



Vegetation

Management

Plan

2009 - 2013

The following Vegetation Management Plan (VMP) has been developed to ensure compliance with Rights-of-Way Management Regulations (333 CMR 11.00).

<u>TABLE OF CONTENTS</u>	<u>PAGE(S)</u>
IDENTIFICATION AND QUALIFICATIONS OF APPLICANT	2
STATEMENT OF OBJECTIVES	3
DESCRIPTION OF TARGET VEGETATION	4, 5, 6, 7
INTEGRATED ROADSIDE VEGETATION MANAGEMENT	8, 9, 10, 11
SUMMARY OF CONTROL METHODS	12
JUSTIFICATION OF HERBICIDE USE	13
HERBICIDE APPLICATION METHODS	13, 14
IDENTIFYING AND PROTECTING SENSITIVE AREAS	14, 15, 16, 17
OPERATIONAL GUIDELINES FOR HERBICIDE APPLICATORS	18
MITIGATION MEASURES	19
ALTERNATIVE LAND USE OPTIONS	19
REMEDIAL PLAN TO ADDRESS SPILLS AND RELATED ACCIDENTS	20, 21
HERBICIDE ALTERNATIVES	22
EVALUATION AND RECOMMENDATIONS	22

IDENTIFICATION AND QUALIFICATIONS OF APPLICANT

**George Batchelor
Supervisor of Landscape Design
Massachusetts Highway Department
10 Park Plaza
Boston, MA 02116**

In his capacity as Statewide Program coordinator for the Massachusetts Highway Department's Vegetation Management Program, Mr. Batchelor is responsible for contract and plan design, implementation, interagency issues, and correspondence associated with the State's Vegetation Management program. Mr. Batchelor is a landscape architect whose 15-year career with MassHighway has been dedicated to the enhancement and care of the roadside environment. Mr. Batchelor has been supervisor of the MassHighway Landscape Design Section for 11 years

STATEMENT OF OBJECTIVES

This Vegetation Management Plan (VMP) is intended to establish the criteria whereby the Massachusetts Highway Department (Mass Highway) controls vegetation along state roads and highways in compliance with the Rights of Way Management Regulations (333 CMR 11.00) as promulgated by the Massachusetts Department of Agricultural Resources. The plan was developed in accordance with the revised 333 CMR 11.00 Right of Way Management Regulations effective September of 2005 and revised in March of 2007.

The primary objective of the VMP is to provide a safe, unobstructed roadway corridor and preserve the integrity of the highway infrastructure. Management of vegetation is an important element of roadside maintenance for safety and aesthetic purposes. Left uncontrolled, roadside vegetation can impede normal maintenance operations, obstruct motorists' line of vision, threaten pedestrian safety and cause damage to structures such as median barrier, pavements, guard posts, drainage lines and waterways. Other objectives include development of an aesthetically pleasing roadside, pest control, provisions of habitat, and stabilization of embankments and other areas prone to erosion.

When roadside vegetative growth threatens the safety and comfort of the traveling public or maintenance personnel, jeopardizes the capital investment in the transportation infrastructure, or endangers environmental quality, the Massachusetts Highway Department is charged with the responsibility of initiating vegetation management procedures.

To achieve this, Mass Highway will implement an Integrated Roadside Vegetation Management Program (IRVMP). The key components of this strategy will be to identify priorities for vegetation control, to implement controls in an environmentally sensitive manner, and to monitor success to refine methods and adjust priorities. Controls shall include mechanical, chemical, cultural, biological, and roadside development methods.

Although roadside development is not a control tool readily available to maintenance forces, it is included in Mass Highway's IRVMP as it has become an efficient, cost effective method of vegetation management implemented as part of road widening/resurfacing/bridge related construction projects. Mass Highway will continue to refine its specifications and construction policies to ensure that the roadside is not only safe for motorists, but also preserves the quality of the roadside environment, and that improvements will minimize demand for operational controls.

It shall be a goal of the IRVMP to minimize the use of chemical controls, through minimizing areas of application, quantity of chemicals, and frequency of applications. Chemical control techniques shall be limited to use on high traffic volume, high speed interstate and primary roadways in the Commonwealth where safety of motorists, department employees and contractors precludes the use of mechanical methods. In addition the IRVMP will actively pursue testing and evaluation of alternative methods of vegetation control.

