

## Attachment F

California Regional Water Quality Control Board  
Lahontan Region

# Best Management Practices and Mitigation Measures

## South Shore Project Waste Discharge Requirements

Many terms used in this document have specific meanings as defined in Attachment A. All other terms shall have the same definitions as prescribed by the California Forest Practice Rules (California Code of Regulations, title 14, section 895.1 et seq.), Public Resources Code section 4528, subdivision (f), and the Porter-Cologne Water Quality Control Act (Water Code section 13000 et seq.), unless specified otherwise.

The following Best Management Practices (BMPs) may be subdivided into operations which may take place during or outside of dry conditions, or during or outside of normal operating periods. "Dry conditions" and "normal operating periods" shall be as defined in BMPs No. 5 and 6; "wet conditions" and "outside of normal operating periods" shall be defined as all other times.

### General Best Management Practices

- 1) All equipment used shall be monitored daily for leaks, and immediately repaired and/or removed from service if necessary to protect water quality. All hazardous material spills, whether from equipment, fueling activities, or other materials handling and storage, shall be immediately contained and spilled materials and/or contaminated soils must be disposed of in a legal and responsible manner. An emergency spill kit adequate to contain spills that could result from hazardous materials or equipment on-site shall be at the project site at all times.
- 2) Uncured concrete materials shall be stored in a weatherproof area, away from Riparian Conservation Areas (RCAs), Stream Environment Zones (SEZs), and waterbodies. Concrete mixing shall only occur within a self-contained and removable, impenetrable container that provides protection from accidental runoff. Concrete mixers or sweepings shall not be washed out within 50 feet of storm drains, open ditches, streets, RCAs, SEZs, or waterbodies; concrete wastes shall be cleaned up and disposed of properly.

- 3) Where any part of BMPs No. 10, 17, 20, 21, 24, 39, 50, and 52b is either not practicable due to the specified field conditions or is left to the Discharger's discretion, the Discharger's staff, as noted in the relevant BMP, shall implement BMPs and mitigation measures that provide equal or better protection to these original BMPs. Where such deviations are made, additional explanation, tracking, and reporting is required pursuant to the MRP.
- 4) Where any of the following BMPs require submittal of additional details, plans, BMPs, mitigation measures, or any other design to the Water Board, those designs shall be provided to the Water Board for review and acceptance at least 30 days prior to site activities unless a shorter time period is requested by the Discharger and accepted by the Water Board Executive Officer.

**Vegetation treatments in uplands (during normal operating period and dry conditions)**

- 5) "Normal operating periods," as used throughout these documents, refers to that period between May 1<sup>st</sup> and October 15<sup>th</sup>, when conditions within the Lake Tahoe Basin are generally dry. However, ground-based equipment operations are allowed during this period only when dry soil moisture conditions, as determined pursuant to BMP No. 6, exist. Temporary erosion control measures as noted throughout this Attachment shall be in place throughout the Project prior to commencing any soil-disturbing activities, and the Discharger shall implement additional BMPs as required in BMP No. 23 prior to any forecast storm event which may mobilize loosened sediments towards waterbodies.
- 6) To determine operable dry soil conditions, the Discharger's Soil Scientist shall evaluate soil moisture conditions at the 12-inch depth. Operable moisture conditions shall be only as noted in the 'operable area' of Table 1 in the South Shore DEIS Appendix D, Stream Environment Zone Sensitivity Rating System. The acceptable 'operable area' from that Table is reproduced below, as defined by those characteristics recommended for operable soils in the Table by both the USFS Regional Soil Scientist and Bob Powers (USFS PSW Soil Scientist).

Stream Environment Zone Sensitivity Rating System Table 1:

	<b>Coarse Soils</b>	<b>Light Soils</b>	<b>Med. Soils (&lt;35% clay)</b>	<b>Heavy Soils (&gt;35% clay)</b>
<b>Soil Moisture % Increases Downward</b>	Loamy sands, fine sand loam, very fine sands, coarse sands	Fine sandy loams, sandy loams, very fine sandy loam	Sandy clay loam, loam, silt loam, sandy clay loam, clay loam	Clay loam, sandy loam, silty clay loam, clay

<b>Dry Soils</b>	Dry, loose, single grained flows thru fingers	Dry, loose, flows thru fingers	Powdery, dry, sometimes slightly crusted but breaks down into powdery conditions	Hard, baked, cracked sometimes has loose crumbs on surface
<b>Moist Soil</b>	Still appears dry, will not form a ball with pressure	Still appears to be dry; will not form a ball		
<b>Moist Soil</b>	Still appears dry, will not form a ball with pressure			

