent, woody stems.</li> <li>• Easily invade weed-free areas.</li> <li>• Can climb utility poles and signs, and can severely reduce access to structures.</li> <li>• Most vines are perennials but a few are annuals.</li> </ul>
<b>Woody Plants: Brush, Trees &amp; Shrubs</b>	<ul style="list-style-type: none"> <li>• Perennials that reproduce by seed or from sprouting roots.</li> <li>• Brush and shrubs have several stems that grow to 3 meters in height.</li> <li>• Trees divided into hardwoods (deciduous) and conifers usually have a single stem and grow greater than 3 meters in height.</li> <li>• Trees are the primary target in rights-of-way vegetation management due to their height and potential for contact with lines.</li> <li>• For conifers: mechanical, non-chemical methods are the preferred control due to ability to re-sprout from cut areas.</li> <li>• For deciduous trees: a combination of mechanical methods followed by the selective application of herbicides to eliminate re-sprouting is preferred.</li> </ul>

## 2.4 Monitoring Populations of Problem Vegetation *[IPMR Section 58(2)(c)]*

Monitoring problem vegetation, including hazard trees, is an essential planning and prevention tool for the FortisBC Vegetation Management Program. Results of monitoring inspections/patrols are used to determine what action is required to minimize risks associated with the possibility of vegetation coming into contact with transmission and distribution lines. FortisBC uses tree risk identification and evaluation processes to make decisions regarding what potential hazards may be associated with a particular tree or groupings of trees. Table 4 provides a summary of the FortisBC monitoring program that is completed on a regular basis:

**Table 4 Summary of the FortisBC Monitoring Program**

<b>Monitoring Method</b>	<b>Data Collection</b>
Helicopter Patrol	GPS, species, physical location, hazard rating*
Ground Patrol	GPS, species, physical location, hazard rating*
Public/ Internal Reports	Site specific work plan

- \* hazard rating – is determined by the combination of (1) the presence of vegetation that could grow into contact with transmission and distribution lines, and (2) the presence of trees that are defective (i.e. hazard trees) that could hit or damage transmission or distribution lines when they fall.

## **2.5 Injury Thresholds and How Treatment Decisions Are Chosen and Applied** *[IPMR Section 58(2)(d)]*

The decision to initiate treatment for problem vegetation is based almost exclusively on clearance specifications. The intent is to remove tree species that have the potential to grow into energized conductors. Clearance requirements for existing lines/rights-of-way depend on line voltage. Special clearance requirements for radial circuits to mountain repeaters are summarized in Appendix 1.

## **2.6 Treatment Options & Selection Criteria** *[IPMR Section 58(2)(e)]*

IPM involves the use of different techniques to control undesirable vegetation on FortisBC transmission and distribution rights-of-way. The selection of a particular technique will depend on:

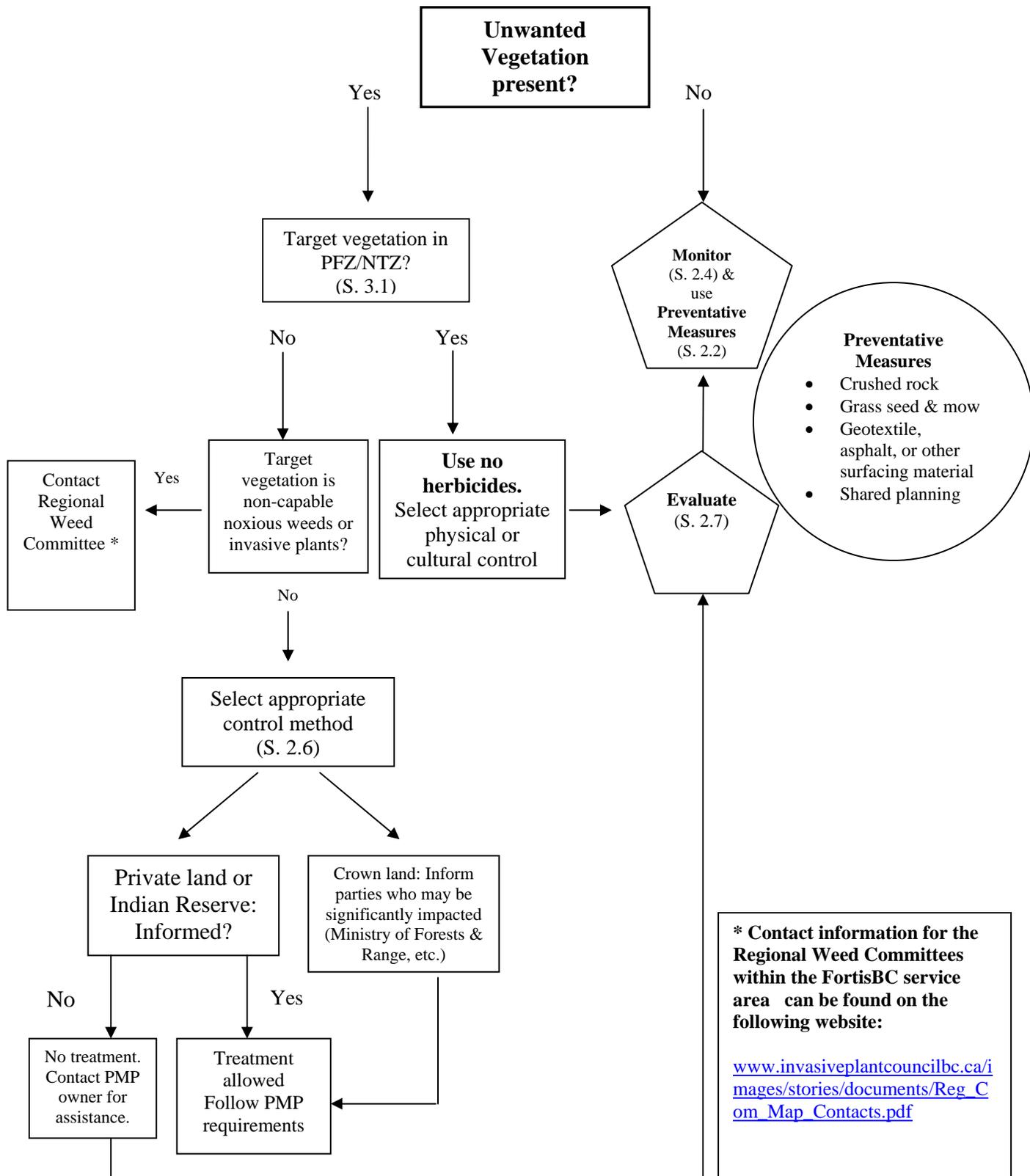
- How required clearance specifications can be achieved;
- Land use (including public versus private and adjacent land uses);
- Proximity of water sources, bodies of water and other environmentally sensitive features;
- The possibility of adverse impacts to wildlife, fish, surrounding land, workers and adjacent residents;
- Safety, security and economic impacts;
- Existing soil types, weed species present, objectives of control, and how these relate to the suitability of the particular method(s) being considered;
- Site accessibility; and,
- The consequences of not treating.

General site conditions and environmental sensitivities are assessed during regular inspections or during patrols, and again immediately prior to control measures being implemented.

A Treatment Decision Tree, such as is shown on the following page, can be used to determine the most appropriate IPM technique to employ for problem vegetation.

The IPM techniques proposed for use under this PMP on or adjacent to FortisBC transmission and distribution rights-of-way include physical controls, cultural controls, biological controls, and chemical controls (herbicides). Physical controls will be primarily considered in the selection process to manage problem vegetation. Herbicides will be combined with physical treatments where physical treatments alone are not providing effective vegetation management. The targeted purpose for each herbicide approved under this PMP is discussed in detail later in this section. During all use of herbicides, disturbance to low growing vegetation will be minimized when controlling woody vegetation by selective applications.

### Treatment Decision Tree



## 2.6.1 Non-Chemical Treatment Options

### 2.6.1.1 Physical Control Methods

Physical controls may include slashing, mowing, pruning and burning. Table 5 provides a description and rationale, and the benefits and limitations of each of these physical treatment methods.

