

Legend

- | | | |
|-------------------------------|---------------------|----------------------|
| Sierra Pacific Industries | Proposed Road | Existing Sonde |
| Watershed Boundary | Permanent Road | Proposed Sonde |
| Plantation < 5 years | Seasonal Road | East Units Completed |
| Wet Area | Class 1 Watercourse | West Units Completed |
| Road Proposed to be Abandoned | Class 2 Watercourse | WLPZ |
| | Class 3 Watercourse | |

Judd Creek Monitoring Study Group
Draft Experimental Design
Phase 6 Monitor Fall / Winter 2008



SIERRA PACIFIC INDUSTRIES
 Growing Forests For Our Future





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January 7, 2011

Matt Greene
35500 Hauser Bridge Road
Cazadero, CA 95421

RE: Examples of NTMP road upgrades

Matt:

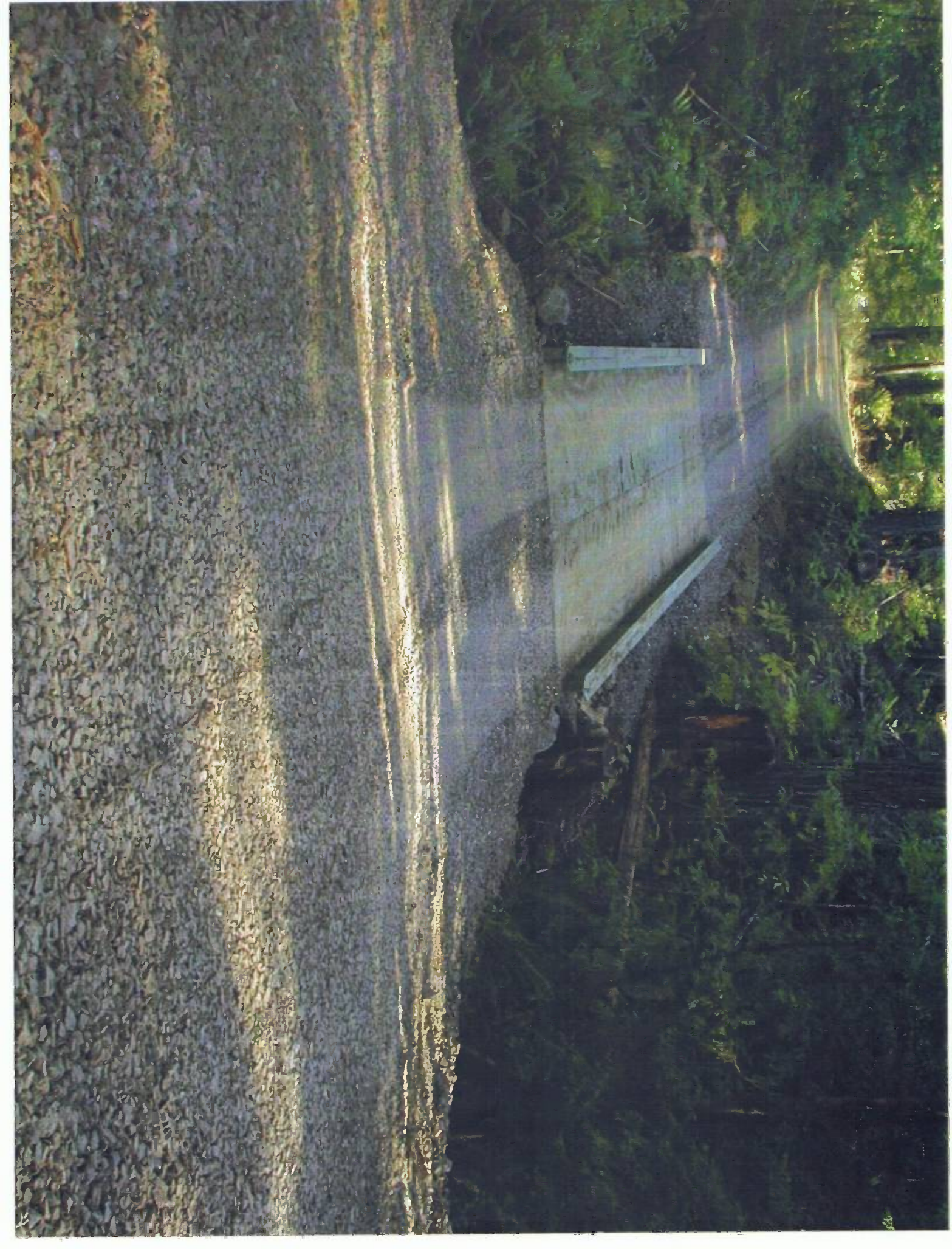
Enclosed are a few photo examples of recent and continuing road upgrades being routinely performed on NTMP 1-99NTMP-014HUM we talked about. In addition to the few crossings pictured, we have performed many other crossing upgrades, surface rocking and stabilization, hydrological disconnects and drainage improvements, armoring, etc. in the course of management over the years. Well before it was required to identify and correct deliverable sediment sources to area watercourses, we have been doing so on a voluntary basis. I know this NTMP is not unique in this regard, as other RPF land managers have also performed similar work on the properties they manage. As you know, road work is expensive and given the log market conditions of the past few years, it is a difficult proposition to impose additional costs onto landowners. I hope CLFA is successful in their efforts to present this case to WQ that yet another layer of regulatory burdens is unnecessary and present unreasonable costs to landowners. Hope this helps.

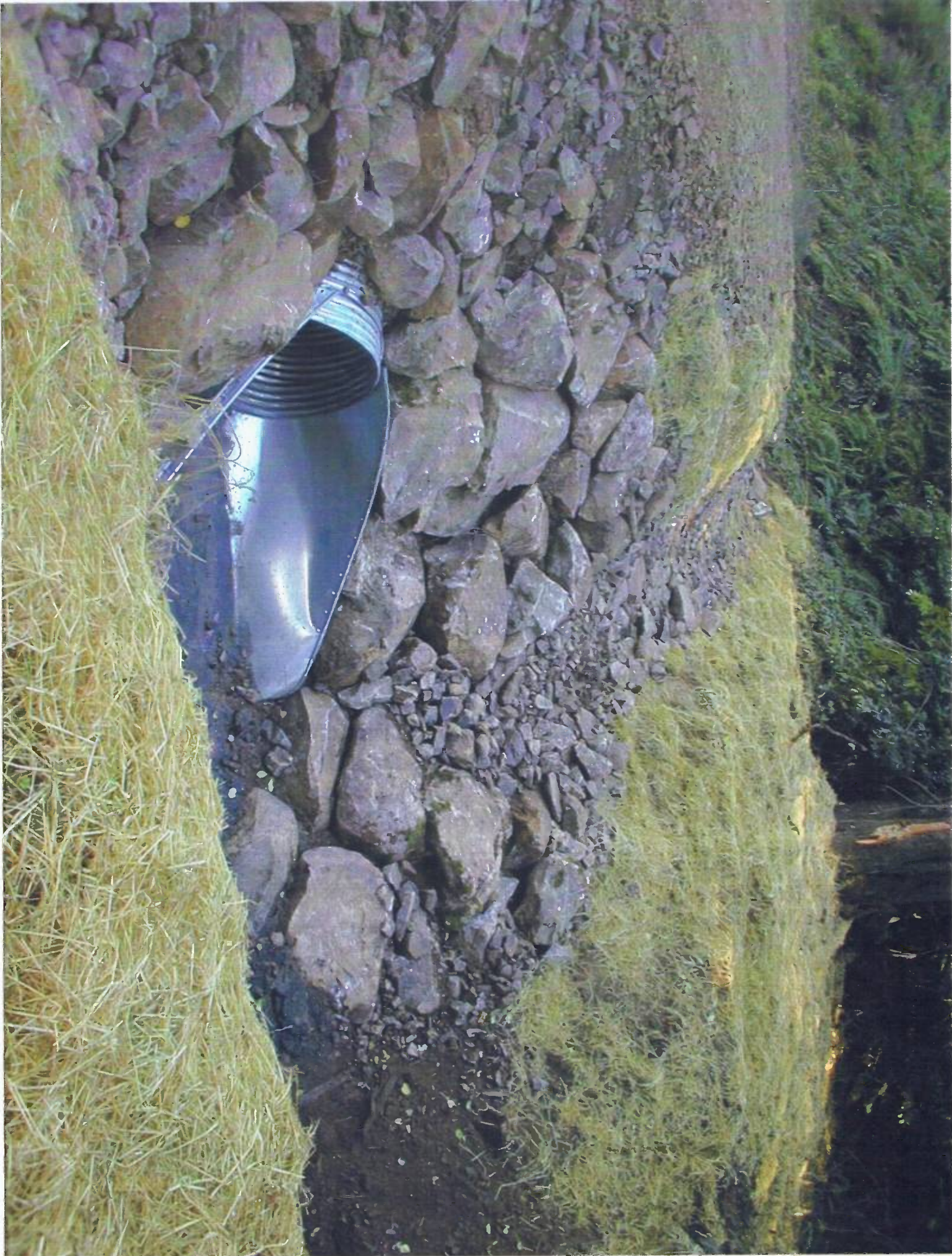
Thanks,

Bob Kelley, RPF #1994
CPESC #699









**North Coast Regional Water Quality Control Board
Timber Harvest Division
Active/Completion/NOT Inspection Checklist**

Today's date: June 2, 2010

Inspection date: May 27, 2010

WQ Inspector: Thomas Williams

CDF Inspector: None

NTMP No. 1-99-014 HUM, NTO #37

Inspection Type: Active

Company and/or Landowner: McAdams Lands

RPF/Designee: Robert Kelley

LTO (If known): Woody Murphy

Primary Watershed: Mad River

Adjacent watercourse: Mill Creek

Roads and Landings (Appurtenant and THP):

Drainage facilities adequate: Yes

Comments/Concerns/Recommendations: The road system has been maintained and upgraded over time. New bridges were installed at Map Points 1 and 2 last year. New rolling dips have also been installed and the roads have recently been spot rocked.

Yarding (if evaluated): Tractor: X Cable: Helo: Other:
Skid trails-adequately drained: Yes
Cable corridors adequately drained: n/a
WLPZ residuals protected: Yes

Comments/Concerns/Recommendations: The silvicultural prescription in the NTO area has been single tree selection using tractors. Group selection is proposed in the future.

Site Preparation: n/a

Watercourses protected: n/a

Fire Lines (drainage adequate, etc.): n/a

Comments/Concerns/Recommendations:

WLPZ Practices:

Drainage facilities adequate:	Yes	Roads rocked where necessary:	Yes
Retentions adequate:	Yes	Vegetative buffers adequate:	Yes
Soil stabilization adequate:	n/a	DWS protected:	n/a

Comments/Concerns/Recommendations: The entire NTMP NTO area has been harvested using single tree selection. When a tree is removed from the WLPZs, it is usually located along the outer margin of the WLPZ. This is an older second growth stand and overhead canopy retention within the WLPZs is estimated to be from 70-90 percent.

There was an apparent diversion of a Class II watercourse several decades ago at Map Point 3. The new watercourse is actively downcutting from Map Point 3 downstream to Mill Creek.

Instabilities/Slides: n/a

Estimated size (ft ² , yard ³)	n/a	New since operations	n/a
Potential Delivery to watercourses	n/a	Tree retention adequate	n/a

Comments/Concerns/Recommendations/Cause(s):

Additional Comments/Concerns/Recommendations for needed work (use reverse side if necessary):

**DONALD G. OSTERHOUDT
CONSULTING FORESTER
REGISTERED PROFESSIONAL FORESTER 1004**

120 North Dewitt Way
Yreka, California 96097
Telephone (530) 842-5657

February 2, 2011
Ref: Last Resort NTMP
2-09NTMP-003-SIS

Mr. Matt Greene
35500 Houser Bridge Road.
Cazadero, CA 95421

Dear Matt,

The NTMP was approved on December 22, 20011, with the CA Forest Practice Rules for 14 CCR 936.5 requirements for WLPZ's.

Enclosed are the water temperatures from 8/22/2010 to 10/4/2010. The upstream temps were taken as the stream entered the NTMP and the downstream temps as it left the NTMP.

On 1/19/2011 we had a telephone meeting with WQ that went on for 2 hours. Mr. Walcott sent the enclosed E-mail. That is the best deal we could get!

Anyway I hope you can use the information.

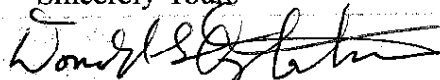
Now the problem is that CDF does not want to enforce Water Qualities WLPZ's retention measures of Walcott's e-mail. They do not agree with WQ retention measures and they don't want it in the Notice of Operations.

It may get interesting before it's over.

If you are able to keep me informed my e-mail is: mosterho@thegrid.net.

I may have sent you the Temps before.

Sincerely Yours



Donald G. Osterhoudt

2
 Last Resort water temperature from Timber Products

11/18/10

HoboLocation	Date	DailyAveC	DailyMaxC	WeeklyAveC	WeeklyMaxC
Downstream	8/22/2010	10.05	12.90	10.06	13.13
Downstream	8/23/2010	9.46	12.90	9.79	12.80
Downstream	8/24/2010	9.76	13.30	9.56	12.24
Downstream	8/25/2010	10.48	14.10	9.34	11.96
Downstream	8/26/2010	11.41	14.80	9.14	11.73
Downstream	8/27/2010	10.58	13.30	8.93	11.51
Downstream	8/28/2010	8.70	10.60	8.88	11.57
Downstream	8/29/2010	8.18	10.60	9.09	11.96
Downstream	8/30/2010	7.80	9.00	9.22	12.11
Downstream	8/31/2010	8.23	11.30	9.25	12.39
Downstream	9/1/2010	9.07	12.50	9.19	12.17
Downstream	9/2/2010	9.98	13.30	9.01	11.61
Downstream	9/3/2010	10.24	13.70	8.59	10.94
Downstream	9/4/2010	10.11	13.30	8.14	10.44
Downstream	9/5/2010	9.08	11.70	7.79	10.10
Downstream	9/6/2010	8.01	10.90	7.64	9.99
Downstream	9/7/2010	7.81	9.80	7.63	9.99
Downstream	9/8/2010	7.83	8.60	7.68	10.14
Downstream	9/9/2010	7.08	8.60	7.74	10.37
Downstream	9/10/2010	7.07	10.20	7.99	10.81
Downstream	9/11/2010	7.67	10.90	8.23	10.87
Downstream	9/12/2010	8.01	10.90	8.53	11.04
Downstream	9/13/2010	7.96	10.90	8.65	10.89
Downstream	9/14/2010	8.19	10.90	8.68	10.84
Downstream	9/15/2010	8.23	10.20	8.52	10.51
Downstream	9/16/2010	8.83	11.70	8.38	10.29
Downstream	9/17/2010	8.75	10.60	8.19	10.07
Downstream	9/18/2010	9.78	12.10	8.01	10.01
Downstream	9/19/2010	8.83	9.80	7.66	9.74
Downstream	9/20/2010	8.13	10.60	7.47	9.80
Downstream	9/21/2010	7.10	8.60	7.43	9.80
Downstream	9/22/2010	7.24	8.60	7.56	10.09
Downstream	9/23/2010	7.48	10.20	7.68	10.37
Downstream	9/24/2010	7.51	10.20	7.80	10.47
Downstream	9/25/2010	7.35	10.20	7.99	10.63
Downstream	9/26/2010	7.45	10.20	8.14	10.69
Downstream	9/27/2010	7.89	10.60	8.31	10.57
Downstream	9/28/2010	7.97	10.60	8.23	10.23
Downstream	9/29/2010	8.08	10.60		
Downstream	9/30/2010	8.34	10.90		
Downstream	10/1/2010	8.86	11.30		
Downstream	10/2/2010	8.40	10.60		
Downstream	10/3/2010	8.63	9.40		
Downstream	10/4/2010	7.35	8.20		
Upstream	8/22/2010	9.68	11.70	9.79	12.56
Upstream	8/23/2010	9.19	12.50	9.55	12.40
Upstream	8/24/2010	9.56	12.90	9.33	11.90
Upstream	8/25/2010	10.28	13.70	9.11	11.61
Upstream	8/26/2010	11.14	14.40	8.91	11.39
Upstream	8/27/2010	10.23	12.50	8.70	11.17
Upstream	8/28/2010	8.45	10.20	8.65	11.29