- 7) Ground-based treatments may be used to reduce upland hazardous fuels on slopes less than 30% and soils not considered sensitive. Skid trails shall be designated and flagged to be at least 40 feet apart.
- 8) On slopes greater than 30%, ground-based equipment shall not be used, however, hand treatments, end-lining, or equipment reach may be used to reduce hazardous fuels in these areas. See also BMP No. 9. Berms from ruts created by end-lining shall be raked in, and disturbed soils shall be covered, as described in BMP No. 21b-c.
- 9) Where isolated, small areas of slopes greater than 30% are present in a treatment unit, trees shall be hand-felled and the logs end-lined to a part of the treatment unit where they can be picked up by heavy equipment. Berms from ruts created by end-lining shall be raked in, and disturbed soils shall be covered, as described in BMP No. 21b-c.
- 10) Where end-lining occurs on slopes above 10%, materials shall be end-lined along slope contours (i.e., cross-slope) to avoid creating ruts in the soil that are oriented downhill. Berms from ruts created by end-lining shall be raked in, and disturbed soils shall be covered, as described in BMP No. 21b-c. Where this operation is not practicable, the Discharger shall follow BMP No. 3.
- 11) Water bars on skid trails shall be installed to provide proper drainage and prevent erosion before large precipitation events (one inch forecasted by the National Weather Service [NWS, <http://www.nws.noaa.gov/>]) and within 15 days after operations are complete. Spacing of water bars shall be in accordance with California Department of Forestry and Fire Protection's (CalFire's) California Forest Practice Rules 2009 (FPRs), California Code of Regulations, title 14, section 914.6:

MAXIMUM DISTANCE BETWEEN WATERBREAKS

Estimated Erosion Hazard Rating	US Equivalent Measure Road or Trail Gradient (in percent)			
	10 or less	11-25	26-50	>50
	feet	Feet	Feet	Feet
<b>Extreme</b>	100	75	50	50
<b>High</b>	150	100	75	50
<b>Moderate</b>	200	150	100	75
<b>Low</b>	300	200	150	100

These specific requirements of the FPR’s design and spacing of waterbreaks (equivalent to water bars) shall be included on the 100% plans provided to the Water Board and the Contractor. All water bars shall be evaluated to determine if additional energy dissipaters, per BMP No. 37d, are necessary.

**Vegetation treatments in RCAs and SEZs (during and outside of normal operating periods).**

- 12) SEZs shall be determined by application of the criteria set forth in the Tahoe Regional Planning Agency’s (TRPA’s) Water Quality Management Plan for the Lake Tahoe Region, Volume III, SEZ Protection and Restoration Program (1988). Prior to commencing operations within any treatment unit, maps of sufficient scale (no greater than 1:1000 [1”= 83 feet]) shall be developed to identify SEZs and waterbodies. SEZs shall also be flagged on the ground prior to operations. Flagging shall be maintained throughout the life of the Project activities (including prescribed fire activities) within any active treatment unit. Work in SEZs shall be limited to the time of year when soils are dry, or when operable conditions are present outside of normal operating season, as specified in BMPs No. 6, 22a, and 22b.
- 13) Ground-based equipment operations shall be limited in SEZ stands to Cut-to-Length (CTL) operations or operations using equipment that has been demonstrated to the Water Board Executive Officer to not result in permanent disturbance in SEZs.
  - a) SEZ stands that exhibit equal or less sensitivity than the Heavenly Valley Creek SEZ Demonstration Project (HSEZ) site based on the Sensitivity Rating System (see South Shore DEIS Appendix D) may be treated with the above CTL or approved equivalent ground-based equipment under operable soil moisture conditions, as specified in BMP No. 6.
  - b) Ground-based equipment shall not be used to treat SEZ stands that rate more sensitive than the HSEZ project site. These areas may be treated

by hand crews, endlining (per BMPs No. 8, 9, 10, and 21), or mechanical over-snow operations (per BMP No. 22a).

- c) When SEZ stands are rated more sensitive than the HSEZ site, but only a portion of the stand is responsible for the high sensitivity rating, the less sensitive part may be treated with the above CTL or approved equivalent ground-based equipment, provided access to the less sensitive part across operable soils is available. The more sensitive portions of these stands must still be treated by hand crews, endlining, per BMPs No. 8, 9, 10, and 20, or mechanical over-snow operations, per BMP No. 22a. Waterbody buffer zones, per BMPs No. 14 and 15, from more sensitive SEZ soils, watercourse channels, wet soils, special aquatic features, or other sensitive features within these particular stands shall be flagged prior to commencement of CTL or approved equivalent mechanical operations.