**Table 5: Description and Rationale, Benefits and Limitations of Physical Control Methods**

Description & Rationale	Benefits/Limitations
<p><b>Selective Slashing</b> is the primary physical method to remove problem vegetation, and involves the use of chain saws or other appropriate tools to selectively cut problem vegetation to ground level in order to maintain the required clearance specifications. For conifer trees, re-sprouting will not occur if all green branches are removed. For deciduous trees, herbicide may be applied to the cut stump area to prevent re-sprouting.</p>	<p>Species specific, and enables desirable vegetation to be left on the right-of-way.</p> <p>Useful for deciduous vegetation control, as it allows the follow-up selective application of herbicides to cut surfaces to inhibit re-sprouting.</p> <p>Can be done without decreasing slope stability, increasing erosion potential or causing damage to the streambed of bodies of water and riparian areas</p> <p>Generally not suitable or economical for areas with high stem densities (&gt; 5,000 to 10,000 coniferous stems per hectare or &gt; 10,000 to 20,000 deciduous stems per hectare), or where the problem vegetation is greater than 4 meters in height.</p> <p>It may also be dangerous for workers if the vegetation is dense, or is located in areas of steep terrain.</p> <p>Selective slashing taller vegetation generally results in an excessive amount of debris that could become an increased fire risk. Appendix 3 provides more details on selective slashing.</p>
<p><b>Mowing</b> is the use of mechanized mowers such as tractor-mounted mowers, grade all or hydro axes to remove all ROW vegetation to ground level.</p>	<p>Less expensive than other physical methods, as problem vegetation can be removed faster.</p> <p>Generally not suitable for use in areas that are rocky, have stumps, or that are on slopes or boggy areas, due to restricted access and/or worker safety considerations.</p> <p>Not suitable for use in riparian areas or in areas where low-growing compatible species predominate.</p> <p>Often promotes the re-sprouting of deciduous vegetation, resulting in the need for future treatments or herbicide applications to inhibit re-sprouting. Because mowing uses wheel or track-mounted equipment, there is generally widespread soil disturbance (track marks and rutting) that can lead to the establishment of noxious weeds and invasive plants.</p>

	<p>Although less labour intensive and therefore less expensive it is not selective and both desirable and undesirable species are removed.</p> <p>Mowing mulches the brush using high speed, flail type action, which can spread debris across the ROW. This may also open up the opportunities for undesirable species to sprout from seed if soil is disturbed.</p> <p>Appendix 3 provides more details on mowing.</p>
<p><b>Pruning</b> is the reduction of tree growth through the use of proper arboricultural practices. It requires the consideration of two factors: clearances required to ensure line safety for the length of the cycle (normally 3 years); and the health of the tree. The priority is to optimize long-term clearances. Proper pruning methods influence the direction of branch growth so that trees can be pruned away from conductors.</p>	<p>Can be used in riparian areas to protect wildlife habitat where tree removal may not be appropriate or allowed.</p> <p>May also be used where the main stem of the problem tree is not on the right-of-way, but the branches are encroaching.</p> <p>In residential areas, pruning is often a more acceptable method of controlling problem vegetation than other physical control methods.</p> <p>Proper pruning on right-of-way perimeters may influence the direction of branch growth and may eliminate the need to remove problem trees.</p> <p>Does not adversely affect wildlife habit, biodiversity or aesthetics.</p> <p>Because pruning may have to be repeated at regular intervals, it is costlier and more labour intensive than other physical control methods.</p> <p>Knowledge and experience of proper arboricultural techniques are needed for successful pruning. Improper pruning can cause tree damage and can result in unsightly, unhealthy and hazardous trees that may require further remedial action. Appendix 3 provides more details on pruning.</p>
<p><b>Burning</b> is a recognized physical control for problem vegetation. Unless undertaken in accordance with the requirements of the BC Ministry of Forests, FortisBC will generally not utilize burning as a physical control method.</p>	

### 2.6.1.2 Cultural Control Methods

Cultural controls involve encouraging the planting and maintaining of low growing trees and shrubs and/or compatible tree species by private landowners adjacent to the ROW, encouraging the establishment of certain types of agroforestry on the ROW, and investigating the feasibility of using tree growth regulators/inhibitors if and when they become registered for use in Canada. Table 6 provides a description and rationale, and the benefits and limitations of each of these cultural treatment methods.

**Table 6: Description and Rationale, Benefits and Limitations of Cultural Control Methods**

<b>Description &amp; Rationale</b>	<b>Benefits/Limitations</b>
<p><b>Planting Low Growing Trees and Shrubs</b> on adjacent private land will be promoted where practical and feasible.</p>	<ul style="list-style-type: none"> <li>Landowners can be educated on the benefits of planting and maintaining of low growing trees and shrubs for safety; system reliability; reduced requirement for treatment of undesirable vegetation. Desirable species include native and cultivated trees and shrubs, grasses and/or field crops not capable of growing tall enough to interfere with overhead lines.</li> </ul>
<p><b>Planting Compatible Tree Species</b> on adjacent private land will be promoted where practical and feasible.</p>	<p>Planting and maintaining trees at sites close to distribution lines will be encouraged, provided that the tree is appropriate for the location. Appendix 4 describes tree-planting zones, based on proximity to power lines, and provides some guidance for selecting the appropriate trees and shrubs. These guidelines generally do not apply to transmission lines.</p>
<p><b>Encouraging Agroforestry</b> ventures on ROWs will be encouraged, provided that they do not grow or can come into contact with transmission and distribution lines.</p>	<p>FortisBC will consider commercial agroforestry ventures as long as they do not adversely impact the Company's business. Currently, the following types of agroforestry ventures are located on FortisBC rights-of-way:</p> <ul style="list-style-type: none"> <li>Christmas tree farms;</li> <li>Commercial vineyards; and,</li> <li>Native grasses and seed production.</li> </ul>
<p><b>Tree Growth Regulators/Inhibitors</b> will be investigated for possible use on both ROWs and on adjacent private land.</p>	<ul style="list-style-type: none"> <li>No products are yet registered in Canada that would allow for tree growth regulators/inhibitors on utility corridors. Once available, FortisBC will include these products into its PMP toolkit where practical and feasible.</li> <li>Potential sites may be municipal boulevards where limiting growth may result in saving aesthetically appealing trees from excessive pruning.</li> </ul>

### 2.6.1.3 Biological Control Methods

Biological control techniques utilize agents such as fungi or insects that specifically target certain problem weed species. The only biological control agent registered for use in Canada for the control of certain species of problem vegetation is Chontrol Paste ®. This biological control product inhibits the re-sprouting and re-growth from the cut stumps of limited species in ROWs and forest vegetation management. This product is a fungus, *Chondrostereum purpureum*, which inhibits re-sprouting of cut stumps by colonizing and decaying the stumps. The fungus is specific to limited species. The product is applied to freshly cut stumps during the growing season, early spring and fall, and when conditions are conducive for fungal growth and development.

**Table 7 Description and Rationale, Benefits and Limitations of Using Chontrol Paste ®, a Biological Control Agent**

<b>Description &amp; Rationale</b>	<b>Benefits/Limitations</b>
<p>Chontrol Paste ® is a newly registered biological control alternative to the use of the herbicide active ingredients glyphosate and triclopyr to control re-sprouting of limited species following manual cutting. It is applied as a paste from a squeeze bottle to freshly cut stumps.</p> <p>FortisBC intends to investigate this product for possible use in controlling re-growth and re-sprouting on red alder and sitka alder.</p>	<ul style="list-style-type: none"> <li>• The use of this biological control agent may reduce the need for using chemical herbicides.</li> <li>• Because this species of fungus is abundant throughout Canada, its use will not result in a significant increase in the natural environmental background levels of the fungal spores that this species produces.</li> <li>• This product is used by direct application to the cut stumps of target trees, the exposure to adjacent non-target plants will be negligible (i.e. no drift, as the product is not sprayed).</li> <li>• Apart from this product being registered for only limited species, there are no known limitations to the use of this biological control agent.</li> </ul>

## **2.6.2 Chemical (Herbicides) Control Methods** *[IPMR Section 58(2)(e)]*

Chemical control involves the use of herbicides to inhibit growth of problem vegetation within or adjacent to FortisBC transmission and distribution ROWs. Selection of the herbicide is determined by:

- Soil residual activity
- Mode of action
- Selectivity
- Environmental characteristics
- Health and safety characteristics

### **Soil Residual Activity**

A herbicide with residual properties tends to be retained in the soil for a certain period of time. Herbicide active ingredients are generally classified by their degree of soil residual activity—low, moderate, or high. The most common herbicides used by FortisBC have low to moderate soil residual activity.

### **Mode of Action**

An herbicide's mode of action refers to how it affects the plant. Uptake of herbicides is by plant roots, stems, and foliage.

### **Selectivity**

Herbicides that control all vegetation are termed non-selective, while those that are effective in controlling certain types of vegetation are termed selective.

### **Environmental Characteristics**

The following properties are considered when making an herbicide selection:

- volatility
- adsorption to soil particles
- toxicity to non-target organisms
- selectivity
- residual activity

### **Health and Safety Characteristics**

All herbicides used by FortisBC have low to moderate toxicity. Applicators are well trained and protected by personal safety equipment such as goggles, gloves, coveralls, and chemical-resistant boots based on the label recommendations. To minimize exposure,

FortisBC selects herbicides with the lowest level of toxicity and rates that proved acceptable levels of weed control.

### 2.6.3 The Need for Herbicide Use

Herbicides may be required on FortisBC rights-of-way to target specific types of vegetation problems. Herbicides will generally be used to selectively control deciduous vegetation and re-sprouting, to control individual stems or trees, or for the spot treatment of problem vegetation following physical controls. Although a main objective of this PMP is to minimize the use of herbicides for vegetation management where viable alternatives exist, herbicides are an important tool in right-of-way vegetation management.