Over the 5-year period, Mass Highway will monitor and evaluate the success of the program and integrate appropriate new methods into the VMP and Yearly Operational Plans (YOP).

DESCRIPTION OF TARGET VEGETATION

Mass Highway will inventory roadways and develop priorities for control of target vegetation. These areas will be mapped and prioritized on the basis of roadway volumes, speeds, and significance of vegetation conditions. Early identification and timely removal of unwanted species is the easiest, most effective, and least costly method of weed control, both in terms of dollars and environmental impact. From a highway operations standpoint, target vegetation along roadways falls into one or more of the following categories: hazard vegetation, detrimental vegetation, nuisance vegetation, and invasive vegetation. From a roadside vegetation management standpoint, target vegetation will be one or more of the following types: annual and perennial grasses and weeds, low-growing woody shrubs and vines, and tall growth (trees). Of these, some target vegetation may be determined to be persistent and invasive, meaning that the vegetation will proliferate and re-sprout when removed by mechanical means.

- *Hazard Vegetation.* This category represents the primary target material, including vegetation obscuring sightlines, growing over guardrails, creating obstacles to signs or vehicular movement, posing windfall hazard over vehicular or pedestrian ways, or creating winter shade leading to icing conditions. A guardrail that is grown over with weeds, vines, or grass becomes an obstacle obscuring sight lines or causing motorists to veer toward the center of the road. In special instances conifers may present a hazard. In the winter, shadows cast on roadways by conifers can delay melting (especially in “low salt” areas) resulting in possibility of hazardous road conditions and an increase in the amount of de-icing chemicals (road salt) applied.
- *Detrimental Vegetation:* This category comprises grasses and woody plants that are destructive to or compromise the function of highway structures, including grasses in pavement and bridge joints, medians barriers and traffic islands, as well as vegetation growing in and along drainage structures thus compromising drainage ways. The roadway drainage impact of vegetation creates storm water accumulation and hazardous icing conditions.
- *Nuisance or Noxious Vegetation:* This category includes any vegetation growing along state roadways that could potentially cause problems to the general public and/or Mass Highway employees or contractors maintaining the ROW. The overwhelming majority of plant material to be controlled in this instance is Poison Ivy (*Toxicodendron radicans*). Poison Ivy and other nuisance vegetation growing within 30 feet of the edge of pavement, bridge abutments, a drainage structure or swale, other structures and appurtenances requiring maintenance, within Mass Highway ROW, will be considered target vegetation.

Invasive Vegetation: Some areas of Mass Highway ROW have become infested with invasive plant species. Invasive vegetation consists typically of introduced plants that have spread from gardens and agricultural areas into the wild, where they pose problems for the natural environment. Not all invasive plants are non-native and not all introduced species become invasive. However, invasive plants are typically non-native, and there are no local diseases or pests to control them. They reproduce and spread quickly and thrive in disturbed conditions, outcompeting and displacing native species. This reduces biodiversity, because as the native plants disappear, so also do the insects and animals which depend on them for food and habitat.

DESCRIPTION OF TARGET VEGETATION (Cont'd)

Working with input from environmental agencies and academic and technical resource institutions such as the University of Massachusetts Extension Service, Mass Highway will seek opportunities to remove invasive material and to encourage growth of native species. Specific target invasive plants include but are not limited to Tree of Heaven (*Ailanthus altissima*), Japanese Knotweed (*Polygonum cuspidatum*), Multiflora Rose (*Rosa multiflora*), Oriental Bittersweet (*Celastrus orbiculatus Thunb.*), and Russian Olive (*Eleagnus angustifolia*). Reference and definition for invasive plants shall be as posted on <http://www.massnrc.org/MIPAG/>.



Nuisance vegetation such as Poison Ivy creates a public safety hazard to workers & pedestrians.

DESCRIPTION OF TARGET VEGETATION (Cont'd)

Detrimental vegetation damages state infrastructure and is unsightly. Herbicide treatment will be low-pressure low-volume application along pavement joints.



Hazard vegetation obstructs drainage and impedes pedestrian movement. Management will be mechanical cutting where possible. Herbicide application would include up to 3-foot swath of low-pressure low volume application directly beneath guardrail and along pavement joints.

DESCRIPTION OF TARGET VEGETATION (Cont'd)

Hazard vegetation obstructs visibility of guardrail, including reflectors, along shoulder.



