

CSX Transportation, Inc.

Vegetation Management Plan 2015–2019

For Railroad Rights-of-Way in Massachusetts

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for CSX Transportation, Inc.

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I. INTRODUCTION AND GENERAL STATEMENT OF GOALS AND OBJECTIVES

This Vegetation Management Plan (VMP) describes CSX Transportation, Inc.'s (CSX's) plan for vegetation control on CSX's railroad rights-of-way within the Commonwealth of Massachusetts for the five-year period 2015 through 2019. It was prepared in accordance with 333 CMR 11.00, the Massachusetts Rights-of-Way Management Regulations, as revised March 9, 2007. CSX manages railroad rights-of-way over approximately 155 miles through 39 municipalities in the Commonwealth (listed in Appendix A). Appropriate control of vegetation on all rights-of-way is an absolute necessity to ensure the safe passage of trains, and the safe and effective inspection and maintenance of tracks, switches, and signals, and is mandated by state and federal law.

The purpose of this VMP is to establish the operations, procedures, and guidelines by which CSX manages vegetation along railroad rights-of-way in Massachusetts. The specific goals and objectives of CSX's VMP are to:

- Control vegetation along the rights-of-way to ensure the safe passage of trains;
- Control vegetation to allow for appropriate inspection and maintenance of the railroad;
- Employ an Integrated Vegetation Management (IVM) program to minimize the amount and frequency of herbicides used to control vegetation; and
- Minimize the risk of harm to humans and the environment during the control of vegetation.

Railroad rights-of-way are similar to other rights-of-way in that they are linear properties that pass through privately- and publicly-owned land in varied environments. However, the railroad rights-of-way are different from some other rights-of-way in that they are owned by the railroad in fee (whereas electric and pipeline companies usually obtain easements which convey only specific use rights). Vegetation management on railroads also differs from some other rights-of-way in that much of the rights-of-way and railroad structures must be kept completely free of vegetation to ensure visibility and safety of train passage (compare, for example, electric utilities, which need only restrict the height of vegetation).

Not all vegetation on CSX's property will be removed during the vegetation management process. Some vegetation offers benefits to the railroad and the Commonwealth. Tree and shrub species along the right-of-way offer an aesthetic benefit, and serve to screen the track and associated structures, as well as passing trains, from view. Certain species, particularly low-growing herbaceous and shrub species, can inhibit the incursion of non-native species, many of which opportunistically colonize unvegetated, disturbed, or open areas. Maintaining low vegetation adjacent to the railroad ballast provides stability to slopes and embankments, reducing erosion and slowing the flow of stormwater. Finally, the railroad provides a specialized managed habitat for many plants and wildlife that prefer woodland edges, open areas, and corridors. CSX's vegetation management program seeks to control vegetation that will be damaging to the railroad, but encourages the growth of vegetation that serves the above-listed benefits without detrimental effects to the railroad.

CSX's vegetation management program represents a significant and ongoing evolution in approach and methods as a result of improved herbicides and the development of an integrated approach to vegetation control. Railroads have used chemical herbicides as the primary means to control unwanted vegetation since the 1950s. At that time herbicides were often applied several times per year at rates as great as 100 lbs. active ingredient per acre. Since that time

the efficacy of herbicides has improved, and the rate of use has steadily declined. Today's herbicide label rates for the railroad rights-of-way now average less than 3.0 lbs. active ingredient per acre for the most frequently applied herbicides in Massachusetts. The decrease in herbicide use is the combined result of new, advanced herbicides, new application techniques, and restrictions that consider the potential adverse effects of chemicals in the environment. CSX uses only herbicides permitted by the Massachusetts Department of Agricultural Resources (MDAR) for use in sensitive areas, and generally makes one foliar herbicide application per year to weeds on the right-of-way. CSX's current vegetation management methods are based on technological advancements, and knowledge gained through experience. This VMP complies with all applicable regulations and seeks to minimize the risk of harm to humans and the environment in the control of vegetation on the railroad rights-of-way.

The VMP consists of this introductory/objectives section, followed by the following headed sections:

- Description of the rights-of-way requiring vegetation control;
- Identification of target vegetation;
- Description of the integrated pest management (IPM) program, justification for proposed herbicide application, and alternative control methods;
- Proposed methods of vegetation management;
- Methods, references, and control strategies for sensitive areas;
- Operational guidelines for applicators relative to herbicide use;
- Identification and qualifications of individuals developing and submitting the plan;
- Description of alternative land use provisions or agreements; and
- Description of a remedial plan to address spills and related accidents.

II. DESCRIPTION OF THE RIGHTS-OF-WAY REQUIRING VEGETATION MANAGEMENT AND JUSTIFICATION FOR PROPOSED HERBICIDE USE

The railroad rights-of-way consist of track and equipment used for the transport of trains and maintenance equipment. The steel track is mounted on a railroad bed constructed of cross-ties supported by a bed of ballast (crushed stone). The ballast is typically situated on a slightly elevated earthwork section that slopes downward away from the track to promote drainage. The railroad rights-of-way also includes track switches, electrical signals and associated equipment, road crossing barriers, and signs. All of these facilities and equipment must be maintained free of vegetation, as described below.