Although mowing, pruning and selective slashing remain important parts of FortisBC's rights-of-way maintenance program, in some instances these methods can be impractical, dangerous for the workers, incompatible with environmental protection values, labour intensive and expensive. In certain areas, mechanical methods cannot be used for vegetation control. Steep terrain may limit access by mowers and can be dangerous for a chain saw operator. Exceedingly dense brush can create both a visibility and a physical hazard to workers and can result in an increased incidence of injuries due to slipping and tripping while operating power equipment. Mechanical methods are non-selective, and can also lead to soil erosion by removing a high percentage of the vegetative ground cover. They can also damage compatible plant species such as low growing shrubs and grasses. Biodiversity is reduced when non-selective mechanical methods are used to remove most of the vegetation from a site.

Herbicide use has not been shown to impair applicator health provided that personal protective measures and equipment, as indicated on product labels, are adhered to. Herbicide use is often the only practical and safe method of controlling vegetation where rights-of-way traverse rugged, mountainous terrain, or areas inaccessible to motorized equipment. From an economic viewpoint, mechanical methods have been shown to cost, on the average, four times more per hectare than control of the same vegetation using herbicides.

Appendix 5 provides details on the properties/use patterns, timing of application. Where and how they will be applied, and the equipment used for application, for the herbicide active ingredients proposed for use under this PMP.

### 2.6.4 Herbicide Identification, Application Equipment, and Application Methods

The herbicide active ingredients proposed for use under this IVMP are shown in Table 8.

**Table 8: Herbicide Active Ingredients Proposed for Possible Use Under the IVMP**

ACTIVE INGREDIENT	
dicamba	glyphosate
triclopyr	picloram

Appendix 5 provides a description of soil residual activity, mode of action, selectivity, and application for each of the herbicides.

### **2.6.4.1. Herbicide Application Equipment**

The application equipment proposed for use in applying herbicides under this PMP include:

#### **Backpack Sprayer**

A backpack is a portable, manually operated, pressurized container with a positive shut-off system and a nozzle for applying herbicides. It operates under low pressure, thus minimizing the possibility of drift. It is particularly useful for spraying small areas or individual trees and plants.

#### **Wick/Wipe On Applicator**

Wick/wipe on application may be used to selectively apply herbicides containing the active ingredient glyphosate by wiping it directly onto plants. Only small amounts of glyphosate are applied, so the need for pumps, control devices and spray tanks is eliminated. Wick/wipe on applications are ideal for vegetation management in areas where no spray drift can be tolerated. Wick/wipe on applications of glyphosate may be used for vegetation management on transmission and distribution ROWs or to the cut surface of deciduous stumps to inhibit re-sprouting following physical control methods.

#### **Handgun (Power Hose and Nozzle)**

A handgun (power hose and nozzle) is a hand-held spray gun and hose attached to a portable tank filled with herbicide solution, usually with a power driven pump to provide pressure to the herbicide solution in the hose. Handguns are generally used on transmission and distribution ROWs where large areas of vegetation have to be controlled. Within this PMP, handguns may be used for the foliar or soil application of all the active ingredients for vegetation management on transmission and distribution ROWs.

#### **Squirt Bottle**

A hand-held, non-pressurized container, used to apply the herbicide active ingredients glyphosate and triclopyr to the cut surface of deciduous stumps to inhibit re-sprouting following physical control methods.

#### **Injection Tools**

An automatic lance or battery-powered drill used to inject the herbicide active ingredients glyphosate and triclopyr into individual deciduous stems to inhibit re-sprouting following physical control methods.

## 2.6.4 Herbicide Application Methods/Techniques

The herbicide application methods/techniques proposed for use under this PMP include foliar, wick/wipe-on, and cut surface applications. A description, rationale for use, and the benefits and limitations of each of these application methods/techniques, is shown in Table 9.

**Table 9: Description and Rationale, Benefits and Limitations of Herbicide Application Methods/Techniques**

<b>Description &amp; Rationale</b>	<b>Benefits/Limitations</b>
<p><b>Foliar</b> applications involve use of a manually operated pressurized backpack sprayer or a handgun, and can be used to apply all of the active ingredients. This method/technique is most effective when the target vegetation is actively growing.</p>	<ul style="list-style-type: none"> <li>• Can be carried out at any time of the year, provided the target plants are actively growing.</li> <li>• As foliar applications are susceptible to drift, caution must be exercised around desirable plants and environmentally sensitive areas.</li> <li>• If a non-selective herbicide such as one containing the active ingredient glyphosate is being applied, it will control both the target vegetation and desirable plants that are growing among them.</li> </ul>
<p><b>Wick-Wipe-on</b> applications involve the use of a wick soaked with the active ingredient glyphosate that is wiped or dragged over the foliage of the target vegetation. The wick applicators are available in various materials and in many sizes. This technique will generally be used where cut stumps have re-sprouted, or for treating small patches of vegetation on transmission and distribution ROWs in areas where no drift can be tolerated.</p>	<ul style="list-style-type: none"> <li>• Virtually eliminates drift,</li> <li>• Useful for the safe and effective treatment of individual plants or stems located in areas of desirable vegetation.</li> <li>• Labour intensive, and is only practical to use for small treatment areas or for a small number of individual plants.</li> </ul>
<p><b>Cut Surface</b> applications will be used in conjunction with manual treatments for controlling deciduous vegetation. With this method/technique, the problem vegetation is cut as low to the ground as possible and herbicide is applied to the cut surface of the stump to limit re-sprouting. The active ingredients glyphosate and triclopyr may be applied using this method/technique.</p>	<ul style="list-style-type: none"> <li>• Preferable in highly visible areas or in areas where standing dead trees do not meet treatment objectives.</li> <li>• Because herbicide application is restricted to the cut surface of freshly cut stumps, there is generally no herbicide drift, resulting in minimal impact to fish, wildlife, and bodies of water, water sources, and food intended for human consumption.</li> <li>• Pose little risk of herbicide exposure to workers or the general public.</li> <li>• If treatment is not undertaken immediately following physical control, this technique may not be successful.</li> </ul>

## **2.7 Post Treatment Evaluations** [IPMR Section 58(2)(c)]

All herbicide applications on FortisBC transmission and distribution ROWs under this PMP will be undertaken by contracts issued to qualified companies in possession of a valid BC Pest Control Service License. All herbicide applications will be made by certified pesticide applicators in the appropriate category of certification or supervised by certified pesticide applicators in the appropriate category of certification.

During their regular operations and maintenance site visits, FortisBC staff will monitor the effectiveness of vegetation management treatments undertaken by each contractor.

FortisBC will ensure independent evaluations of contractor's work through inspections of sites treated with herbicides. The timing and procedure for evaluating specific treatment programs will be dependent on the treatment used. Inspections will be undertaken on the ground, and will generally be based on visual evaluations. Evaluations may include both qualitative and quantitative determinations of mortality to the targeted problem vegetation, as well documentation of any non-target mortality that is evident. Effectiveness of the treatments will be determined by comparing pre-treatment and post-treatment problem vegetation levels.

Work will be inspected to determine and adhere to:

- Commitments made in this PMP;
- Compliance with the *Integrated Pest Management Act and Regulations*;
- That site objectives have been achieved;
- The success of the treatment methods employed;
- If pesticide free zones, no treatment zones and buffer zones were maintained;
- If any negative environmental impacts have occurred; and,
- If corrective action is required.

A ROW Post Treatment Monitoring Form is shown in Appendix 7.

## **3.0 Environmental Protection Strategies and Procedures**

All pest management activities undertaken under this PMP (both chemical and non-chemical) incorporate measures designed to protect the natural environment including:

- Strategies to protect community watersheds;
- Strategies to protect domestic and agricultural water sources;
- Strategies to protect fish and wildlife, riparian areas, bodies of water and wildlife habitat;
- Strategies to prevent herbicide contamination of food intended for human consumption;
- Pre-treatment inspection procedures for identifying treatment area boundaries;
- Procedures for monitoring weather conditions and strategies for modifying herbicide application methods for different weather conditions; and,

- Procedures for pre-treatment inspections to ensure protection of human health and the environment during treatment period.

In this PMP, all pesticide free zones (PFZ) and no treatment zones (NTZ) will comply with the standards contained in Division 7 of the IPMR.

### 3.1 Water Protection PFZs and NTZs

According to the *Integrated Pest Management Regulation (IPMR)*:

**Table 10: Definitions of PFZ and NTZ as Stated in the IPMR**

<b>Pesticide Free Zone (PFZ)</b>	means an area of land that <ol style="list-style-type: none"> <li>must not be treated with pesticide, and</li> <li>must be protected from pesticide moving into it</li> </ol>
<b>No Treatment Zone (NTZ)</b>	means an area of land that must not be treated with pesticide

The following table lists the minimum no-treatment zones (NTZs) and pesticide-free zones (PFZs) that are followed to protect domestic and agricultural water sources, such as water intakes and wells.