HoboLocation	Date	DailyAveC	DailyMaxC	WeeklyAveC	WeeklyMaxC
Upstream	8/29/2010	8.03	10.60	8.87	11.73
Upstream	8/30/2010	7.60	9.00	9.00	11.83
Upstream	8/31/2010	8.03	10.90	9.03	12.06
Upstream	9/1/2010	8.87	12.10	8.97	11.90
Upstream	9/2/2010	9.68	12.90	8.81	11.40
Upstream	9/3/2010	9.91	13.30	8.42	10.73
Upstream	9/4/2010	9.96	13.30	8.01	10.23
Upstream	9/5/2010	8.92	11.30	7.67	9.84
Upstream	9/6/2010	7.81	10.60	7.53	9.74
Upstream	9/7/2010	7.66	9.80	7.52	9.69
Upstream	9/8/2010	7.70	8.60	7.58	9.84
Upstream	9/9/2010	7.00	8.20	7.63	10.07
Upstream	9/10/2010	6.99	9.80	7.87	10.51
Upstream	9/11/2010	7.60	10.60	8.10	10.57
Upstream	9/12/2010	7.91	10.60	8.37	10.73
Upstream	9/13/2010	7.79	10.20	8.48	10.56
Upstream	9/14/2010	8.04	10.90	8.50	10.56
Upstream	9/15/2010	8.08	10.20	8.35	10.23
Upstream	9/16/2010	8.66	11.30	8.22	10.06
Upstream	9/17/2010	8.60	10.20	8.03	9.84
Upstream	9/18/2010	9.53	11.70	7.84	9.79
Upstream	9/19/2010	8.65	9.40	7.52	9.51
Upstream	9/20/2010	7.95	10.20	7.32	9.57
Upstream	9/21/2010	6.95	8.60	7.29	9.57
Upstream	9/22/2010	7.22	9.00	7.40	9.80
Upstream	9/23/2010	7.33	9.80	7.49	9.97
Upstream	9/24/2010	7.28	9.80	7.61	10.09
Upstream	9/25/2010	7.25	9.80	7.80	10.24
Upstream	9/26/2010	7.28	9.80	7.94	10.30
Upstream	9/27/2010	7.74	10.20	8.11	10.24
Upstream	9/28/2010	7.68	10.20	8.05	9.96
Upstream	9/29/2010	7.89	10.20		
Upstream	9/30/2010	8.13	10.60		
Upstream	10/1/2010	8.64	10.90		
Upstream	10/2/2010	8.23	10.20		
Upstream	10/3/2010	8.48	9.40		
Upstream	10/4/2010	7.28	8.20		

**LAST RESORT- NONINDUSTRIAL
TIMBER MANAGEMENT PLAN**

S1/2, SE1/4, of the NW1/4 and
NE1/4 of the SW1/4
of Section 36
T43N, R1W., MDM



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Contour Int. 40 feet

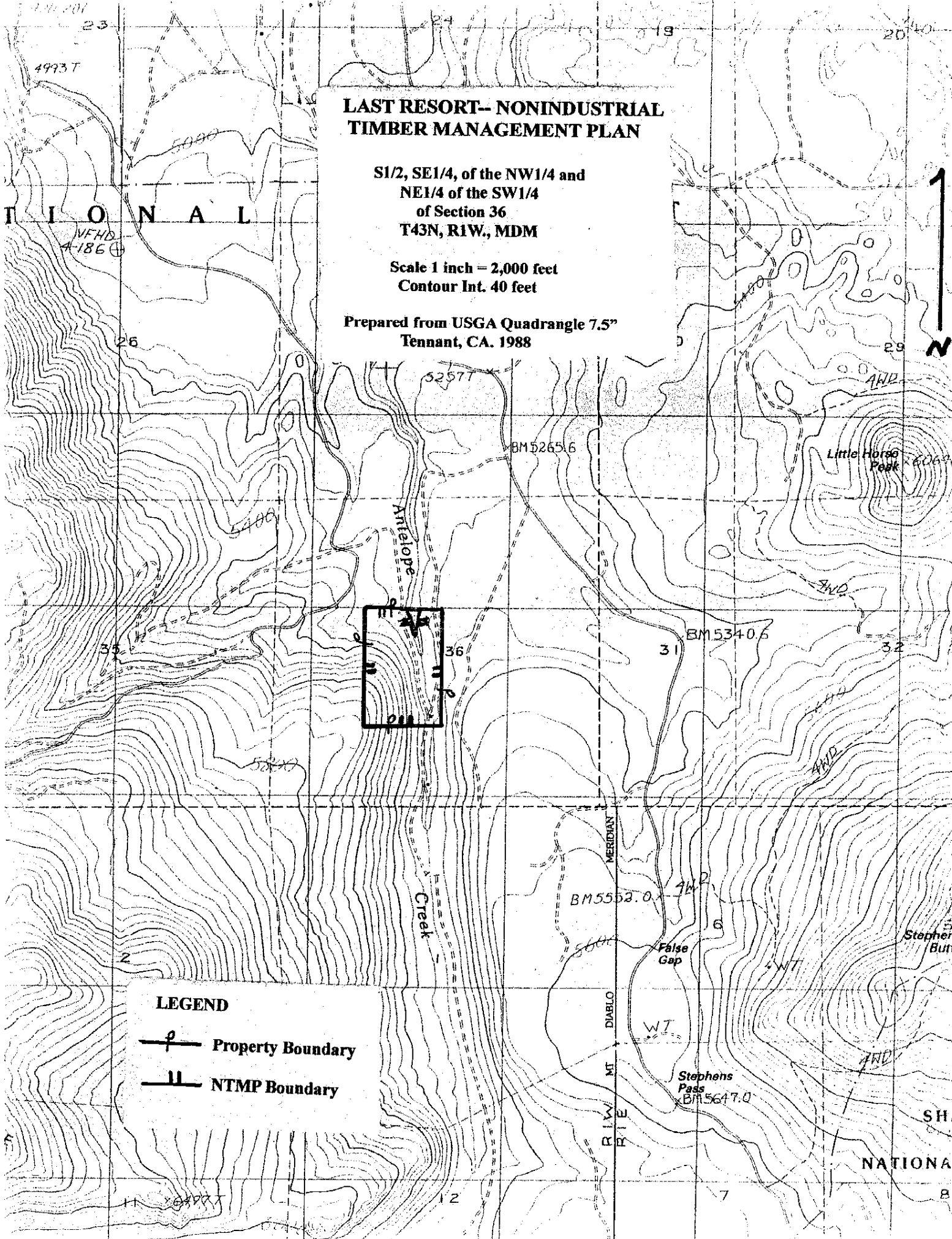
Prepared from USGA Quadrangle 7.5"
Tennant, CA. 1988

NATIONAL



LEGEND

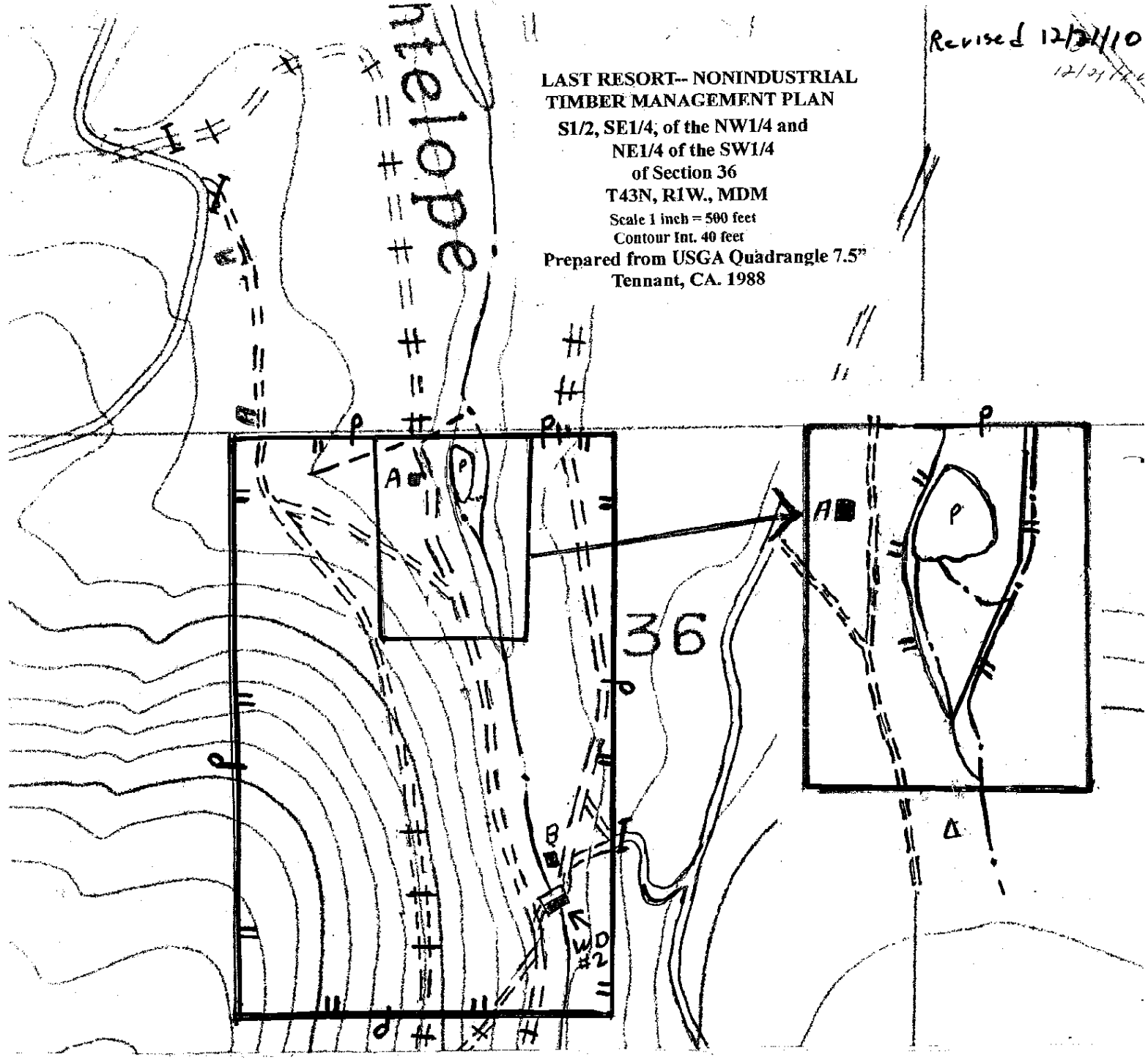
-  Property Boundary
-  NTMP Boundary



Revised 12/24/10
12/21/76

LAST RESORT-- NONINDUSTRIAL
TIMBER MANAGEMENT PLAN
S1/2, SE1/4; of the NW1/4 and
NE1/4 of the SW1/4
of Section 36
T43N, R1W., MDM
Scale 1 inch = 500 feet
Contour Int. 40 feet
Prepared from USGA Quadrangle 7.5"
Tennant, CA. 1988

Antelope



LEGEND

- Property Boundary
- Dwelling-Hazard Reduction
- Bridge 10'x48'
- Section Number
- UTM Lines

- NTMP Boundary
- Class I Watercourse - Antelope Creek
- Unclassified Draw
- Pond
- Out Building - Abandoned

Locked Gate

Water Drafting Site #2

- Roads
- Appurtenant Seasonal-Pvt.
- Seasonal -Pvt. Log hauling Restricted
- Seasonal - USFS

Site III Erosion Hazard Rating- Moderate

Prescription - Selection System/Group Selection

All Logging systems are Tractor/Skidder

Flagging Colors

- Boundary for NTMP Pink with TIMBER HARVEST BOUNDARY
- Class I Streamcourse Protection Blue & White with LAKE AND WATERCOURSE PROTECTION
- Unclassified Streamcourse White
- Information Yellow

22.0

B. GUALALA RIVER WATERSHED TMDL

Portions of this NTMP which are encompassed by the Big Pepperwood Creek (PWS #1113.850201), Robinson Creek (PWS #1113.810002) and Doty Creek (PWS #1113.810003) watersheds are located within the larger Gualala River Watershed, encompassing 300 mi² or 191,145 acres. The Gualala River is listed as “impaired” for sedimentation pursuant to Section 303(d) of the Federal Clean Water Act. This listing describes the Gualala River as not fully supporting all beneficial uses of water or is not meeting water quality objectives. Sedimentation was determined to be impacting the cold water fishery, which includes the migration, spawning, reproduction, and early development of cold water fish such as the coho salmon and the steelhead trout. Listed for excessive sediment, the Gualala River Total Maximum Daily Load (TMDL) sediment budget for the Gualala River watershed was established by the North Coast Regional Water Board (NCRWQCB) and approved by the U.S. Environmental Protection Agency (EPA) in December 2001.

The EPA defines the TMDL as the current loading capacity, which is the total amount of sediment that can be delivered to the river and still attain the applicable water quality criteria for sediment. The TMDL (loading capacity) is apportioned from background loading, point source wasteload, and non-point source wasteload allocations.

Based on data representing historic and current populations of salmonids, specifically coho salmon, the TMDL report finds that sustainable populations of salmonids existed, however there is no measurable data available. A sediment delivery rate comparable to the Noyo was extrapolated and applied to the Gualala River for a historic baseline of sediment. The estimated average sediment delivery rate for the 1933-1957 period of the Noyo River is 475 tons/mi²/yr. **The TMDL for the Gualala River is 475 tons/mi²/yr.** The results of the sediment source analysis are as follows:

Source Sediment	Current Load (tons/mi²/yr)	Load Allocation(tons/mi²/yr)
Natural Landslides	180	180
Natural Streambank Erosion	200	200
Road-Related Landslides	370	56
Road-Stream Crossing Failures	50	5
Road-Related Gullies	150	8
Road-Related Surface Erosion	140	7
Skid Trail Surface Erosion	30	5
Other Harvest Related Delivery	<u>100</u>	<u>14</u>
Total	1220	475

(See TMDL document attached in Section V)

C. POTENTIAL WATERSHED EFFECTS FROM TIMBER HARVESTING AND OTHER ACTIVITIES

1. Sediment Effects

Natural erosion processes are occurring in the stream channels of all watercourses in the WAA. Some watercourses show erosion effects from historic logging activity. China Gulch, a Class I watercourse, and one unnamed Class III watercourse have the potential to contribute sediment to the mouth of the Gualala River. Robinson Gulch and Big Gulch, Class II watercourses, drain directly into the Pacific Ocean. Unit 11 has portions of the North Fork Gualala River that travel near the unit, but the expanded width of the Class I WLPZ restriction and other applicable Threatened or Impaired rules will create adequate buffers to prevent sediment from the plan area from entering the Gualala River at these locations. Units 5 and 9 are located at the of the first ridge from the Pacific to the east of Old Stage Road and have Class II and III watercourses that eventually flow into the North Fork Gualala River and subsequently into the Gualala River. The buffering effect of WLPZ restrictions and the location of these units 2,500 feet distant from the Gualala River at the closest point combine to mitigate to the point of insignificance any potential sediment effects on the Gualala River.

The Gualala River is listed by the Environmental Protection Agency as a 303(d) impaired water body for sediment and temperature. The potential exists for additional operations to contribute adverse impacts to the system. Mitigations have been designed to reduce sediment loads downstream of the NTMP area which include: watercourse buffers, installing dips, upgrading currently undersized culverts, placing waterbars on skid trails, and other general improvements to the road system which aim to reduce total sediment contributions downstream.\

The North Gualala Water Company, a privately owned public utility, provides drinking and other domestic water for the coastal communities of Gualala and Anchor Bay. Its service area extends from the north side of the Gualala River approximately six miles north and extending from the Pacific Ocean to the top of the coastal ridge. The water company currently services 1,033 connections. Fines and sediment washed into sources of domestic water outtake may raise the turbidity of water above levels permitted for the utility. Water with turbidity levels exceeding 1.5 nephelometric turbidity units (NTU) may not be brought into the system. Facilities with potential for adverse effects from timber operations conducted pursuant to this NTMP are two surface water collection points. Surface water collection facilities employing perforated pipes buried in the active stream gravels are located Robinson Gulch and Big Gulch. These are supplemental water sources typically used beginning after the end of the rainy season in mid June or July until fall rains set in around mid November. When the rainy season sets in, the facilities are shut down until the next year. The most significant current adverse impact to the system is from turbidity generated from storm runoff of Big Gulch Road, an rocked residential access road located on the west side of Big Gulch. According to John Bower, owner and operator of the water company facilities, when a storm hits during the period that the Big Gulch facility is in operations, the pump must be shut down within one and one-half hours after commencement of rain to avoid turbidity impacts to the water supply. Although some temporary increase in winter-flow stream turbidity from timber operations under this NTMP may occur immediately following years during which timber operations in these watersheds occur, they are not expected to affect the quality of water drafted from the water company facilities due to the time of year during which the water company operates these facilities.

The main source of the North Gualala Water Company's water supply is from deep wells located at Elk Prairie. Three wells ranging in depth from 115 to 142 feet currently provide water all year from the Elk Prairie fields. Elk Prairie is in a seasonal flood plain located at the confluence of the North Fork and Little North fork branches of the Gualala River. No surface turbidity effect on the quality of water drafted from the Elk Prairie wells has been experienced by the company even when the well fields are flooded.

One small Unit of the NTMP, Unit 11, has potential to impact the North Fork drainage of the Gualala River. Unit 11 is located near the confluence of the Little North Fork and the North Fork Gualala River, both of which are Class I watercourses and flow out to the Pacific Ocean. The unit is located above the floodplain of the river and any sediment discharge into the river from this unit will enter the North Fork channel downstream of the water company's wells.

The Gualala River watershed has been subject to intensive monitoring surveys by the Gualala River Watershed Council (GRWC) since 1995, and has access to monitoring data as early as 1992. A monitoring "reach" (NFG3 #204) located upstream of its confluence with the Little North Fork and extending 2,000 upstream was install by the GRWC in 1995 and was surveyed in 1999 and 2001. In 2007 the North Gualala Water Company (NGWC) contracted with the GRWC to establish new temperature monitoring stations below, between and above the current NGWC well sites, re-survey the monitoring reach and analyze the data. In December 2008 the GRWC presented the results of their findings, excerpts of which are quoted below:¹

NFG3 #204 reach data shows an increase in primary pool formation, maximum pool depth and a decrease in channel aggradation over the past 9 years (1999-2008). The channel degradation is consistent with overall watershed-wide findings. Channel degradation appears to confirm the premise that excess sediment loads are slowly transporting out of the watershed. According to the NCWAP study, over a sixteen-year period (1984-2000) portions of channels having negative fluvial sediment conditions decreased within the watershed for an overall watershed reduction of 47% and a reduction of 40% in the North Fork SPWS.