The primary need for vegetation control is to ensure safety for the railroad and the public. Code of Federal Regulations, 49 Part 213, Section 37, Track Safety Standards - Vegetation, requires that vegetation on railroad property which is on or immediately adjacent to the roadbed shall be controlled so that it does not:

- (a) become a fire hazard to track-carrying structures (e.g., ties);
- (b) obstruct visibility of railroad signs and signals along the right-of-way, and at highway-rail crossings;
- (c) interfere with railroad employees performing normal trackside duties;
- (d) prevent proper functioning of signal and communication lines; or
- (e) prevent railroad employees from visually inspecting moving equipment from their normal duty stations.

In order to minimize the potential for fires, the Commonwealth of Massachusetts likewise requires the railroad to be free of vegetation, mandating by statute (Section 160 Chapter 235A) that railroads keep their rights-of-way clear of flammable material including vegetation.

Vegetation on the railroad right-of-way affects the safety of the railroad operators and the public, both directly and indirectly. Trains depend on friction between the rails and wheels for moving and braking. Plant tissues crushed between the wheel and rail acts as a lubricant and can hinder train acceleration and braking.

Vegetation can also interfere with visibility, both for train and maintenance vehicle operators and for the public at road crossings. Vegetation can obstruct the visibility of signs, signals, and switches by the train operator and maintenance personnel. It can impede visual inspection, measurements and testing of track structure and geometry, and maintenance of the track structure and facilities. Vegetation can also create unsafe working conditions for track and facility maintenance personnel, cause damage to trains and cargo, restrict the drainage function of the roadbed causing saturation and soil instability, and long-term deterioration of the railroad, and present a fire hazard.

Vegetation also creates unsafe footing for railroad employees, particularly crews which may be at work at any hour and in any weather. The vegetation itself may be the hazard, or it may conceal objects or areas of unsafe footing.

Visibility is important both for railroad personnel working on or near trains and for motorists crossing railroad tracks. Train engineers and other operating personnel must be able to see all types of railroad signals. These signals indicate the status of the traffic on the track ahead and

also indicate when whistles must be sounded as the train approaches a road crossing. Signs also provide other types of safety information as well. Motorists must be able to see trains as they approach railroad crossings and employees must be able to visually inspect moving rail equipment. Locomotive engineers must be able to see around curves and see that switches and derails are in the correct position.

Federal laws require vegetation control to ensure proper functioning of signals and communication lines. Trees and plants can cause short-circuits in electrical equipment and cause failure of communication systems and signals.

Vegetation itself is rarely directly the cause of a railroad accident or incident. Vegetation on railroad rights-of-way has a significant indirect effect on railroad safety. In 2014, the last complete year for which data are available from the Federal Railroad Administration (FRA), a total of 402 accidents nationwide were attributed to track defects. Railroad accidents result in property damage with very significant costs, lost productivity of our transportation system, injuries, and sometimes fatalities. The significance of careful inspection and maintenance of the railroad, including the prevention of interference with vegetation, cannot be overstated.

The primary method for minimizing accidents caused by track and roadbed defects is the federally-mandated periodic visual inspections of rails and associated structures by a qualified track inspector. These inspections are performed weekly on the Fitchburg Secondary Line and thrice-weekly for CSX's main line track between West Stockbridge and Worcester.

Inspections are normally done from a hi-rail vehicle, supplemented when necessary by walking inspections of switches and other complicated track work. It is essential that the roadbed be kept free of vegetation to provide the track inspector with unobstructed views of the track structure including rails, ties, and fasteners. Vegetation within the roadbed increases the probability that a track or roadbed defect will go undetected resulting in greater potential for an accident. Vegetation in the roadbed hinders other methods of track inspection as well. Railroads employ electronic rail testing to periodically test rails for internal defects. This testing is done by special rail cars that establish a magnetic field around the rail. Vegetation adjacent to the rails hinders this process and can result in invalid tests. Other special rail cars measure track geometry such as surface, line, and gauge. The gauge measurement is done optically and is adversely affected by vegetation between and above the rails.

Concern for public and employee welfare, environmental protection, and safety is the primary reason for vegetation maintenance on the railroad rights-of-way. Railroads are unique in their relationship to interstate commerce, carrying a flow of materials and products through the Commonwealth. CSX also allows other railroads to use their track system to provide commuter rail and intercity passenger service on some routes, making railroad safety even more critical.

The railroad vegetation management program requires the use of specific herbicides because this is the only means proven to control vegetation adequately. Improved herbicides and the development of an integrated approach to vegetation control have reduced the amount of herbicide use, their frequency of application, and their potential deleterious effects in the environment greatly since they were first used. Herbicides are applied annually, when the weeds are actively growing. CSX uses only herbicides permitted by the DAR for use in sensitive areas, as these materials result in good control over the entire right-of-way, and are not significantly long-lived or mobile in the environment.