Hazard vegetation obstructs sight distance at intersection.

Management shall be mechanical cutting where possible. Herbicide application would include up to 3-foot swath of low-pressure low volume application directly beneath guardrail and along pavement joints.

INTEGRATED ROADSIDE VEGETATION MANAGEMENT

Mass Highway's Integrated Roadside Vegetation Management (IRVM) methods include **roadside development and cultural practices** (active planting to encourage appropriate competing vegetation, non-organic barriers), **mechanical** (mowing, hand cutting, selective trimming) and **chemical** (low volume foliar herbicide treatments and basal or cut-stump treatment.) Each one of these methods has benefits and impacts, and each by itself will not work effectively for long term vegetation management. When these methods are integrated, they complement one another in terms of both effectiveness and minimization of environmental impacts. The methods listed above will be chosen by Mass Highway personnel familiar with the right of way, based on a variety of factors including, but not limited to, location, environment, terrain, and public/employee safety. The method chosen for a given vegetation problem will attempt to achieve a long term, low maintenance vegetation management program through the encouragement of a stable herbaceous community.

Roadside Development

A key aspect of the Mass Highway IRVMP is the development of the roadside through Mass Highway construction projects. Mass Highway Design Guide goals include the creation of sustainable low-maintenance landscapes that preserve and protect the natural and cultural resources surrounding the roads. Measures to be implemented include:

- Consistent with the Design Guide goals, Mass Highway will pursue options for reducing mowing frequency as an economic way of establishing naturalized roadside environments, while meeting operational safety requirements.
- Mass Highway will refine seeding and planting specifications with a goal of establishing self-sustaining/low maintenance plantings.
- Working with EOEEA and other agencies, Mass Highway has eliminated the use of invasive species for roadside planting.
- Where feasible Mass Highway will use native plant species to encourage biodiversity.
- Where consistent with Federal and State regulations and policy, Mass Highway will allow private abutters to maintain roadside vegetation using mechanical means only

In addition to these landscape strategies, Mass Highway remains committed to pursuing technological developments that will lead to reduced control requirements. These include:

- Continued use of under-guardrail mulches, mulch mats, and other weed barriers.
- Continued exploration of appropriate sealants and other strategies to reduce vegetation establishment in pavements and highway structures.

INTEGRATED ROADSIDE VEGETATION MANAGEMENT (Cont'd)

Mechanical

- Mowing
- Hand Cutting
- Selective Trimming

Each method of vegetation removal has costs and benefits. The cost of mechanical methods is the amount of labor and time involved, which often includes repeated efforts throughout the growing season to achieve effective control of aggressive species and to prevent their re-establishment. The benefits of these methods are that they incur minimal damage to desirable plants, the site, and surrounding ecosystems. There is no threat of toxic impacts to abutters, residents, laborers, animals, or the environment. The combined costs of equipment, tools, and time and labor tend to be high for this method of roadside vegetation management.

Mowing is the principal vegetation control method employed by Mass Highway. Mowing consists of the seasonal, mechanical cutting of target vegetation using machines. Mass Highway utilizes several types and sizes of mowers including, large gang tow tractor mowers, 6 ft. rear deck tractor mowers, 10 ft. flex wing rotary tractor mowers, articulated boom tractor mowers, small ride-on lawn mowers, push mowers and line trimmers (weed whackers). Selection of specific equipment is based on terrain, target vegetation size and equipment availability. Mowing will be utilized in areas where terrain and target stem size permit safe and efficient use of the equipment.

Hand cutting consists of the mechanical cutting of target species using chain saws and brush clearing saws. Target species are cut as close to the ground as practical with stump heights usually not exceeding three inches. Hand cutting is used in order to protect environmentally sensitive sites. It is also used on target vegetation greater than four feet tall where herbicide use is prohibited or on non-sprouting conifer species greater than six feet in height. Hand cutting is used on those restricted sites where terrain, site size or sensitivity renders mowing impossible or impractical. This method may be practiced at any time of the year.

Selective trimming consists of the mechanical pruning of encroaching limbs on tall trees, which may hamper access to the roadway. This trimming will be accomplished using aerial lifts mounted on trucks or tractors or, if terrain or obstructions prevent equipment access, by climbing crews.