A Variation Index (VI) for the thalweg is developed for each monitoring site using a model designed by Mary Ann Madej (USGS and Redwood National Park). Simply stated, the VI measures the complexity of the channel bed; reduction of complexity occurs with excessive sediment introduction, increased complexity indicates a recovery from such a condition....The VI target for recovery is considered to be '20...and channels with a VI index of ≥ 20 are believed to be in recovery from excessive sediment loads. NFG3 #204 shows a steady increase in the VI from 36.8 in 1999 to 48.9 in 2008.

Areas of soil instability have specific protection measures provided for them in the NTMP, these measures will reduce the risk of sediment impacts. The steep slopes adjacent to Robinson Gulch,

¹ NorthFork Gualala Reach Site #204 1999-2008, Prepared by The Gualala River Watershed Council, December, 2008. See Section V for the complete report.

Big Gulch and portions of Unit 9 will be harvested using cable yarding or by the long-lining of trees to outside of the EEZ.

2. Water Temperature Effects

Water temperature is highly correlated with near-stream canopy retention. There are Class I WLPZ and Class II watercourses within the NTMP area, which will be protected by WLPZ, and maintain a baseline level of residual canopy. Some canopy near watercourses will be removed in road use and timber operations. The overall net effect of canopy removal from Class I, Class II and Class III watercourses is not anticipated to contribute detrimental effects to water temperature.

The GRWC report for NFG3 #204 reports North Fork Gualala river water temperatures at Units 10 & 11 as follows:

Temperatures for 2007 show a slight decrease in the Maximum Weekly Average Temperature (MWAT) and the Maximum Weekly Maximum Temperature (MWMT) since 1995. Reach water temperatures range from “somewhat suitable” to “moderately suitable” for summer rearing for salmonids. No recorded temperatures reached the maximum daily lethal temperature of 23.9° Celsius. In 2007 the highest daily recorded maximum was 19.65° Celsius.

3. Organic Debris Effects

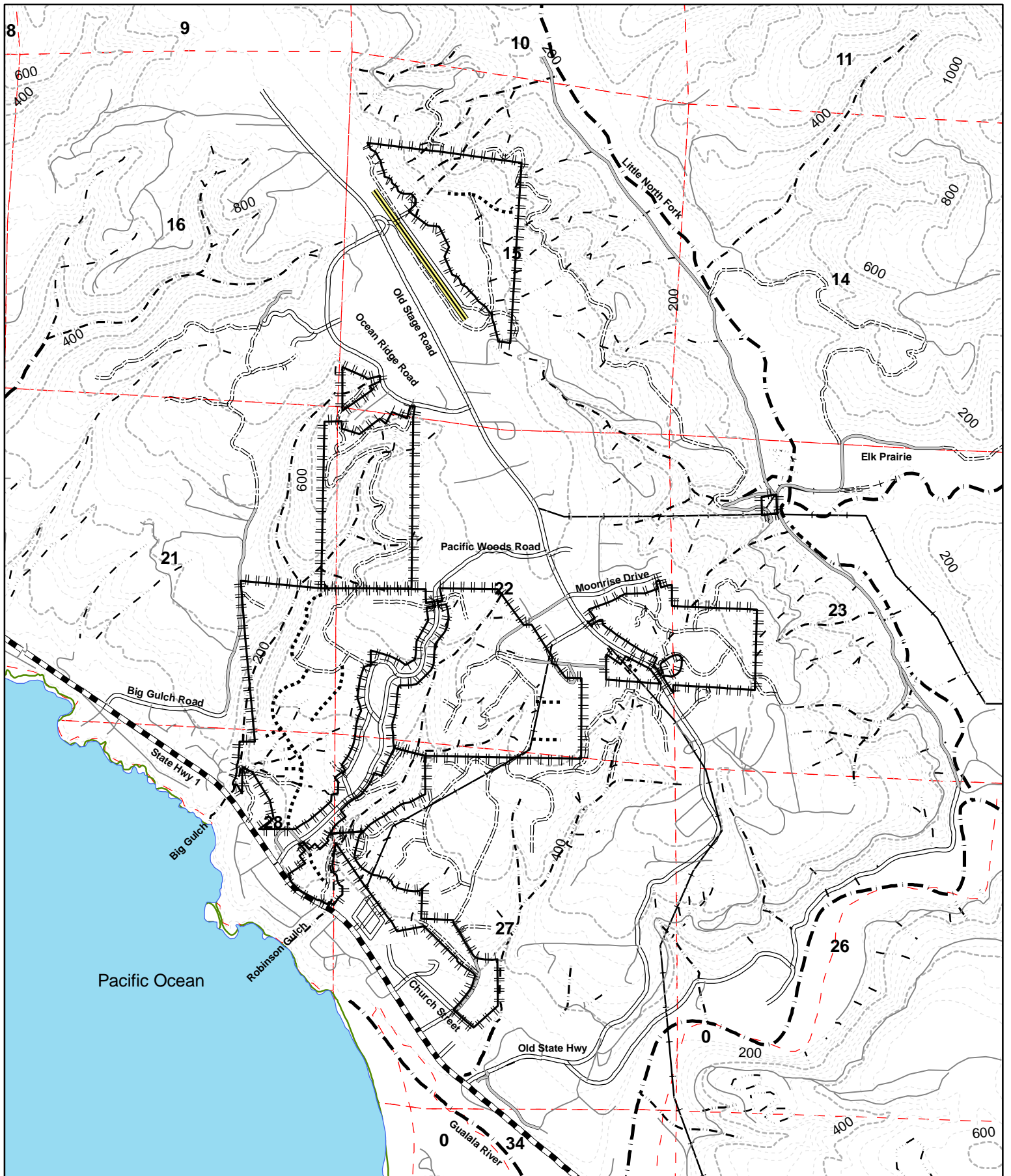
Organic debris in varying states of decomposition is present in the watercourses in the NTMP area. Watercourses in the NTMP area flow primarily during the winter period and potential for organic debris effects are remote because of increased buffering capacities during greater water flow periods, also yarding operations will have ceased before increased rainfall begins.

4. Chemical Contamination Effects

There are no known sources of chemical contamination that exist within the WAA. Chemical contamination is theoretically possible from a number of activities. These include, but are not limited to, accidental discharge from faulty equipment, operational discharge from logging equipment, deposition of tree marking paint, chemical dust stabilizers, improper application of pesticides and herbicides, and illegal dumping.

Chemical Dust Suppressants

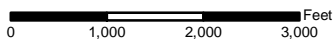
Chemical dust suppressants may be used on the seasonal roads to reduce dust pollution. Dust suppressants are commonly formulated of Magnesium-Chloride, which is derived naturally through solar evaporation of sea water. Dust-Off, a commercially available dust suppressant, provides superior dust control, improved visibility, cleaner air, improved road surface stabilization, reduced equipment maintenance costs, reduced pathogen vector, and improved suppressant duration. In a dust control study done by the Environmental Protection Agency and U.S. Army Construction Engineering Research Laboratory, Dust-Off has been evaluated and found to be environmentally acceptable. A detailed study was conducted in 1989 by an independent environmental consulting firm on the environmental impact of Dust-Off. The study showed that when used properly, and with appropriate precautions, it poses minimal environmental risk. It is recommended that Dust-Off not be applied if a domestic drinking water supply source is less than 25 feet from the surface or on roads immediately adjacent to a low-volume stream or pond used as a domestic



Contour Interval = 40 feet

Scale = 1:24,000

1 inch = 2,000 feet



Revised October 15, 2009

Environmental Resource Solutions, Inc.

NTMP Boundary Map

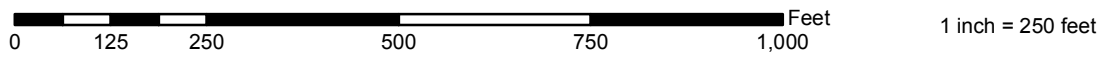
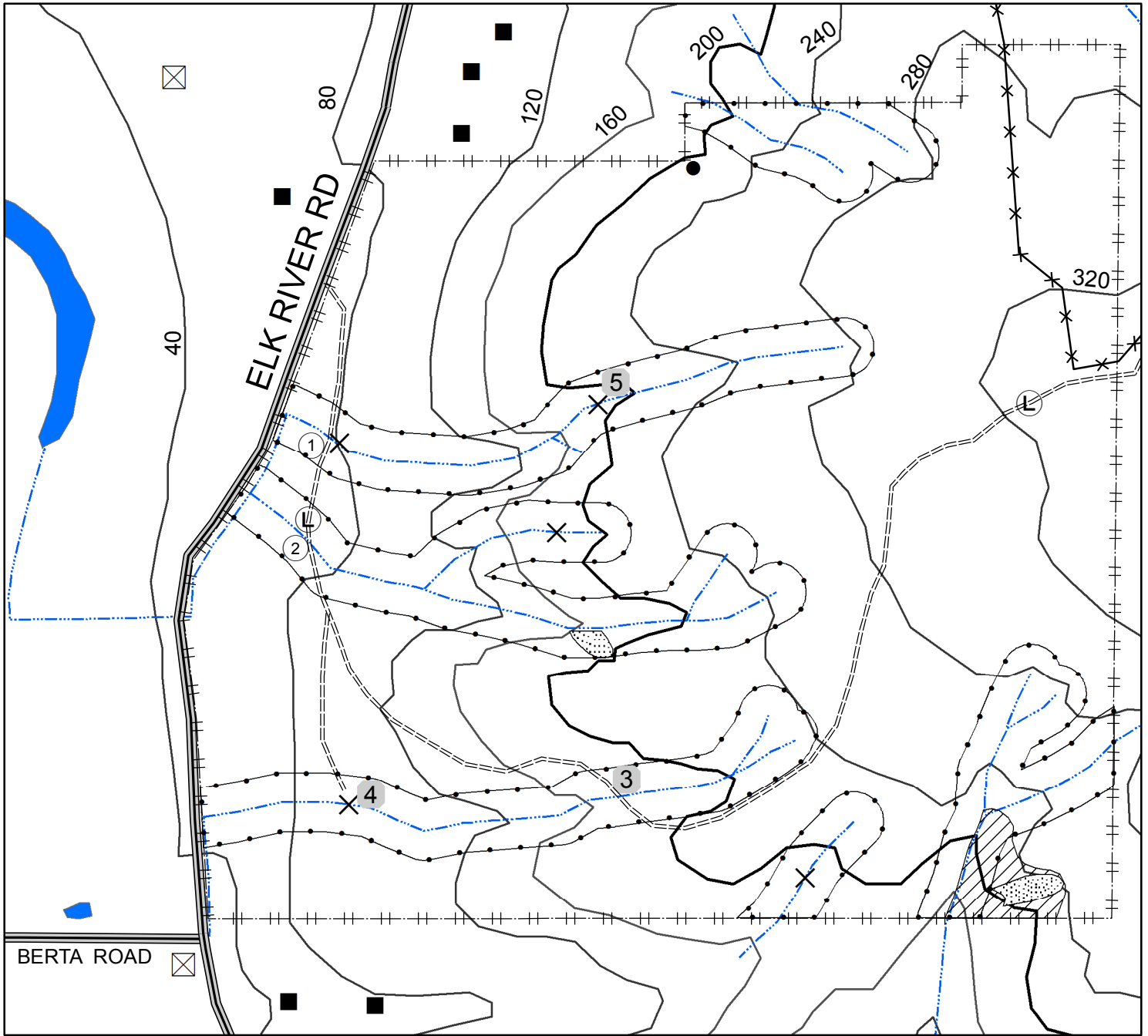
Bower NTMP
 Portion of Sections 15, 21, 22, 23, 27, & 28,
 T11N, R15W, MDB&M

Page #

Legend

- NTMP Boundary
- Public Land Survey
- Powerline
- Pacific Ocean
- Class 1 Watercourse
- Class 2 Watercourse
- Class 3 Watercourse
- Class 4 Watercourse
- Highway 1
- Airstrip
- Existing Permanent Paved
- Existing Permanent Rocked
- Existing Seasonal
- Proposed Seasonal
- Abandoned
- Unclassified Road

Turner Parcel THP / S & W Properties
Sediment Prevention Plan/Category F Waiver Map
Portion of Section 15, T4N, R1W, HBM, Humboldt County, CA
Base Map: Fields Landing USGS 7.5 Min Quad.(1972)
Contour Interval = 40 feet



General Features

- | | | | |
|--|--------------------------------|--|-----------------------------|
| | THP Boundary | | No Harvest Area |
| | Seasonal Roads | | Class III Watercourse |
| | Landing | | Ponding Area |
| | Addressed SPP Crossing | | House |
| | Addressed Watercourse Crossing | | Barn |
| | Existing Skid Crossings | | Old Water Tank (Not in Use) |
| | Old Fence Line | | |
| | Slide | | |
| | Class III ELZ (Approximate) | | |



**Technical Report Pursuant the Categorical Waiver of Waste Discharge Requirements for
Discharges Related to Timber Harvest Plans
Order No. R1-2004-0016.**

I. Sediment Prevention Plan (SPP)

This section addresses the requirements of the California Regional Quality Control Board's Order R1-2004-0016 for Sediment Prevention Plan (SPP) related to timber harvest activities on Non-Federal lands in the North Coast Region. This SPP is for **Slack and Winzler Properties LLC**, private timberland owners wishing to harvest timber on **±42 acres of their property located at 6562 Elk River Road, Eureka, California, 95503.**

An SPP is to be developed and implemented as part of a Timber Harvest Plan (THP) seeking coverage under Categorical Waiver F. The SPP is to be inclusive of the entire project area, including roads used for timber harvest activities owned by or under the control of the Timberland Owner (i.e., the Discharger applicant). The SPP is to be developed and implemented to prevent and/or minimize the discharge or threatened discharge of sediment or other earthen material from controllable sediment discharge sources into waters of the State. Sediment discharge sources may include, but are not limited to, failing or failed watercourse crossings, road failures, road surfaces, landslides, unstable features discharging to or near watercourses, unstable watercourse banks, soil stockpiles, storage of sediment, or any other location discharging, or having the potential to discharge, sediment or earthen materials.

The Registered Professional Forester (RPF) has conducted an inventory of controllable sediment discharge sources within the project area. The inventory method consisted of an appurtenant road inventory, aerial photo and ground assessment of the harvest area, and a complete ground assessment of all watercourses and associated stream protection zones within an area of planned timber harvest operations. The schedule for implementing the prevention and minimization (P/M) management measures for controllable sediment sources will be consistent with the life of the timber harvest plan. The SPP will implement these measures in accordance with the priority level assigned to the site (generally high priority sites will be addressed first with medium and low priority sites to follow). Work at all sites will be accomplished at time frames specified by the timber harvest plan, and prior to the filing of a work completion report, if not otherwise specified. General prevention and minimization (i.e., sediment control) measures will be implemented concurrent with operations.

Controllable sediment sources associated with this THP may include proper installation and maintenance of erosion control structures on permanent, seasonal and temporary roads, installation and removal of temporary road and skid trail crossings, and control of sheet erosion from unsurfaced roads and exposed soils within the harvest units. Specific measures to control sediment related to crossing installation and removal are addressed in Section II of the THP, and summarized here in Section A of the SPP. General measures employed to reduce sediment production related to this project are also discussed within the THP and given below in Section B of the SPP.

A. Inventory and Treatment of Controllable Sediment Sources

There are no active or bleeding unstable areas, or other existing sources in need of sediment control on the property prior to timber operations. The following three described crossings are on ephemeral/intermittent Class III watercourses and were the only crossings assessed to have a measurable and/or significant potential for sediment delivery to a channel. All watercourses on the plan area are Class III's with no surface conductivity to a higher order watercourse, other than during periods of flooding when Elk River overtops its banks inundating the valley floor.

Road Point Number	Estimated Excavation Volume (cu. yds)	Current Diversion Potential	Sediment Delivery Potential (cu. yds)	Crossing Description and Treatment	Timing of Installation, Replacement, or Other Specified Work
Crossing #3 1611 required	±30 cu.yds	low	±10 cu. yds	Existing earth and woody debris fill road crossing of an ephemeral/intermittent Class III watercourse. Existing fill is partially eroded away and is not passable with a vehicle. Treatment: Existing fill shall be completely removed, and a minimum 30 inch permanent culvert is to be installed at or near original channel grade as feasible. A critical dip is to be installed over the pipe or at the hinge line to the channel. Bare mineral soil within the flagged ELZ shall be seeded and mulched prior to the winter period as outlined in Item 18.	Crossing installation shall be completed prior to road use.
Crossing #4 1611 required	±50 cu.yds	none	±30 cu. yds	Existing earth and woody debris fill skid trail crossing of an ephemeral/intermittent Class III watercourse. Channel at the crossing is 5 to 6 feet below the old road surface and is 18 to 20 feet wide at the top of the fill base. Approximately half of the earth materials have been washed out and eroded away since the last use of the trail 30 plus years ago. Treatment: Existing fill shall be completely removed, and a minimum 30 inch permanent culvert is to be installed at or near original channel grade as feasible. Brow logs shall be placed along the outboard edge of crossing fill as necessary to prevent sweeping of soils into the channel during crossing use. A critical dip is to be installed over the pipe or at the hinge line to the channel. Bare mineral soil within the flagged ELZ shall be seeded and mulched prior to the winter period as outlined in Item 18.	Crossing installation shall be completed prior to skid trail use.
Crossing #5 1611 required	±50 cu.yds	none	±20 cu. yds	Existing skid trail crossing point on a moderately deep draw of an ephemeral Class III watercourse. Channel at the crossing is 8 to 12 feet below the old road surface and is 12 to 20 feet wide at the top of the fill base. Treatment: The crossing shall be utilized in its present condition as a temporary earth fill. Upon completion of crossing use and prior to October 15, the earth fill shall be completely removed with the watercourse channel and side slopes restored to their natural orientation and depth. Excavated soil is to be drifted out over the skid trail approaches, compacted, and stabilized in a position so as to prevent delivery to the watercourse channel. Exposed soils within the flagged EEZ of the watercourse shall be grass seeded and mulched as specified by Item 18 of the plan.	Crossing removal is to be completed upon skid trail use and prior to October 15.