**Table 11: Minimum Water Protection Measures for the Protection of Domestic and Agricultural Wells and Water Intakes, Bodies of Water, and Streams**

<b>All Pesticides</b>	<b>Required Distance</b>
Potable domestic and agricultural wells and water intakes, including all methods and pesticides	<b>30 meter NTZ</b>
Any water body or stream using any pesticide except glyphosate, subject to label restrictions and including all application methods	<b>10 meter PFZ</b>
<b>Glyphosate Applications</b>	
A water body or stream that is fish bearing and not within an industrial site (as defined by <i>Integrated Pest Management Regulation</i> )	<b>5 meter PFZ</b>
A water body or stream that is fish bearing and within an industrial site (as defined by <i>Integrated Pest Management Regulation</i> )	<b>2 meter PFZ</b>
A permanent water body that is not fish bearing at any time of the year	<b>2 meter PFZ</b>
Up to high water mark of a temporary free-standing body of water that is not fish-bearing and does not drain directly into fish-bearing water, at any time of year	<b>0 meter PFZ</b>

Dry streams that are not fish bearing at any time of the year and do not drain directly into fish bearing water, at any time of the year	<b>0 meter PFZ</b>
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### 3.2 Environmental Feature Protection Strategies and Procedures

**Table 11: Strategies/Procedures for the Protection of Environmental Features**

<b>Environmental Feature</b>	<b>FortisBC PMP Protection Strategy/Procedure</b>
<b>Community Watersheds</b> – defined under the BC <i>Forest Range Practices Act</i>	<ul style="list-style-type: none"> <li>• Locations of community watersheds are verified by accessing information from the Ministry of Environment or local governments</li> <li>• Pesticides will not be stored within a community watershed for more than 24 hours prior to their use, and removed from the community watershed within 7 days of their use, unless they are stored in a permanent structure</li> <li>• NTZs are maintained around all lakes and other water bodies consistent with those listed in Section 3.1</li> <li>• A 100 meter NTZ will be maintained upslope from all licensed water intakes within the community watershed, except when failure to treat weeds could compromise public or worker safety. In those cases, NTZs are consistent with those listed in Table 11</li> <li>• Pesticide use will be discontinued if pesticide residues or pesticide breakdown products are detected at a community watershed water intake, and further use will not be undertaken until the BC Ministry of Health Services (Medical Health Officer) has been satisfied that all required measures have been implemented to preserve water quality</li> <li>• Prior to the use of pesticides, community watershed maps will be consulted to determine if pesticide treatments are within a community watershed or are within 100 meters upslope of any water intake, or 30 meters downslope of any water intake. These are available on the provincial interactive mapping site “<i>Online Cadastre</i>” (Community Watersheds layer) <a href="http://www.srmwww.gov.bc.ca/sgb/IMF/index.html">www.srmwww.gov.bc.ca/sgb/IMF/index.html</a></li> </ul>
<b>Domestic and Agricultural Water Sources, including water intakes and wells</b>	<ul style="list-style-type: none"> <li>• Domestic and agricultural water sources, including water intakes and wells, will be protected by adhering to the PFZs and NTZs listed in Table 11</li> <li>• A visual survey will be done to determine if there are wells present not identified by accessing information from the Ministry of Environment or local governments</li> </ul>

<b>Groundwater Sources, Surface Water Intakes</b>	<ul style="list-style-type: none"> <li>• Efforts will be made to identify groundwater sources (watersheds, wells, surface water intakes) in advance of treatment by using the best available information from the Ministry of Environment document/data base entitled “<i>Guide to Using the BC Aquifer Classification Maps for the Protection and Management of Groundwater</i>”, and from local governments</li> <li>• Visual surveys will be conducted in areas adjacent to proposed treatment sites to determine the presence of domestic or agricultural surface water</li> </ul>
<b>Riparian Areas, Wildlife, Wildlife Habitat, and Species at Risk</b>	<ul style="list-style-type: none"> <li>• A minimum 15 meter NTZ will be maintained around riparian areas when cleaning or fueling application equipment and refilling pesticide dispensing equipment</li> <li>• Prior to control measures being implemented, the boundaries of any required PFZ or NTZ shall be established and marked</li> <li>• Appropriate precautions shall be taken when applying pesticides in critical wildlife habitat areas</li> </ul>
<b>Protection of Food Intended for Human Consumption</b>	<ul style="list-style-type: none"> <li>• Where possible, areas containing food plants for human consumption shall be located, NTZs of appropriate width established around these areas for their protection, and treatment notices posted at public access points to proposed treatment areas advising of treatments.</li> <li>• In addition, all pesticide use under this PMP will be undertaken in a manner that minimizes the possibility of any negative impact on these environmentally sensitive areas. Appropriate precautions that may be taken during weed control operations to avoid contaminating these areas include providing increased buffer zones during herbicide applications or using alternative, non-chemical methods of control where possible.</li> <li>• In the vicinity of certified organic farms, it is the responsibility of the grower to maintain an 8m buffer zone between their organic crops and power poles. As recommended by the Certified Organic Associations of British Columbia (Standard #3, Land and Resource Management).</li> </ul>
<b>Monitoring Weather Conditions</b>	<p>Weather conditions will be monitored prior to and periodically during pesticide applications. Wind speed and direction, precipitation, temperature and sky conditions (clear, overcast, cloudy, partly cloudy) will be recorded for foliar herbicide applications using backpacks or handguns. Temperature, precipitation, frost and dew conditions will be recorded for stem, bark, wick/wipe-on and stump applications.</p>

	<p>Pesticide applications will be shut down if:</p> <ul style="list-style-type: none"> <li>• The maximum temperature stated on the herbicide label is exceeded</li> <li>• The wind speed and/or direction cause the application of herbicide to drift and/or miss the weeds</li> <li>• It begins to rain, increasing the chances of excessive runoff and leaching</li> </ul>
<p><b>Procedures for Pre-Treatment Inspections and Identifying Treatment Area Boundaries</b></p>	<ul style="list-style-type: none"> <li>• A pre-treatment inspection shall be completed prior to pesticide use to protect environmentally sensitive areas and to establish treatment area boundaries. During this inspection, the location of environmentally sensitive areas shall be located and mapped.</li> <li>• A pre-treatment meeting/discussion shall be held and crew members shall be instructed in the flagging/marking requirements (which may include the use of Riparian Zone and PFZ flagging tape), as well as the methodology and procedures for herbicide application and handling and the posting of treatment notices by the contractor at locations that meet regulatory requirements</li> </ul>
<p><b>Private &amp; Public Property</b></p>	<ul style="list-style-type: none"> <li>• In areas such as on or adjacent to parks, schools, daycare centers, lawns, landscaped areas, flowerbeds, or domestic animals on agricultural lands, all pesticide use will be undertaken in a manner that minimizes the possibility of any negative impact on these environmentally sensitive areas.</li> <li>• Treatment notices will be posted at locations that meet regulatory requirements</li> </ul>

## 4.0 Operational Information

Appendix 6 provides details on the operational information/practices that are required to be included in a PMP, including:

- Qualifications and responsibilities of persons applying herbicides;
- Procedures for safely transporting herbicides [IPMR Section 58(3)(a)(i)];
- Procedures for safely storing herbicides [IPMR Section 58(3)(a)(ii)];
- Procedures for safely mixing, loading and applying herbicides [IPMR Sections 58(3)(a)(ii) and (iii)];
- Procedures for the safe disposal of empty herbicide containers and unused herbicides [IPMR Section 58(3)(a)(iv)];
- Procedures for responding to herbicide spills [IPMR Section 58(3)(a)(v)]; and,
- Identification of each pesticide that will be used under the plan, the manner of its application, and the type of equipment required for each manner of application [IPMR Section 58(3)(c)].

## 5.0 Reporting, Notification and Consultation

### 5.1 Reporting

Accurate record keeping allow FortisBC and the Administrator, *Integrated Pest Management Act*, to monitor the quantity of pesticides used, and to ensure compliance with the *Integrated Pest Management Act and Regulation*, the commitments made in this PMP, and the contents of the Pesticide Use Notice. FortisBC will ensure that each of the required records described below are maintained.

#### 5.1.1 Confirmation Holder Use Records

Each contracting firm that applies pesticides for FortisBC must maintain daily records of herbicide use.

Section 37(1) of the *Integrated Pest Management Regulation (IPMR)* describes the requirements for these records. The following records must be kept for each treatment location and day of use:

- The date and time of the pesticide use;
- The name of the pest targeted by the use or the purpose of the pesticide use;
- The trade name of each pesticide used and its registration number under the federal Act;
- For each pesticide used, the method and rate of application and the total quantity used;
- The prevailing meteorological conditions including temperature, precipitation and velocity and direction of the wind, these conditions should be measured at

the beginning of each day before starting treatment, re-measured if obvious changes in environmental conditions occur throughout the day, and re-measured at the end of any treatment day; and,

- A record for each piece of the holder's pesticide application equipment that requires calibration showing when the equipment was calibrated and the data upon which its calibration was based.