INTEGRATED ROADSIDE VEGETATION MANAGEMENT (Cont'd)



TYPICAL MOWING OPERATIONS

INTEGRATED ROADSIDE VEGETATION MANAGEMENT (Cont'd)

Chemical

- Foliar Treatment
- Stem Treatment (Cut Stump, Basal)

Mass Highway is committed to minimizing its use of chemicals for vegetation control. Chemical herbicides shall be limited to selected high traffic volume, high-speed roadways where the placement of personnel and equipment in or around the roadway would jeopardize the safety of the motoring public, Mass Highway employees, and/or contractors. There are three methods of herbicide application that may be utilized by Mass Highway, foliar treatment, cut stump surface treatment, and basal applications.

Foliar Treatment is the application of herbicides to fully developed leaves, stems, or blades of a plant. The herbicide is mixed or diluted with water and a drift control agent and surfactant and applied as a uniform spray over the entire foliage of the plant. This is generally the most effective and economical method, particularly in areas where mechanical methods preclude the safe placement of men and equipment. It is also the best technique to control noxious and poisonous vegetation that presents a public safety hazard to pedestrians, and inspection and maintenance crews.

Mass Highway will utilize post-emergent, low volume, low pressure foliar treatment herbicide applications only. All herbicides used by Mass Highway, have been researched, tested and approved for use by the Department of Agricultural Resources (DAR) in "Sensitive Areas." The application of herbicides to bare ground shall be avoided.

Stem Treatment is any technique including, but not limited to stump, basal, stem, injection, banding, frill, or girdle and any other technique which delivers herbicide at low pressure to the stump, base or stem of the target vegetation. Ideally, treatment should be made to freshly cut stumps or live stems, and avoided during the season of high sap flow. This method is often not practical in moderate or heavy stem densities but offers the opportunity to chemically treat undesirable vegetation in sensitive or difficult to access sites where other methods are not possible.

When used in concert with mechanical components of an IVM program, herbicides can support the establishment of low-growing, favorable plant communities. Used properly, herbicides are the most effective and environmentally sound means for preventing the re-growth of target vegetation. Chemical controls are, therefore, an integral part of an IVM program and the selective and judicious use of herbicides is critical in the effective management of undesirable vegetation along state roadways.

SUMMARY OF CONTROL METHODS

TARGET*	CONDITIONS	CONTROL METHODS
Grasses And Low Growth	- Where terrain and traffic conditions allow	Mechanical (mowing)
	- Under guardrail; or - Pavement cracks; or - Joints where traffic volumes and speeds pose a hazard to motorists and MHD employees or contractors	Chemical (low volume foliar treatment)
Low Growth	- Terrain allows, and - Species are not persistent or invasive	Mechanical (mowing)
	- Terrain prevents mowing, and - Species are not persistent or invasive	Mechanical (hand cutting)
	- Terrain prevents mowing, and - Species are persistent and invasive	Chemical (low volume foliar treatment)
	- Poison ivy that is -in ROW; and -within thirty (30) feet of pavement, or any MHD structure or appurtenance	Chemical (low volume foliar treatment)
Tall Growth	- Individual trees or branches	Mechanical (selective trimming)
	- Plants >12 feet high ; or - Terrain too steep; and - Species are not persistent or invasive	Mechanical (hand cutting)
	- Plants >12 feet high; and - Species are persistent and invasive	Chemical (cut-stump, stem/basal treatment)

***Target vegetation shall include hazardous, detrimental, nuisance, or invasive vegetation, as determined by Mass Highway personnel.**

JUSTIFICATION OF HERBICIDE USE

The long-term goal for every VMP, Mass Highway or other, is to reduce the need for vegetation management. Mass Highway will implement an integrated approach to vegetation management by encouraging plant communities that hinder the development of target vegetation. This program will utilize roadside development, mechanical and chemical methods to control vegetation and will address public, environmental, employee safety and economic concerns by minimizing the applications of and reliance on herbicides.

To date, there is no environmentally, economically feasible and safe ROW management program that eliminates the use of herbicides altogether. In particular, guardrails, medians and traffic islands on high-speed high-volume roads present conditions unsafe for hand-cutting and mowing operations. Many of the species growing in these conditions are invasive and persistent, and cannot be adequately controlled without chemical treatment. Nuisance plants, Poison Ivy in particular, are not only invasive and persistent, but present a potential health hazard to mechanical equipment operators, as well as the general public.

