WDR Attachment E

California Regional Water Quality Control Board
Lahontan Region

Maps and Tables

South Shore Project Waste Discharge Requirements

PROPOSED

Table E1 - Soil Moisture Operability Protocol for Ground-Based Equipment

Conditions to be evaluated at the 2 to 10-inch depth
(see Attachment F, BMP No. 6)

.

Soil Moisture % Increases Downward	Coarse Soils	Light Soils	Med. Soils (<35% clay)	Heavy Soils (>35% clay)
	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
Dry Soils	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
Moist Soil	Still appears dry, will not form a ball with pressure	Still appears to be dry; will not form a ball	Not Operable: Somewhat crumbly, but will hold together from pressure	Not Operable: Somewhat pliable; will form ball under pressure. At plastic limit.
Moist Soil	Still appears dry, will not form a ball with pressure	Not Operable: Tends to ball under pressure but seldom will hold together	Not Operable: Forms a ball and is very pliable, sticks readily if high in clay.	Not Operable: Easily ribbons out between fingers, has a slick feeling. At plastic limit.
Very Moist Soil	Not Operable: Tends to stick together slightly, sometimes forms a very weak ball	Not Operable: Forms a weak ball that breaks easily, will not stick. Plastic limit or nonplastic.	Not Operable: Forms a ball and is very pliable, sticks readily if high in clay. Exceeds plastic limit.	Not Operable: Easily ribbons out between fingers, has a slick feeling. Exceeds plastic limit.

PROPOSED

PROPOSED

Table E2 – Waterbody Buffer Zones

(see Attachment F, BMP No. 15)

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

PROPOSED

Table E3a - WDRs' Best Management Practices (BMPs) to FEIS' Resource Protection Measures (RPMs) Crosswalk

WDRs BMP requirements are equal to or more stringent than the FEIS RPMs and are therefore to be followed throughout the Project, per WDR section B4.
(See also Table E3b and Attachment F)

	WDRs' BMPs	FEIS' RPMs (page numbers refer to FEIS)
General BMPs	1	WS-1: page 2-28, WS-25; page 2-34
	2	R-5: page 2-38
	3	-
	4	-
Vegetation Treatments in Uplands	5	WS-2, 3, 5: pages 2-28 and 2-29; WS-12, WS-16: pages 2-31, 2-32
	6	WS-3: page 2-28; App. D
	7	-
	8	-
	9	-
	10	WS-6: page 2-29
	11	WS-5: page 2-29
	12	WS-7, 8: page 2-30
	13	WS-5, WS-7, WS-12: pages 2-30, 2-31; Appendix C
	14	WS-13: page 2-31; WS-33: page 2-37
	15	WS-11, WS-14 to WS-16: pages 2-30 through 2-32
	16	WS-7: page 2-30; WS-30
	17	AR-1: page 2-25
	18	AR-2: page 2-25; AR-4, page 2-26
	19	-
	20	AR-3: page 2-26
	21	WS-6: page 2-29; WS-16: page 2-32
	22	WS-28: page 2-36; WS-33: page 2-37
	23	WS-2: page 2-28 and WS-31, WS-32: page 2-36
	24	WS-28, WS-29: page 2-36; WS-34, page 2-37

PROPOSED

Table E3a, continued

	WDRs' BMPs	FEIS' RPMs (page numbers refer to FEIS)
	25	WS-4: page 2-28; WS-17 to 22: pages 2-33, 4-2
	26	WS-4: page 2-28; WS-17, 18: pages 2-33, 4-2
	27	WS-4: page 2-28; 4-2
	28	WS-4: page 2-28; WS-9: page 2-30; WS-19: page 2-33; WE-5: page 2-45
	29	WS-4: page 2-28; WS-21: page 2-33
	30	WS-4: page 2-28; WS-22: page 2-33
	31	WS-20: page 2-33
	32	Consistent with Project Description
	33	R-1: page 2-38; R-3: page 2-38
	34	R-1: page 2-38; R-4: page 2-38
	35	R-1: page 2-38; R-6: page 2-39
	36	R-1, R-2, and R-7: pages 2-38, 2-39
	37	R-1: page 2-38; R-6 through R-10: page 2-39; and narrative on page 2-5
	38	R-1: page 2-38; R-7, R-8, R-9, and R-10: page 2-39; R-18, R-19: page 2-41
	39	R-1: page 2-38; R-18 to R-20: page 2-41
	40	R-1: page 2-38; R-20: page 2-42
	41	R-1: page 2-38; R-18: page 2-42
	42	R-1: page 2-38; R-7: page 2-39; R-11: page 2-40
	43	R-1: page 2-38; R-12 and R-14: page 2-40
	44	R-1: page 2-38; R-13: page 2-40