### **5.1.2 Annual Report for Confirmation Holders**

In accordance with Section 39 of the IPMR, FortisBC will provide to the Regional Administrator, *Integrated Pest Management Act*, the following information for a calendar year by January 31 in the next calendar year for operations conducted under this PMP during the calendar year:

- The name and address of the confirmation holder, and their confirmation number;
- Trade name and active ingredient of the pesticide(s) applied, including their PCP numbers;
- Total area treated; and,
- Quantity of each active ingredient applied (kg).

## **5.2 Notifications**

FortisBC commits to providing the following notifications with respect to this PMP:

### **5.2.1 Notification of PMP Confirmation**

FortisBC will, within 7 days of the plan confirmation date, make available, for the term of the confirmation, a copy of the confirmation and the PMP with relevant maps at their local offices to allow inspection by the public.

### **5.2.2 Annual Notice of Intent to Treat**

As per section 42 of the IPMR, for the purpose of an annual Notice of Intent to treat, FortisBC will prepare and retain a detailed map showing the treatment locations for the applicable calendar year, which indicate the following for each treatment location:

- The proposed treatment areas; and
- The geographic features that require a pesticide-free zone or a no-treatment zone.

FortisBC will forward, in writing, to the B.C. Ministry of Environment, at least 21 days prior to treatment in each year during which the PMP is in effect, an Annual Notice of Intent to Treat (NIT) for the following year. This NIT will identify:

- Name and business location of confirmation holder;
- Proposed treatment areas;
- The total area proposed for treatment.

### **5.2.3 Requests to Amend the PMP**

FortisBC will forward, in writing, to the Ministry of Environment, amendments requested for the PMP. Amendment requests to add new application techniques or similar changes will not require further public advertising or First Nations consultation, provided that the amendment request is within land owned or controlled by FortisBC. Amendments to add new active ingredients will require further public advertising and/or First Nations consultation.

### **5.2.4 Notification of Contraventions**

Section 72(1)(d) of the IPMR requires that a confirmation holder give written notice to the administrator on a contravention of the *IPMA* or IPMR that involves the release of a pesticide into the environment. FortisBC commits to abiding by this requirement.

Failure of the contractor to observe the following requirements may be cause for contractor dismissal:

- Violation of the requirements of the *IPMA* or the IPMR;
- Mixing of chemicals in inappropriate locations such as near environmentally sensitive zones;
- Failure to use adequate personal protective equipment when required by the product label;
- Application of treatment chemicals within prohibited zones;
- Improper cleanup or reporting of spills;
- Application of pesticides by uncertified personnel without appropriate supervision;
- Improper disposal of unused chemicals or containers;
- Improper equipment calibration;
- Application of pesticides under inappropriate or unsafe conditions;
- Failure to properly complete and submit daily operating logs or records; or,
- Handling, storing, mixing, transporting, or applying pesticides in a manner that violates product labels.

### **5.2.5 Posting of Treatment Notices**

Prior to treatment, notification signs will be posted on land being treated with herbicides. The applicator is responsible for posting notification signs according to regulatory requirements.

Signs will be clearly visible and legible from each approach to the treatment area used by public/employees/contractors to access the treatment area or at locations where due diligence

would seem to require them. Signs may not be removed for at least 14 days after the herbicides have been applied.

For each treatment location, the applicator will maintain a record of where notices were posted.

## **5.3 Consultations**

### **5.3.1 Public Consultation Plan**

Prior to submitting a Pesticide Use Notice to the Ministry of Environment for PMP confirmation, FortisBC will carry out a consultation process with the public and individuals adjacent to FortisBC property potentially significantly affected by the PMP.

The objectives of conducting consultations when this PMP is at the draft stage are:

- To increase public awareness of the PMP process and of the principles of Integrated Pest Management which are embodied in the PMP;
- To ensure that the public have an opportunity to identify concerns, and for FortisBC to address those concerns, before the PMP is finalized and submitted and a Pesticide Use Notice submitted for confirmation;
- To ensure a transparent and accountable review process for the PMP;
- To educate the public on the need to manage problem vegetation, noxious weeds and invasive plants; and,
- To explain how the planning process that is described in the PMP recognizes the need to protect human health and the environment.

The public will be consulted of the PMP development via notices in local community newspapers throughout the FortisBC service area. As per Section 61(1) of the IPMR, at least 45 days before submitting a Pesticide Use Notice, the first of 2 notices, at least 40 cm<sup>2</sup> in size, will be published within a 2 week period in newspapers circulated in the various communities (or nearest communities).

Communities or individuals adjacent to FortisBC property potentially significantly affected by the PMP will be directly forwarded written notice of the development of this PMP, prior to submitting a Pesticide Use Notice as per Section 61(2) of the Regulation.

During the public consultation process, the draft PMP will be accessible to the public in various locations, as stated in the public notifications.

### 5.3.2 Public Consultation Report

FortisBC will prepare a Public Consultation Report that contains:

- A summary of public consultations, including the names and addresses of those who provided input, the nature of their concerns and/or recommendations, and the FortisBC response to the input from the public; and,
- A list of newspapers in which notification of the pending PMP submission appeared, along with the publication dates and a photocopy or tear sheet of a representative advertisement.

### 5.3.3 First Nations Consultation Plan

In addition to the objectives for public consultation outlined in Section 5.3.1, FortisBC will consult with First Nations to avoid infringement on aboriginal rights, treaty rights, or cultural values during the vegetation management program. Consultation is also undertaken to request authorization to undertake pesticide applications on Federal Reserve lands.

FortisBC not only has an obligation to consult with First Nations, it must also attempt to address their concerns and accommodate their cultural interests. Consultation processes must take into account the BC Treaty negotiation process, and current litigation actions by First Nations respecting aboriginal land use or sovereignty. Both of these major issues can have an impact on the FortisBC vegetation management program.

In light of the above sensitivities and special concerns, FortisBC is committed to establishing and maintaining positive relationships with First Nations through meaningful and respectful consultation.

In conducting these First Nations consultations, FortisBC will refer to the procedures outlined in the *August, 2011 publication entitled “Draft Guidelines for IPM Proponents Conducting Consultations with First Nations”*, published by the BC Ministry of Environment, Integrated Pest Management Program.

The FortisBC First Nations consultation plan is outlined below:

- Develop a draft pest management plan (this document) that incorporates all related government policies, procedures, standards and information into a single, comprehensive planning document that incorporates the principles of integrated pest management as the basis for decision making options;
- Hand deliver an introductory letter and hard copy of the draft PMP to all First Nations, inviting their input into the development of the plan and with an offer to meet with Chief and Council or staff if desired
- At minimum three efforts will be made with each First Nation;
- FortisBC will prepare a report that provides a summary of First Nations consultations, including the names and addresses of those First Nations that

provided input, descriptions of specific aboriginal interests and potential impacts, descriptions of any modifications implemented for accommodation purposes, a communications log, including copies of correspondence, meeting notes, and attempts to communicate;

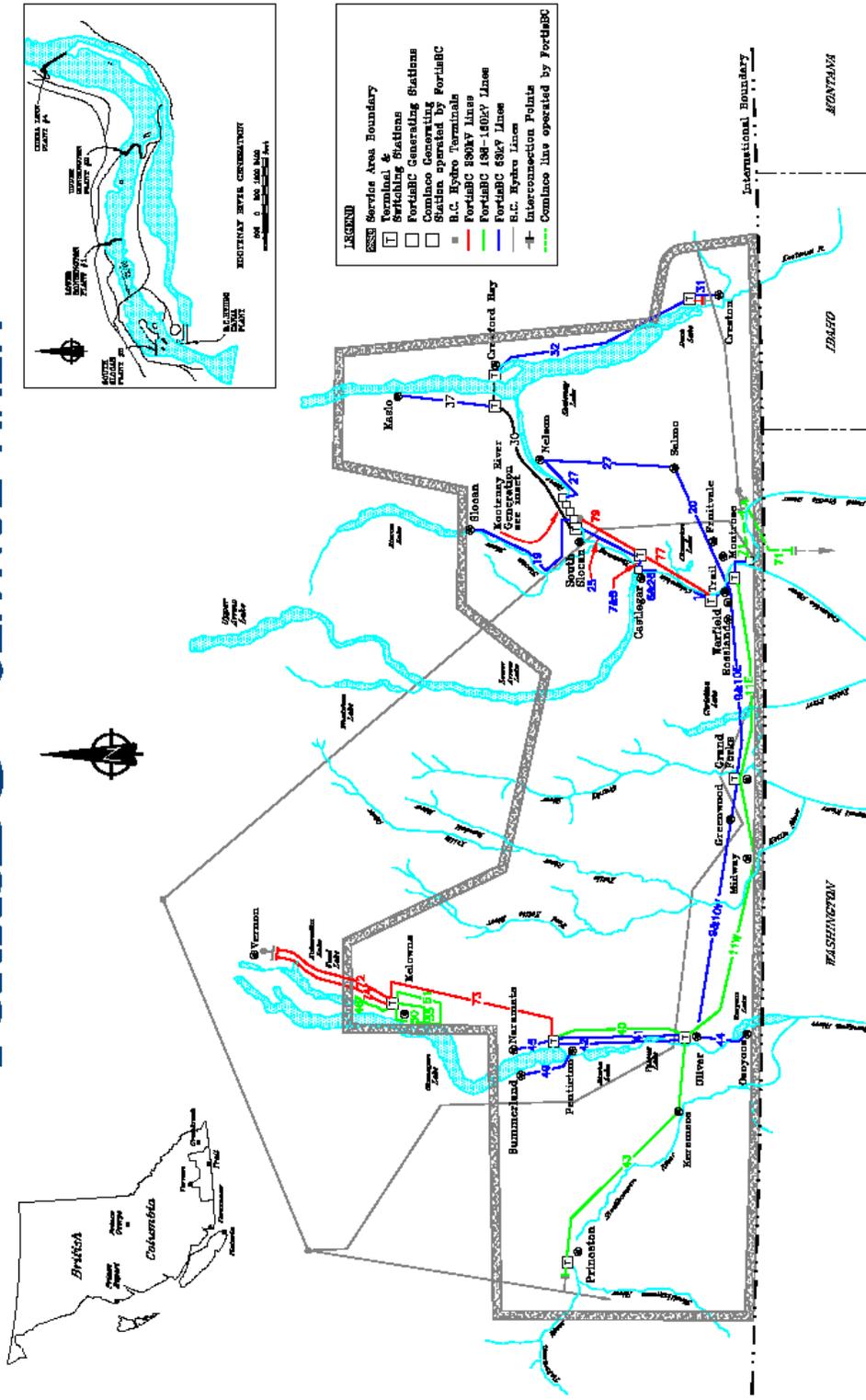
- Summaries of engagement activities and outcomes, and
- Submit a Pesticide Use Notice to the Ministry of Environment confirmation of the PMP.
- 