14) In the area between any waterbody and 25 feet beyond the 100-year floodplain of any waterbody, CTL tree removal methods shall be limited to reaching in and removing logs with full suspension to avoid ground disturbance.

15) For Whole Tree (WT) equipment operations, waterbody buffer zones for all waterbodies shall be, at a minimum, as required in Attachment B of the 2009 Timber Waiver R6T-2009-0029:

<b>Slope of land adjacent to watercourse or lake (%)</b>	<b>Class I</b>	<b>Class II (includes special aquatic features)</b>	<b>Class III</b>	<b>Class IV</b>
<b>&lt;30</b>	75 feet	50 feet	25 feet	25 feet
<b>30-50</b>	100 feet	75 feet	50 feet	50 feet
<b>&gt;50</b>	150 feet	100 feet	50 feet	50 feet

Ground-based equipment in WT treatment stands shall not operate in SEZs or within these waterbody buffer zones. Hand or CTL (per BMPs No. 13 and 14) treatments may be used in these areas. SEZ areas within WT stands shall be treated with hand crews, leaving the resulting logs in place, except as described in BMP No. 21. No standard buffer zone width has been established for unclassified waterbodies. However, timber harvest and vegetation management activities shall be excluded from within the channel zone, except for use and maintenance of existing roads and crossings.

16) All waterbody buffer zones shall be flagged per BMP No. 15 prior to operations. Flagging shall be maintained throughout Project operations in all active Treatment Units.

- 17) Existing downed trees and Large Woody Debris (LWD) that are in perennial or intermittent watercourse channels shall be left in place unless the Discharger's Hydrologist authorizes removal to protect or improve channel stability and the Discharger follows BMP No. 3. If embedded LWD must be removed, a sediment curtain shall be erected around the LWD to be removed and dewatered unless those portions of the LWD which are not embedded can be sawed off and removed to avoid disturbing stream bed and bank. Once the LWD has been removed, the disturbed bed and/or bank shall be stabilized prior to reintroducing stream flow.
- 18) Trees (live or dead) may be marked for removal within five feet of the bank edge of any waterbody only where fuel loads or stand densities exceed prescription and where LWD is at or above desired levels. No live trees greater than 14-inch DBH which contribute to the stability of stream banks, as determined by the Discharger's Hydrologist, shall be removed.
- 19) Riparian vegetation, other than target species, that is found along waterbodies, or within or bordering meadows and wet areas, must be retained and protected during timber harvest and vegetation management activities.
- 20) Directional falling shall be used to keep felled trees out of perennial, intermittent, and ephemeral watercourses unless the channel reach is identified as deficient in LWD. Taylor Creek has been identified in the DEIS as being below desired LWD levels; therefore, within LWD-deficient section(s) of Taylor Creek, the Discharger's Fisheries Biologist shall select trees greater than 12-inch DBH, while adhering to BMPs No. 3 and 18, to be felled directionally into the channel.
- 21) To achieve desired fuel loading in SEZs within WT units, the Discharger's Watershed Specialist may determine to end-line trees out of the SEZ, per BMP No. 3. Ruts caused by end-lining shall be mitigated, per Paragraph c below. Slash in excess of 15 tons per acre shall be removed by hand from waterbody buffers, per BMP No. 15, and may be piled and burned.
  - a) Any other WT tree removal methods that disturb the ground surface within waterbody buffer zones, per BMP No. 15, shall be prohibited. Ground-based equipment may reach in to remove material with full suspension, and may only operate within the waterbody buffer zone when constructing, removing, or utilizing temporary or permanent watercourse crossings.
  - b) 90% ground cover (such as slash, wood chip, or masticated material - collectively termed "chip" throughout these BMPs) shall be provided to a depth of two inches to prevent erosion in disturbed areas. Existing ground cover shall be considered sufficiently effective where monitoring supports that the rock or vegetation retain soils, reduce raindrop splash, prevent erosion, and promote infiltration.
  - c) Berms from ruts created by end-lining shall be raked in and ground cover per Paragraph b, above, shall be provided to stabilize soils.