B. General Prevention and Minimization Management Measures for Controlling Sediment Discharge

In addition to the site specific measures detailed in Section A above, the following general erosion control measures have been incorporated into the THP as required by the Forest Practice Rules, other State or Federal regulating agencies, or as a matter of course by the landowner to prevent and/or minimize future sediment delivery. These measures include, but are not limited to the following:

1) Watercourse Protection Zones

All watercourses receive a protection zone commensurate with classification. The protection may range from limited equipment operations to exclusion of all harvest activities.

Within these zones, measures to stabilize soils, minimize soil erosion, and prevent discharge of sediment into waters in amounts deleterious to aquatic species or the quality and beneficial uses of water, or that threaten to violate applicable water quality requirements, are applied in accordance with the following standards:

- For areas disturbed from May 1 through October 15, treatment of bare mineral soil to prevent erosion

within a zone will be completed prior to the start of any rain that causes overland flow across or along the disturbed surface.

- For areas disturbed from October 16 through April 30, treatment of bare mineral soil within a zone will be completed prior to any day for which a chance of rain of 30 percent or greater is forecast by the National Weather Service or within 10 days, whichever is earlier.
- The traveled surface of logging roads shall be treated (ex., rocked, dipped, have waterbars installed, seeded and mulched, etc.) to prevent waterborne transport of sediment and concentration of runoff that results from timber operations.
- The treatment for other disturbed areas, including: (A) areas exceeding 100 contiguous square feet where timber operations have exposed bare soil, (B) approaches to tractor road watercourse crossings between the drainage facilities closest to the crossing, (C) road cut banks and fills, and (D) any other area of disturbed soil that threatens to discharge sediment into waters in amounts deleterious to the quality and beneficial uses of water, may include, but need not be limited to, mulching, rip-rapping, grass seeding, or chemical soil stabilizers. Where straw mulch, or fine packed slash is used, the minimum coverage shall be 90%, and any treated area that has been subject to reuse or has less than 90% surface cover shall be treated again prior to the end of timber operations. The RPF may implement alternative treatments as desired or necessary that will achieve the same level of erosion control and sediment discharge prevention.
- Where undisturbed natural ground cover cannot effectively protect beneficial uses of water from timber operations, the ground will be treated by measures including, but not limited to, seeding, mulching, or replanting, in order to retain and improve its natural ability to filter sediment, minimize soil erosion, and stabilize banks of watercourses and lakes.
- Where grass seeding is used for stabilization, a seed bed layer of not less the 30 pounds per acre 'State' seed mix will be applied to exposed mineral soils, or as needed to insure full cover crop establishment. Straw or fine packed slash shall be applied as required to provide a depth of at least two inches with a minimum 90% surface coverage.

2) Roads

Practices related to the construction, reconstruction, and maintenance of truck roads are key factors in the control of sediment that could be produced from timber harvesting operations. The landowner and LTO shall apply measures in road construction, re-construction, and maintenance standards and techniques, that have been developed in conjunction with the "Handbook for Forest and Ranch Roads" (Weaver and Hagans, 1994), and Designing Watercourse Crossings for Passage of 100-year Flood Flows, Wood and Sediment (Cafferata, Spittler, Wopat, Bundros, and Flanagan).

New construction/reconstruction-

- Emphasize erosion control by utilizing critical dips over crossings, and rolling dips and/or waterbars to avoid concentrating water on the road surface.
- Emphasize disconnecting road systems from watershed hydrology.
- Minimize number of roads.
- Minimize road widths.

- Use temporary access where appropriate.
- If applicable, abandon all temporary roads after use. Abandonment would include crossing removal and road surface treatment, including large dips or waterbars spaced at intervals not less than those required for the assigned erosion hazard rating, and/or obliterating the road by pulling fill materials and slash back onto the road surface. All temporary road entrances shall be blocked to standard four-wheel drive vehicles. At crossing sites where abandonment is generally prescribed in the THP, fills will be pulled back to the natural side-slope grade and will not exceed a 2:1 ratio (two feet horizontal and 1 foot vertical).
- Limit construction/reconstruction activities to drier times of the year (i.e., non-winter period).
- Treatment of sidecast or fill material extending more than 20 feet in slope distance from the outside edge of the roadbed that has access to a watercourse or lake which is protected by a WLPZ may include, but need not be limited to, mulching, rip-rapping, grass seeding, or chemical soil stabilizers. Where straw mulch or slash is used, the minimum coverage will be 90%, and any treated area that has been subject to reuse or has less than 90% surface cover will be treated again prior to the end of timber operations. The RPF may implement alternative treatments that will achieve the same level of erosion control and sediment discharge prevention.
- Road related operations during the winter period will focus on inspections and maintenance.

Maintenance-

The RPF/Landowner plans to implement proper road design and construction techniques with an ongoing maintenance program to ensure that roads are adequately maintained, particularly in regard to drainage structures and erosion control. Applicable maintenance measures may include the following to ensure that potentially significant impacts from erosion processes related to road maintenance are avoided:

- Roads not surfaced for winter use will be gated or otherwise blocked during the winter period to prevent unauthorized vehicular access and damage to drainage structures. Access on these roads during the winter period will be limited to that necessary for timber falling, hazard abatement burning, road maintenance inspections, reforestation, wildlife surveys, and/or botanical surveys. Where appropriate, such access will be restricted to the use of low ground pressure all-terrain vehicles or foot.
- Throughout the year, and prior to the onset of the winter period, the RPF/Landowner shall inspect all roads appurtenant to the timber harvest plan. The inspection will assess the effectiveness and quality of all newly installed and existing erosion control structures, and will identify areas needing additional maintenance prior to the winter period. A list of work improvement sites will be prepared for those areas identified as needing additional work or repair. Items to be assessed as part of the road inspection program include the following:
 - Waterbars shall be inspected to insure proper spacing, depth, interception of the ditch line, and complete diversion of water flow from the haul road and skid trail surfaces.
 - Ditches shall be inspected to insure that they are properly functioning and free of debris that could plug the ditch or a culvert and cause diversion of water onto the road surface.
 - Culverts shall be inspected to insure that they are properly placed and functioning, and that downspouts or culvert outfalls are correctly functioning.
 - The road prism shall be inspected to identify areas exhibiting ponding, inadequately breached

outside berms, unprotected fresh fill slopes, or other sites that exhibit a potential for cut bank or fill failure.

- All newly constructed and reconstructed roads shall be inspected prior to the winter period to insure that they were properly constructed, weatherized, and that they are in compliance with the Forest Practice Rules, and that mitigation measures included in THPs were properly applied.
- Newly constructed or reconstructed roads will be inspected during the winter period. Special attention will be given to road conditions during and after significant storm events so that problems can be promptly identified and corrected. Repairs will be made at the time of inspection if possible. If heavy equipment is necessary to repair a problem, the location will be noted and the repair will be carried out as soon as practical and weather conditions allow access.

3) Yarding

The proposed timber harvest will utilize the Selection Harvest Method and emphasis will be placed on the use of low impact yarding equipment when feasible.

All yarding operations will occur on slopes 50% or less, and no further measures beyond adhering to the standards set forth by the Forest Practice Rules are necessary.

4) Log Hauling

Log hauling will only occur on haul roads that have a stable operating surface. Log hauling will be suspended if a significant storm event occurs that would cause saturated soil conditions on haul roads regardless of time of year. Hauling will not be resumed until it is determined that the road surface can withstand truck traffic without causing significant rutting of the road surface, loss of surface material, or generate waterborne sediment in amounts sufficient to cause a visible turbidity increase in downstream Class I, II, III, or IV waters.

5) Burning

Broadcast burning is not necessary or proposed. Burning where needed will be limited to slash pile burning at landing sites.

6) Winter Operations

“Winter period” means the period between November 15 and April 1.

- All waterbreaks will be installed no later than the beginning of the winter period of the current year of timber operations.
- Installation of drainage facilities and structures is required from October 15 to November 15 and April 1 to May 1 on all constructed skid trails and tractor roads prior to sunset if the National Weather Service forecast is a “chance” (30% or more) of rain within the next 24 hours.
- Operation of trucks and heavy equipment on roads and landings will be limited to those with a stable operating surface.
- Manual timber felling, burning for hazard abatement, tree planting operations, administrative access, and maintenance of roads are the possible activities that may occur during the winter period.

- Where appropriate, only low ground pressure all terrain vehicles will be used during the winter period when traveling over seasonal or temporary roads to access the harvest area.
- Log hauling shall only be conducted outside the winter period between April 1 to November 15 when a stable road surface is present.
- Construction or reconstruction of logging roads, tractor roads, or landings will not take place during the winter period as part of this THP.
- No mechanical site preparation is proposed.

II. Fuel Management Plan

Not applicable to the project. No on-site fuel storage is planned, nor will fueling equipment exceed 1320 gallons.

III. Inspection Plan

A Registered Professional Forester (RPF) or an RPF's Supervised Designee shall conduct a minimum 3 inspection as sequence below. These monitoring inspections are also to be used to determine if any new controllable sediment discharge sources have developed within the project area.

At a minimum the indicated inspections shall be conduct each year and throughout the duration of the life of the plan.

- a. By November 15 in any year in which harvest operations are conducted to assure Project area is secure for the winter; and
- b. Once following ten (10) inches of cumulative rainfall commencing on November 15 and prior to March 1, as worker safety and access allows; and
- c. After April 1 and before June 15 to assess the effectiveness of management measures designed to address controllable sediment discharges and to determine if any new controllable sediment discharge sources have developed.

Multiple county wide weather information sites may be used to determine the ten (10) inch cumulative rain inspection trigger, which may include the National Weather Station at Woody Island, The Realtime Weather Access Stations (RAWS) on the internet, or use of near site rainfall collection stations.

July 13, 2006

Jim Burke
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RE: Tichenor NTMP 1-05-026 SON Additional Information

Dear Jim,

In April you requested some additional information regarding NTMP 1-05-026 SON and the Erosion Control Plan contained within it. Within the ECP specific measures were given for roads, skid trails, and landings. Within the ECP 7 Mitigation Point (M-1, M-2 and M-4 through M8) were discussed. In addition to the 8 Mitigation Points, there are 7 crossings, 1 landslide and an inner gorge area associated with the main class II watercourse on the property. Crossing "h" was upgraded from a Mitigation Point, M-3 to a crossing at the PHI.

To comply with the Categorical Wavier Order R1-2004-0016 and obtain coverage, you requested the following additional information:

- Amount of sediment available for discharge
- The potential to discharge
- The timeframe with which each source of sediment will be corrected.

No activities have been conducted on the property since 1985. All erosion control structures, crossings and culverts have been left unattended for 21 years. The road infrastructure on the property was constructed in the 1940's or 50's.

We will use the following categories to discuss the potential that a sources may deliver measurable amounts of sediment; high, medium, and low. A high potential will almost certainly deliver sediment within 1 to 5 years. A moderate potential will have the ability to deliver sediment within the next rotation (cutting cycle) and a low potential will have a potential to deliver within 15 to 100 years from now. These ratings are based on professional judgment that evaluates the location of the source to the nearest source of transportation, (i.e. watercourses), and what type of watercourse that it may affect (domestic water supply, class I, II, III, or IV watercourse).

Erosion Control Plan

An Erosion Control Plan is defined in the Categorical Waiver Order R1-2004-0016 as:

A plan designed and implemented to prevent and minimize the discharge of sediment to waters in violation of applicable water quality requirements or other conditions of this Order. The Erosion Control Plan (ECP) shall be developed by a qualified professional, included in the approved Project or submitted with the application when seeking coverage under these General WDRs, and shall incorporate Regional Water board staff recommendations generated as part of the Project review and approval process that were designed to prevent and minimize discharge of sediment. The ECP shall include but is not limited to a map clearly showing the location(s) of the site(s) that could discharge sediment, site-specific designs and/or management measures to prevent and minimize the discharge of sediment and a time schedule for implementation of site-specific designs and/or management measures.

Below are potential sources of sediment. These were created for NTMP 1-05-026SON. The mitigation points, geological features, and crossings, are all identified on pages 32.1, 33, 35 and 36.1 of the approved NTMP.

Terms & Definitions

- **Controllable Sediment Discharge Source:** Must meet the following conditions
 1. Is discharging or has the potential to discharge sediment to waters of the state in violation of applicable water quality requirement or other provisions of this Categorical Waiver
 2. Was caused or affected by human activity, and
 3. May feasibly and reasonable respond to prevention and minimization management measures.
- **Amount of Sediment available for discharge:** This is the amount of sediment that a controllable sediment discharge sources (CSDS) could potentially contribute to the waters of the state.
- **Potential for discharge:** This is a professional judgement, that a csds or a mitigation point will move or change over the foreseeable future. Mitigation points may not delivery, but as part of this NTMP, could contribute to other problems associated with the Forest Practice Rules.
- **Potential for delivery:** This is the potential of a mitigation point, landslide, or crossing to deliver sediment to waters of the state. This defines the difference between a mitigation points and CSDS. If there is any potential, then a point is a CSDS

So as to not add confusion to the LTO, the mitigation points, landslides, and crossings discussed below match the items in the NTMP. By the above definitions, Mitigation Points M-1,4,-7 and Slide #1 all meet the definition of CSDS and will be mitigated as follows below. All crossings are by definition a CSDC because they are watercourses.

The implementation schedule of all the below listed potential erosion sources for all of the Mitigation Points, landslides, and crossing is discussed in Section II of the NTMP.

Mitigation Points

- **M-1:** Skid trail crossing a small swale. A Class III watercourse begins below this point. There is no sign of sediment transportation above the trail or across the trail.
Amount of Sediment available for discharge: 1 to 2 cubic yards.
Potential for discharge: This point has not been modified in 21 years and is showing no sign of erosion. The road gradient is flat. There is little potential for this Mitigation Point to contribute any sediment in its current state.
Potential for delivery: High - This Mitigation Point is located just above a class III watercourse that flows into the South Fork of the Gualala River.
Mitigation: The trail should be dipped and straw mulched. The stump on the lower side of the trail should be maintained to keep the stability of the trail intact.
Timing for Correction: This mitigation point is located within Unit 1 and will be mitigated for during the first entry into the unit, which is scheduled at this point in time for 2006.
- **M-2:** Bank seepage along skid trail. The trail is currently shaped with an inside ditch for 40 feet. The seepage runs down the ditch and across the trail by means of a non-functioning 4-inch plastic pipe. A large hole has been dug at the head of the pipe creating a pool.
Amount of Sediment available for discharge: Minor and insignificant surface erosion from wildlife using the seep as a wallow.
Potential for discharge: There is some minor surface erosion associated with the wallow.
Potential for delivery: Low – This seep does not connect to any watercourse.
Mitigation: A properly functioning French drain will be installed. The drain will be dug about 2 feet deep and 1 1/2 inch drain rock will be laid. A 6 inch prefabricated pipe will be installed inside a filter fabric wrap with rock in-between. This trail will not be used during the winter, but will be outslopped.
Timing for Correction: This mitigation point is located within Unit 1 and will be mitigated for during the first entry into the unit, which is scheduled at this point in time for 2006.
- **M-3:** Skid trail crossing of a small Class III watercourse. During the PHI, this draw was receiving runoff from the two springs located up sloped and showed some more sign of sediment transportation. At the PHI this Mitigation Point was upgraded to a Class III watercourse crossing and will be addressed as crossing “h”.
- **M-4:** Swale on seasonal haul road. There is no sign of sediment transportation or erosion occurring above or at the road.
Amount of Sediment available for discharge: 1 to 2 cubic yards at most.
Potential for discharge: This road has not been maintained for 21 years with only a slight amount of sediment movement. The MP is only about 100 from the top of the

watercourse and doesn't receive much in the way of water collection. The water that moves across this point is a function of the two small springs above.

Potential for delivery: High - This Mitigation Point is located in a class III watercourse that flows into the South Fork of the Gualala River.

Mitigation: The swale will be dipped and straw mulched.

Timing for Correction: This mitigation point is located within Unit 1 and will be mitigated for during the first entry into the unit, which is scheduled at this point in time for 2006.

- **M-5:** Swale across skid trail. During the last harvest, a waterbar was created to carry any water into the channel created by the class III downhill 20 feet. See the diagram on page 36 of the NTMP to see the area in depth.

Amount of Sediment available for discharge: 1 to 2 cubic yards.

Potential for discharge: This mitigation is currently working well and is being proposed as preventative maintenance.

Potential for delivery: High - This Mitigation Point is located in a class III watercourse that flows into the South Fork of the Gualala River.

Mitigation: The swale will be dipped out (as it currently is) and slash packed for at least 25 feet above the swale on both spurs of the skid trail.