Alternative control methods have been attempted in the past. The Massachusetts Railroad Association, of which CSX Transportation is a member, has tested several alternatives without success:

- No mechanical equipment has been developed that will operate in close proximity to the track components in the roadbed area. In 1996, Consolidated Rail Corporation, predecessor to CSX Transportation in Massachusetts, built and tested a mowing machine specifically for target vegetation growing in the roadbed and ballast. This machine was completely ineffective at removing vegetation below the top-of rail height, and fouled the ballast with plant clippings, creating both drainage problems and a fire hazard.
- A steam application which required 7,000 gallons of potable water and several hundred gallons of diesel fuel per railroad mile for heating the water resulted in partial weed control lasting about one week.
- In another test, an application of a fish by-product resulted in approximately ten percent control of target vegetation.
- Manual weed control using conventional mowers, weed trimmers, or brush trimmers has proven similarly ineffective at removing vegetation from close proximity to rails, switches, and other steel structures.

Manual techniques for weed control will be used in areas where herbicide use is prohibited, where necessary, but they are not an effective alternative for vegetation management on most of the railroad rights-of-way.

III. IDENTIFICATION OF TARGET VEGETATION

Vegetation targeted for control includes any vegetation that compromises the safe operation of the railroad, but in fact consists primarily of a group of species whose growth characteristics cause them to interfere with the track and equipment. The program of vegetation management includes the removal or restriction of weedy species that inhabit edges and disturbed ground, shrub and tree species that have the potential to grow into the track area or obscure other railroad structures, vines, non-native species, and species that may be hazardous to trackside workers, such as greenbrier and poison ivy.

Prior to herbicide application, track inspection will be used to identify areas where herbicide application is appropriate, noting location, density, and type of vegetation. In accordance with the federal regulations, all vegetation growing in the ballast and ballast shoulder, in yards (not constituting right-of-way), and around switches, signals, signs, and highway grade crossings is considered target vegetation and must be controlled.

Woody vegetation growing in areas adjacent to the shoulder will be managed to promote the growth of low-growing shrubs and restrict the growth of unwanted species. Targeted woody vegetation will be that which has the potential to block visibility or invade the roadbed and/or overhead communication lines. Target woody vegetation consists of all woody species growing within the rail gauge and on the ballast. Shrub species growing on rights-of-way outside the ballast will not be controlled, but rather encouraged to grow and provide the benefits described earlier. CSX's IVM program fosters the growth of species that will grow slowly and/or inhibit the nuisance species.

Low-growing, herbaceous, and vine species are a particular problem because of their tendency to obscure visibility of the track structure and obstruct the track and associated equipment. All low-growing species that have the potential to overgrow the ballasted areas will be removed. Particular effort will be made to control non-native invasive species wherever they occur on the rights-of-way.

Examples of native herbaceous, vine, or woody species commonly found on railroad right-of-way and requiring control:

- Fox grape (*Vitis labrusca*)
- Poison ivy (*Toxicodendron radicans*)
- Roundleaf (common) greenbrier (*Smilax rotundifolia*)
- Virginia creeper (*Parthenocissus quinquefolia*)

Examples of non-native species commonly found on railroad right-of-way and requiring control:

- Japanese barberry (*Berberis thunbergii*)
- Japanese knotweed (*Polygonum cuspidatum*)
- Multiflora rose (*Rosa multiflora*)
- Oriental bittersweet (*Celastrus orbiculatus*)
- Reed canary grass (*Phalaris arundinacea*)

IV. INTEGRATED VEGETATION MANAGEMENT PROGRAM AND INTENDED METHODS OF VEGETATION CONTROL

CSX uses an Integrated Pest Management program, herein refined to consist only of plants and termed Integrated Vegetation Management, as the principal means of vegetation control on the rights-of-way. IVM is an effective and environmentally sensitive approach to management that consists of a series of management evaluations, decisions, and controls including action thresholds, monitoring and identification of unwanted species, prevention, and control, including through the judicious use of appropriate herbicides. IVM uses information on the growth habits and life cycles of plants and their interaction with the environment, understanding of desirable versus undesirable species, as well as available weed control practices other than herbicides.

The vegetation management program used by CSX has been developed and refined considerably since herbicides were first used on railroad rights-of-way in the 1950s. The principal herbicide component of the IVM program is a selective low-pressure application in designated areas to control target species, timed to have the greatest effect on vegetation throughout the year through (normally) a single herbicide application per year. CSX uses only herbicides permitted by MDAR for use in sensitive areas. The IVM program includes herbicides because, to date, no environmentally and economically feasible and safe alternatives to herbicides have been demonstrated for use in areas of the railroad rights-of-way requiring total vegetation control.

Before resorting to herbicide application, limited control can be obtained in some locations as a result of track maintenance or construction activity. By identifying and coordinating the activities of divisional and operational units such as repair, ballast replacement, construction, and other right-of-way tasks the railroad can control vegetation as an indirect benefit of these activities. Thus, unnecessary application of herbicides can be avoided. All non-chemical techniques and methods which remove or control pest vegetation will be identified and integrated into the scheduling for vegetation management activities. Thus no area of right-of-way will receive herbicide treatment if a routine or operational activity will remove the vegetation. This operational procedure will reduce the reliance on chemical control and the amount of herbicide applied each year.