**Vegetation Treatments in uplands (outside of normal operating period)**

- 22) When working outside of the normal operating period, conditions shall be adequate to prevent erosion, sediment delivery to water bodies, and soil compaction that could impact soil productivity or soil hydrologic function.
- a) Operations shall be permitted in hard-frozen soil conditions where operated vehicles, tractors, and equipment can travel without creating ruts in soil, road, or landing surfaces. Temperatures shall also remain low enough to preclude thawing of the soil surface sufficient to create rutting.
  - b) For over-the-snow operations, a minimum of 12 inches of compact snow/ice shall be maintained on undisturbed ground, and six inches of compacted snow/ice shall be maintained on existing disturbed surfaces. Before over-snow operations begin, snow shall be packed on landings and main trails to facilitate freezing. Wood chips may also be spread in packed snow base, to provide traction.
  - c) When snow conditions are at acceptable depth and temperatures, as defined in Paragraph b, to be suitable for over-the-snow operations, ground-based equipment operations shall be allowed per BMPs No. 22 and 23.
- 23) When conditions are approaching inoperable (i.e., outside the operable conditions defined in BMP No. 6), all BMPs designed to contain or infiltrate runoff before it reaches a waterbody shall be installed as equipment and materials are being moved to staging areas or paved locations. Discharger staff shall time activities to complete all tasks and safely stage equipment and materials prior to the arrival of the anticipated storm event or warming trend.
- 24) When adequate snow or frozen soil conditions are not present, but soils are dry per BMP No. 6, WT equipment operations and temporary crossings on intermittent or ephemeral channels may be approved on a case by case basis through agreement between the Discharger's Sale Administrator and Watershed Specialist. These agreements shall be documented and performed according to the conditions of BMPs No. 3 and 53 through 55. Over-snow watercourse crossings may be constructed as long as they are designed to pass all flows during rain on snow events, snow melt, or other unexpected flow event equal to or greater than a 20-year, one-hour storm event, without the risk of diversion or obstruction of the natural flow of water within the channel, and removed at the conclusion of operations. Removal of such watercourse crossings shall be done without obstructing flows, impairing water quality, or disturbing watercourse bed or banks, per BMPs No. 54d through f, and 55.

**Hand-Piling and Pile Burning in SEZs, and other Prescribed Fires**

- 25) The design features and BMPs for the Project burn piles, underburning, and other controlled burns, as detailed in the Discharger's Project Fire

Prescription Plan (Burn Plan) and BMPs No. 26 through 31, shall be adhered to throughout Project operations.

- 26) A 50-foot buffer (no hand piling or pile burning) shall be flagged and maintained along perennial or intermittent watercourses, lakes, and special aquatic features. Piling and burning shall be permitted up to 10 feet from the edge of ephemeral channels where slopes are less than 15%.
- 27) Where effectiveness monitoring on burned piles in SEZs, as required in the MRP, indicates hydrophobic soils were created beneath the burn piles, the burn area shall be raked to a depth of six inches to break up the hydrophobic soils, native organic matter shall be amended into the soils, and the area shall be covered as described in BMP No. 21b.

If the effectiveness monitoring of the burn piles indicates that impacts had occurred on greater than 20% but less than 50% of these piles, the Discharger shall notify Water Board staff and provide a monitoring and mitigation plan. If 50% or more of the piles subject to the original effectiveness monitoring effort indicate impacts, all remaining (unmonitored) burn piles in SEZs shall be monitored, and mitigated wherever additional impacts are observed. Mitigation measures shall include an adaptive management strategy for all future burn pile creation in SEZs.

- 28) Fire shall be allowed to creep between piles and into these buffers, except where sensitive plants, fens, and the noxious weeds whitetop and cheatgrass are present. Flame lengths shall be controlled to less than two feet in height.
- 29) Each pile shall be allowed to be re-piled once after the initial ignition of the pile, as long as it is still burning. Adding extra fuel may create a hotter fire, potentially resulting in more damage to the soils. Where re-piling occurs, the locations of all sites where re-piling has occurred must be documented on the Implementation Checklist. Where effectiveness monitoring, as required in the MRP, indicates hydrophobic soils were created beneath the burn piles, the burn area shall be raked to a depth of six inches to break up the hydrophobic soils, native organic matter shall be amended into the soils, and the area shall be covered as described in BMP No. 21b.

If the effectiveness monitoring of the burn piles that were re-piled during burning indicates that impacts had occurred on greater than 20% but less than 50% of these piles, the Discharger shall notify the Water Board and provide a monitoring and mitigation plan. If 50% or more of the piles subject to the original effectiveness monitoring effort indicate impacts, all remaining (unmonitored) burn piles in SEZs shall be monitored, and mitigated wherever additional impacts are observed. Mitigation measures shall include an adaptive management strategy for all future burn pile creation in SEZs.