Timing for Correction: This mitigation point is located within Unit 1 and will be mitigated for during the first entry into the unit which is scheduled at this point in time for 2006.

- **M-6:** Two hundred twenty five foot section of existing seasonal road. Currently the road is insloped with an inside ditch. Two springs seep out of the cut bank in this stretch of road. These two springs run down the inside ditch and across the road instead of staying inside the ditch to crossing "d". This inside ditch is adequately working and has been in place for approximately 40 years.

Amount of Sediment available for discharge: In theory if the inside ditch failed, there is a potential for the whole road to slide, albeit unlikely. If that were to happen it could deposit between 25,000 and 30,000 cubic yards. The amount of sediment that is currently being produced is 1 to 2 cubic yards due to the two failed waterbars.

Potential for discharge: This road was built in the 1940's-50 and has had no maintenance since. This site is similar to M-7 which caused Slide 1 to occur this year.

Potential for delivery: Moderate - This Mitigation Point is located approximately 200 feet from a class II watercourse that flows in the South Fork of the Gualala River.

Mitigation: A French drain will be installed in-between the two springs to pick up the flow. An 18" X 40' culvert will be installed below the second spring and run across the road just above the large clump of redwoods. A downspout will be installed to take the flow down to the existing class III watercourse associated with crossing "d". The downspout must be maintained. It can either be an open flume like downspout or a closed culvert.

Timing for Correction: This mitigation point is located within Unit 2 and will be mitigated for during the first entry into the unit.

- **M-7:** 300 feet of inside ditch along the existing insloped seasonal road. This section of road is associated with a 30-foot high cutbank and seeping ground water. The cutbank has failed in the past causing some minor deposits on the road. The inside ditch runs down the road past the lower switchback and into a class II watercourse off the property. **Amount of Sediment available for discharge:** In theory if the inside ditch failed, there is a potential for the whole road to slide, albeit unlikely. If that were to happen it could deposit between 10,000 and 15,000 cubic yards. The amount of sediment that is currently being produced is 1 to 2 cubic yards due to the two failed waterbars. **Potential for discharge:** This road was built in the 1940's-50 and has had no maintenance since. **Potential for delivery:** High - Given the activities downslope associated with Slide 1. **Mitigation:** As much as feasible, the road will be reshaped to an outslopped road with rolling dips. The inside ditch will be maintained to keep the spring water off of Slide 1 that was caused by this water in February 2006. **Timing for Correction:** This mitigation point is located within Unit 2 and will be mitigated for during the first entry into the unit.

Note for M-7 & M-8, we will be implementing an erosion control structure maintenance program following the initial harvest. There has been no erosion control maintenance on this property prior to our beginning work for this client, and thus the problems that have arisen. The waterbars and inside ditches that are associated with these Mitigation Point will be maintained until Unit 2 is logged and the problems can be remedied with equipment.

M-8: Skid trail crossing a small swale. The skid trail was constructed by pushing fill into the draw and ramping over the normal grade of the draw. Currently, a small amount of the fill along the outside edge of the trail has been eroded.

Amount of Sediment available for discharge: 5 to 10 cubic feet.

Potential for discharge: This trail has not been maintained for 21 years with only a slight amount of sediment movement. With that being said there is a good chance that the outside edge could continue to erode if not properly treated.

Potential for delivery: Low - This draw does not connect to a watercourse and any sediment generated would likely end up on the road below the trail and not reach a watercourse.

Mitigation: Before skidding commences along this section of trail, 2 to 3 logs will be set along the outside edge of this trail to act as a natural retaining wall. The logs will be locked into place behind the tanoak clumps on either side of the draw. If available, a redwood stump may also be set in place in an attempt to get a tree growing to stabilize the trail. Straw will be mulched following operations on this trail.

Timing for Correction: This mitigation point is located within Unit 2 and will be mitigated for during the first entry into the unit.

Geologic Features

Slide 1: This is a slide that has resulted from the spring associated with M-7. The slide came down on February 1, 2006 as a result of a significant amount of rain over the previous month. This slide is approximately 60 feet wide and 100 feet long. The head of

the scarp was the existing road surface, which is no longer present. At this time there are no plans to rebuild the section of road. This slide is located on the neighboring property, but affects the Project Area.

Amount of sediment available for discharge: Approximately 500 cubic yards liquefied and flowed directly into the South Fork of the Gualala River. Some of this material (approximately 250 cubic yards) is still available to deliver into the River.

Potential for discharge: This area received over 80 inches of rain this year which is about double the average rainfall for a year. This area also received close to 20 inches in a 4 day period just prior to the movement of this slide. Since 1972 there have been 6 years with a greater rain accumulation than 2006 (so far); 74, 78, 82, 83, 92, & 98. The storm we saw that caused this slide to occur and the winter that we experience were sever.

Potential for delivery: High – this slide is located approximately 120 feet above the South Fork of the Gualala River.

Mitigation: An Engineering Geologists will evaluate this slide prior to the NTO being filed. The recommendations will be added to the NTO and operations will not commence for at least 10 days so that CGS may review the report and make a site inspection if necessary. In the meantime, a walking bridge will be constructed across the slide for recreational use. This bridge is not intended for vehicle use, just pedestrian and horse traffic. This slide is currently unstable to walk on or across. Once it solidifies, redwoods trees will be planted on the slide to help establish some roots into the ground.

Timing for Correction: This mitigation point is located off of the property and is associated (by appurtenance) with Unit 2 and will be mitigated for during the first entry into the unit if the neighboring landowner allows us to.

Inner Gorge: The watercourse associated with crossings “a”, “b”, and “e” has been heavily impacted by historic logging practices, which ran a series of skid trails up the watercourse. These skid trails were built by cutting into the hillside and creating a large cutbank adjacent to the watercourse. These cutbanks have begun to fail all along the watercourse creating an inner gorge area for most of the length of the watercourse between crossings “a” and “e”. These failures in some instances run all the way up to the seasonal haul road that runs the length of the property.

For most of the length of the seasonal haul road between crossings “a” and “e” the road was built with a full bench cut just above the class II watercourse. The result was a cutbank of 20 to 30 feet high in most instances and the spoils being pushed over the edge of the road or down to the river. This has resulted in numerous bank failures and spoil/fill failures.

Potential for discharge: This feature is continuing to contribute sediment annually and the old skid trail is cut through by the streambed. I would estimate that it produces 5 to 10 cubic yards annually.

Potential for delivery: High – The inner gorge is associated with a class II watercourse that is connected to the South Fork of the Gualala River.

Mitigation: An Engineering Geologists will evaluate this area prior to the NTO being filed. The recommendations will be added to the NTO and operations will not commence

for at least 10 days so that CGS may review the report and make a site inspection if necessary.

Watercourse Crossings

Crossing “a”: Existing 30” X 60’ galvanized culvert on a class III watercourse. The outfall of this culvert has created some erosion during the winter of 2005-06.

Amount of sediment available for discharge: 1 to 2 cubic yards have been contributed during the winter of 05-06.

Potential for discharge: If left unmitigated this site could continue to erode at its current rate or faster.

Potential for delivery: High – The crossing is associated with a class II watercourse that is connected to the South Fork of the Gualala River.

Mitigation: An energy dissipation device (redwood stump) will be installed at the base of the culvert to protect from further erosion. A redwood stump will be set in place and should work. For approximately 100 feet above the culvert, all of the flow is subsurface, however a trash rack in front of the culvert will be installed. A critical dip will be constructed over the crossing to prevent any future diversion of water. The section of landing associated with the critical dip will be rocked with ¾” drain rock for 25 feet on both sides.

Timing for Correction: This crossing is located within Unit 1 and will be mitigated for during the first entry into the unit, which is scheduled at this point in time for 2006.

Crossing “b”: Existing dry skid trail crossing on a class III watercourse. The current crossing consists of a large waterbar preventing water from traveling down the trail.

Amount of sediment available for discharge: None currently

Potential for discharge: NA

Potential for delivery: NA

Mitigation: This crossing will be shaped and slash packed upon completion. This crossing will only be used when dry. The large waterbar on the downhill side will be at least 2 feet tall from top to bottom to prevent any diversion.

Timing for Correction: This crossing is located within Unit 1 and will be mitigated for during the first entry into the unit which is scheduled at this point in time for 2006.

Crossing “c”: There is no crossing “c”.

Crossing “d”: Existing seasonal road crossing of a class III watercourse. The current crossing consists of a 30” X 40’ properly functioning culvert. The culvert has a high diversion potential and is shotgunning approximately 8 feet downslope. Below the crossing the watercourse becomes incised and heavily eroded. This crossing is associated with mitigation point M-6.

Amount of sediment available for discharge: 20 to 50 cubic yards if the culvert failed and blew out the road.

Potential for discharge: As stated above there is a high diversion potential with this crossing.

Potential for delivery: High - The crossing is associated with a class III watercourse that is connected to the South Fork of the Gualala River.

Mitigation: A trash rack and downspout will be installed, and a rolling dip will be installed just north of the crossing to divert any potential chance of the culvert failing.

Timing for Correction: A trash rack will be installed as part of our road maintenance program prior to this coming winter and a hand-dug waterbar will be created until equipment is available in this unit (2).

Crossing “e”: Existing temporary skid trail crossing of a class II watercourse. The existing bridge that was used for foot traffic has failed. The class II watercourse is heavily down cutting through fill that was pushed into the creek and river for the road. Below the crossing, there is a hole that has been created by erosion of fill.

Amount of sediment available for discharge: Below the crossing the creek has contributed upwards of 1000 cubic feet since the 1940-50's when the road infrastructure was created. The channel seems to be near its original angle and thus hopefully the down cutting will lessen.

Potential for discharge: If left unmitigated, the crossing itself could contribute approximately 20 cubic yards, but no movement has occurred since at least 1985 according to the landowners.

Potential for delivery: High - The crossing is within 125 feet of the high water mark of the Gualala River (i.e., inside class I WLPZ).

Mitigation: A large redwood stump will be placed into the hole in an effort to stop/slow the erosion that is occurring. A temporary Humboldt crossing will be constructed. Logs will be cabled together and dropped into the channel. At least 6” of straw will be mulched over the logs and soil will be used to cover the straw for skidding. The logs will be rested on the stump. In the event that water is still flowing in this watercourse, a small pipe of sufficient size will be installed to carry the flow and be braced by the logs. Once logging has been completed the crossing will be removed and a small footbridge like the one currently existing may be installed. The encroachments will be straw mulched.

Timing for Correction: Operations will take place between May 1 and Oct. 15. This crossing requires a DFG 1603/1606 permit (streambed alteration agreement). This mitigation point is located within Unit 2 and will be mitigated for during the first entry into the unit.

Crossing “f”: Existing temporary skid trail crossing of a class II watercourse. The current crossing is a ford, which has begun to erode the outer edge of the trail.

Amount of sediment available for discharge: 5 to 10 yards.

Potential for discharge: This trail was built in the 1940's-50 and has had no maintenance since.

Potential for delivery: High - The crossing is associated with a class II watercourse that is connected to the South Fork of the Gualala River.

Mitigation: The crossing will be shaped to use for skidding. Upon completion, the crossing will be shaped to prevent water from continuing down the trail causing further erosion troubles. The trail will be slash packed, while the crossing itself will be mulched.

The outfall will be slash packed as well. This crossing will only be used during dry conditions.

Timing for Correction: Operations will take place between May 1 and Oct. 15. This crossing requires a DFG 1603/1606 permit (streambed alteration agreement). This mitigation point is located within Unit 2 and will be mitigated for during the first entry into the unit.

Crossing “g”: Existing temporary skid trail crossing of a class II watercourse. The current crossing is a ford.

Amount of sediment available for discharge: 5 to 10 yards.

Potential for discharge: This trail was built in the 1940's-50 and has had no maintenance since.

Potential for delivery: High - The crossing is associated with a class II watercourse that is connected to the South Fork of the Gualala River.

Mitigation: The crossing will be shaped to use for skidding. Upon completion, the crossing will be shaped to prevent water from continuing down the trail causing further erosion troubles. The trail will be slash packed, while the crossing itself will be mulched. The outfall will be slash packed as well. This crossing will only be used during dry conditions.

Timing for Correction: Operations will take place between May 1 and Oct. 15. This crossing requires a DFG 1603/1606 permit (streambed alteration agreement). This mitigation point is located within Unit 2 and will be mitigated for during the first entry into the unit.

Crossing “h”: Formally Mitigation Point M-3: Skid trail crossing of a small Class III watercourse. During the PHI, this draw was receiving runoff from the two springs located up sloped and showed some more sign of sediment transportation. At the PHI this Mitigation Point was upgraded to a Class III watercourse crossing and will be addressed as crossing “h”.

Amount of sediment available for discharge: There is some minor sign of sediment transportation occurring above the trail and will be corrected by shaping of the trail to out sloping. 5 cubic yards may be available for discharge.

Potential for discharge: This road has not been maintained for 21 years with only a slight amount of sediment movement.

Potential for delivery: - The crossing is associated with a class III watercourse that is connected to the South Fork of the Gualala River.

Mitigation: The swale will be dipped and straw mulched.

Timing for Correction: This crossing is located within Unit 1 and will be mitigated for during the first entry into the unit, which is scheduled at this point in time for 2006.

CSDS Site	Potential For Discharge	Amount of Sediment Available for Discharge
M-1	High	1 to 2 cubic yards
M-4	High	2 to 2 cubic yards
M-5	High	3 to 2 cubic yards
M-6	Moderate	25,000 to 30,000 cubic yards
M-7	High	10,000 to 15,000 cubic yards
Slide #1	High	250 cubic yards
Crossing "a"	High	1 to 2 cubic yards
Crossing "d"	High	20 to 50 cubic yards
Crossing "e"	High	20 cubic yards
Crossing "f"	High	5 to 10 cubic yards
Crossing "g"	High	5 to 10 cubic yards
Crossing "h"	High	5 cubic yards

Inventory Method

The NTMP layout included an inspection of all of the roads and skid trail on the project area. This inspection looked at the need to use any/all trails and roads, the necessary upgrades to comply with current Forest Practice Rules (including looking at culvert for proper sizing, the need for erosion control structures, and the need to add or abandon section of infrastructure). Crossings were evaluated for the need to replace or upgrade culverts, the need to add energy dissipaters (trash racks and downspouts), and the need to use again for future activities.

All of the watercourses were evaluated during the planning process for proper classifications (i.e., I, II, III, IV, or none of the above). This was done several times during the planning process; initially during the timber inventory of the property and then multiple times during plan layout. Aquatic life; fish, amphibians and insects were surveyed for and help in making the final watercourse classifications. During these efforts, instream and near stream sources of sediment were noted and recorded and written into the NTMP prior to submission of the NTMP.

During the initial preparations of this project, aerial photography is used to assess timber types and look for landslides or other areas of potential sediment. The most recent available photographs were compared with historical photos. Most sources are discovered during the inventory of the project. A transect grid was established to evaluate the timber types. During the inventory, notes are taken when the cruiser comes to watercourses, roads, slides and other potential sources.

If you have any questions, please feel free to give me a call. I have also enclosed our application for compliance under the Categorical Wavier Order R1-2004-0016.

Sincerely,

Matt Greene, RPF#2747



June 22, 2010

Cherie Blatt
NCRWQCB
Timber Harvest Division
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

RE: Request for Waiver with NTMP 1-10-001 SON

Dear Cherie,

As per our phone discussion, I have prepared the following narrative to help with the request for our waiver and the Alternative WLPZ protection that has been proposed within NTMP 1-10-001 SON.

During the PHI, watercourse "D" was upgraded from a class III to a class II – standard watercourse. Following the upgrade of watercourse "D", we began a consultation process with CDFG that took about two months to get through. The result was the Alternative WLPZ that is found in Section II of the NTMP.

- * No Core Zone
- * Total WLPZ width 50' for slopes 30% or less and 75' for slopes 30 to 50%
- * Retention of the following trees: 1). Trees within the channel zone. 2). Trees with boles overlapping the channel. 3). 2/3 of all trees with roots permeating the bank or providing stability to grade control.
- * Retention trees (12" and greater) must be within 25 feet of a harvested tree.
- * 80% retention of overstory canopy within the Channel Zone.
- * 50% retention of overstory canopy within the remainder of the WLPZ.
- * No Sanitation Salvaging
- * Install Erosion Control Structures to a HIGH EHR where feasible.
- * No new trail construction. All operations will be confined to the existing infrastructure.
- * Bare areas greater than 100 sq ft within the WLPZ will be slashed or mulched.

The Channel Zone as is defined in the Forest Practice Rules is, that area located between the watercourse transition lines.

The Alternative WLPZ protection measures were proposed for the following reasons:

- * There are two historic landslides within the WLPZ that have not revegetated.
- * There are two large openings that were historic skid trails within the WLPZ that are void of vegetation.
- * Numerous hardwoods have died from Sudden Oak Death (SOD).
- * The current WLPZ forest is an even-aged forest, which is not a properly functioning riparian forest.
- * The current infrastructure contains no erosion control structures and should be properly mitigated.

As part of the agreement with CDFG, all of these areas will be planted with redwoods this winter following operations. The revegetation of slides 1 & 2 are enforceable language and can be found in Section II of the NTMP. The planting of the open areas within the WLPZ is not a requirement of the Forest Practice Rules, but was offered by the landowners as responsible forest landowners and an attempt to increase the acreage within the project area that is forested, restore the natural ecosystem, and provide long-term benefits to the watershed.