PROPOSED

Table E3a, continued

	WDRs' BMPs	FEIS' RPMs (page numbers refer to FEIS)
	45	R-1: page 2-38; R-15: page 2-40
	46	R-1: page 2-38; R-16: page 2-40
	47	R-1: page 2-38; R-17: page 2-41
	48	WS-23: page 2-34
	49	WS-24: page 2-34
	50	WS-25: page 2-34
	51	WS-26: page 2-36
	52	WS-27: page 2-35; WE-6: page 2-45
	53	WS-11: page 2-30
	54	R-8, R-9, R-10: page 2-39; Monitoring page 4-3
	55	-
	56	R-8, R-9: page 2-39; Narrative on page 2-7
	57	R-9: page 2-39; Narrative on pages 2-6 to 2-7
	58	Narrative on pages 2-7 to 2-8; Monitoring page 4-5
Aesthetics	59	SR-1: page 2-47
	60	SR-2: page 2-47
	61	SR-3: page 2-47
	62	SR-4: page 2-47
Air Quality	63	AQ-1: page 2-20
Biological Resources	64	WL-1: page 2-23
	65	WL-2: page 2-23
	66	WL-3: page 2-23
	67	WL-4: page 2-23
	68	WL-5: page 2-23
	69	WL-6: page 2-24
	70	WL-7: page 2-24
	71	WL-8: page 2-24
Cultural Resources	72	HR-1: page 2-48
	73	HR-2: page 2-48
	74	HR-3: page 2-48
	75	HR-4: page 2-48

PROPOSED

Table E3a, continued

	WDRs' BMPs	FEIS' RPMs (page numbers refer to FEIS)
Pest Management	76	P-1: page 2-21
	77	WE-1: page 2-44
	78	WE-2: page 2-44
	79	WE-3: page 2-45
	80	WE-4: page 2-45
	81	WE-5: page 2-45
	82	WE-6: page 2-45
Recreation	83	Rec-1: page 2-46
	84	Rec-2: page 2-46
	85	Rec-3: page 2-46
Sensitive and Special Interest Plants and Fungi	86	SP-1: pages 2-42 to 2-43
	87	SP-2: page 2-43
	88	SP-3: page 2-43
	89	SF-1

PROPOSED

Table E3b - FEIS' Resource Protection Measures (RPMs) to WDRs' Best Management Practices (BMPs) Crosswalk

WDRs BMP requirements are equal to or more stringent than the FEIS RPMs and are therefore to be followed throughout the Project, per WDR section B4.
(See also Table E3a and Attachment F)

Category	Issue	FEIS' RPMs	WDRs' BMPs
General BMPs	field discretion tracking	-	3
	cooperative review of undisclosed plans	-	4
	upland ground-based equipment operations - restrictions	-	7
	protection of riparian vegetation	-	19
	crossing protections	-	55
Air Quality		AQ-1	63
Pest Management		P-1	76
Focal Wildlife Species		WL-1	64
		WL-2	65
		WL-3	66
		WL-4	67
		WL-5	68
		WL-6	69
		WL-7	70
		WL-8	71
Aquatic Resources	removal of LWD / CWD	AR-1	17
	removal of trees near streambanks	AR-2	18
	directional falling; LWD / CWD deficiencies	AR-3	20
	stream shade	AR-4	18
Soil, Water, Riparian	spills	WS-1	1
	BMP placement before storms	WS-2	5, 23
	operable soil conditions	WS-3	5, 6
	fire prescriptions	WS-4	25 through 31
	water bars	WS-5	11
	end-lining	WS-6	10, 21
	flagging exclusion buffers	WS-7	12, 13c, 16, 26, 31a
	flagging special aquatic features	WS-8	12
	flame heights, ignition	WS-9	28
	crossing SEZs with inoperable soil moisture conditions	WS-10	6
	equipment ops in watercourses	WS-11	15, 53
	CTL equipment ops in SEZs	WS-12	13