- 30) Hot piling of burn piles shall be prohibited within SEZs. Hot piling shall also be prohibited where burn piles have been created adjacent to aspen trees which are outside of SEZs. Exceptions may occur where specific conditions (e.g., on coarse alluvium soils) and mitigation measures have been previously identified and detailed in the approved Burn Plan.
- 31) Additional Burn Plan BMPs to reduce the potential impact to SEZ soils and water quality shall include:
- a) SEZs shall be identified and flagged during prescribed burns as described in BMP No. 12.
  - b) Piles shall be placed in a non-linear pattern in each treatment unit.
  - c) Pile spacing shall be greater than 20 feet between piles in each treatment unit.
  - d) Maximum pile size shall not exceed 10-foot diameter by five-foot height.
  - e) No more than 30% of any SEZ acre shall be occupied by piles.
  - f) No more than 15% of any SEZ acre shall be burned each year.
  - g) For broadcast burning activities, ignition shall not be allowed in SEZs but fire would be allowed to back into these areas.
  - h) Water shall not be drafted from wetlands or other special aquatic features. Drafting of water for prescribed burns shall not cause impacts to watercourse bed or banks. Access routes to drafting sites shall not result in sloughing of soils into waterbodies, compacting of soils leading to access points, or destruction of riparian vegetation. Any impacts caused to these resources during drafting shall be mitigated to original conditions, including revegetation where necessary. Mitigation measures shall include an adaptive management strategy for all future water drafting sites.

**Roads (during normal operating period and dry conditions)**

- 32) No new permanent roads shall be constructed.
- 33) All roads used for this Project shall be maintained and/or restored to Forest Service standards that support equipment and trucks needed for activities and are tailored to protect beneficial uses and soil and water quality resources from the impacts of specific classifications of equipment use. The prescribed maintenance period for erosion controls on permanent and seasonal roads, associated landings, and drainage structures which have not been decommissioned (such that they are hydrologically invisible on the landscape) shall be for three years following completion of the Project.
- 34) Dust control, including the use of chips and slash, shall be used throughout the Project to prevent transport of fine sediment to waterbodies or to human receptors, such as open recreational areas, residences, etc. Roads and landings shall be watered for dust abatement at least as often as needed to keep dust down. Water used for dust abatement shall come from South

Tahoe Public Utility Department hydrants. Water shall not be applied in excess so as to cause erosion into any waterbody. Commercial dust palliatives may be used, provided published materials indicate they do not have impacts on water quality. Oil-based palliatives shall therefore not be used, but certain Organic Nonpetroleum - Lignin Derivatives, Synthetic Polymer Derivatives, and enzyme-based palliatives, among others, may be used. Material Safety Data Sheets (MSDSs) and publications such as the U.S. Forest Service's "Dust Palliative Selection and Application Guide" (Publication Number 9977-1207-SDTDC, 1999) shall be used to make the selection. The MSDSs for dust palliatives used during Project activities shall be included in the approved Project SWPPP. All environmental impacts and the product-specific BMPs for handling, storage, and use of the selected dust palliative(s) shall be reiterated under its own heading in the SWPPP. Since some dust palliatives which do not impact water quality may still have adverse effects on aquatic life, at a minimum, dust palliatives shall not be used within 50 feet of a waterbody, or 75 feet where the road gradient towards the waterbody exceeds 30%.

- 35) Road drainage shall be established and maintained on all roads used for Project activities so that roads do not channel runoff. All drainage features shall be evaluated to determine if additional energy dissipaters, per BMP No. 38d, are necessary. Reconstructed and new temporary roads shall be outsloped to ensure proper drainage.
- 36) Where a native surface road meets a paved road, the road intersection shall be covered with a minimum of clean three-inch plus competent angular rock, with no less than four-inch lift at any spot at any time, for a distance of at least 25 feet, to prevent tracking of mud onto the paved road. This coverage shall be maintained in operable condition throughout use. The paved roads shall be swept clean whenever dirt tracking does occur. Where vehicles continue to track soils onto the paved road, additional measures, such as rumble strips or tire wash-offs shall be installed.
- 37) When a temporary road would use the alignment of a previously decommissioned road, the following reconstruction activities shall take place:
  - a) Vegetation removal.
  - b) Grading: Obstacles such as ruts, water bars, leadoff ditches, and pronounced dips shall be graded out to make the road suitable for logging traffic during operations.
  - c) Crossings: Facilities such as culverts or fords shall be installed to accommodate the free flow of channels and ditches. All such crossing work shall occur within the road prism. The outflow of these structures shall be rocked to ensure dispersal of waters such that erosion of the streambed does not occur.
  - d) Drainage of runoff: Dips and leadoff ditches shall be installed to facilitate occasional thunderstorm runoff. All such dips and leadoff ditches shall be evaluated to determine if additional energy dissipaters, such as rock,

slash, or vegetation, to facilitate immediate infiltration of occasional thunderstorm runoff, is necessary. Where existing materials are insufficient to infiltrate runoff within 20 feet of any drainage (other than channels), additional energy dissipaters shall be installed and maintained.

