

Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont

SECTION 1: INTRODUCTION

The “Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont” (“AMPs”) were first adopted on August 15, 1987 under the authority of Chapter 47 of Title 10 of the Vermont Statutes Annotated, Water Pollution Control (10 V.S.A. §1251a and 1259(f)). See Code of Vermont Rules 12 020 010. The initial adopted rule provided that “the AMPs are the proper method for the control and dispersal of water collecting on logging roads, skid trails and log landings to minimize erosion and reduce sediment and temperature changes in streams.”

Act No. 64 of the Acts of 2015 amended 10 V.S.A. §2622 to require the Commissioner of the Department of Forests, Parks and Recreation to revise by rule the AMPs to ensure that all logging operations on both public and private forestland are designed to prevent or minimize discharges of sediment, petroleum products, and woody debris (logging slash) from entering streams and other waters; improve soil health of forestland; protect aquatic habitat and aquatic wildlife; and prevent erosion and maintain natural water temperature. The purpose of the acceptable management practices is to provide measures for loggers, foresters, and landowners to utilize, before, during, and after logging operations to comply with the Vermont Water Quality Standards and minimize the potential for a discharge from logging operations in Vermont in accordance with 10 V.S.A. §1259.

Pursuant to Section 2-03B.1 of the Vermont Water Quality Standards, there is a presumption that logging operations that are in compliance with the AMPs are also in compliance with the Vermont Water Quality Standards. However, this presumption may be overcome if a water quality analysis demonstrates that there is a discharge of wastes into waters of the State due to logging.

Additionally, logging operations that are in compliance with the AMPs are exempt from the discharge permit requirements in accordance with 10 V.S.A. §1259(f), the stream alteration permit requirements pursuant to 10 V.S.A. §1021(f), the stormwater permit requirements pursuant to 10 V.S.A. §1264(d)(1)(C), and wetland permit requirements pursuant to 10 V.S.A. §913(a) and Section 6.01 – 6.05 of the Vermont Wetland Rules.

SECTION 2: POLICY AND PURPOSE

The purpose of the AMPs is to provide measures for loggers, foresters, and landowners to utilize, before, during, and after logging operations to comply with the Vermont Water Quality Standards and minimize the potential for a discharge from logging operations in Vermont in accordance with 10 V.S.A. §1259.

SECTION 3: AUTHORITY

This rule is adopted pursuant to 10 V.S.A. §2622(a) and (b), 10 V.S.A. §1259(f), 3 V.S.A. §801(b)(11) and 3 V.S.A. §2853(5).

SECTION 4: APPLICABILITY

The AMPs apply to all logging operations on public and private lands in Vermont regardless of the purpose of the logging. For example, logging may be conducted for forest management purposes or logging may be conducted for the purpose of clearing land for some other type of land use, such as commercial, residential or electric utility development.

SECTION 5: DEFINITIONS

For the purposes of this Rule, the following terms shall have the specified meaning.

5.1 “**Agency**” or “**ANR**” means the Vermont Agency of Natural Resources.

5.2 “**AMP (Acceptable Management Practices for Maintaining Water Quality on Logging Jobs in Vermont)**” means regulations promulgated under the authority of 10 V.S.A. §2622(a) and (b) and 10 V.S.A. §1259(f)

5.3 “**Approaches to Stream Crossings**” means that length of a truck road or skid trail associated with stream crossings that traverse through the forest buffer.

5.4 “**At-Grade Ford**” means a stream crossing on a truck road that is constructed perpendicular to the stream channel with approaches being properly stabilized with clean stone fill, and there is no change in existing stream channel cross-section and bed elevation except for minor bank grading at the point of the crossing.

5.5 “**Broad-based Dip**” means a drainage structure, usually used on truck roads where grades are less than or equal to 8 percent. They are specifically designed to divert surface runoff from a truck road into a filter area while vehicles maintain normal travel speeds.

5.6 “**Brushed-in Crossing**” means a temporary method of crossing intermittent streams during logging operations when the ground is frozen. Brushed-in crossings are constructed by placing logs in the bottom of the stream channel, parallel to the stream channel, and then placing topwood (tree limbs and branches) over the logs.

5.7 “**Continuous Forest Cover**” means maintaining a minimum of 60 to 70 percent crown cover or B-level stocking as recommended in the U.S. Forest Service silvicultural guides.

5.8 “**Drainage Ditch**” means a ditch constructed along a road to collect surface water runoff from the travelled portion of the road and divert it into a filter area.

5.9 “**Drainage Structure**” means any type of device, structure or method used to divert surface water runoff from an impervious surface such as a truck road, skid trail or log landing into a drainage ditch or filter area.