Due to the unique structure of the railroad right-of-way, different environmental areas, such as road crossings, may require different levels of vegetation control, and will be selectively managed based on the site and target species. A team of professionals comprised of roadmasters, inspectors, environmental scientists, and herbicide application specialists will develop the annual Yearly Operational Plans (YOP) to describe the vegetation control methods that will adequately control vegetation and minimize risk for the general public and the environment. Over the 5-year period covered by this VMP, CSX will monitor and evaluate the success of the program and potentially integrate new methods in the YOPs consistent with the VMP as appropriate.

In areas where total vegetation control is not required, such as those adjacent to the right-of-way roadbed, various selective vegetation control techniques can be practiced. The purpose of this approach will be to increase competition for light and growing space with desirable species by selectively eliminating undesirable species. Some shrubs, forbs, and graminoids are desirable species (non-target) that can be tolerated on the adjacent area and will be selectively managed. By selectively removing these target species by cutting or herbicide treatments, the

non-target species will not be affected. If a target species capable of resprouting is cut or mowed, a cut stump treatment will be applied to prevent sprouting and the need for further herbicide applications.

In certain adjacent areas of the right-of-way, branches and limbs of trees can grow into or have the potential to move into the roadbed area, striking trains or overhead communication lines. In these cases, the tree will not be eliminated if a selective side trimming of the encroaching limbs can be made from an aerial lift mounted on hi-rail equipment, or from a truck. Selective side trimming will be done on a site by site basis according to the type and density of target vegetation present and its propensity to invade the roadbed area or communication lines. Trees and brush on the right-of-way which act as a buffer between the adjacent property and right-of-way will only be managed if they will interfere with the function and safety of the right-of-way. Selective vegetation management increases desirable vegetation, prevents erosion, and is aesthetically pleasing.

V. METHODS OF VEGETATION MANAGEMENT

Federal laws require the railroad to control vegetation located on the roadbed and certain other areas. All vegetation will be eliminated from the following areas, except where they are located within sensitive areas as described in Section VI:

- Roadbed ballast section including shoulder
- Bridges
- Culverts
- Drainage ditches
- Right-of-way areas adjacent to the shoulder, such as road crossings, signs, inside curves

1. Areas Requiring Vegetation Control

A. Roadbed

The roadbed is a man-made structure which consists of the rail and ties, ballast, ballast shoulder, and drainage system. The ballast and ballast shoulder are constructed of crushed stone which supports the track. The ballast distributes the load on the ties and track evenly, and allows water to drain away from the track structure. The roadbed is the principal structure on the right-of-way requiring vegetation control. All parts of the roadbed outside of restricted areas will be treated as necessary to remove all vegetation.

B. Bridges

Open deck bridges, such as over streams and other water bodies, will not be treated. Roadbed approaches to bridges will be treated as necessary to maintain required setbacks to sensitive areas. Stonework in bridge abutments and similar structures may be treated if outside of the sensitive area setbacks because plant roots can loosen and damage mortar. The area under bridges will be maintained in low growing vegetation.

C. Culverts

Culverts are generally constructed with steel pipe, concrete pipe, or stone and are normally placed at right angles to the track to convey intermittent or small streams, or to provide a means for stormwater drainage from precipitation events (but are otherwise dry). Culverts which are not of sufficient length to extend beyond the roadbed plus the required setback, or which are shallow to the roadbed and constructed of stone and could allow herbicide to enter a watercourse, will not be treated, nor will the length of track within 10 feet of such culvert openings.

D. Drainage Ditches

Constructed drainage ditches must be maintained weed-free to permit the flow of water away from the ballast and track structure and maintain a stable roadbed. Ditches will be cleared by mechanical means and by herbicide application when no water is present (constructed and maintained drainage ditches do not constitute wetland resource areas per the Massachusetts Wetlands Protection Act).

E. Right of Way Area Adjacent to the Shoulder

Woody vegetation growing within the rights-of-way and adjacent to the shoulder will be managed to promote the growth of low growing shrubs. Targeted vegetation will be that which has the potential to block visibility or invade the roadbed and/or overhead communication lines, as described above. On the side of the right-of-way containing overhead signal and communication lines, where present, low growing shrubs and most herbaceous plants will be maintained and encouraged in an effort to reduce the opportunity for growth and development of tall trees into these areas. Low growing vegetation will be encouraged in areas containing underground communication or signal lines. Vegetation on the area adjacent to the shoulder must be controlled in the following situations.

a. Grade Level Road Crossings

At grade level road crossings vegetation must be controlled to provide safe lines of sight between motorists and rail traffic.

b. Railroad Signals, Signal Cases, and Signs

The area around railroad signals, signal cases, and signs will be maintained weed free providing a safe line of sight and to permit maintenance access.

c. Inside Curves

In the area adjacent to the shoulder, on the inside of curves, low growing vegetation must be maintained to permit visibility and allow workers on the trains to inspect the trains as it moves around the curves.

F. Railroad Facilities

Railroad facilities include yards, buildings, fueling facilities, and off-track areas. These areas are not considered rights-of-way, and are not covered under these regulations, but are treated with herbicides independently of the ROW.

2. Vegetation Control Procedure

The railroad rights-of-way vegetation control procedure consists of two direct methods and one indirect method. The direct methods are mechanical cutting and herbicide applications. The indirect method is any right-of-way operational activity which eliminates vegetation as a secondary benefit (e.g., construction, resurfacing).