#### **5.3.4 First Nations Consultation Report**

In order to facilitate Ministry consideration of the adequacy of First Nations consultations and of the FortisBC response to any issues raised, FortisBC will prepare a report that describes the consultation process and outcomes as described above. This report will be submitted to the Administrator, *Integrated Pest Management Act*, in conjunction with the submission of the Pesticide Use Notice application.

Appendix 1 The FortisBC Service Area

**FORTISBC - SERVICE AREA**



PHILIP JAMES IN: WAYS SERVICE AREA  
 ACT UPDATED: 01-21-04

## Appendix 2 Minimum Clearance Specifications

### Clearance to Distribution Lines (under 60 kV) Initial Clearing/New Construction

<b>Overhead Clearance</b>	<b>No vegetation overhang is permitted</b>
<b>Side Clearance</b>	<ul style="list-style-type: none"> <li>* 6 meters from the conductor for 3-phase primary</li> <li>* 5 meters from the conductor for 1-phase primary</li> <li>* 3 meters from the conductor for secondary</li> </ul>
<b>Under Clearance</b>	<p>Remove all undesirable tree species in the clearance zone. When removal is not possible, achieve a clearance that is the greater of:</p> <ul style="list-style-type: none"> <li>* 3 meters from the neutral conductor, or</li> <li>* 1.2 meters from joint use contacts</li> </ul>

### Clearance to Transmission Lines (60 kV and over)

<b>Overhead Clearance:</b>	<b>No vegetation overhang is permitted</b>
<b>Side Clearance from SRW Centerline:</b>	<p>Optimum No trees capable of falling on lines (all voltages) Statutory Right-of-Way (SRW) 60 kV - 16 meters 170 kV - 19 meters 230 kV - 32 meters</p> <p>Minimum 60 kV - 5 meters 138 kV - 7 meters 170 kV - 10 meters 230 kV - 12 meters</p>

### Clearance for Distribution Lines (Under 60 kV) for Radial Circuits to Mountain Repeaters

<b>Overhead Clearance</b>	<b>No vegetation overhang is permitted</b>
<b>Side Clearance</b>	<p>Optimum: 16 meters Minimum: 5 meters</p>

**Appendix 2 continued**
**Clearance to Distribution Lines (under 60 kV) for Existing Construction**

<b>Overhead Clearance</b>	<b>3 meters from the conductor</b>
<b>Side Clearance</b>	3 meters from the conductor for 3 phase primary 3 meters from the conductor for 3 phase primary
<b>Under Clearance</b>	Remove all undesirable tree species in the clearance zone. When removal is not possible, achieve a clearance that is the greater of: 3 meters from the neutral conductor, or 1.2 meters from joint use contacts

Note: The exception to the above clearance requirements is that mature conifers that have 1.5 meters of side clearance will not require pruning. If pruning is required, a minimum distance of 3 meters must be obtained.

**Appendix 3 Limits of Approach**

<b>Voltage Range</b>	<b>Insulated Tool Limits for Certified Utility Arborists</b>	<b>Normal Work Limits for Certified Utility Arborists</b>	<b>Normal Work Limits for Apprentice Utility Arborists</b>
Phase to Phase	(meters)	(meters)	(meters)
750v to 20 kV	0.3	0.9	3
Over 20 kV to 30 kV	0.45	1.2	3
Over 30 kV to 75 kV	0.9	1.5	3
Over 75 kV to 250 kV	2.1	3	4.5
Over 250 kV to 325 kV	2.6	4.5	6
Over 325 kV to 550 kV	3.7	6	6

## **Appendix 4      Physical Control Methods and Techniques**

### **Pre-Mow Slashing**

Pre-mow slashing (also called brushing) is the removal (cutting to ground) of all vegetation that will eventually grow into lines. It is particularly appropriate for rural rights-of-way. With customer permission, brushing may be extended into private property adjacent to the rights-of-way to improve long-term line security. Brushing can be accomplished with a variety of specialized mechanized equipment.

Pre-mow slashing involves the use of mechanized equipment to cut down all problem vegetation on a right-of-way in preparation for mowing. In preparation for mowing, pre-mow slashing must achieve the following:

Vegetation must be removed to maintain clearance standards;

- All fence lines, power poles, guy wires, telecommunication pedestals, signs, stumps greater than 15 cm in diameter, and any other obstructions must be removed for a minimum distance of 1 meter on all sides;
- Within clearance areas, trees with a diameter of 10 cm or more at breast height must be cut down, unless otherwise directed;
- All trees that are dead, weak, diseased, top heavy, rotten or leaning towards the line will be cut down;
- Stumps will be cut flat and no taller than 10 cm from the ground;
- Steep slopes, ditch banks and other areas inaccessible to mowing will be slashed, and the debris piled for disposal;
- All slash will be placed in areas accessible to the mower, and not within 1 meter of hazardous obstacles such as rocks and stumps greater than 15 cm in diameter, or in hazardous areas such as steep ditch bottoms; and,
- Debris will not be piled in environmentally sensitive areas such as in runoff areas, creek beds, or other areas prone to spring flooding.

### **Mowing**

Mowing is the use of mechanized mowers such as tractor-mounted mowers, grade all or hydro axes, to remove all vegetation from a right-of-way. With mowing, all vegetation is cut to the ground, leaving a level right-of-way. This technique facilitates the subsequent application of herbicide to deciduous vegetation to control re-sprouting. Well-timed and properly performed mowing can inhibit the re-growth of deciduous vegetation for several years. Mowing is less labour intensive, less expensive and is less hazardous to workers than hand slashing.

Mowing is not selective. Desirable species of vegetation are cut as well as the undesirable species. Because mowing mulches the brush using high speed, flail type action, this can spread debris and leave the right-of-way unsightly. Mowing may also open up the seedbed, allowing undesirable species to sprout from seed. Mowing is also limited by terrain.

Mowing is seasonably effective. Mowing after the spring flush of growth through late summer will inhibit growth better than mowing done at other times of the year. This is particularly important in areas where the problem vegetation is deciduous, and follow-up selective herbicide treatment is not possible. Mowing must be done to cut stubs as close to the ground as possible, which may necessitate the expense of mowing an area several times to reduce the stubs to ground level.

For maximum effectiveness, mowing should be followed in 2 to 3 years by the selective use of herbicides by spot treatment, or wipe-on application to individual stems, to control re-sprouting. An alternative to herbicide use would be to plough and reseed or replant with desirable, low-growing vegetation that will inhibit the growth of undesirable vegetation. This may not be practical or economical for large areas, but may be useful on private property adjacent to a right-of-way where grass, crops, native shrubs and bushes, and landscape trees and shrubs can be planted and maintained by the private landowner.

### **Hand Slashing**

Hand slashing involves the use of chain saws, brush cutters, or other hand-held equipment to remove undesirable vegetation. Hand slashing can be species-specific, enabling desirable vegetation to be left. The remaining desirable vegetation will inhibit the growth of tall growing species, and give the area a more landscaped look.