5.10 “**Filter Area**” means a vegetated area where surface water runoff is diverted and dispersed so that sediment and other pollutants are trapped and retained. A filter area can include or be within a forest buffer.

5.11 “**Forest Buffer**” means an area of forested land adjacent to streams and other waters where forest management practices are modified to protect water quality. The width of the forest buffer shall be in accordance with Table 4.

5.12 “**Forest canopy**” means a layer or multiple layers of branches and foliage at the top or crown of a forest’s trees.

5.13 “**Gully Erosion**” means a form of soil erosion where gullies of six inches deep or more are created by surface water runoff.

5.14 “**Hay-bale check dam**” means a temporary sediment control structure that is constructed using hay bales to intercept and filter surface runoff to protect water quality in nearby streams and other bodies of water.

5.15 “**Hazardous Material**” means any material determined by the Secretary to have an unusually harmful effect on water quality if discharged to the waters of the state. Hazardous substances associated with logging operations include but are not limited to petroleum products, solvents and coolants.

5.16 “**Intermittent Stream**” means a stream with a well-defined channel, evidence of sediment transport and which regularly experiences periodic interruption of surface flow throughout its length.

5.17 **“Log Landing”** means a place where trees and logs are gathered and sorted in or near the forest during a logging operation for further processing and transport to a mill or log yard facility.

5.18 **“Logging Equipment”** means equipment, implements, accessories, and contrivances used directly and principally in the cutting or removal of timber or other solid wood forest products including, but not limited to machinery used for bucking, bunching, debarking, de-limbing, felling, forwarding, loading, piling, skidding, topping, and yarding operations performed on timber; and chain saws used for commercial logging.

5.19 **“Logging Slash”** means any residual tree material, whole or part, including leaves, bark, wood and root tissue, that is created as a result of a logging operation.

5.20 **“Percent Grade/Percent Slope”** means a measurement of incline or decline expressed as a percentage and as determined by dividing the length of vertical rise in elevation by the length of horizontal distance. (Example: A 6% grade would be a 6 foot vertical rise per 100 feet of horizontal distance: $6 \div 100 = .06$ or 6%)

5.21 **“Perennial Stream”** means a watercourse or portion, segment or reach of a watercourse, generally exceeding 0.5 square miles in watershed size, in which surface flows are not frequently or consistently interrupted during normal seasonal low flow periods. Perennial streams that begin flowing subsurface during low flow periods, due to natural geologic conditions, remain defined as perennial. All other streams, or stream segments of significant length, shall be termed intermittent. A perennial stream shall not include the standing waters in wetlands, lakes, and ponds..

5.22 **“Permanent Stream Crossing”** means a bridge, culvert or at grade ford that is left in place after logging is completed.

5.23 **“Permanent Truck Road”** means a road that remains in place at the conclusion of a logging operation for continued long term access and is designed for year-round use.

5.24 **“Person”** means any landowner, logger, individual; partnership; company; corporation; association; joint venture; trust; municipality; the state of Vermont or any agency, department, or subdivision of the state, any federal agency, or any other legal or commercial entity.

5.25 **“Pole Ford”** means a temporary method of crossing intermittent or perennial streams using logs placed in and parallel to the stream channel.

5.26 **“Rut”** means a depression in a skid trail, logging road, log landing made by the passage of a vehicle or equipment.

5.27 **“Secretary”** means the Secretary of the Agency of Natural Resources or the Secretary’s authorized representative.

5.28 **“Sediment”** means soil that has been eroded from the land surface and is transported and deposited in streams or waters.

5.29 **“Silt Fence”** means a temporary sediment control device used to intercept and filter surface runoff to protect water quality in nearby streams and other bodies of water.

5.30 **“Skid Trail”** means a cleared trail that is used by logging equipment during a logging operation to transport harvested trees and logs to a log landing.

5.31 **“Stream”** means the full length and width, including the bed and banks, of any watercourse, including rivers, streams, creeks, brooks, and branches, which experience perennial flow. “Stream” does not include ditches or other constructed channels primarily associated with land drainage or water conveyance through or around private or public infrastructure.

5.32 **“Stream Channel”** means an area that contains continuously or periodic flowing water that is confined by banks and a streambed

5.33 **“Streambank”** means the portion of a stream channel that restricts lateral movement of water at normal water levels.

5.34 **“Surface Water Runoff”** means precipitation and snowmelt that does not infiltrate into the soil, including material dissolved or suspended in it..

5.35 **“Temporary Stream Crossing Structure”** means a stream crossing structure such as a bridge, culvert, pole ford or brushed-in crossing that is installed in a stream channel. Temporary stream crossing structures must be removed after logging is completed.