PROPOSED

Table E3b, continued

Category	Issue	FEIS' RPMs	WDRs' BMPs
	CTL / waterbody exclusion zone	WS-13	14
	waterbody buffer zones	WS-14	15
	WT equipment waterbody exclusions	WS-15	15
	WT equipment SEZ exclusions	WS-16	15, 21
	burn pile waterbody buffer zones (excluding ephemeral channels)	WS-17	25, 26
	burn pile ephemeral channel buffer zone	WS-18	25, 26
	fire creep	WS-19	25, 28
	piing within SEZs	WS-20	25, 31
	re-piling burn piles	WS-21	25, 29
	hot piling of burn piles	WS-22	25, 30
	landing construction	WS-23	48
	landing and fuel exclusions in SEZs	WS-24	49
	landing and fuel restrictions in RCAs	WS-25	1, 50
	landing drainage	WS-26	51
	landing decommissioning	WS-27	52, 21b, 39
	operations outside normal operating period	WS-28	22, 24, 3
	operations on lesser snow depths with operable soil moisture	WS-29	22, 24, 3
	flagging wet areas that do not freeze well	WS-30	13c, 16, 26
	monitoring conditions when approaching inoperable	WS-31	11, 22, 23
	timely removal of equipment and materials before conditions become inoperable	WS-32	23
	Over-snow operations in SEZs	WS-33	13b, 14, 22a
	temporary crossings when adequate snow or frozen soil conditions are not present	WS-34	24
Roads	implementation and maintenance of road BMPs	R-1	33 through 47
	rocking native surface roads at intersections with paved roads (normal operating period and dry conditions)	R-2	36
	reconstructing / maintaining USFS System Roads	R-3	33, 35
	dust abatement	R-4	34
	concrete storage, mixing, and wastes	R-5	2

PROPOSED

Table E3b, continued

Category	Issue	FEIS' RPMs	WDRs' BMPs
	hydrologically disconnecting new temp roads from waterbodies	R-6	35, 37
	determination of permits and extent/type of stabilization at FS roads with City or County roads	R-7	36, 42
	construction and removal of temporary crossings on ephemeral channels.	R-8	38, 53, 54, 55, 56
	construction and removal of temporary crossings on intermittent channels.	R-9	38, 54, 55
	design flow for, and removal of temporary crossings on intermittent channels	R-10	38, 54, 55
	rocking native surface roads at intersections with paved roads (during wet conditions or outside of normal operating period)	R-11	42
	use of a rutted native surface road	R-12	43
	plowing paved roads for use	R-13	22, 44
	minimum snowpack on, & plowing of, native surface roads for use	R-14	22, 43, 44
	marking roads for plowing; avoiding plowing into sensitive areas	R-15	45
	identifying and protecting sensitive areas before winter operations commence	R-16	46
	providing adequate drainage during plowing	R-17	11, 47
	restoration of decommissioned roads to specified standards	R-18	41
	reconstruction of decommissioned roads	R-19	21b, 33, 37, 38, 39, 40
	blocking decommissioned roads and trails	R-20	39, 40
Sensitive Plants		SP-1	86
		SP-2	28, 76c, 87
		SP-3	88
Sensitive Fungi		SF-1	89
Noxious Weeds		WE-1	77
		WE-2	78
		WE-3	79
		WE-4	80
		WE-5	28, 81