Hand slashing is compatible with the species-specific spot application of herbicides used to control re-sprouting of deciduous vegetation, single stem treatments or small patches of problem vegetation. Generally, hand slashing includes clean up and hauling away of debris, giving the right-of-way a tidier appearance. The major disadvantage of hand slashing is that re-growth is not inhibited as well as it is by mowing. The eight considerations listed under brushing and pre-mow slashing are all applicable to hand slashing. For maximum effectiveness, hand slashing, like mowing, should be followed immediately or within 1 year by the selective use of herbicides.

### **Pruning**

#### **Collar Cuts**

When removing a lateral branch from a stem or limb, or when reducing an upright to a lateral, the final cut must be made at the correct place in order to minimize danger to the tree and prevent re-sprouting. These cut lines are indicated by the branch collar and by the branch bark ridge. Proper cuts will minimize decay and promote closure of the cut. When removing a branch, cuts will be made as close as possible to the branch collar, taking care not to remove or injure the collar. Injury to the collar destroys a major defense system of the tree and also leads to excessive sprouting. When cutting a stem, cuts will be made close to, and on an angle with, the branch bark ridge. The remaining branch will be at least one third the diameter of the trunk. Stubs will not be left, as they are entry points for rot-causing fungi. Pruning cuts will not be painted, as this does not stop rot. There is no set angle for a correct cut. The size and shape of the collar will determine the position and angle of the cut. Cuts will always be made where branches meet other branches or the trunk. Making cuts between nodes (internodal) leads to excessive sprouting and to the

development of cracks and rots, which are the major causes of branch and trunk failure. When branches are properly pruned, rings of living tissue will form around the cut after one growing season. Incomplete rings of tissue indicate improper cuts, and may lead to decay.

### **Three Point Cut**

When cutting leaders or laterals of more than 2.5 cm, three cuts will be made in order to ensure that bark does not rip and wood does not split. The first cut is a notch.

### **Directional Pruning**

Directional pruning is the practice of removing appropriate limbs or laterals to encourage the tree or limb to grow in a desired direction. The use of proper cuts is essential to make this practice successful. Proper cuts will minimize re-sprouting and encourage directional growth, while improper cuts will encourage re-sprouting and defeat directional growth.

### **Crown Reduction**

Crown reduction is the reduction of the crown of a tree to a smaller size. It involves cutting back the leaders and laterals to an appropriate crotch where the stem remaining is no less than one third of the size of the portion of stem removed. Crown reduction also employs directional pruning practices. With this technique, the smaller interior branches are generally left to provide form for the tree and adequate leaf area to sustain the tree. Crown reduction provides adequate clearance and minimizes re-growth. Directional pruning is employed to ensure that re-growth is directed away from the lines. In cases where tree removal is not possible, crown reduction using deep crotch pruning is the main procedure used for trees growing both under and beside the lines.

### **Through Pruning**

Through pruning is a specialized form of crown reduction that uses proper cuts to allow the lines to pass through the center of the tree canopy. This technique is only applicable to deciduous trees and only where removal cannot be achieved. Through pruning involves the removal of the central leaders on trees growing under lines and the directional pruning of other branches to create a “V” in the center of the tree. This allows clearance for lines to pass through the tree.

### **Crown Raising**

With crown raising, the lower lateral branches are removed to increase the branch to ground clearance. All laterals are removed at the main stem or limb. This type of pruning may be required to keep underground transformer boxes free of overhanging branches.

### **Side Pruning**

Side pruning is a type of crown raising. All branches are removed from one side of the tree in order to achieve a 3 meter under clearance. This technique is only appropriate where removal is not practical or possible, as it leaves an unbalanced tree. It is particularly effective for Douglas firs and poplars when they cannot be removed. In cases where the tree is a mature conifer, the lower long limbs that shade the right-of-way will be left. Deciduous trees will have all lower branches removed, except when their branch diameter exceeds 35% of the diameter of the trunk.

**Under Pruning**

Under pruning is another type of crown raising. With this technique, the canopy is raised to a level where adequate clearance is required above the lines. As under pruning leaves overhanging branches and a lopsided tree, this is not a preferred method of pruning. It is an acceptable technique for cedars and other stable branched species, but should not be used on alders, poplars or Douglas firs. Under pruning is generally used on larger or taller trees, especially when side pruning or removal is inappropriate or uneconomical.

**Crown Thinning**

Crown thinning is the reduction of canopy mass without significant reduction to the size of the tree or its profile. The use of this technique will allow for reduced wind resistance, less snow loading, less branch breakage, and reduced chance of blow down. The entry of sunlight into the inner crown will generally improve the health and stability of the tree. Using proper cuts, the crown is thinned by removing every second or third branch. This technique is appropriate for large trees with thick upper canopies such as cedars. When under pruning has been employed with large trees, additional protection may be achieved by thinning the balance of the crown.

**Crown Cleaning**

Crown cleaning involves the removal of deadwood, damaged or diseased limbs. Inappropriate interior branches are generally removed at the same time. Falling deadwood is frequently a cause of outages. Crown cleaning is generally done on larger, mature trees. The use of crown cleaning not only improves tree health, but substantially reduces its potential hazard.

**Shearing**

Shearing is the cutting back of all terminal buds to a common distance to create a hedge effect. This practice may be used on evergreens where removal is not possible. The creation of a hedge will only be allowed if the customer has agreed to maintain it on an annual basis in the future. Shearing may also be an acceptable option in cases where large mature coniferous trees have previously been sheared, re-growth is not vigorous, and clearances are more than is required for cycle maintenance. Creation of hedges should be to a height of 2 to 4 meters to encourage customer maintenance. Many conifers are suitable for privacy screening and can be trimmed for hedging. Ideally, hedges should be started as juvenile conifer trees and maintained.

### **Appendix 5 Pesticide Properties/Use Patterns, Timing of Application, and Where and How They Will Be Applied, for the Herbicide Active Ingredients Proposed for Use Under This PMP**

<b>Active Ingredient</b>	<b>Soil Residual Activity*</b>	<b>Mode of Action</b>	<b>Selectivity **</b>	<b>Where and When Applied ***</b>
<b>dicamba</b>	low	translocation	selective	foliage; post emergent
<b>glyphosate</b>	low	translocation	non-selective	foliage & cut surface; post emergent
<b>picloram</b>	high	translocation	selective	foliage; post-emergent
<b>triclopyr</b>	low	translocation	selective	foliage & basal bark; post emergent

\* LOW generally refers to residual soil activity of up to 40 days, MODERATE for residual soil activity of up to one year and HIGH for residual soil activity of greater than one year.

\*\* Herbicides that control all vegetation are termed non-selective, while those that control certain types of vegetation (e.g., only grasses or only broadleaf) are termed selective.

\*\*\* Post emergent refers to treatments made after the vegetation has emerged through soil surfaces and pre emergent refers to treatments before the vegetation has emerged through the soil surface.



## **Appendix 6: Operational Practices in Pesticide Use**

This appendix provides details on the operational practices, including contractor responsibilities, on the handling and transport of herbicides used for vegetation management on FortisBC transmission and distribution ROWs.

### **Qualifications for Persons Applying Pesticides**

The majority of pesticide use on FortisBC transmission and distribution ROWs is carried out by outside contractors.

The transportation, storage, handling, application and disposal of pesticides are governed by federal and provincial legislation. All outside contractors and FortisBC personnel working with pesticides will follow safe handling practices including workplace requirements for Workplace Hazardous Materials Information System (WHMIS) labeling and worker education. The required practices for contractors and their workers are detailed in:

- Worker's Compensation Board of British Columbia (1998) *Occupational Health and Safety Regulation – BC Regulation 296/97 as amended by BC Regulation 185/99 – Sections 6.70 to 6.109;*
- B.C Ministry of Environment, Lands and Parks (1995) *Handbook for Pesticide Applicators and Dispensers;* and,
- Worker's Compensation Board of British Columbia (1990) *Standard Practices for Pesticide Applicators.*

Any individual or company (i.e., a contractor) that provides a service to FortisBC by applying commercial or industrial pesticides for vegetation management on FortisBC transmission and distribution ROWs must have a valid B.C Pest Control Service Licence, and each supervising applicator must have a valid B.C. Pesticide Applicator Certificate in the Industrial Vegetation and Noxious Weed Category.

Under the B.C. *Pesticide Control Act Regulation*, a certified pesticide applicator can supervise up to 4 uncertified assistants, provided the assistants are within continuous auditory or visual range at all times while applying pesticides. Individuals must carry proof of their applicator certification with them when applying pesticides for inspection purposes.

### **Transportation of Pesticides**

The transportation of pesticides will comply with all current legislation, federal and provincial, governing their transport. In addition, the following procedures will be followed while pesticides are being transported for application under this PMP:

- Limited amounts of pesticides will be carried in any one vehicle. The quantity will be no more than what is necessary for each project;
- Pesticides will be carried in a secure lockable compartment;
- Pesticides will be transported in original labeled containers;

- Pesticides will be transported separately from food and drinking water, safety gear and people;
- Spill containment and clean up equipment will be transported separately from pesticides, but in close proximity to them, on each vehicle during transport and use;
- Appropriate documents such as Pest Control Service Operations Records, material safety data sheets (MSDS), this PMP and the PMP approval document, will be available during transport and use of pesticides;
- All documents and placards will be carried in, or placed on, transport vehicles if required under the *Transportation of Dangerous Goods Act* or the *BC Pesticide Control Act*; and,
- All pesticide containers will be inspected for defects prior to transporting, and will be secured against spillage or unauthorized removal.