5.36 **“Temporary Truck Road”** means a minimum-standard road designed for short-term use to access a logging operation. Temporary roads must be closed out at the conclusion of logging.

5.37 **“Top-of-Streambank”** means the crest of a streambank.

5.38 **“Truck Road”** means a road that connects a log landing to a public road system. A “truck road” may be designed, constructed and maintained to provide either permanent or temporary access.

5.39 **“Turn-up”** means a method used on skid trails to divert surface runoff from a skid trail into a filter area.

5.40 **“Waterbar”** means a mound of soil excavated across the width of a skid trail or truck road to divert surface runoff from side ditches and road surfaces into a filter area.

5.41 **“Waters”** means any natural body of open water other than a stream that is a water of the state under 10 V.S.A. Chapter 47.

SECTION 6: ACCEPTABLE MANAGEMENT PRACTICES

6.1 Truck Roads – Practices to Be Applied During Logging

6.1.1 Permanent and temporary truck roads shall not exceed 10 percent grade. Where no reasonable alternative exists, a steep section of no more than 15 percent grade is allowed but shall not exceed 300 feet in length.

6.1.2 Drainage structures on permanent and temporary truck roads shall be correctly installed to divert surface water runoff into road ditches or filter areas. Drainage structures shall be spaced at intervals according to Table 1 where rock and ledge allows.

6.1.3 Water entering a permanent or temporary truck road shall be moved under and away from the road and into a filter area. Culverts used for ditch drainage on truck roads shall be at least 15 inches in diameter, correctly installed to divert ditch water into a filter area and spaced according to Table 1 where rock and ledge allows.

6.1.4 Drainage ditches along permanent and temporary truck roads shall not terminate directly into streams or other waters. On approaches to stream crossings, ditches shall be turned out into a filter area a minimum of 25 feet away from the top of the streambank.

6.2 Truck Roads - Practices to Be Applied Immediately After Logging

6.2.1 Waterbars on temporary truck roads shall be correctly installed to divert surface water runoff into a filter areas and shall be spaced at intervals according to Table 1 where rock and ledge allows.

6.3 Skid Trails - Practices to Be Applied During Logging

6.3.1 Skid trails shall not exceed 20 percent grade. Where no reasonable alternative exists, a steep section of no more than 25 percent grade is allowed but shall not exceed 300 feet in length.

6.3.2 Waterbars and turn-ups shall be correctly installed on skid trails to divert surface water runoff into a filter area and shall be spaced at intervals according to Table 1 where rock and ledge allows.

6.4 Skid Trails - Practices to Be Applied Immediately After Logging

6.4.1 Ruts on skid trails shall be smoothed to prevent gully erosion and to prevent sediment from entering streams and other waters.

6.4.2 Waterbars on skid trails shall be correctly installed to divert surface water runoff into a filter area and shall be spaced at intervals according to Table 1 where rock and ledge allows.

6.5 Stream Crossings on Truck Roads And Skid Trails – Practices To Be Applied During Logging

6.5.1 Streams and all waters shall be kept free of logging slash and logging debris.

6.5.2 Stream crossings shall be made perpendicular to the stream channel. Stream crossings shall be located where the stream channel is narrow and well defined, streambanks are stable and approaches are level or gently sloping.

6.5.3 Temporary stream crossings on truck roads shall be over a bridge, culvert or by constructing an at-grade ford. Culvert diameter and bridge structure opening shall be according to Table 2. At-grade fords shall be used only where streams have low banks, stable beds (cobble or ledge) and stable, gradual approaches.

6.5.4 Temporary stream crossings on skid trails shall be over a bridge, culvert or pole ford. Culvert diameter and bridge structure opening shall be according to Table 2. Pole fords are allowed on skid trails where the streambed is cobble or ledge. Brushing-in is allowed but only on intermittent streams and when the ground is frozen.

6.5.5 Permanent stream crossings on perennial streams shall be in compliance with standards set forth in the Vermont Agency of Natural Resources Stream Alteration Rule and General Permit. Environmental Protection Rule, Chapter 27, Subchapter 5.

6.5.6 Logging equipment shall be kept out of stream channels, except when used for the construction of stream crossing structures or the use of at-grade fords on truck roads.

6.5.7 On approaches to stream crossings, waterbars, turn-ups or broad-based dips shall be correctly installed on truck roads and skid trails to divert surface water runoff into a filter area. They shall be installed a minimum of 25 feet away from the top of the streambank.

6.5.8 Except for the travelled portions of truck roads and skid trails, areas of exposed soil within 50 feet of the stream channel as measured from the top of the streambank shall be seeded and mulched, according to Table 3, immediately after installing stream crossing structures.