PROPOSED

Table E3b, continued

Category	Issue	FEIS' RPMs	WDRs' BMPs
		WE-6	52b, 82
Recreation		Rec-1	83
		Rec-2	84
		Rec-3	85
Scenic Resources		SR-1	59
		SR-2	60
		SR-3	61
		SR-4	62
Heritage Resources		HR-1	72
		HR-2	73
		HR-3	74
		HR-4	75

PROPOSED

Table E3c – Crosswalk between the Best Management Practices (BMPs) in the 2011 USFS Region 5 Water Quality Management Handbook and the BMPs Listed in the FEIS

On December 5, 2011, the US Forest Service Regional Forester for the Pacific Southwest Region approved an updated Water Quality Management Handbook (R5 FSH 2509.22, Chapter 10) (WQMH), which provides equal or better protection than the 2000 Handbook. The FEIS' Resource Protection Measures (RPMs) were based on the BMPs from the 2000 Handbook.

The LTBMU South Shore Fuel Reduction and Healthy Forest Restoration Project's Record of Decision (ROD) specified that the updated handbook will be incorporated into the implementation of this Project. The following is a summary of the revised BMPs from the 2011 WQMH which apply to the South Shore Project for Road Building and Site Construction. All other non-road BMPs remain the same in numbering.

Best Management Practice	Description
BMP 2.2: General Guidelines for Location and Design of Roads Replaces former BMP 2-1 and 2-7	Location, design and construction of roads will be agreed upon by the IDT in order to result in minimal resource damage. This includes design and location of drainage features and road surfacing.
BMP 2.3: Road Construction and Reconstruction Replaces former BMP 2-3, 2-9, 2-10, 2-11, and 2-13	Temporary road construction and road re-construction activities will be conducted during the dry season, when rain and runoff are unlikely and weather and ground conditions are such that impacts to soils and water quality will be minimal. This also includes construction of drainage structures, erosion control measures on incomplete roads prior to precipitation events, and providing groundcover or mulch on disturbed areas. The operator shall limit the amount of disturbed area at a site at any one time, and shall minimize the time that an area is left bare.
BMP 2.4: Road Maintenance and Operations Replaces former BMP 2-7, 2-22, 2-23, and 2-24	Assess road maintenance needs periodically as it relates to water quality effects. Provide the basic maintenance required to protect the road and to ensure that damage to adjacent land and resources is prevented. At a minimum, maintenance must protect drainage structures and runoff patterns. This also includes road surface treatments and drainage structure improvements as needed based on road use.

PROPOSED

Best Management Practice	Description
BMP2.7: Road Decommissioning Replaces former BMP 2-26	Temporary roads will be decommissioned following their intended use. Decommissioning may include re-contouring or outsloping to return the road prism to near natural hydrologic function, blocking the road to vehicle access, removing crossings and restoring natural drainage, and stabilizing road surfaces with ripping and/or revegetation.
BMP 2.8: Stream Crossings Replaces former BMP 2-13, 2-14, 2-15, 2-16, 2-17, and 2-20	Crossing locations shall be identified by the IDT to limit the number of crossings to minimize disturbance to the waterbody. During crossing installation, minimize streambank and riparian area excavation, ensure imported fill materials are free of toxins and invasive species, divert streamflow around work site as needed, dewater work areas, and stabilize streambanks and other disturbed surfaces following crossing installation or maintenance. The diverted flows shall be returned to their natural stream course as soon as possible after construction or prior to seasonal closures. Restore the original surface of the streambed upon completing the crossing construction or maintenance. Provide soil cover on exposed surfaces and revegetate disturbed areas. Remove temporary crossings and restore waterbody profile and substrate when the need for the crossing no longer exists.
BMP 2.9: Snow Removal and Storage Replaces former BMP 2-25	Where Forest Roads are used throughout the winter, the contractor will be responsible for snow removal that will protect roads and adjacent resources. Snow berms will be installed in places that will preclude concentration of snowmelt runoff and that will serve to rapidly dissipate melt water. Snow berms will be removed where they result in accumulation or concentration of snowmelt runoff on the road and erosive fill slopes. Store snow in pre-approved areas where snowmelt will not cause erosion or deposit snow or other materials directly into surface waters. Modify snow removal procedures as necessary to meet water-quality concerns.
BMP 2.11: Equipment Refueling and Servicing Replaces former BMP 2-12	Service and refueling sites shall be located away from wet areas and surface water. If the volume of stored fuel at a site exceeds 1,320 gallons, project Spill Prevention, Containment, and Counter Measures (SPCC) plans are required. Operators are required to remove service residues, waste oil, and other materials from National Forest land following completion of the project, and be prepared to take responsive actions in case of a hazardous substance spill, according to the Forest SPCC plan.