In addition, under certain conditions, Mass Highway may also use herbicides to remove persistent invasive vegetation as part of a larger effort to establish sustainable and/or native species.

Consequently, public and occupational safety considerations require judicious use of chemical controls.

HERBICIDE APPLICATION METHODS

MassHighway will utilize two methods of herbicide application, foliar treatment and cut stump/basal stem treatment.

Chemical foliar treatments involve the selective application of approved herbicides and adjuvant diluted in water, to the foliage and stems of the target vegetation. The foliar treatment used shall be low pressure, below 60 psi at the nozzle, with a normal working pressure of 40 psi for application at volumes of less than 40 gallons/acre.

Low pressure nozzles will be used to produce the largest possible droplet size and a drift control agent shall be added at the rate recommended on the label to keep spray drift to an absolute minimum. Experience indicates minimal drift occurs when using low- pressure applications with drift control agent.

HERBICIDE APPLICATION METHODS (Cont'd)

To control vegetation beneath and immediately adjacent to guardrail, a low-pressure foliar treatment shall be applied using a truck mounted spray boom, attached to either side of the front of the unit. In addition, a separate handgun equipped with a low pressure nozzle and adequate length of hose will be used for low-pressure, low-volume spot treatments of target vegetation growing in pavement, median and traffic island joints, around bridge structures, drainage structures, sign posts and other structures and appurtenances.

The herbicide solution is applied to lightly wet the target plant. This technique has few limitations with the exception of reduced effectiveness on tall, high-density target vegetation and will not be used on vegetation over 12 feet in height. This type of vegetation will be controlled using mechanical methods followed by an application of an approved herbicide with a portable pressurized canister or manually painted on the freshly cut surface of the remaining stump (Cut Stump Surface Treatment or Stem Treatment).

Low-pressure foliage applications will take place when plants are in full leaf and actively growing, and in accordance with the product labels.

IDENTIFYING AND PROTECTING SENSITIVE AREAS

Sensitive areas are defined as areas within rights-of-way in which public health, environmental or agricultural concerns warrant special protection to further minimize risks of unreasonable adverse effects (of herbicides) and include public groundwater supplies, public surface water supplies, private drinking water supplies, surface waters, wetlands, rivers, inhabited areas and agricultural areas. For the purpose of identification, sensitive areas can be separated into two categories: areas that are and are not readily identifiable in the field. A significant amount of research and field-work is applied to locating and delineating sensitive areas.

Sensitive areas that are not readily identifiable in the field include public groundwater supplies, private water supplies and public surface water supplies. Sources available to identify these areas include:

- Massachusetts Department of Environmental Protection (DEP) Water Supply Maps (1:25,000); delineating the perimeter of public watersheds and the location of public wells.
- Massachusetts DEP Wetland Conservancy Maps (scale 1:1,000).
- Municipal maps and records.
- Regional Planning Agency maps and records.
- U.S. Fish and Wildlife Service National Wetlands Inventory Maps, available from the University of Massachusetts, Cartographic Information Research Services in Amherst.
- Conservancy Program & Ortho Photo and Information - Massachusetts DEP (1:5000).
- Identification of public and private well locations will be requested in writing from the Board of Health in each community where herbicide applications are proposed.
- Natural Heritage and Endangered Species Program
- Massachusetts Department of Fish and Game

IDENTIFYING AND PROTECTING SENSITIVE AREAS (Cont'd)

Sensitive areas that are readily identifiable in the field include surface waters, wetlands, rivers and agricultural areas. The method utilized to identify these sensitive areas will be as follows:

- Consult EOEEA Mass GIS spatial data maps to locate any of these sensitive areas that may already be identified on these maps.
- Prior to commencement of herbicide application operations, the treatment crew will be provided the marked topographic maps and detailed spray sketches.
- The treatment crew will visually survey the area to be treated for any additional sensitive areas (e.g. catch basins with or drainage ditches with standing water not shown on plans) as well as areas where the ground is bare or has limited re-growth from previous herbicide applications.