6.6 Stream Crossings on Truck Roads And Skid Trails – Practices To Be Applied Immediately After Logging

6.6.1 All temporary structures shall be removed from streams and the channel restored to a stable condition. Brushed-in crossings on intermittent streams shall be removed when skid trail use has been completed or as soon thereafter as ground conditions allow.

6.6.2 After removing temporary stream crossing structures, waterbars shall be correctly installed 25 feet back from the top of the streambank to divert surface water runoff into a filter area. All areas of exposed soil shall be seeded and mulched a minimum of 50 feet on each side of the stream crossing. Seed and mulch at application rates according to Table 3 immediately after logging or as soon thereafter as ground conditions allow.

6.7 Forest Buffer

6.7.1 A forest buffer shall be left along streams and other waters in which only partial cutting can occur such that openings in the forest canopy are minimal and continuous forest cover is maintained.

The width of the buffer shall be in accordance with Table 4 as measured from the top of the streambank.

6.7.2 Truck roads, skid trails and log landings shall not be located within a forest buffer, except for the necessary construction of stream crossings.

6.7.3 In a forest buffer, no logging equipment shall be operated within a 25-foot wide area along streams, as measured from the top of the streambank, and other waters.

6.8 Petroleum Products and Hazardous Materials

6.8.1 Petroleum products and other hazardous materials as necessary for logging shall be stored only on log landings, placed outside of forest buffers, and shall be removed upon completion of logging.

6.9 Log Landings - Practices to Be Applied During Logging

6.9.1 Log landings shall not be located in a forest buffer. The width of the forest buffer shall be in accordance with Table 4.

6.9.2 Silt fencing, hay bale check dams and drainage structures shall be correctly installed on log landings to prevent sediment from entering streams and other waters.

6.10 Log Landings - Practices to Be Applied Immediately After Logging

6.10.1 Log landings shall be stabilized and drainage structures shall be correctly installed to prevent sediment from entering streams and other bodies of water.

6.11 Table 1: Distance (feet) between Drainage Structures on Truck Roads and Skid Trails

Road Grade (Percent Slope)	Skid Trails		Truck Roads Permanent Truck Roads During and After Logging. Temporary Truck Roads During Logging.		Temporary Truck Roads After Logging
	During Logging (Waterbars & Turn-Ups)	After Logging (Waterbars and Turn- Ups)	Broad- Based Dips	Ditch Relief Culverts	Waterbars
1	500	400	500	450	400
2	300	250	300	300	250
5	200	135	180	200	135
10	140	80	140	140	80
15	130	60	---	130	60
20	120	45	---	120	45
25	110	40	---	65	40
30	100	35	---	60	35
40	90	30	---	50	30

6.12 Table 2: Minimum Culvert Sizing for Temporary Stream Crossings

Drainage Area (Acres)	Waterway Area Required For Bridges and Culverts (Square Feet)	Culvert Diameter (Inches)
4	0.6	12
8	1.0	15
15	1.5	18
20	1.9	18
40	3.2	24
50	3.8	30
80	5.3	36
100	6.3	36
150	8.6	42
200	10.6	48
250	12.6	48
300	14.4	54
350	16.2	60
450	19.5	60
550	22.7	66
640	25.4	72

6.13 Table 3: Methods of Seeding and Mulching Truck Roads, Log Landings, Skid Trails and Stream Crossings

Options	Rate of Application	Timing of Application
Option 1. Hay or Straw Mulch with Annual Ryegrass	60 bales/acre or 1 ½ bales/1,000 square feet AND Annual ryegrass at 40 lbs./acre or 1 lb./1,000 square feet	Anytime
Option 2. Hay or Straw Mulch with Winter Rye	60 bales/acre or 1 ½ bales/1,000 square feet AND Winter rye at 112 lbs./acre or 2 ½ lbs./1,000 square feet	Anytime
Option 3. Hay or Straw Mulch with Soil Conservation Seed Mix	60 bales/acre or 1 ½ bales/1,000 square feet AND Soil Conservation Seed Mix at 42 lbs./acre or 1 lb./1,000 square feet	Anytime. Best when applied between April 15 – June 15 OR August 1 – September 15

6.14 Table 4: Minimum Forest Buffer Widths

Percent Slope of Land Between Skid Trails, Truck Roads or Log Landings and Streams or Other Bodies of Water	Width from Top of Streambank (Feet Along Surface of Ground Measured Perpendicular to the Stream)
0-10	50
11-20	70
21-30	90
31-40*	110

*Add 20 feet for each additional 10 percent slope