The planting of redwood trees will occur on a 10' X 10' basis and will be completed in the winter of 2011. These trees grow a foot or so in height each year, so they should provide a new canopy layer within 15 to 20 years, or sooner. Redwood sprouts grow even faster. We will also be planting areas where trees affected by SOD have been removed (for fire hazard reduction purposes). These areas would be void of trees for some time due to the presence of SOD. We have also selectively evaluated the conifers in the WLPZ and selected approximately 20 conifer trees to remove that will benefit the growth of the retained conifers. These trees in general are defective and don't provide much in the way of overhead canopy, and will be replaced with fast growing healthy trees and increase the growth rates of the existing forests. The reason for managing redwoods within the WLPZ is twofold, as it creates a second age class within the WLPZ which is currently evenaged, and it removes some of the defective trees which represent a continued fire hazard. Within the areas that are forested (excluding the unstable areas and two large openings created by the historic skid trails that are currently void of vegetation), the current canopy cover ranges from 80 to 90%. Most of the trees that SOD has killed have been within the last year and still have their leaves and are thus still providing canopy. The proposed harvest of redwoods and hardwood together won't drop the canopy cover below 65%, and in the future (15 to 20 years), we should be able to meet the 80% retention not just in the forested areas, but the unstable areas and other areas that are currently lacking canopy from trees.

As was discussed in the previous information provided, watercourse "D" is a seasonal class II – standard watercourse. This watercourse doesn't provide flow on site or to downstream waters during the critical summer and fall months. The operations as proposed for this reason won't raise onsite or downstream water temperatures during the critical summer and fall months of the year when temperatures are so critical to wildlife species like steelhead, salmon, and amphibian species.

Proposed Operation	Under Rules within R1-2009-0038	Benefits Under Proposed Alternative
Harvesting of SOD hardwoods	<ul style="list-style-type: none"> * Fire hazard remains high and * Diseased trees remain on site * Potentially spread SOD to currently healthy trees 	<ul style="list-style-type: none"> * Fire hazard is reduced * New SOD resistant trees are planted * New age class of trees is created which will form a new canopy layer.
Harvesting of redwoods within WLPZ	<ul style="list-style-type: none"> * Maintains the current level of overhead conifer canopy, but does nothing to increase canopy cover in the long run, to create an uneven-aged forest, or to fill void left by SOD. 	<ul style="list-style-type: none"> * Removes defective and poor growing conifers * Allows for fast and healthy growing stump sprouts * Creates a new age class which will all increase the long term goal of more overhead canopy and moves towards a more natural ecosystem of an uneven-aged forest.
Planting of unstable areas	<ul style="list-style-type: none"> * No requirement to plant 	<ul style="list-style-type: none"> * Establishes trees on unstable area
Planting of historic trails	<ul style="list-style-type: none"> * No requirement to plant 	<ul style="list-style-type: none"> * Establishes trees on historic skid trails and large openings within the WLPZ
WLPZ Width for class II	<ul style="list-style-type: none"> * 50 feet 	<ul style="list-style-type: none"> * 50 feet for slopes 0 – 30% * 75 feet for slopes 30% and greater
Working within the Core Zone	<ul style="list-style-type: none"> * R1-2009-0038 allows for the installation erosion control structures within 30 feet of the watercourse transition line. 	<ul style="list-style-type: none"> * Install erosion control structures within 30 feet of the watercourse transition line. This would not be allowed under the current Forest Practice Rules without this Alternative.
Creating an unevenaged forest through management	<ul style="list-style-type: none"> * Would not be allowed within the WLPZ under R1-2009-0038 	<ul style="list-style-type: none"> * Would not be allowed under the current Forest Practice Rules and is part of the reason that this Alternative was created to restore a fully functioning WLPZ.

As proposed the Alternative WLPZ protection standards for watercourse “D”, a class II – standard watercourse as defined by the Forest Protection Rules will provide better protection than the rules as defined under the NCRWQCB Order R1-2009-0038 for the following reasons:

This proposal takes a proactive approach to restoring the environment that was so badly damaged by natural disasters (fire, and now SOD), which otherwise would be left for nature to take its course and take a much longer time to correct. These deficiencies have already lasted for at least 55 years and have been very slow to be corrected by nature. We can dramatically speed up the process. This proposal increases the width for much of the WLPZ from 50 feet to 75 feet in width which would not be required under R1-2009-0038 or the current Forest Practice Rules. This increase in width is meant to offset the management of the forest within the WLPZ. This proposal also proposes to plant redwood trees on unstable areas, large openings within the WLPZ, and where SOD has killed the existing hardwood trees all of which will help to enhance this property and the watershed now and in the future, by stabilizing soils, establishing trees that aren't killed by SOD, and establishing a new age class of trees in the forest. This would not be

required under the Forest Practice Rules or under R1-2009-0038. Erosion control structures will also be installed in places where they currently don't exist and this would not have been permitted under the current Forest Practice Rules, without this proposed alternative.

Mr. Fick and Mrs. Simonds are new landowners of the property and are devoted to long term sustainable and responsible forest management which is being displayed by obtaining an NTMP instead of a one time THP. A significant amount of time has been spent in consultation with CDFG to create a WLPZ protection that is site specific and appropriate to protect the beneficial uses of fish and wildlife species on this property. With all of the additional (non-regulatory imposed) erosion reductions this project is proposing and the fact that this stream doesn't contribute to an increase of the watercourses thermal regime, there will also be a positive increase to sediment reduction and the beneficial uses of water within the watershed from this proposed Alternative. The goal of forest management on this property is to restore and then maintain a natural and fully functioning uneven-aged forest which is representative of historic conditions.

If you have any questions, please give us a call.

Sincerely,

A handwritten signature in black ink, appearing to read 'Matt Greene', with a long horizontal flourish extending to the right.

Matt Greene, RPF #2747

June 22, 2010

Cherie Blatt
NCRWQCB
Timber Harvest Division
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

RE: Request for Waiver with NTMP 1-10-001 SON

Dear Cherie,

As per our phone discussion, I have prepared the following narrative to help with the request for our waiver and the Alternative WLPZ protection that has been proposed within NTMP 1-10-001 SON.

During the PHI, watercourse "D" was upgraded from a class III to a class II – standard watercourse. Following the upgrade of watercourse "D", we began a consultation process with DFG that took about two months to get through. The result was the Alternative WLPZ that is found in Section II of the NTMP.

- * No Core Zone
- * Total WLPZ width 50' for slopes 30% or less and 75' for slopes 30 to 50%
- * Retention of the following trees: 1). Trees within the channel zone. 2). Trees with boles overlapping the channel. 3). 2/3 of all trees with roots permeating the bank or providing stability to grade control.
- * Retention trees (12" and greater) must be within 25 feet of a harvested tree.
- * 80% retention of overstory canopy within the Channel Zone.
- * 50% retention of overstory canopy within the remainder of the WLPZ.
- * No Sanitation Salvaging
- * Install Erosion Control Structures to a HIGH EHR where feasible.
- * No new trail construction. All operations will be confined to the existing infrastructure.
- * Bare areas greater than 100 sq ft within the WLPZ will be slashed or mulched.

The Channel Zone as is defined in the Forest Practice Rules is, that area located between the watercourse transition lines.

The Alternative WLPZ protection measures were proposed for the following reasons:

- * There are two historic landslides within the WLPZ that have not revegetated.
- * There are two large openings that were historic skid trails within the WLPZ that are void of vegetation.
- * Numerous hardwoods have died from Sudden Oak Death (SOD).
- * The current WLPZ forest is an even-aged forest which is not a properly functioning riparian forest.
- * The current infrastructure contains no erosion control structures and should be properly mitigated.

As part of the agreement with DFG, all of these areas will be planted with redwoods this winter following operations. The revegetation of slides 1 & 2 are enforceable language and can be found in Section II of the NTMP. The planting of the open areas within the WLPZ is not a requirement of the Forest Practice Rules, but was offered by the landowners as responsible forest landowners and an attempt to increase the acreage within the project area that is forested and may provide long-term benefits to the watershed.

The planting of redwood trees will occur on a 10' X 10' basis and will be completed in the winter of 2011. These trees grow a foot or so in height each year, so they should provide a new canopy layer within 15 to 20 years, or sooner. Redwood sprouts grow even faster. We will also be planting areas where trees affected by SOD have been removed (for fire hazard reduction purposes). These areas would be void of trees for some time due to the presence of SOD. We have also selectively evaluated the conifers in the WLPZ and selected approximately 20 conifer trees to remove that will benefit the growth of the retained conifers. These trees in general are defective and don't provide much in the way of overhead canopy, and will be replaced with fast growing healthy trees and increase the growth rates of the existing forests. The reason for managing redwoods within the WLPZ is twofold, as it creates a second age class within the WLPZ which is currently evenaged, and it removes some of the defective trees which represent a continued fire hazard. Within the areas that are forested (excluding the unstable areas and two large openings created by the historic skid trails that are currently void of vegetation), the current canopy cover ranges from 80 to 90%. Most of the trees that SOD has killed have been within the last year and still have their leaves and are thus still providing canopy. The proposed harvest of redwoods and hardwood together won't drop the overstory canopy cover below 65%, and in the future (15 to 20 years), we should be able to meet the 80% retention not just in the forested areas, but the unstable areas and other areas that are currently lacking canopy from trees.

As was discussed in the previous information provided, watercourse "D" is a seasonal class II – standard watercourse. This watercourse doesn't provide flow on site or to downstream waters during the critical summer and fall months. The operations as proposed for this reason won't raise onsite or downstream water temperatures during the critical summer and fall months of the year when temperatures are so critical to wildlife species like steelhead, salmon, and amphibian species.

Proposed Operation	Under Rules within R1-2009-0038	Benefits Under Proposed Alternative
Harvesting of SOD hardwoods	<ul style="list-style-type: none"> * Fire hazard remains high and * Diseased trees remain on site * Potentially spread SOD to currently healthy trees 	<ul style="list-style-type: none"> * Fire hazard is reduced * New SOD resistant trees are planted * New age class of trees is created which will form a new canopy layer.
Harvesting of redwoods within WLPZ	<ul style="list-style-type: none"> * Maintains the current level of overhead conifer canopy, but does nothing to increase canopy cover in the long run, to create an uneven-aged forest, or to fill void left by SOD. 	<ul style="list-style-type: none"> * Removes defective and poor growing conifers * Allows for fast and healthy growing stump sprouts * Creates a new age class which will all increase the long term goal of more overhead canopy and moves towards a more natural ecosystem of an uneven-aged forest.
Planting of unstable areas	<ul style="list-style-type: none"> * No requirement to plant 	<ul style="list-style-type: none"> * Establishes trees on unstable area
Planting of historic trails	<ul style="list-style-type: none"> * No requirement to plant 	<ul style="list-style-type: none"> * Establishes trees on historic skid trails and large openings within the WLPZ
WLPZ Width for class II	<ul style="list-style-type: none"> * 50 feet 	<ul style="list-style-type: none"> * 50 feet for slopes 0 – 30% * 75 feet for slopes 30% and greater
Working within the Core Zone	<ul style="list-style-type: none"> * R1-2009-0038 allows for the installation erosion control structures within 30 feet of the watercourse transition line. 	<ul style="list-style-type: none"> * Install erosion control structures within 30 feet of the watercourse transition line. This would not be allowed under the current Forest Practice Rules without this Alternative.
Creating an unevenaged forest through management	<ul style="list-style-type: none"> * Would not be allowed within the WLPZ under R1-2009-0038 	<ul style="list-style-type: none"> * Would not be allowed under the current Forest Practice Rules and is part of the reason that this Alternative was created to restore a fully functioning WLPZ.

As proposed the Alternative WLPZ protection standards for watercourse “D”, a class II – standard watercourse as defined by the Forest Protection Rules will provide better protection than the rules as defined under the NCRWQCB Order R1-2009-0038 for the following reasons:

This proposal takes a proactive approach to restoring the environment that was so badly damaged by natural disasters (fire, and now SOD), which otherwise would be left for nature to take its course and take a much longer time to correct. These deficiencies have already lasted for at least 55 years and have been very slow to be corrected by nature. We can dramatically speed up the process. This proposal increases the width for much of the WLPZ from 50 feet to 75 feet in width which would not be required under R1-2009-0038 or the current Forest Practice Rules. This increase in width is meant to offset the management of the forest within the WLPZ. This proposal also proposes to plant redwood trees on unstable areas, large openings within the WLPZ, and where SOD has killed the existing hardwood trees all of which will help to enhance this property and the watershed now and in the future, by stabilizing soils, establishing trees that aren't killed by SOD, and establishing a new age class of trees in the forest. This would not be

required under the Forest Practice Rules or under R1-2009-0038. Erosion control structures will also be installed in places where they currently don't exist and this would not have been permitted under the current Forest Practice Rules, without this proposed alternative.

Mr. Fick and Mrs. Simonds are new landowners of the property and are devoted to long term sustainable and responsible forest management which is being displayed by obtaining an NTMP instead of a one time THP. A significant amount of time has been spent in consultation with CDFG to create a WLPZ protection that is site specific and appropriate to protect the beneficial uses of fish and wildlife species on this property. With all of the additional (non-regulatory imposed) erosion reductions this project is proposing and the fact that this stream doesn't contribute to an increase of the watercourses thermal regime, there will also be a positive increase to sediment reduction and the beneficial uses of water within the watershed from this proposed Alternative. The goal of forest management on this property is to restore and then maintain a natural and fully functioning uneven-aged forest which is representative of historic conditions.

If you have any questions, please give us a call.

Sincerely,

Matt Greene, RPF #2747

Proposed Operation

Under Rules within R1-2009-0038
Fire hazard remains high and
diseased trees remain on site and
potentially spread SOD to additional
currently healthy trees.

Benefits under proposed Alternative

Fire hazard is reduced, new SOD
resistant trees are planted, and a
new age class of trees is created

Harvesting of trees affected by SOD

Maintains the current level of
overhead canopy, but does nothing to
increase canopy cover or to fill void
left by SOD
No requirement to plant

Removes defective and poor
growing conifers, allows for fast and
healthy growing stumpsprouts, and
creates a new age class which will
all increase the long term goal of
more overhead canopy
establishes trees on unstable area
establishes trees on historic skid
trails and large openings within the
WLPZ

Harvesting of redwoods within WLPZ
planting of unstable areas

No requirement to plant

planting of historic trails

June 11, 2011

Cherie Blatt
NCRWQCB
Timber Harvest Division
5550 Skylane Blvd., Suite A
Santa Rosa, CA 95403

RE: Fick-Simonds Family Forest NTMP Erosion Control Plan

Dear Cherie,

Enclosed is an Erosion Control Plan for a Non Industrial Timber Management Plan on the Fick-Simonds Family Forest located in western Sonoma County. The NTMP is 1-10NTMP-001 SON and is currently in review. This Erosion Control Plan and attached worksheet have been included in Section V of the NTMP. I have also enclosed our application for compliance under the Categorical Wavier Order R1-2009-0038.

We anticipate logging operations beginning near the end of June 2010. The NTMP encompasses 39.9 acres of which 20 acres are currently timber. We anticipate logging all 20 acres under this plan. Within the plan area there are 4 crossings, 2 unstable areas, and 3 mitigation points. There are also two In-Lieu practices that have been approved and an alternative prescription for WLPZ requirements that DFG agreed to.

With regard to the Alternative Prescription for WLPZ requirements, this was done in consultation with DFG, as per the 2009 ASP Rules. The following information is the history, rationale, and justification for this Alternative Silvicultural Prescription.

The following WLPZ protection measures have been written into the NTMP in consultation with CDFG on the class II – standard watercourse that runs through the project:

- * No Core Zone
- * Total WLPZ width 50' for slopes 30% or less and 75' for slopes 30 to 50%
- * Retention of the following trees: 1). Trees within the channel zone. 2). Trees with boles overlapping the channel. 3). 2/3 of all trees with roots permeating the bank or providing stability to grade control.
- * Retention trees (12" and greater) must be within 25 feet of a harvested tree.
- * 80% retention of overstory canopy within the Channel Zone.

- * 50% retention of overstory canopy within the remainder of the WLPZ.
- * No Sanitation Salvaging
- * Install Erosion Control Structures to a HIGH EHR where feasible.
- * No new trail construction. All operations will be confined to the existing infrastructure.
- * Bare areas greater than 100 sq ft within the WLPZ will be slashed or mulched.

Background and Site Specific Information

The background behind this WLPZ protection is that this property has several factors that are currently affecting the forest and could benefit from management now and in the long-term. First and foremost, is the history on the property. In 1955, the property was badly damaged by the Browns Mill Fire. Following this fire, the property was logged and left to fend for itself. No waterbars or other erosion control structures were installed on the trails and roads by the previous landowners. Today, the property is being severely damaged again, this time by Sudden Oak Death. On average, SOD is killing 9 trees per acre. The result of this past history and the present are that the forest is an even aged stand (one age class), with skid trails that are in need of erosion control structures.

The class II – standard watercourse that runs through the property is a small seasonal watercourse. The language in the Categorical Wavier Order R1-2009-0038 and the intent of the 2009 ASP rules were to do 4 things; 1) maintain and/or improve water quality (temporally) 2) maintain and/or increase geological stability within the WLPZ 3) increase large woody debris recruitment and 4) decrease sediment inputs into downstream watercourses. One thing that both lack is that a fully functioning watercourse from a historic perspective was an uneven age forest in the redwood environment. The intent of the above modified WLPZ protection measure is to create a fully functioning watercourse once again.