The following is a description of how the sensitive areas will be identified for required protection:

- Consult the appropriate reference materials and sources to determine the precise location of these areas.
- Place the boundaries of these sensitive areas on U.S. Geological Survey (USGS) topographical maps, CAD (Computer Aided Drafting) drawings or GIS output.
- Prior to commencement of herbicide application operations, Mass Highway personnel will install permanent color-coded plastic delineators to mark the boundaries of the spray and no spray zones. In addition, the treatment crew will be provided with a copy of the Yearly Operational Plan, the marked up topographic map, and CAD sketch drawings with which to identify the boundaries of these sensitive areas.
- Mass Highway will deploy a qualified point person in advance of the main herbicide application operation to identify the delineation markers and boundaries of the appropriate buffer zone. In addition, point person will be responsible for identifying otherwise unmapped sensitive areas requiring restriction. Information collected by point person will then be transmitted in advance to the treatment crew via two-way radio. This communication will ensure that only the appropriate areas are treated and will minimize the chance of mistakes.

SENSITIVE AREA RESTRICTIONS

Sensitive Areas are defined as areas within rights-of-way in which public health, environmental, or agricultural concerns warrant special protection to further minimize risks of unreasonable adverse effects (of herbicides).

Note: Mass Highway's herbicide applications are limited to low pressure foliar techniques or cut-stump applications only.

IDENTIFYING AND PROTECTING SENSITIVE AREAS (Cont'd)

Table 2 - Sensitive Area Restriction Guide (333 CMR 11.04)

<u>SENSITIVE AREA</u>	<u>NO-SPRAY ZONE</u>	<u>LIMITED USE ZONE</u>	<u>WHERE IDENTIFIED</u>
Wetlands and Water over Wetlands	Within 10 feet. (Unless provisions of 333 CMR 11.04(4)(c) are followed)	10 - 100 feet: 12 months must elapse between applications and herbicides are applied selectively by low pressure foliar techniques or by cut-stump applications.	YOP Maps and identify on site.
Certified Vernal Pool	Within 10 feet.	10 feet to the outer boundary of any Certified Vernal Pool Habitat; 12 months must elapse between application; Selective low pressure, using foliar techniques or basal or cut-stump applications.	YOP Maps and identify on site
Public Ground Water Supply	Within 400 feet (Zone I)	Zone II or IWPA (Primary Recharge Area): 24 months must elapse between applications and herbicides are applied selectively by low pressure foliar techniques or by cut-stump applications.	YOP Maps
Riverfront Areas	Within 10 feet from mean annual high water line.	10 feet from the mean annual high water line and the outer boundary of the Riverfront Area; 12 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications.	YOP Maps and Identify on site
Agricultural & Inhabited Areas	N/A	0 - 100 feet: 12 months must elapse between application; Selective low pressure, using foliar techniques or basal or cut-stump applications.	Identify on site.
State Listed Species Habitat	No application within habitat area except in accordance with a Yearly Operational Plan approved in writing by the Massachusetts Department of Fish and Game.		YOP Maps

IDENTIFYING AND PROTECTING SENSITIVE AREAS (Cont'd)

Table 2 (continued) - Sensitive Area Restriction Guide (333 CMR 11.04)

<u>SENSITIVE AREA</u>	<u>NO-SPRAY ZONE</u>	<u>LIMITED USE ZONE</u>	<u>WHERE IDENTIFIED</u>
Private Water Supply	Within 50 feet	50 – 100 feet 24 months must elapse between applications; Selective low pressure, using foliar techniques or by cut-stump applications.	In YOP well list and identify on site.
Public Surface Water Supply	Within 100 feet of any Class A public surface water source.	100 feet to the outer boundary of the Zone A; 24 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	YOP Maps
	Within 10 feet of any tributary or associated surface water body located outside of the Zone A	10 feet to the outer boundary of the Zone A; 24 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	YOP Maps
	Within a lateral distance of 100 feet for 400 feet upstream of any Class B Drinking Water Intake.	Within a lateral distance of between 100 – 200 feet for 400 feet upstream of intake; 24 months must elapse between applications; Selective low pressure, using foliar techniques or basal or cut-stump applications	YOP Maps

OPERATIONAL GUIDELINES FOR HERBICIDE APPLICATORS

As required by regulation, applicators to roadside rights of way must hold a valid pesticide certification from the Department of Agricultural Resources. In addition to the applicable rules and regulations, applicators will adhere to the following operational guidelines:

Weather - Herbicide application will be restricted during certain adverse weather conditions, such as rain or wind. Scheduling of spray operations will be attentive to forecast conditions. Herbicide applications will not be made during periods of moderate or heavy rainfall. Foliar applications are effective in light mist situations. However, any measurable rainfall that creates leaf runoff will wash the herbicide off the target plant. If foliar applications are interrupted by unexpected rainfall, the treatment will not resume until the rain ends and active leaf runoff has ceased.