- 38) Existing and new temporary roads shall be decommissioned within 30 days after use. Drainage shall be restored during decommissioning by removing all temporary culverts and/or fords. Water bars shall be installed as specified in BMP No. 11 to prevent accumulating water on the road surface and providing chips (per BMP No. 21b). All water bars shall be evaluated to determine if additional energy dissipaters, per BMP No. 37d, are necessary.
- 39) Additionally, new temporary road decommissioning shall include ripping where the rock content of the soil allows (<35% cobble by volume, as determined by the Discharger's Soil Scientist, per BMP No. 3). All compacted temporary roads shall be ripped and mulched upon completion of harvest and post-harvest operations. Chips shall be ripped into the decommissioned roads as a mitigation measure. Use of rock rippers shall not be permitted to accomplish subsoiling requirements. Ripping shall be accomplished using a winged subsoiler or other equipment that will lift and fracture the subsoil by vertical and lateral shattering, leaving the soil loosened through the full width and depth of the compacted layer with the topsoil remaining substantially in place rather than being inverted. Subsoiling shall extend to a depth of 18 inches. The Discharger's Soil Scientist, pursuant to BMP No. 3, may agree to lesser depths when excessive rock or other limiting site conditions are encountered. This work shall be done when the soil is dry. Ground cover requirements, per BMP No. 21b, shall be met after ripping.
- 40) Barriers shall be strategically established along open areas adjacent to decommissioned road or trail access (boulders, split rail fence, and barriers/signs) to discourage post-treatment establishment of user-created routes that are not designated routes. In addition, natural barriers such as large logs and rocks shall be placed at un-gated road or trail entrance points to prevent continued use of decommissioned road alignment.
- 41) All existing temporary roads shall be returned to their original use and width under the Discharger's Access and Travel Management Plans (ATMs) (e.g., road to trail conversions would be returned to trail width). However, all existing temporary roads previous uses and widths shall be evaluated. Where it is determined that the original features were inadequate, the temporary road shall be reworked during decommissioning to prevent erosion and sediment transport to waters (including SEZs).

#### **Roads (during wet conditions or outside of normal operating period)**

- 42) Where a native surface road meets a paved road, the road intersection shall be covered with clean three-inch plus competent angular rock, with no less

than four-inch lift at any spot at any time, for a distance of at least 25 feet, to prevent tracking of mud onto the paved road. This coverage shall be maintained in operable condition throughout use. The paved roads shall be swept clean whenever dirt tracking onto a snowless road does occur. Where vehicles continue to track soils onto the paved road for more than three days in a row, and the rock is not clogged, additional measures, such as rumble strips or tire wash-offs shall be installed. If this native surface road is only to be used outside of normal operating periods or during wet conditions and the preceding coverage has not been provided, adequate snow cover or frozen soil conditions, as defined in BMPs No. 22a and 22b, must be maintained throughout use. Rough organic material (e.g., chip) may be used where roads are packed with at least six inches of snow and additional traction is required.

- 43) If a native surface road becomes rutted, the road shall be closed. If monitoring of the area indicates the rutting is an isolated instance and adequate conditions, as defined in BMP No. 22, exist throughout the rest of the treatment unit, the rutted area may be temporarily repaired with spot rocking with an even-graded sub-base material (FS Specification A, B, or equivalent). Use may continue after the impacted area is re-covered in six inches of packed snow as long as conditions throughout the rest of the treatment unit remain adequate. Where this temporary fix is used, the "repaired" area shall be added to the high risk effectiveness monitoring sites.
- 44) During operations outside of the normal operating season, paved surfaced roads, including paved turnouts, may be plowed, if the action will not cause damage to the road surface and associated drainage structures. Native surfaced roads may also be plowed, as long as the minimum amount of snow, as described in BMP No. 22b remains. No soil shall be intermixed with the side-cast snow during plowing.
- 45) Road alignments within the contract area that require snow removal shall be visibly marked on both sides along the entire alignment to facilitate plowing. Plowed snow shall not be placed into waterbodies, SEZs, or riparian areas.
- 46) Before over-the-snow operations begin, existing culvert locations, and nearby waterbodies, SEZs, and riparian areas shall be clearly marked such that markings shall be visible in deep snowpack. During and after operations, all culverts and ditches shall be open and functional.
- 47) When roads are plowed, snow berms shall be breached to allow drainage during snowmelt. Outlets shall be spaced every 100 feet, at a minimum, so as not to concentrate road surface flows. Erosion control structures, per BMP No. 11, shall be installed as necessary at outlets as snow melts, to collect road generated sediment.