A. Mechanical Techniques

Mowing is the mechanical process of cutting a target species, generally with motor-driven rotating cutting heads. Mechanical control techniques are limited to woody and brush vegetation that cannot be adequately controlled using herbicides, and includes target trees that interfere with the right-of-way. Mechanical techniques may also be used in the areas adjacent to the roadbed to remove unwanted woody vegetation in areas restricted for herbicide application. For

clearing woody vegetation in these areas, cutting heads are mounted on hydraulic arms that greatly extend the lateral reach of the equipment. These machines can be mounted on off-track, or on-track hi-rail equipment. Large machines are required for railroad application because of the wide range of conditions found on the rights-of-way. Railroad safety guidelines may restrict the use of brush cutters within developed areas. Mechanical cutters such as mowers present certain safety hazards which the railroad personnel must consider. Not only is brush cutting potentially hazardous to the workers, but also poses a hazard to the public due to the potential for thrown projectiles. Mechanical cutting with high-reach mowing machines is often restricted within specific distances of roads, buildings, and inhabited areas for safety reasons, greatly restricting its application.

Hand-operated equipment such as brush cutters and string trimmers are appropriate in these areas, but are ineffective against larger-diameter woody vegetation, and generally do not result in adequate full-season control of smaller vegetation.

B. Herbicide Application

Herbicides are successfully applied on railroad rights-of-way because of their specificity, range of target species, economics, relative ease of application, safety, and particularly the degree of effective vegetation control provided. Herbicides are essential to eliminate vegetation on the right-of-way roadbed (the ballast/shoulder area) because they offer complete control of the plants. There is no known mechanical method for adequate vegetation control on the railroad roadbed, as previously noted.

Herbicide use constitutes part of an integrated vegetation management approach by consideration of the area to be treated, target species, timing of application, and type of herbicide used. The two herbicide categories are pre-emergent herbicides, which the plant or seed absorbs before it can emerge, and post-emergent herbicides, which the plant absorbs through foliage and other green parts, or through woody parts (i.e. bark, stem, roots). Pre-emergent herbicides are used only on the railroad yards, not on the rights-of-way. CSX uses only post-emergent herbicides permitted by the MDAR where appropriate on rights-of-way.

The post-emergent herbicide program is directed toward vegetation control on the railroad right-of-way. Post-emergent herbicide applications may be foliar, stem, or cut surface. Foliar application from a hi-rail truck mounted sprayer is the most common application.

The target plants are any and all plants growing between the rails and on the ballast shoulder, and any weedy herbaceous, vine, or woody species with the potential to foul those areas, as previously described. Post-emergent herbicide application is normally performed in June or July, but is dependent on weather, target species, and the date of last treatment of that area. All treated areas are later inspected and the effectiveness of the treatment evaluated. If necessary, a second treatment may be selectively applied to some vegetated areas (per CMR 333 11.03(8)).

As required by 333 CMR 11.07, as part of the YOP process, CSX will make a written public and regulatory agency notification of the proposed dates of herbicide application at least 21 days prior to the application. CSX will also publish a public notice of the proposed herbicide application 48 hours prior to the start of the treatment.

Foliar Treatment is the selective application of herbicide to the foliage, and is normally performed using spray equipment mounted on a hi-rail truck. CSX will use only post-emergent, low-pressure foliar treatment herbicide application on the right-of-way. Foliar application is made when the target vegetation is in full leaf and actively growing, and in accordance with the herbicide label requirements.

Foliar treatment requires the application of an herbicide and adjuvant diluted in water to the foliage of target vegetation. The hi-rail truck equipment applies herbicide at low pressure, normally between 30 and 40 pounds per square inch (psi), but never greater than 60 psi. Low pressure as defined by CMR 333 11.02 is less than 60 psi. The applicator can adjust the pressure for the rate of speed of the truck, increasing the application pressure when the truck is traveling at a higher speed, in order to apply a consistent concentration of herbicide per length of railroad right-of-way.

The hi-rail trucks have a rear-mounted applicator boom located approximately 18 inches above the ground. Spray nozzles mounted on the boom are controlled by the driver from within the cab, and can easily be switched on or off over a very short distance, as little as one foot, depending on the speed of the truck. Spray booms are independently controlled according to left side, center, and right side allowing the operator to shut off the application to areas lacking target vegetation. Foliar spray will not be used on vegetation greater than 12 feet in height, in accordance with the regulation, and is normally directed to vegetation along the ground or up to only several feet high. Spray nozzles are equipped with a spring-loaded shut-off valve to prevent dripping when the pressure is turned off. A trough is mounted below the spray boom to catch any drips from the spray nozzles when they are not in use, and to prevent dripping of herbicide when traveling through herbicide-restricted areas.

Side trimming, when done with herbicides, is the selective application of the herbicide to target portions of a tree and avoids removal of the entire tree. No foliar application of herbicides will be used to control vegetation greater than 12 feet in height except for side trimming, if necessary, as per 333 CMR 11.03 (5).