Excessive wind can create drift during foliage applications causing damage to desirable vegetation. To minimize off target drift, the applicator will comply with the following restrictions:

- The applicator will monitor wind conditions to insure that there is no significant movement of the herbicide. If the applicator can see the herbicide moving off target, the application will immediately stop until the wind has subsided enough to permit further application.
- All herbicide solutions to be used for a foliar application will contain anti-drift agents. Anti-drift agents will be added to the foliage herbicide solutions as per the anti-drift agent label. In moderate wind conditions, as per label recommendations, more anti-drift agent may be added, at the discretion of the applicator to control increased drift.
- Foliar treatments will not be made to target vegetation that exceeds approximately twelve feet in height.

Equipment Calibration – Low-pressure foliar application equipment will be calibrated to maintain pressure not exceeding 60 pounds per square inch at the nozzle. The equipment will be calibrated and a Spray Controller will be used to deliver a consistent flow rate of approximately 40 gallons/Acre.

For application to guardrail areas, a series of two (2) low pressure nozzles shall be properly mounted on a boom, spaced to overlap 30 to 50%. The spray pattern will be a narrow oval with lighter edges and, at a normal working pressure of 40 psi, will produce small to medium droplets. The boom will be kept as low as possible to reduce the drift hazard and a drift control additive will be included in the spray formulation to increase droplet size and give a uniform distribution of spray material.

MITIGATION MEASURES

Monitoring and Record Keeping – An inventory of all roadsides will be taken, with information on the prevailing type of vegetation, terrain, highway condition and current maintenance practice included. Research identifying which treatment(s) promotes the goals of the program will follow. The decision to use one of the vegetation control techniques described above will depend on evaluating the specific situation. The goal of the control method will be to establish an easily maintainable, stable plant population that will not interfere with vehicles or pedestrians. Emphasis will be given to the control method that will address the vegetation problem in the most environmentally sound manner and in a way to minimize vegetation control in the long term.

Quality assurance will include routine use inspections by MassHighway personnel with representation from the D.A.R. Pesticide Board to approve equipment, materials, and application procedures.

Monitoring will include project record keeping to maintain information on the nature, timing, and location of actions taken, including project location, weather conditions, miles completed, amount of material used, worker and equipment hours devoted to the project, personnel responsible for activity and follow-up evaluation. Chemically treated areas shall be monitored after the necessary translocation period of the herbicide to determine the effectiveness of the applications and to monitor any off target injury and drift of the spray solution.

Mass Highway will conduct training for district staff in methods of vegetation management, employee safety and record keeping. The contact people for each District are as follows:

- George Batchelor, Supervisor of Landscape Design, Boston (617) 973-7857
- Timothy Meyer, Environmental Engineer, District 2 Northampton Office, (413) 584-1611
- William Clougherty, Projects Engineer, District 3 Worcester Office, (508) 929-3911
- Brett Loosian, Highway Maintenance Engineer, District 4 Arlington Office, (781) 648-8437
- Terence Roche, Roadsides Engineer, District 5 Taunton Office, (800) 635-3590 ext 4221

ALTERNATIVE LAND USE OPTIONS

MassHighway will review and evaluate new and innovative alternative land uses within its ROW. However, specific criteria must be met for adoption of alternative land use options. The alternative land use option must control the undesirable vegetation in a similar manner, ecologically and efficiently as allowed in the IRVMP. For example, where roadway abutters have been permitted to mow and maintain road shoulders, the area would not warrant vegetation control.

REMEDIAL PLAN TO ADDRESS SPILLS AND RELATED ACCIDENTS

All mixing and loading of herbicides will occur at the storage facility in amounts of herbicide necessary to carry out that day's work. This will minimize waste and the need of excess handling. The spray vehicle will be equipped with a clipboard log of the herbicides on board, a bag of adsorbent, activated charcoal, plastic bats, a broom and a shovel in case of a minor spill.

Major Spills and Related Accidents - For the purpose of this VMP, major spills involve reportable quantities of hazardous materials as defined by the Department of Environmental Protection (DEP) 320 CMR 40.000. Related accidents include fire, poisoning and automobile accidents.