## Landings

- 48) All reasonable efforts shall be made to use existing landings. Where no existing landings are available new landings shall be constructed (see exceptions in BMPs No. 49 and 50). New landings shall be no larger than required in order to safely facilitate the handling and removal of biomass material in compliance with OSHA requirements. Individual landings shall average less than one acre in size and the maximum size shall be two acres.
- 49) Landings, fuel storage, and refueling shall be prohibited in SEZs.
- 50) Landings, fuel storage, and refueling areas shall be located outside RCAs, unless a specific site plan, detailing reasoning for the proposed in-lieu practice and adequate additional mitigation measures is submitted to the Water Board and accepted prior to implementation (per BMP No. 3).
- 51) Landings with slopes  $>2\%$  shall be outsloped to provide proper drainage. On existing landings that cannot be outsloped, ditching may be used. Drainage ditches, where used, shall not hydrologically connect with a waterbody. The outlets of these drainage ditches shall be evaluated to determine if additional energy dissipaters, per BMP No. 37d, are necessary.
- 52) Landings shall be decommissioned after operations are complete in each area using the following methods:
- Chips shall be applied to each landing as described in BMP No. 21b.
  - After chipping, all landings within 50 feet of an SEZ shall be ripped as described in BMP No. 39, and seeded with a native seed mix of grasses, forbs, and shrubs, unless the landing slopes away from the SEZ. Chips shall be ripped into the landings as a mitigation measure. Ripping shall not occur in a known area infested with noxious weeds, or in very rocky soils ( $>35\%$  cobble by volume). The Discharger must comply with alternative procedures and documentation as specified in BMP No. 3 for all areas where ripping is not feasible due to these specific field conditions.

## Crossings and Culvert Replacements

- 53) Ephemeral channel crossings shall not exceed one crossing every 800 feet of channel length.
- 54) Temporary crossings on intermittent and ephemeral watercourses shall be constructed as follows:
- Construction shall only occur when the channels are dry (i.e., seasonally non-flowing).
  - Temporary crossings shall be "modified Spittlers." The incorporated culvert shall be sized to pass a 20-year, one-hour storm event, so that these crossings do not need to be removed prior to a storm event.

- “Humboldt” crossings may be used, but must be removed, and the associated soils stabilized, prior to any one-inch storm event forecast by the NWS.
- c) Detailed Diversion Plans (for perennial and intermittent channel crossings only) and Dewatering Plans (for all crossings) as required in Section D 1, Reports Required, of the WDRs, shall be implemented where flow or standing water is encountered during installation and removal. The Diversion Plans shall include provisions for damming any potential stream flow above the construction site, transporting all anticipated flows around the construction site, and discharging the flow below the construction site in such a manner which shall not create disturbance of the stream bed or banks. The Dewatering Plans shall specify that any accumulated groundwaters, rainwater, or other unexpected water collected in the construction area shall be pumped to an upland (i.e., non-waterbody, floodplain, or SEZ) location where discharge will infiltrate without returning to any waterbody or SEZ.
  - d) Temporary over-snow crossings shall be constructed and removed according to BMP No. 24.
  - e) Photo-point monitoring, using MRP Attachment 7, shall occur at those crossings which have flow during installation or removal.
  - f) All temporary crossings, with the exception of over-snow crossings, shall be properly removed, with the channel bed and banks stabilized, prior to October 15<sup>th</sup>, per BMP No. 55.
  - g) Crossings on a temporary road, which remain in place outside of the normal operating period, shall be constructed such that they can pass the 100-year flood flow and associated debris.
- 55) All crossings on all waterbodies shall be protected from side-sloughing of native-surfaced roads by placing coir logs, straw bales, or the equivalent along the edges of the crossing above the creek. Any accumulated or sloughed-in soils in the channel following removal of a temporary crossing shall be removed and stabilized in an upland (i.e., non-floodplain or SEZ) location, and the stream bed and banks shall be restored to their original configuration. Disturbed soils shall be stabilized per BMP No. 21b.
- 56) The proposed new culvert crossing on Powerline Road (Rd 12N08) shall consist of a 36-inch corrugated metal culvert. Diversion and Dewatering Plans shall be implemented per BMP No. 54c. Installation of this crossing shall require additional fill to bring the road grade at the crossing to an acceptable height for haul trucks to pass the entry and exit slopes. This fill shall be excavated primarily from the road alignment on either side of the crossing, with some excavation coming from the land adjacent to the road to lessen the slopes on either side of the road prism. To reduce the amount of fill needed for this culvert replacement and road upgrade, concrete headwalls shall be used to maintain the road width through the crossing. Concrete shall be stored, mixed, and disposed of per BMP No. 2. Additional drainage features shall be added per BMP No. 11 along the incised road segment