### **Spill Treatment Equipment**

Spill treatment equipment will be ready and available at storage (including mobile storage), mixing and loading sites, and will include the following:

- Personal protective equipment, as recommended on the respective pesticide labels;
- Absorbent material such as sawdust, sand, activated charcoal, vermiculite, dry coarse clay, kitty litter or commercial absorbent;
- Neutralizing material such as lime, chlorine bleach or washing soda; and,
- Long handled broom, shovel, and waste-receiving container with lid.

### **Spill Response Planning**

A copy of an approved spill response plan will be available at each work site. All personnel working on a project involving pesticides must be familiar with its contents. If contractors that work under this PMP have their own spill response plan, it must meet or exceed the contents of this plan.

The following procedures must be followed if a spill occurs:

- All personnel will be protected from pesticide contamination by wearing appropriate protective clothing and safety gear;
- Any person exposed to a pesticide will be moved away from the place of the spill and kept warm. First aid will be administered, if required;
- The source of the spill will be stopped;
- The spilled material will be stopped from spreading by creating a dam or ridge;
- The project supervisor will ensure operations cease until the spill is contained and the source is repaired,
- Absorbent material will be spread over the spill, if applicable, to absorb up any liquid;
- The absorbent material will be collected into garbage bags or containers, with the contents clearly marked;
- Contaminated soil or other material will be removed from the spill site and placed in garbage bags or containers;

- Where the pesticide involved in the spill results or may result in its release into the environment, the person responsible for the product will immediately report it to the Provincial Emergency Program by telephoning 1-800-663- 3456 or, where that is impractical, to the local police or nearest detachment of the R.C.M.P; and,
- An approved representative of the PMP holder will be notified of the details related to the spill as soon as is practical by the project supervisor.

### **Pesticide Storage**

No vegetation management pesticides will be stored by FortisBC or by contractors at facilities owned or operated by FortisBC. All pesticides will be supplied by the contractor, who must follow, as a minimum, the storage requirements described below.

Pesticides stored on FortisBC property will be in accordance with the *Pesticide Control Act and Regulation* and the Worker's Compensation Board document “*Standard Practices for Pesticide Applicators*”.

In summary, the storage area must:

- Be ventilated to the outside atmosphere;
- Be locked when left unattended;
- Be entered only by persons who are authorized to do so; and,
- Have a placard affixed and maintained on the outside of each door leading into the facility in which the pesticides are stored bearing, in block letters that are clearly visible, the words “WARNING – CHEMICAL - STORAGE -AUTHORIZED PERSONS ONLY”.

In addition, the person responsible for the storage area shall notify the appropriate fire department of the presence of the pesticide on the premises.

FortisBC has no direct control of the pesticide storage practices of its contractors while not under contract to them. These companies are still governed by the provisions of the BC Pesticide *Control Act and Regulation* with respect to storage by a Pest Control Service Licencee.

Some contractors may store pesticides for extended periods of time in vehicles when performing a number of pesticide treatments for FortisBC. The vehicle is considered to be a mobile storage unit. Persons responsible for the pesticide storage will ensure that all pesticides are stored in a locked canopy or similar arrangement, separate from the driver and personal protective gear.

### **Mixing and Loading Pesticides**

All mixing and use of pesticides will be carried out by certified pesticide applicators in the appropriate category of certification, or by individuals directly supervised by a certified pesticide applicator in the appropriate category of certification.

Mixing of pesticides must always be conducted in a safe manner. Safety spill kits, spill response plans and first aid supplies will be present on site. Eye wash station(s) and protection clothing as recommended on the respective product labels shall be available on site. Product labels and MSDSs will be available on site to ensure that quantities of pesticides being mixed and used are consistent with label rates.

There will be no mixing or loading of pesticides within 10 meters of sensitive environmental features.

### **Pesticide Application Procedures/Conditions**

FortisBC will ensure that the following conditions are adhered to for all application of pesticides under this PMP:

- Pesticide applicators will be provided with current labels and Material Safety Data Sheets for the pesticide products they will be using;
- Applicators will inspect each site and plan application procedures before treatment begins. ;
- All pesticides will be applied using only trained and certified personnel who have the required application equipment and protective equipment;
- All pesticide will be applied at the lowest possible application rate that will do the job, and will not exceed the lesser of the pesticide label rate or the rate specified in this PMP;
- Pesticides will only be applied when there is clear evidence of a current or impending pest problem;
- Where possible, pesticides will be applied when target species are at their most susceptible stage;
- Pesticide products and application methods will be selected to maximize the degree of selectivity for the target pest and to minimize the degree of toxicity to non-target organisms, pesticide drift, bystander and worker exposure, and persistence in the environment;
- Pesticide use will be restricted to periods that minimize human exposure and adverse impacts to the environment. Due consideration will be given to the proximity of bystanders, workers, adjacent open windows, high foot-traffic areas and other local sensitive pesticide features. Where possible, pesticides will be applied during periods of low staff or public presence, in the early morning or evening, or on weekends if necessary;
- Unless other required by product labels, outdoor pesticide applications are restricted to conditions where wind speeds due not exceed 8 km/hr; and,
- For outdoor pesticide use, applications will only occur during suitable weather conditions.

## **Protective Equipment**

Protective clothing and equipment required during pesticide mixing, loading, application and disposal will conform with Workers' Compensation Board Occupational Health and Safety Regulations. Equipment such as protective clothing, headgear, eye and face protection, gloves, footwear and respiratory protection equipment must be used where required.

## **Bystander and Worker Protection/Pesticide Treatment Signs**

All of the conditions listed above under pesticide mixing, loading and application are designed, in part, to protect bystanders and workers from exposure to pesticides. Section 8 of this PMP (the next section), will describe the notification requirements that will be adhered to with respect to pesticide use. These conditions relate directly to bystander and worker protection.

At all sites scheduled for pesticide treatment, workers will be advised, either verbally or in writing, of the dates and locations of pesticide treatments, as well as advice or precautions to follow, as appropriate, to minimize their exposure.

Before pesticides are applied, signs will be posted at the treatment site on the day of application. The signs will remain posted for a minimum of 14 days after application. The signs will be visible from both within and outside each treatment area.

Notices will also be posted at all major entry points to sites that receive pesticide treatment. The notices will contain the following information:

- A description of the area to be treated;
- Date and start time of the proposed application;
- Pesticide product name(s) and active ingredient(s); and,
- Precautions, including any applicable re-entry times or conditions, needed for persons to minimize exposure to the pesticide(s) or residues.

## **Equipment Maintenance and Calibration**

All pesticide application equipment used in FortisBC property safe, clean, in good repair, and compatible and appropriate for the pesticide being used.

As a minimum, all pesticide application equipment will be calibrated once per year prior to use, and at regular intervals throughout the season of use. The frequency of calibration will be dictated by factors such as the formulation of pesticides used (e.g., abrasive formulations will result in greater nozzle wear and will require more frequent calibrations), when changing pesticide products, and when nozzle output begins to vary.

## **Disposal of Pesticide Containers and Residual Pesticides**

Disposal of empty containers shall to according to the manufacturer's instructions as noted on the product label or provincial instructions and recommendations that are detailed in the BC Ministry of Environment, Lands and Parks document “ *Handbook for Pesticide Applicators and Dispensers* “ (1995). As a minimum, empty pesticide containers shall:

- Be triple rinsed or pressure rinsed;
- Be made so they cannot be reused by crushing, puncturing or damaging them; and,
- Be disposed of in a permitted sanitary landfill or other approval disposal site.

**Appendix 7 Rights-of-Way Post-Treatment Inspection Report**

<b>Rights-of-Way Post-Treatment Inspection Report</b>		V.1 Oct 2009
<b>Site Name:</b>		
<b>Site Location</b> (address or UTM coordinates):		
<b>Date of Herbicide Treatment(s):</b>		
<b>Licensee Undertaking Herbicide Treatments:</b>		
<b>Service Licence #:</b>		
<b>Applicator(s) Applying Herbicides:</b>		
<b>Herbicide(s) Applied/Application Rate:</b>		
<b>Target Pest(s):</b>		
<b>Treatment Efficacy:</b>		
<b>Environmental Features Requiring Protection:</b> (i.e., permanent and seasonal water bodies, community watersheds, residential areas, habitat or riparian areas, catch basins, potable and non-potable water intakes) <b>*NOTE: Must maintain NTZs and PFZs as per Integrated Pest</b>		

<b>Management Regulations</b>	
<b>Environmental Protection Measures Taken:</b>	
<b>Domestic Water Intakes and Wells:</b> <b>YES NO</b> <b>(if yes, describe location and distance from ROW)</b>	
<b>Comments/ Recommendations:</b>	