PROPOSED

Best Management Practice	Description
BMP 2.13: Erosion Control Plan (ECP)[1] Replaces former BMP 2-2 and 2-9	Effectively plan erosion control measures to control or prevent sedimentation. Prior to initiation of construction activities, prepare a general erosion control plan for limiting and mitigating erosion and sedimentation from land disturbing activities.

[1] See WDR Attachment F, Best Management Practices and Mitigation Methods, BMP No. 90, for the details on the 2011 WQMH BMP 2.13 requirements for a project-specific ECP.

PROPOSED

Table E4 - Stream Classification Crosswalk

California Term	USFS Term	Definition
Class I	Perennial or Intermittent	Fish always or seasonally present onsite, includes habitat to sustain fish migration and spawning.
Class II	Perennial or Intermittent	1) Fish always or seasonally present offsite within 1000 feet downstream; and/or 2) Contains aquatic habitat for non-fish aquatic species, including springs, fens, etc.; and 3) Excludes Class III tributaries to Class I waters.
Class III	Intermittent or Ephemeral	No aquatic life present, but watercourse shows evidence of being capable of sediment transport to Class I or II waterbody under normal high water flow conditions.
Class IV	Ephemeral	Man-made watercourses which provide beneficial uses downstream of project sites.
Unclassified	Ephemeral	Channel present, but no aquatic life or connection to Class I, II, or III waterbody exists.

The US Forest Service categorizes waterbodies as watercourses which tend to have permeable beds which connect surface waters to groundwater. A **perennial stream** is expected to flow throughout the year, albeit with only small dry-weather flows in some cases. An **intermittent stream** ceases to flow in dry periods. The flow may occur when the groundwater table is seasonally high, but there will not be flow when the groundwater table is significantly below the stream channel bed level. An **ephemeral stream** flows only after rain or snow-melt and has no base flow component. The WDRs, for the most part, uses these same terms to provide consistency between the WDRs and the FEIS/ROD.

However, it may be difficult at times to determine when a watercourse is responding to specific groundwater conditions. Additionally, that classification system does not impart an immediate sense for the potential long-term threat to water quality, aquatic species, or beneficial uses. Therefore, where Project activities potentially may cause impacts, the BMPs incorporated into these WDRs require the identification of waterbodies by biological habitat and ability to transport sediment, as defined in the California Code of Regulations, title 14 (2009 Forest Practice Rules) Watercourse and Lake Protection Zones (WLPZs).

PROPOSED

Table E5 - Summary of Permanent Fill and Excavation on System Roads in or adjacent to SEZs, including Crossings

Road Number	Station	Excavation (CY)	Fill (CY)	Comments
11N13	308 to 723	0	60	Place road base on existing road through SEZ
12N01A	1873	10	200	Low water crossing – includes permeable fill material and surfacing of approaches
12N02	609	0	28	Rocking of low spot in roadway
12N08	713	0	12	Rocking of low spot in roadway
	2100	10	75	Culvert replacement – includes fill and road base
	6000	0	12	Rocking of low spot in roadway
	7540	0	24	Rocking of low spot in roadway
12N19	1312	0	12	Rocking of low spot in roadway
12N20	548	60	160	Culvert replacement - includes permeable fill material and surfacing of approaches
12N27 Seg A	827	0	12	Rocking of low spot in roadway
	1722	0	24	Road base required due to proximity to SEZ*
12N27 Seg B	N/A	0	50	Road base required to drain wet area in road
Temporary roads	various	5	5	
TOTALS		**85**	**674**	