Stem Treatment includes any technique in which an herbicide is selectively applied to the stem, stump, or base of the target vegetation. The equipment for basal spraying is often a manual-pump apparatus. Normally, the herbicide is manually painted or otherwise applied directly onto the cut stump surface. These methods are not practical for most applications along the right-of-way, but can be useful for treatment in difficult areas where foliar spray application is not feasible, or for certain target vegetation that may be resistant to foliar application.

VI. IDENTIFICATION AND CONTROL STRATEGIES FOR SENSITIVE AREAS

A. Sensitive Area Identification

Sensitive Areas, as defined in 333 CMR 11.04, are any areas within Rights-of-Way, including No-Spray and Limited-Spray Areas, in which public health, environmental, or agricultural concerns warrant special protection to further minimize risks of unreasonable adverse effects. Sensitive areas are identified using maps prepared by the Massachusetts Department of Environmental Protection (DEP), by reference to state regulations, and/or indicated by other data sources and field observations, as in the cases of private wells and inhabited areas. CSX will apply herbicides where warranted in accordance with the IVM program in compliance with the requirements of 333 CMR 11.00, including all sensitive area restrictions.

No herbicide application is allowed within the following sensitive areas:

- (a) Within a Zone I (area of contribution to a drinking water supply);
- (b) Within 100 feet of any Class A Surface Water Source;
- (c) Within 100 feet of any tributary or associated surface water body where the tributary or associated surface water body runs within 400 feet of a Class A surface water source;
- (d) Within ten feet of any tributary or associated surface water body where the tributary or associated surface water body is at a distance greater than 400 feet from a Class A surface water source;
- (e) Within a lateral distance of 100 feet for 400 feet upstream, on both sides of the river, of a Class B Drinking Water Intake;
- (f) Within 50 feet of any identified Private Well;
- (g) Within ten feet of any Wetlands or Water Over Wetlands;
- (h) Within ten feet of the mean annual high-water line of any river;
- (i) Within ten feet of any Certified Vernal Pool.

Herbicide application is restricted to no more than one application every two years:

- (a) Within any Zone II or Interim Wellhead Protection Area;
- (b) Between 100 feet and 400 feet of any Class A Surface Water Source;
- (c) Between 10 and 200 feet of any tributary or associated surface water body where the tributary or associated surface water body runs outside the Zone A for the Class A surface water source;
- (d) Between 100 and 200 feet for 400 feet upstream, on both sides of the river, of a Class B Drinking Water Intake;
- (e) Between a 50 and 100 foot radius around a private well.

Herbicide application is restricted to no more than one application per year:

- (f) Between 10 and 100 feet from wetlands or water over wetlands;
- (g) Between 10 feet from the mean annual high water line of any river to the outer boundary of the Riverfront Area;
- (h) Between 10 feet from any Certified Vernal Pool to the outer boundary of the Certified Vernal Pool Habitat (100 foot buffer);
- (i) Within one hundred 100 feet of any agricultural or inhabited area.

For the purposes of identification to ensure the restrictions are followed, sensitive areas are separated into two categories: areas that are readily identifiable in the field; and areas that are not readily identifiable in the field. According to 333 CMR 11.03 (4), “the perimeter of any sensitive areas which are not readily identifiable on the right-of-way shall be identified with a clearly visible marker system, consistent with the VMP, prior to any herbicide application.”

CSX has determined that the following areas are readily identifiable in the field: inhabited areas; agricultural areas; and areas of intermittent standing or flowing water, such as drainage ditches, in which herbicide application is prohibited in the event that standing or flowing water is present at the time of application (not including intermittent tributaries to a Class A surface water source, whether in a natural or artificial channel, which will be mapped as restricted).

The remaining sensitive areas are considered not readily identifiable in the field, and as such have been marked with a permanent marker system that itself is identifiable in the field to the CSX track inspector, herbicide applicator, and interested parties. The most common type of sensitive area encountered on the CSX right-of-way are areas within 100 feet of wetlands or water over wetlands. The other sensitive areas marked in the field are certified vernal pools and setbacks from public and private drinking water supply areas.

B. Map Preparation

In order to accurately mark sensitive areas in the field, CSX reviewed several data sources, principally geographic data publicly available from the Massachusetts Office of Geographic and Environmental Information (MassGIS). Relevant data layers (listed below) were downloaded and overlain on a USGS topographic base layer (MassGIS USGS Topographic Quadrangle Images) and/or digital orthophoto layer (MassGIS 1:5,000 Color Ortho Imagery - 2005 or MassGIS USGS Color Ortho Imagery - 2008). The MassGIS 1:5,000 Road and Rail Centerlines datalayer was placed on the base maps, modified as necessary by hard copy map and other data from CSX.

Sensitive area data layers obtained from MassGIS are:

- DEP Public Water Supplies (PWSDEP_PT)
- DEP Interim Wellhead Protection Areas (IWPA_POLY)
- DEP Approved Wellhead Protection Areas (ZONE2_POLY)
- Surface Water Supply Protection Areas (SWP_ZONES_POLY)
- Waterbodies (HYDRO25K_POLY)
- Rivers/Streams (HYDRO25K_ARC)
- Certified Vernal Pools (CVP_PT)
- Surface Water Supply Watersheds (SWP_WATERSHEDS_POLY)
- DEP Wetlands (WETLANDSDEP_POLY)

In addition to these GIS data, CSX obtained data on locations of private wells by reviewing a copy of the Private Well Registry from MDAR, and by making written inquiry to the Board of Health in each municipality regarding wells potentially located with 100 feet of the right-of-way.