- a) Administer proper first aid and call an ambulance and/or Massachusetts Poison Information Center in cases involving injury due to poisoning.
- b) Call the police and/or fire department in cases involving automobile accidents or fire.
- c) If possible, control the spill by stopping the leak or source of spill.
- d) Confine the spread of liquids with a dike composed of soil or other absorptive materials.
- e) Call ChemTrec, Massachusetts Pesticide Bureau or chemical manufacturer for assistance (see phone listing below) if unable to handle the spill or the material is unfamiliar.
- f) Notify the DEP if water bodies are contaminated, and for releases or threatened releases of reportable quantities of hazardous material.
- g) Notify the District Hazardous Material Coordinator.
- h) Clean up spill:
 - 1) If the spill occurs in a public location, isolate the spill areas and deny unauthorized entry until cleanup is complete.
 - 2) Absorb spilled liquids with sand, absorptive clay, spill control gel, vermiculite, pet litter, sawdust or other absorptive material. Wear proper protective clothing and equipment.
 - 3) Sweep or shovel contaminated absorbent into a leak proof, sealable container for proper disposal.
 - 4) Dry herbicides, such as dust, granular and pellets can be directly swept or shoveled into leak proof sealable containers without absorptive materials.
 - 5) Neutralize contaminated area with hydrated lime, sodium hypochlorite (bleach), or soapy water. Never mix bleach and ammonia base products or a poisonous gas will result.
 - 6) Dispose of contaminated material at an approved location.

REMEDIAL PLAN TO ADDRESS SPILLS AND RELATED ACCIDENTS (Cont'd)

Minor Spills - Minor spills involve less than reportable quantities of hazardous materials.

- a) In case of contact with herbicides, wash with plenty of soap and water. Administer proper first aid and see a doctor, if necessary.
- b) Change clothing which has absorbed herbicides.
- c) Clean up spill. (Same as above for major spills).

In the event of a spill, information on safety precautions and clean up procedures may be gathered from the following sources:

- Herbicide label
- Herbicide MSDS sheet
- Herbicide Manufacturers
 - Dow (517) 636-4400
 - Dupont (800) 441-3637
 - Monsanto (314) 694-4000
 - BASF (800) 832-4357
- Massachusetts DAR - Pesticide Bureau (617) 626-1700
- Massachusetts DEP Incident Response Unit (888) 304-1133
- ChemTrec (800) 424-9300
- Massachusetts Poison Control Center (800) 682-9211
- Massachusetts Department of Public Health
Bureau of Environmental Health
Environmental Toxicology Program (617) 624-5757
- Massachusetts Highway Department
 - Boston Headquarters (617) 973-7500
 - District 1 Headquarters (Lenox) (413) 637-5700
 - District 2 Headquarters (Northampton) (413) 582-0599
 - District 3 Headquarters (Worcester) (508) 929-3800
 - District 4 Headquarters (Arlington) (781) 641-8300
 - District 5 Headquarters (Taunton) (508) 824-6633

HERBICIDE ALTERNATIVES

While Mass Highway remains committed to finding effective alternatives, to date no effective alternative to conventional herbicides has been developed or proven to provide superior control in right of way applications. The agricultural industry has made some successful strides in seeking and testing alternatives. Mass Highway has made a good faith effort to stay true to our statements and mission of minimizing herbicide use and seeking effective alternatives to chemical control. With funding from the Federal Highway Administration and the Massachusetts Highway Department, an Alternative to Chemical Herbicide study was conducted over a three year period with the assistance of the University of Massachusetts Plant and Soil Sciences Department. Intensive research and testing of alternative chemicals and control methods was conducted. The published report of this study is available on-line at:

(<http://www.mhd.state.ma.us/default.asp?pgid=content/publicationother&sid=about>)

MassHighway will evaluate the findings and consider incorporating any effective new vegetation control methods into our right of way program during the course of this Vegetation Management Plan.

EVALUATION AND RECOMMENDATIONS

On an annual basis, Mass Highway will evaluate the success of the vegetation management program. This evaluation will include reporting of control measures by district, as well as quantities of herbicides used and total area treated. In addition, in light of the goals of this plan, the condition of the roadside will be evaluated. Finally, the evaluation will make recommendations including any possibilities for reducing mechanical and/or chemical controls. Mass Highway will provide a copy of the evaluation report annually to the Pesticide Board.