Justification

This class II – standard watercourse is in many ways different than most class II watercourses for the following reasons:

- * This class II watercourse is a seasonal watercourse. It doesn't contribute to downstream temperatures during critical summer months as it stops flowing in June or earlier.
- * Due to the small nature of the watercourse (less than 2 feet wide and a foot deep at its largest point) transportation of LWD is not feasible.
- * The proposed use of the existing infrastructure will allow for abandonment of parts of the existing skid trails and the instillation of erosion control structures (to an increased EHR rating of High). The existing trails that are in place are much wider than necessary and will be pulled back and planted to establish a new age class of trees.
- * The use of single-tree selection silviculture on the entire project will create an uneven-aged forest over time; with each entry creating a new age class, both by sprouting and by planting to fill in openings and expand the current forest.

- * By working in the zone within 100 feet of this watercourse, the massive amount of trees being killed by SOD will be removed to decrease the very real and dangerous fire hazard that exists on the property. A fire at this time would do far more damage to the watershed than the 1955 fire due to the extent of dead trees from SOD.

To summarize, temperature during the critical summer months isn't an issue on this watercourse as there aren't summer flows that contribute to downstream conditions. In this watercourse, the only means that LWD could be contributed from the project area to downstream waters is through mass wasting, which we are taking several proactive actions to reduce the chances of occurring by installing erosion control structures on trails and roads (where they currently don't exist), stabilizing and correcting existing issues, and thinning out the forest to reduce the fire hazard which will help in the event that there is a fire in this area again in the future. Finally and most importantly we are proposing a significant number of erosion reductions which should greatly improve habitat on the property and downstream.

By allowing the landowner to work within the WLPZ, habitat will dramatically be enhanced by the immediate planting of conifer trees, which will reduce the potential for future mass wasting events, create a new forest canopy in understocked and bare areas, and increase the amount of biomass that reaches downstream watercourses, while reducing ladder fuels in the forest understory which badly need to be thinned out.

If you have any questions, please give me a call.

Sincerely,

Matt Greene, RPF #2747

enc.

**Erosion Control Plan
For
Fick-Simonds Family Forest
2010 Non Industrial Timber Management Plan
1-10NTMP-001 SON**

On June 23, 2004 the North Coast Regional Water Quality Control Board adopted Order # R1-2009-0038, General Waste Discharge Requirements for timber harvest activities on private timberlands. Timber Harvest Plans that propose using heavy equipment within a watercourse or lake protection zone (WLPZ) or equipment limitation zone of a watercourse (except for using and maintenance of existing permanent roads, use of existing bridges and culverts as skid trail crossings and maintenance of associated drainage facilities or structures) require an Erosion Control Plan for coverage under this order.

An Erosion Control Plan, ECP must identify all controllable sediment discharge sources within the project area. These sources usually include roads, trails, landings, and other sites where logging occurs or has occurred in the past. Controllable sediment discharge sources (CSDS) are defined as sites or locations, both existing and those created by proposed timber harvest activities, within the project area that meet all of the following conditions:

1. is discharging or has the potential to discharge sediment to waters of the state in violation of applicable water quality requirements or other provisions of the General Waste Discharge Requirement.
2. was caused or affected by human activity, and
3. may feasibly and reasonably respond to prevention and minimization management measures.

Results

This property is new to our forest management. No active forest management has occurred since the 1970's. The property was heavily burned in 1954 and logged sometime shortly after. The implementation of this NTMP will allow for the installation of erosion control structures that comply with the current Forest Practice Rules.

There are 4 watercourse crossings (a – d) within the project area. These watercourse crossings are all existing and are functioning well. The crossings are in good shape and ready to be used again. All 4 crossings will be dry fords using redwood logs in the creek so that the banks aren't affected and continue to remain stable. The crossing will be dipped out and mulched upon completion of operations. If the crossings are not dry during operations, culverts will be installed and rock laid to prevent any sediment from reaching the watercourses and to keep equipment out of the creek.

There are three mitigation points located on the property. One of the mitigation points is road related and the other is related to a skid trail. Mitigation Point M-1 has directly been caused by M-2. Water concentrating at M-2 flows down hill approximately 300 feet to M-1 where the outside edge of the skid trail has been slightly eroded. Two redwood stumps will be placed on the outside edge of the trail to prevent further erosion. Also as discussed below, M-2 will be corrected so the water that is causing the problem will be corrected.

The section of road (Mitigation Point M-2) is a section of road that will be reshaped to relieve the focusing of water that has caused Slide #2. Approximately 200 of existing berm will be reincorporated into the road surface to break the concentration of drainage.

M-1a is a mitigation point that was added during the PHI. A small amount of water that is flowing from over the top of Slide #2 and the subsurface flow from watercourse E will be channelized to further prevent the overland flow that is causing M-1. The channel will be dug for a length of 35 feet, from the bottom end of the old buckskin log down to the class II watercourse.

The new channel will be dug approximately 2 feet deep by 2 feet wide. The spoils from the channel will be utilized to build up the bank. The new channel will be stabilized with slash to prevent downcutting. The creation of this channel will be completed following the last log skidded through this area and prior to the Fall Operating Period beginning.

There are two unstable areas on the property. These two unstable areas appear to have failed following the 1954 fire and prior to 1978. These two unstable areas appear to have stabilized and show no sign of contributing sediment over recent years. No operations are proposed on or within 25 feet of the unstable area other than falling of dead hardwoods which are contributing to a high fire hazard. The hardwoods will be felled and lopped on site.

There are 2 In-Lieu practices proposed within the NTMP. L-1 is 50 feet of an existing skid trail within a class II – standard watercourse. L-2 is 30 feet of an existing skid trail within a class II – standard watercourse. Both of these existing trails are in good shape and will be waterbarred to a HIGH EHR where feasible.

There is one alternative practice that was approved by DFG and in the NTMP. The core zone for operations has been eliminated in order to establish an uneven aged WLPZ forest.

Inventory Method

The NTMP layout included an inspection of all of the roads and skid trails on the project area. The inspection took place between June 2009 and December 2009. This inspection looked at the need to use any/all trails and roads, the necessary upgrades to comply with current Forest Practice Rules (including looking at culvert for proper sizing, the need for erosion control structures, and the need to add or abandon section of infrastructure). Crossings were evaluated for the need to replace or upgrade culverts, the need to add

energy dissipaters (trash racks and downspouts), and the need to use again for future activities.

All of the watercourses were evaluated during the planning process for proper classifications (i.e., I, II, III, IV, or none of the above). This was done several times during the planning process; initially during the timber inventory of the property and then multiple times during plan layout. Aquatic life; fish, amphibians and insects were surveyed for and help in making the final watercourse classifications. During these efforts, in-stream and near stream sources of sediment were noted and recorded and written into the NTMP prior to its submission.

During the initial preparations of this project, aerial photography is used to assess timber types and look for landslides or other areas of potential sediment. The most recent available photographs were compared with historical photos. Most sources are discovered during the inventory of the project. A transect grid was established to evaluate the timber types. During the inventory, notes are taken when the cruiser comes to watercourses, roads, slides and other potential sources.

If you have any questions, please feel free to give me a call. I have also enclosed our application for compliance under the Categorical Wavier Order R1-2009-0038.

Sincerely,

Matt Greene, RPF#2747

Map Point	Type of Source	Estimated amount of Sediment (Cubic yards)	Potential for Delivery	Priority	Current Condition	Prescription/Mitigation	Timing for Correction
M-1	Mitigation Point	10 cu yd	100%	High	Unstable	Stick two stumps in the hole that has formed.	1st entry
M-1a	Mitigation Point	1 to 2 yards	50%	Mod	overland flow	Channelize the water	1st entry
M-2	Mitigation Point	1,000 cu yd	75%	Mod	Stable	Shape road to drain evenly.	1st entry
Slide 1	Unstable Area	500 cu yd	50%	Low	Stable	Remove dead hardwoods and plant redwoods.	No action necessary
Slide 2	Unstable Area	0	100%	Low	Stable	Remove dead hardwoods and plant redwoods.	No action necessary
Crossing "a"	Class III Watercourse	5 cu yd	100%	High	Stable	Reuse and dipout.	1st entry
Crossing "b"	Class II S Watercourse	2 to 3 cu yd	100%	High	Stable	Reuse and dipout.	1st entry
Crossing "c"	Class II S Watercourse	2 to 3 cu yd	100%	High	Stable	Reuse and dipout.	1st entry
Crossing "d"	Class III Watercourse	3 to 4 cu yd	100%	High	Stable	Reuse and dipout.	1st entry
L-1	WPLZ Skid Trail	2 to 3 cu yd	50%	Mod	Stable	Waterbar to HIGH EHR	1st entry
L-2	WPLZ Skid Trail	3 to 3 cu yd	50%	Mod	Stable	Waterbar to HIGH EHR	1st entry

Surface erosion potential is related to ground disturbance.

Case Study: A 1988 post-harvest survey conducted in San Mateo County quantified ground disturbance in selective harvest of second-growth redwood (Hannon, 1991). This study removed 60% of the trees 18" dbh+. Since this harvest intensity is no greater than the proposed maximum long-term sustained-yield harvest on the project area, impacts in the watershed should be less than those found in the survey.

A summary of the survey:

Clusters of four 1/400th acre circular plots were uniformly distributed throughout four THPs over a 400 acre area. Estimates of percent ground cover were made in 5 classes: bare, 1-33%, 34-66%, 67-99%, and full cover. Ground cover measured was that which would be capable of mitigating rain drop impact and acting as a filter to retard surface water flow and sediment movement. Cover included grasses and herbs, leaf litter, duff, and slash. The study results are displayed in Table 22.

Ground Cover	% Samples
Bare (0%)	10
0-33% cover	10
34-66% cover	16
67-99% cover	30
full cover (100%)	<u>34</u>
	100

The 10% completely "bare" samples were those falling within roads and trails. This corresponds well with the 10-15% figure often cited for the percentage of area disturbed by roads and trails in tractor selective harvesting. The data indicates that most of the survey area has adequate erosion control cover. Survey data shows that cover improves in bare areas as vegetation and litter re-establish. For example, the 1988 survey showed 13% bare area, but the 1985 THP, logged 3 years earlier, showed only 6% bare area. RPF experience in Mendocino County is that bare roadbeds are generally 90%+ covered with litter or vegetation within 2-5 years following selective harvest.



**California Regional Water Quality Control Board
North Coast Region
Bob Anderson, Chairman**



Linda S. Adams
*Secretary for Environmental
Protection*

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**Arnold
Schwarzenegger**
Governor

Questionnaire for economic considerations

For

Proposed Revisions to the Categorical Waiver of Waste Discharge Requirements for
Timber Harvesting Activities on Non-Federal Lands in the North Coast Region

As you know, on June 4, 2009 the North Coast Regional Water Quality Control Board is scheduled to consider adoption of Order No. R1-2009-0038, revising the Categorical Waiver of Waste Discharge Requirements for Timber Harvesting Activities on Non-Federal Lands in the North Coast Region. The draft order can be viewed on our website at: http://www.waterboards.ca.gov/northcoast/board_decisions/tentative_orders/

We are requesting input from timberland owners and Registered Professional Foresters (RPFs) that would assist the Regional Board in further understanding the potential economic impacts the proposed changes to the Categorical Waiver may have. Your answers will provide the Board valuable information.

We are hoping that you can provide an estimate of the cost of preparation of technical reports for THPs and NTMPs that you believe are above and beyond requirements already required for compliance with the Forest Practice Rules (FPRs) in order to receive an approved enrollment in a categorical waiver. This estimate should not include the cost of implementation (except where the cost of implementation is specifically requested, as in the case of inspections). We ask that you send us your estimates by May 25, 2009 so that we will be able to present this information to the Water Board in our report.

We understand these are rough estimates and that different situations will require different levels of involvement. For that reason, the questions have been qualified as to the scope of a report, for instance, acreage and numbers of sediment sites for an Erosion Control Plan (ECP). A range of costs would be helpful. Also, in presenting this to the Board, we will explain the nature of the estimates. Any information you can provide as to how you arrived at an estimate is very helpful as well. We appreciate your willingness to take the time to give these questions your consideration.

Thank you for your time in responding. We believe the information will be valuable for completing the revision to the waiver. Please contact me at (707) 795-7235, or by email at jburke@waterboards.ca.gov, If you have any questions or need additional information.

California Environmental Protection Agency

Sincerely,

Jim Burke
Engineering Geologist.
Timber Division
NCRWQCB

Note: Responses begin on Page 3

Attachment: Cost Estimate for additional costs to comply with Proposed Revisions to Timber Waiver.

Please provide cost estimates for technical reports for the following hypothetical situations. : For example, 14CCR 916.9(o) requires identification and treatment of active erosion sites where feasible in the so-called T/I planning watersheds. What is the *additional* cost required for preparation of ECPs beyond that required by the FPRs? When estimating the cost of providing the required technical report on a *new* project, vs. an *existing* one, please consider how much of the required field work can be conducted concurrently with layout of the new plan and how much additional field work would be required to prepare the reports for existing plans.

Erosion Control Plans

1. Cost of preparation (not implementation) of an erosion control plan (ECP) on a new 100 acre THP or NTMP with ten controllable sediment discharge sources (CSDS) in both : a) T&I watershed, and b) non-T&I watershed.

I am not sure it would be significantly different T&I vs. non-T&I. I assume the controllable sediment sources are all road-related and therefore, readily accessible and that the sites do not mandate any specialized engineering. In addition to the 10 sites that must be specifically addressed, you would also have to address general erosion control practices as well. In this case, specific site and general recommendations can be field-judged concurrently in the same field visit.

Cost: one field day and two office days; \$1800-\$2160 per 100 acres, assuming ATV access

Note: If sites require extensive access via foot, price goes up proportionately.

2. Cost of preparing an ECP on an existing and previously approved 100 acre NTMP with 10 CSDS that has already been enrolled in the Waiver. The estimate should represent the cost for additional work (field and office) required to comply with the Categorical Waiver reporting requirements, but not to fix the sites.

While you may not have to specifically address the 10 sites in detail, you still have to conduct a general field trip to assess other conditions to be addressed in the ECP.

Cost: one day in woods, one day in office; \$1200-\$1440.

3. Cost of conducting two winter period inspections per year and a brief annual summary report for a 100 acre THP or NTMP. Assume that the purpose of the inspections is to inspect the entire road system, not just ECP sites.

Even though it will not probably take a full day to conduct the actual winter inspections (assuming no major problems are encountered), you should pack a shovel and chainsaw on the ATV to touch up waterbars and cut logs out of the road, etc., so you can easily dedicate a day to each visit.

Cost: Two days in woods, ½ day in office for report; \$1500-\$1800.

Note : If you find problems on your inspection, price goes up proportionately.

Road Management Plans

1. Cost of preparing a road management plan for a new 100 acre NTMP with one mile of road and 20 watercourse crossings. Assume the road plan would contain the following:
 - a. The location of all roads and watercourse crossings within the logging area;
 - b. The current status of each road, including road surface material, road and watercourse design, and use restrictions;
 - c. Work needed to address road upgrades;
 - d. The future plan and implementation schedule for each road; and
 - e. Work needed to address maintenance of the road for specific uses
 - f. A long term inspection and maintenance schedule designed to ensure that prevention and minimization measures are functioning as intended and to identify and correct any problems that could cause sediment discharge in a timely manner. All roads must either be:
 - i. inspected and maintained annually, or
 - ii. hydrologically maintenance free, i.e., do not alter natural hydrology of the hillslope, or
 - iii. decommissioned

20 is (are) a lot of crossings. It depends upon the history/condition of the crossings, and the extent of detail required by WQ. You would likely encounter some problem crossings that require additional thought. To be safe:

Cost : Two days in woods, two days in office; \$2400-\$2880per 100 acres

2. Cost of preparing a road plan for an existing 100 acre NTMP with one mile of road and 20 watercourse crossings, assuming the road plan would contain the same information listed above.

The idea that cost is reduced because you operate an existing vs. new NTMP is not necessarily true. The reason for this is that, as a forester, I can only handle so much information concurrently. For example, when considering a new plan, the first field visit focuses on silviculture and operability elements (which involve road logistics, not necessarily road condition). Once basic logistics are solved, then I look at specifics such as road upgrades, archeology, botany, wildlife, etc.).

While there may be some synergy, I generally must concentrate on one aspect at a time; otherwise, I get overloaded and cannot digest any of the information. I cannot think about which trees I might harvest at the same time I am looking for an arch site. Neither can I run a property line at the same time I am considering culvert sizes. It does take longer, and it takes multiple trips to the site, but I feel it yields a more coherent product.

There are always two elements to all the rules under which we operate. One, is the paperwork process, the other is the actual field implementation. Most foresters do not mind the latter as much as the former. Effectiveness is increased if you minimize the descriptions, the calculations, and the write-up, and focus on the field implementation (ie. make it performance-based).

Cost: Basically the same as for a new plan.

Final Note: Cost increases referenced above are basically linear---that is, for a 200 acre NTMP with 20 sediment sources, the price would almost be double that for a 100 acre NTMP with 10 sources. For a 300 acre NTMP with 30 sources, price would almost triple, etc.

*Craig Blencowe
RPF No. 2003*

Weger Ranch

Stream Temperature Data 2000-2010

Compiled December 2010

Significance of Cool Water Temperatures

The “threatened” listings of the coho salmon (federal/state) and steelhead (federal) were the primary reason that the Threatened and Impaired Watershed (T&I) rules were originally developed as part of the California Forest Practice Rules. When the status of the coho was changed to “endangered”, the T&I rules were again revised into the Anadromous Salmonid Protection (ASP) Rules. One of the key fish habitat requirements addressed by these rules is water temperature. Water temperature is primarily a function of shade, which is a direct result of tree canopy above the stream.