An extensive field investigation was conducted into the locations of jurisdictional wetlands, under the Massachusetts Wetlands Protection Act, near the rights-of-way, and wetlands

determinations were sought from the Conservation Commission in each municipality in which wetlands were found to be present near the right-of-way (further described below).

CSX used desktop GIS to develop rules describing appropriate setbacks that define the sensitive area boundaries. This GIS process was used to generate a map of the entire CSX right-of-way system in Massachusetts showing all sensitive areas and restricted spray zone perimeters within the rights-of-way. The map was divided into 1:5000 scale maps suitable for field use. Maps will be updated each year as part of the YOP to include any changes to MassGIS data layers, and new private well data.

C. Field Marking of Sensitive Areas

The perimeters of sensitive areas where herbicide application is restricted, as described above, are marked on the CSX rights-of-way using permanent color-coded markers. No-spray areas are defined by yellow marker plates and/or yellow painted rail and cross-tie sections. Areas restricted to herbicide application no more than once every two years are similarly marked in purple/dark blue. Areas restricted to no more than one application every year are likewise marked in light blue. The locations of restricted spray areas were determined by GIS map data analysis for all sensitive areas except wetlands. Setbacks from wetlands and water over wetlands were preliminarily identified by GIS data, but were ascertained by field investigation.

The Rights-of-Way management regulations 333 CMR 11.00 define wetlands as any of the areas defined in 310 CMR 10.02(1)(a), (b), (c), and (f). These consist of: any bank, freshwater wetland, coastal wetland, beach, dune, flat, marsh, or swamp bordering on the ocean, any estuary, creek, river, stream, pond, or lake; land under any of those water bodies; and land subject to tidal action. No herbicides may be applied within ten feet of any wetlands or water over wetlands, within ten feet of the mean annual high-water line of any river, or within ten feet of any Certified Vernal Pool. Also, herbicides are restricted to no more than one application per year between 10 and 100 feet from any wetlands, between 10 feet from the edge of any river and the outer boundary of the Riverfront Area, and between 10 feet from any Certified Vernal Pool to the outer boundary of the Certified Vernal Pool Habitat (100 foot buffer).

CSX performed a field investigation to identify and mark the locations of 10-foot and 100-foot offsets from wetlands where they intersect the right-of-way. The locations of all spray restriction zone starting and ending points were recorded using handheld sub-meter GPS equipment, and portrayed on ROW maps for use in the wetlands determinations, and to guide the herbicide application operators.

Wetlands were identified along the ROW in accordance with the DEP manual "Delineating Bordering Vegetated Wetlands Under the Massachusetts Wetlands Protection Act". The principal indicators used were direct observation of surface water, saturated conditions, or 50% or more wetland indicator plants in a sample plot, as defined by the U.S. Fish and Wildlife Service's National List of Vascular Plant Species that Occur in Wetlands, Northeast Region. As required by 333 CMR 11.02, CSX requested a wetlands determination in accordance with 310 CMR 10.05(3)(a) 1 and 2 from the Conservation Commission of each municipality in which such wetland areas are present near the right-of-way.

D. Control Strategies for Sensitive Areas

Sensitive areas in which herbicide application is allowed but restricted to no more than once per year or per two years will be treated with herbicide, if necessary, using only low pressure foliar techniques or cut-stump applications. As required by 333 CMR 11.03, no herbicide will be applied when the wind velocity is such that there is a high propensity to drift off target, no herbicide will be applied during measurable precipitation, and no person shall apply herbicides in such a manner that results in drift of herbicide into any no-spray area. For sensitive areas in which herbicide application is prohibited, CSX will control vegetation using mechanical methods. These sensitive area restrictions will apply to annual rights-of-way vegetation control as described in this plan, and not for separate projects such as control of invasive species performed outside of the rights-of-way management regulations.

VII. OPERATIONAL GUIDELINES FOR APPLICATORS RELATIVE TO HERBICIDE USE

Any applicator performing herbicide application on CSX right-of-way will hold a valid pesticide certification granted by the Commonwealth of Massachusetts. The applicators will follow all railroad safety regulations, all relevant federal and state requirements, and all herbicide label instructions.

The applicator will be accompanied during the herbicide application procedure by a representative of CSX who is familiar with that section of the right-of-way, and by a CSX representative who has knowledge of the sensitive area locations, the maps and associated data defining those areas, and the applicable regulations.

The applicator and accompanying personnel will have access, during the treatment process, to paper maps and/or a laptop computer displaying GIS data indicating the locations of all restricted spray areas on the right-of-way being treated, to aid in identification of the boundaries of those areas and ensure no herbicide application is improperly made.