which will increase in length after excavating the required fill. Any areas disturbed by the excavation or filling for road crossing replacement shall be covered with chips per BMP No. 21b, except on the approaches and crossing itself. These areas shall be covered with clean, three-inch plus competent angular rock, with no less than four-inch lift at any spot at any time, to provide stability. In addition, drainage features shall be constructed such that discharge shall infiltrate immediately into soils without reaching a waterbody (per BMP No. 37d). Photo-point monitoring, using MRP Attachment 7, shall occur at this location during installation and removal.

- 57) The permanent watercourse crossing on Forest Service system road 12N01A over a tributary to Saxon Creek shall be replaced and improved in the fall, when the channel is dry and the meadow is drier than at other times of the year. Diversion and Dewatering Plans shall be implemented per BMP No. 54c. Possible designs to be evaluated for reducing installation disturbance to the floodplain include: 1) a series of pre-fabricated bridge segments with gabion basket supports filled with small boulders permeable to water flow, and 2) a series of five arched culverts surrounded by the gabion baskets, with the center culvert large enough to pass the bank-full water volume. The final design shall be provided to the Water Board at least 30 days prior to site activities for acceptance and any other design used shall be at least as protective of beneficial uses and soil and water resources as these two potential designs. Excavation in the floodplain (within the existing road prism) would be required to remove the existing fill and connect the foundation of the road with the crossing to support equipment and hauling trucks. Excavated fill shall be removed to an upland (i.e., non-floodplain or SEZ) location and stabilized. The removed fill would be replaced with clean granular rock to support the weight of the crossing and the intended use. Photo-point monitoring, using MRP Attachment 7, shall occur at this location during installation and removal.
- 58) A crushed culvert on Forest Service system road 12N20 in the Osgood Swamp watershed shall be removed, and the crossing over the spring-fed perennial watercourse shall be improved. An objective for this crossing is the maintenance of a natural stream bed, with possible designs including a bottomless arched culvert, a prefabricated steel span, or a prefabricated concrete "box" culvert with the underside buried under the natural stream bed. The final design shall be provided to the Water Board at least 30 days prior to site activities for approval, any other design used shall be at least as protective of beneficial uses and soil and water resources as these three potential designs. Because this channel is spring fed, it flows perennially. The flow therefore shall be diverted around the site during culvert replacement. Diversion and Dewatering Plans shall be implemented per BMP No. 54c. Once the construction area is free of standing water, the existing culvert and unsuitable materials (i.e., organic soil) shall be removed to an upland (i.e., non-floodplain, riparian, or SEZ) location and stabilized, and the new crossing shall be installed with its footings extending below the existing

channel to allow for a natural material bed. Finally, fill consisting of clean cobble, gravel, or sand shall be placed around and over the new culvert to connect the existing road surface elevation with the culvert crossing. Prior to allowing the channel flow back into the downstream reach after crossing installation, water would be pumped to upland areas until turbidity levels are less than 3 NTU at the downstream end. If a turbidity level of less than 3 NTU cannot be reached after three days of pumping, pumping and infiltration will continue until decreases in turbidity greater than 25% of the previous measured turbidity are no longer being achieved and turbidity is less than or equal to 20 NTUs prior to releasing flows into the existing channel. The DISCHARGER will contact Water Board staff to inform them of: 1) the turbidity level in the new channel; and 2) how long it is anticipated treatment shall occur, should this final step be necessary. Monitoring shall include photo-points, using MRP Attachment 7, at this crossing during installation and removal, as well as the data collected to achieve the 3 NTU standard.

TENTATIVE