PROPOSED

1) All numbers are estimates. Discrepancies in totals between these numbers and that reported in the FEIS (as miles) are

Table E6 – Disturbance in Uplands and SEZs (in acres)	**Pre-Existing within the entire Project Area, to be Used During Project Activities**		**New Disturbance Due to Project Activities**		**Total Disturbance within Project area (existing + new) During Activities**	**Disturbance After Project Mitigation Measures are applied**		**Total New Disturbance in SEZs**	**Total SEZ Acres Restored**
	Upland	**SEZ**	**Upland**	**SEZ**	**Acres**	**Upland**	**SEZ**	**SEZ**	**SEZ**
System Roads	251	25	0	0	276	251	25	0	0
Road Maintenance			6.22	**0.6**	6.82	6.22	**0**	**0.6**	**0**
Road Reconstruction			8.34	**0.67**	9.01	8.34	0.67	**0.67**	**0**
Road Decommissioning (other than Temp Rds below)		**8.24**			**na**		**na**		**8.24**
Landings - reconstructed	36.4	0			36.4	0	0	0	
Landings - new construction			24.3	0	24.3	0	0	0	
Temporary Roads - reconstructed	11.51	0.18			**11.69**	0	0		**0.18**
Temporary Roads - new construction			5.75	**0.31**	**6.06**	0	0	0.31	**0.31**
Forwarder/Skid trail Crossings		0		**0.12**	0.12		**0**	0.12	**0**
System Trails	81.75	10.7	0	0	92.45	81.75	10.7	0	
Burn Piles in SEZ				42	42		0	42	42*
Aspen restoration									251**
TOTALS	380.66	35.88	44.61	**1.7**	462.85	341.09	36.37	**1.7**	**8.73****
TOTAL OF PROJECT-RELATED "ROAD" DISTURBANCE	416.54		46.31		499.25	377.46			

attributable to the following:

a. width estimates in calculating acreages (FEIS acreage is based on 14-foot widths; accurate assumed road widths, which vary between 4 [trails] and 40 [State and Federal Highways] feet, are shown in FEIS Table 3-46, p. 3-114),
b. maximum road length vs. actual sections of road requiring maintenance or reconstruction,
c. maintenance which could extend beyond current road widths (brushing, minor blading , etc.),
d. ground-truthing following publication of the FEIS, and/or
e. recent conversion of WT or CTL Units to Hand Treatment Units (thereby reducing the numbers of roads requiring maintenance or reconstruction).

2) Road decommissioning estimates are based on Forest Service GIS/INFRA database information within the South Shore Project area. Estimate includes decommissioned area from SEZ (combined road and trail acreage) since 2004. Assumed road width averages 14 feet and trail widths assumed width averages 4 feet.
3) All disturbance in SEZ is assumed to be creating 100% new land coverage, This is a conservative assumption as many SEZ crossings for the project involve existing land coverage in SEZs

"*The 42 acres of burn piles in SEZ is estimated based on a total 138 acres of SEZ in the project area that are planned to receive burn pile treatment. The WDR mandates a cap of no more than 30 percent of an SEZ area to be covered in burn piles and only 15 percent of the SEZ area may be burned in any given year. The 30 percent covered in piles equates to 42 acres.

**All Aspen restoration areas are assumed to be entirely within SEZ. The 251 acres of Aspen restoration is conservatively assumed to not involve restoration of existing disturbance or land coverage, and therefore, is not added to the total SEZ restored.

"SEZ" columns include stream crossings on Temp Roads and Forwarder/Skid Trails Crossings.

PROPOSED

Table E7 - Maximum Distance Between Waterbreaks

(see Attachment F, BMP No. 11)

Estimated Erosion Hazard Rating	US Equivalent Measure Road or Trail Gradient			
	10% or less	11-25%	26-50%	>50%
	feet	feet	feet	feet
Extreme	100	75	50	50
High	150	100	75	50
Moderate	200	150	100	75
Low	300	200	150	100

PROPOSED