Herbicide application will be restricted during the following adverse weather conditions:

- Herbicide application will not be made during measurable rainfall. Foliar herbicide application may be effective in fog or mist conditions, but precipitation that creates runoff from plant leaves will render the herbicide ineffective. Herbicide application will be postponed until the leaves of target vegetation are sufficiently dry to allow the herbicide to adhere to the leaves and be effective;
- If application is interrupted by an unexpected rain event, herbicide application will be stopped and will not resume until precipitation and leaf runoff have stopped, and the leaves of target vegetation are sufficiently dry to allow herbicide to be effective;
- Excessive wind can cause drift of the herbicide spray; herbicide application will stop if the applicator observes significant movement of the spray, and will not resume until the wind has subsided sufficiently to prevent observable movement away from the target of the spray.

A daily field report of vegetation control activities will be filled out each day by the licensed herbicide applicator, and will include, but not be limited to:

- date and time of application;
- vehicle identification;
- track identification;
- name and volume of all herbicide and associated materials used;
- weather; and
- any other information deemed by the applicator to be relevant to the day's herbicide application activities.

In the weeks following herbicide application, the scheduled CSX track inspector will observe and make note of the effectiveness of the application for use in subsequent vegetation management activities.

VIII. ALTERNATIVE LAND USE

CSX has evaluated alternative land uses on the right-of-way. Safety considerations preclude alternative land uses with regard to maintenance of the railroad right-of-way. Certain other uses of the right-of-way that are compatible with the railroad are co-located electric distribution and transmission, telecommunication lines, water or sewer lines, or other pipelines. These uses reduce the length of new rights-of-way required for all uses, but do not change the vegetation management requirements along the rights-of-way.

IX. REMEDIAL PLAN TO ADDRESS SPILLS AND RELATED ACCIDENTS

This remedial plan is offered as a guide to proper procedures for addressing pesticide accidents. In the event of an accident, the applicator must weigh factors specific to the situation and use their best judgment to decide the appropriate course of action.

Federal and state statutes establish emergency response procedures that must be followed by CSX and contractor in the event of a spill or related accident. It is the applicator's legal responsibility to clean up pesticide spills resulting from their use and handling of the product. Applicators are liable for damages, subject to penalties, and obligated to clean up and decontaminate areas resulting from pesticide spills.

Because applicators normally carry only relatively small amounts of herbicides, the potential for serious accidents is relatively small. The high-rail vehicle also carries diesel fuel, motor oil, engine coolant, other fluids (e.g. brake), and hydraulic oil. The applicator will be prepared to take remedial measures in the event of a spill of any of these materials.

Applicators will carry the herbicide labels, Material Safety Data Sheets (MSDS) for the chemicals being used, as well as equipment for emergency action including gloves, sand or other absorptive material, broom, shovel, and heavy duty plastic bags or other leak-proof sealable containers.

A copy of the YOP will be carried with the herbicide applicator. The YOP contains telephone numbers for the state police, local fire department, poison control center, herbicide manufacturer(s), and DEP, as well as a spill response checklist and MSDS.

In the event of a spill or related accident, the following actions will be taken:

- administer first aid if required (if necessary, call ambulance, Massachusetts poison information center);
- in case of contact with herbicides, decontaminate as directed by MSDS, change clothing as appropriate, seek medical attention if appropriate;
- call police in event of damage to property, or fire/explosion;
- if possible and safe to do so, control the spill and confine the spread of liquids with dikes, sand, and/or absorbent materials;
- clean up spilled material as necessary and label any containers of contaminated materials for proper disposal;
- if unable to clean up entire spill with materials available, contact local police and fire department;
- notify MassDEP immediately if a wetland, water body, or other sensitive area is threatened or contaminated by release of hazardous materials;
- contact MassDEP immediately in the event of a spill of a reportable quantity of oil or hazardous materials.

X. IDENTIFICATION / QUALIFICATIONS OF INDIVIDUALS DEVELOPING THIS PLAN

This Vegetation Management Plan is based on the plan originally developed by Conrail in 1989 for the railroad rights-of-way now owned by CSX. This 2015-2019 Vegetation Management Plan was updated under the direction of Mr. Stephen Herzog of Amec Foster Wheeler, Inc. It is based on the 2010-2015 Vegetation Management Plan also prepared by Mr. Herzog. Amec Foster Wheeler is an international engineering and environmental consulting organization with expertise in civil and geotechnical engineering, natural resources, contaminated site remediation, human health and ecological risk assessment, environmental compliance and permitting, and GIS services. Mr. Herzog is a natural resources scientist with B.S. and M.S. degrees in environmental science and geology, and over 20 years' experience in environmental services. He has expertise in ecology, land use planning, and geographic information systems. For this project Mr. Herzog managed the field wetlands delineations, GIS data development, and the wetlands determinations required as part of sensitive area identification. He also developed the YOPs prepared under the previous VMP, and has accompanied licensed herbicide applicators during previous vegetation control efforts on CSX's rights-of-way.

Appendix A – List of Affected Municipalities

Auburn
Becket
Berlin
Bolton
Brimfield
Brookfield
Charlton
Chester
Clinton
Dalton
East Brookfield
Framingham
Hinsdale
Huntington
Lancaster
Leicester
Leominster
Marlborough
Middlefield
Monson
Montgomery
Northborough
Oxford
Palmer
Pittsfield
Richmond
Russell
Southborough
Spencer
Springfield
Sterling
Warren
Washington
West Brookfield
West Springfield
West Stockbridge
Westfield
Wilbraham
Worcester