It has been repeatedly demonstrated and widely accepted among professional fishery biologists, that 59-60 degrees Fahrenheit (with a range of 56-64 degrees F), is considered to be optimum temperature for coho salmon and steelhead spawning and rearing on the Mendocino Coast.

To ensure that forest operations maintain water temperatures within this acceptable range, a stream temperature monitoring program has been implemented on the Weger Ranch.

Background

In 2000, the Weger Ranch voluntarily began to participate in the Mendocino County Stream Temperature Monitoring Program. The Program was originated by John Harper, Range Management Specialist, University of California Co-operative Extension. In-stream temperatures are recorded by submerged data loggers which continually record temperature every 30 minutes during the summer-fall period. On the attached temperature print-outs, this encompasses only that portion of the graphs between Points A and B, when the data loggers were actually submerged in the stream. Data readings outside these points represent air temperature fluctuation as the data loggers were transported to/from the sites.

Temperature data is retrieved when the data loggers are removed and interfaced with the Co-op Extension computer program. All data is downloaded and permanently cataloged at the Co-op Extension office in Ukiah. The Weger Ranch is provided a copy of the output.

Attached is temperature data for the three monitored streams on the Weger Ranch: Dark Gulch, Soda Creek, and Cody Creek. Dark Gulch and Cody Creek are direct tributaries to the South Fork Big River. Soda Creek feeds into Daugherty Creek, a major tributary to the South Fork.

Dark Gulch

For over a mile, this Class I (fish-bearing) stream runs either through or adjoins the Weger Ranch. Under the Non-Industrial Timber Management Plan (NTMP), most of the area around the western portion of the watercourse was selectively harvested in 2003 and a small area around the headwaters was selectively harvested in 2004. Temperature Range: 53-63 degrees F.

Soda Creek

This Class I tributary runs through the Ranch for a mile. Portions of the area directly around the watercourse were first selectively harvested under a Timber Harvest Plan (THP) in 1998-1999. The area north of the creek was again selectively harvested in 2007 and 2009 under the NTMP.

The watershed was extensively burned during the fires of 2008. Selective salvage logging occurred south of the creek in 2009 and continued into 2010.

Temperature Range: 52-62 degrees F.

Cody Creek

This Class II (aquatic life, no fish) runs through the Ranch for more than ½ mile. Much of the area directly around the watercourse was first selectively harvested under a THP in 2000 and 2001. The northern portion was selectively harvested in 2002 under the NTMP.

Temperature Range: 52-60 degrees F.

Conclusion:

The data indicates:

- Stream temperatures are well within the acceptable range for coho and steelhead.
- There was no temperature change pre- to post-harvest.
- Forest operations had no negative effect on water temperatures.

Based upon the data presented, it is clear that harvest operations conducted under the Weger Ranch Non-Industrial Timber Management Plan (NTMP) provide abundant streamside canopy to maintain ideal stream temperatures. Under current NTMP operations, water temperatures continue to remain at optimal levels for successful rearing and spawning of both coho salmon and steelhead.

Note:

No data loggers installed in 2006 or 2008 (due to fire).

No data for Cody Creek in 2009 (probe malfunction).

All probes replaced in 2010 (normal probe life = 10 years).

1-05NTMP-017 SON

Erosion Control Plan

This ECP has been developed for the entire plan area. Erosion control to prevent and minimize discharge or threatened discharge of sediment from controllable sediment discharges sources into waters of the state to the degree necessary to avoid a violation of water quality requirements or other provisions of the Categorical Waiver Order R1-2004-0016.

Sediment discharge sources include but are not limited to, failing or failed watercourse crossings, road failures, road surfaces, landslides, unstable features discharging to or near watercourses, unstable watercourse banks, soil stockpiles, storage of waste, skid trails, landings, exposed harvest units, or any other locations discharging waste or earthen materials.

The inventory of controllable sediment discharge sources within the NTMP found no such sites on the NTMP. To prevent sediment discharge from roads, they will be outsloped where feasible with rolling dips. Class III Watercourse skid trails will have soil removed and be stabilized after use as per 14 CCR 914.8, 923.3 (d), and Item 18 above.

Implimentation Schedule

If controllable sediment discharge sources are found on the NTMP, these sites will be stabilized as soon as possible or within 5 years to correspond with presence of heavy equipment on the site for timber harvesting. New CSDS sites will be reported to NCRWQCB as required by the Waiver, with implementation schedule described.

Inventory of Controllable Sediment Discharge Sources

The RPF performed an on-the-ground inventory CSDS sites for the NTMP area. The STAR inventory system will be used to estimate potential sediment delivery for future sites that develop.

Map Points

Map Point A: A Class III Watercourse formed by concentrated flows from a County Road culvert crosses a skid trail and flows on the trail for 40 feet. Retain channel in existing location where flow enters the natural channel. The trail is in the outer 50 feet of a Class II WLPZ for a spring. Stabilize trail as per Item 18 (seed and mulch or slash pack) prior to October 15. Rock the edge of the trail where flow crosses to prevent potential erosion.

Map Point B: A stable landing and skid trail leading to the landing on a neighboring landowner's property may be used with permission of the landowner (Gulala Redwoods Inc.). Use of this landing will be for a specific NTO, and CDF will be notified of the additional landowner at that time through a minor amendment that indicates that the additional landowner has been informed of their responsibilities for erosion control maintenance as per the Forest Practice Rules.

Known Unstable Areas

The following are recommendations by the Department of Conservation, CEG, Dave Longstreth on a similar NTMP that is adjacent to this plan that borders the Annapolis Road, and are incorporated in this plan to protect public safety between unstable areas S1 to the west to S8 to the east:

- Group opening shall be set back at least 100 feet from the top of the road cut that descends down to the county road.
- A 50-foot EEZ extending northward (upslope and away from the county road) from the top of the slide scarps of slides S1, S4, S5, S6, S7, and S8 shall be established. 80% of overstory canopy shall be retained within these EEZ's.

Area S1: A debris slide above the Annapolis Road. The slide is 40 feet wide by 175 feet long and 10 feet deep on 60% slopes. The slide is well vegetated with tanoak and stocking is 60 square feet adjacent to the slide. The slide does not appear to be active. No harvesting trees on the slide or within 25 feet. 25 foot EEZ.

Area S2: A debris slide. The slide is 250 feet long by 40-140 feet wide and 4-8 feet deep on an 80% slope. Slide is sparsely vegetated with grass and stocking is 40 square feet adjacent to the slide. The slide does not appear to be active. No harvesting trees on the slide or within 25 feet. Within cable yarder area.

Area S3: A debris slide below the Annapolis Road. The slide is 300 feet long by 75 feet wide and 6-12 feet deep on 70-80% slopes. The slide is well vegetated with conifer saplings and stocking is 60-80 square feet adjacent to the slide. The slide does not appear to be active. No harvesting trees on the slide.

Area S4: A debris slide above the Annapolis Road. The slide is 200 feet long by 40-60 feet wide and 10-15 feet deep on 65% slopes. The slide is well vegetated and stocking is 60-80 square feet adjacent to the slide. The slide does not appear to be active. No harvesting trees on the slide or within 25 feet.

Area S5: A debris slide above the Annapolis Road. The slide is 150 feet long by 30-50 feet wide and 10-15 feet deep on 45% slopes. The slide is well vegetated and stocking is 80 square feet adjacent to the slide. The slide does not appear to be active. No harvesting trees on the slide or within 25 feet.

Area S6: A debris slide above the Annapolis Road. The slide is 120 feet long by 30 feet wide and 6 feet deep on 75% slopes. The slide is sparsely vegetated and stocking is 70 square feet adjacent to the slide. The slide appears to have recent movement. No harvesting trees on the slide or within 25 feet.

Area S7: A bank failure above the Annapolis Road. The slide is 50 feet long by 40 feet wide and 6 feet deep on 85% slopes. The slide is sparsely vegetated and stocking is 60 square feet adjacent to the slide. The slide appears to have recent movement. No harvesting trees on the slide or within 25 feet.

Area S8: A bank failure above the Annapolis Road. The slide is 50 feet long by 40 feet wide and is 3-6 feet deep on 65% slopes that descend to Annapolis Road. The slide is moderately vegetated and stocking is 70 square feet adjacent to the slide. The slide is creeping. No harvesting trees on the slide or within 25 feet.

Additional Special Instructions:

Skid Trails on Steep Slopes: Pre-open skid trails prior to falling. Skid trails on slopes over 50% will be waterbarred at the extreme erosion hazard rating spacing, which is every 50 feet. On steep slopes, waterbars shall be cut diagonally a minimum of 6 inches into the skid trail and shall have a continuous firm embankment of at least 10 inches in height immediately adjacent to the lower edge of the waterbreak cut. Waterbars shall be built such that the minimum amount of material is sidecast off the trail onto steep slopes below the trail, and drain onto non-erodible areas or well-vegetated areas. The water bar outlets shall be treated with slash where there is a potential for sediment delivery to a nearby watercourse. Exception skid trails will not be used after October 15, or before May 1.

Agency Notification: The RPF of record shall ensure that Water Quality Control Board Staff is notified, and given at least five working after submittal of each Notice of Operations to review operations proposed in WLPZ, ELZ, EEZ, and operations on unstable areas, prior to operations in those areas. The purpose of the notification is to allow the agency to coordinate inspections of outstanding issues of concern where environmental variables make long-term evaluation during the PHI difficult.

Monitoring and Maintenance

Roads and road watercourse crossings shall be monitored by the landowner on an annual basis prior to October 15 to ensure roads are properly drained and watercourse crossings are functioning properly. During the winter period, the landowner shall check drainage facilities to ensure they are functioning properly.

Erosion Control Plan

This ECP has been developed for the entire plan area. Erosion control to prevent and minimize discharge or threatened discharge of sediment from controllable sediment discharge sources (CSDS) into waters of the state to the degree necessary to avoid a violation of water quality requirements or other provisions of the Categorical Waiver Order R1-2004-0016.

Sediment discharge sources include but are not limited to, failing or failed watercourse crossings, road failures, road surfaces, landslides, unstable features discharging to or near watercourses, unstable watercourse banks, soil stockpiles, storage of waste, skid trails, landings, exposed harvest units, or any other locations discharging waste or earthen materials. Definition from R1-2004-0016:

"Controllable sediment discharge source" means sites or locations, both existing and those created by proposed timber harvest activities, within the Project area that meet all the following conditions:

1. is discharging or has the potential to discharge sediment to waters of the state in violation of water quality requirements or other provisions of these General WDR's, 2. was caused or affected by human activity, and 3. may feasibly and reasonably respond to prevention and minimization management measures.

Implementation Schedule

Subsequent NTOs shall specify implementation schedule for stabilization of CSDS sites. Refer to specific CSDS sites for priority for treatment. Priority was determined based on potential sediment volumes (5-10 cy = 1, 11-50 cy = 2, 51+ cy = 3), proximity to watercourses (w/in 20' = 1, w/in 10' = 2, adjacent = 3), imminence of failure (w/in 10+ years = 1, w/in 5 years = 2, w/in 1 year = 3), and aquatic values present (Class III = 1, Class II intermittent = 2, Class I/II permanent = 3). Total values of 4-7 is low priority, 8-10 is moderate priority, 11+ is high priority.

Inventory of Controllable Sediment Discharge Sources

The RPF performed an on-the-ground inventory CSDS sites in 2007 for the NTMP area. The STAR inventory system was used to estimate relative potential sediment delivery. The inventory of controllable sediment discharge sources within the NTMP are Watercourse Crossings, Map Points, and Unstable Areas that are identified as CSDS sites in the site descriptions below. Sites listed below are located on the referenced Timber Operations Maps.

CSDS Site	Priority Rating	Expected Date of Treatment	Cubic Yards of potential sed. deliv. to be controlled under the NTMP	1603 permit required
Crossing 40	10-moderate	2008	110	no
Crossing 42	11-high	2008	38	yes
Crossing 43	11-high	2008	84	no
Crossing 46	9-moderate	2008	10	no
Crossing 47	11-high	2008	25	no
Crossing 48	11-high	2008	15	yes
Map Point L	8-moderate	2008	30	no
Crossing 306	11-high	2009	12	yes
Crossing 308	11-high	2009	111	no
Crossing 309	11-high	2009	47	yes
Crossing 310	11-high	2009	82	yes
Crossing 311	11-high	2009	96	yes
Crossing 312	11-high	2009	79	yes
Crossing 322	11-high	2009	78	yes
Total			817	

The following Watercourse Crossings and Map Points are part of this Erosion Control Plan. The volume of controlable sediment discharge at Crossings and Map Points which are not listed in the table above was not quantifiable at the time of the assessment. Some of these sites are causing chronic surface erosion and/or are draining improperly having the potential to cause erosion, the nature of which is not certain at this time. Other sites are mitigations to proposed operations in this plan which are designed to prevent erosion.

Watercourse Crossings

Temporary Class III skid trail crossings shall not be used between the period of October 15 to April 30, and shall have a temporary culvert installed if water flow is present. Temporary skid trail crossing approaches shall be stabilized with seed and mulch or alternatively with slash packing within 50' of Class III's. Refer to Item 18 for stabilization treatment coverage.

Any new culverts will be sized for a 100 year flood event, and will have rock armored downspouts/energy dissipators installed and critical dips installed where appropriate to prevent side hill or stream channel erosion. Gualala River Watershed Council Culvert Sizing map was used for 100 year flood event culvert sizing. *Culvert sizes were calculated using the Rational Method. The formula used is on page 58.5.*

Rock used for stabilization measures shall be of sufficient size to stay where placed, and not be moved off site during peak flows. Rock size will be a minimum of 6 inches in diameter unless otherwise specified. Refer to the Rock Ford Diagram.

Unstable fill and other sources of sediment shall be removed or stabilized to the extent feasible when watercourse crossings are constructed, reconstructed, or maintained. No fill will be placed in an unstable condition or location.

Crossing 34: (West Operations Map) Ditch relief culvert on a seasonal road is undersized. Replace the 12" diameter steel pipe with a culvert 18" diameter by 60' long.

Crossing 37: (West Operations Map) Class III watercourse crossing of seasonal road. Install rock ford 15' wide by 15' long by 6" deep. Increase existing dip. Outslope through the crossing and 50 feet on either side.

Crossing 38: (West Operations Map) Class III watercourse crossing of a seasonal road. *The watercourse is diverted down the road. Install a rock ford 20' wide by 15' long by 1' deep. Return the watercourse to its original channel which is perpendicular to the road.*

Crossing 39: (West Operations Map) Class III watercourse crossing of a seasonal road. Install rock ford 20' wide by 15' long by 1' deep. Install rock spillway 5' wide by 5' long.

Crossing 39.1: (West Operations Map) Class III watercourse crossing of a seasonal road. Install rock ford 20' wide by 15' long by 1' deep. Install rock spillway

5' wide by 8' long.

Crossing 40: (West Operations Map) **CSD= 110 cu.yd.** Class III watercourse crossing of seasonal road. Install culvert 30" diameter by 40' long at stream grade. Install critical dip. Leave large woody debris in place or replace after installation. Inslope road through crossing. Remove perched fill on left side.

Crossing 40.1: (West Operations Map) Bank seep on seasonal road. Install rock ford 20' wide by 20' long by 1' deep. Install rock spillway across fill 5' wide by 8' long.

Crossing 40.2: (West Operations Map) Class III watercourse crossing of seasonal road. Install rock ford 20' wide by 15' long by 1' deep. Install rock spillway 5' wide by 8' long. Install rolling dip above where flagged

Crossing 41: (West Operations Map) Class III watercourse crossing of seasonal road. Install rock ford 20' wide by 15' long by 1' deep. Install energy dissipator at outlet.

Crossing 42: (West Operations Map) **CSD= 38 cu.yd.** Class II watercourse diverted into ditch to Crossing 42.2. Install culvert 30" diameter by 60' long in original channel, where flagged. Lay back perched fill. Replace the large woody debris in the stream channel.

Crossing 42.2: (West Operations Map) Ditch captures a bank seep on a seasonal road. Install a ditch relief culvert 18" diameter by 20' long with spillway. Install critical dip.

Crossing 43: (West Operations Map) **CSD= 84 cu.yd.** Class III watercourse crossing of seasonal road. Install culvert 30" diameter by 40' long with 10 foot downspout to stream grade. Excavate culvert inlet area. Regain 3 feet of road width and stabilize fill face with large rock, at least 2-3' diameter, keyed in to fill.

Crossing 44: (West Operations Map) Class III watercourse crossing of a seasonal road. Install a rock ford 15' wide by 15' long by 1' deep.

Crossing 46: (West Operations Map) **CSD= 10 cu.yd.** Class III watercourse diverted along seasonal road. *Remove perched fill from the landing on the downstream side and end haul to a stable location. Install a rock ford or culvert.*

- *The rock ford will be at least 20' wide by 15' long with a dip that is at least 1 foot deep, creating a cross sectional area of approximately 10 square feet which will pass anticipated 100-year flows and debris. The Rational Method for determining culvert size to pass 100-year flows at this crossing yields a 36 inch diameter*

culvert which has a cross sectional area of 7 square feet. Thickness of the rock surface will be at least 1 foot so the dip should be installed 2 feet deep to allow for surface rock and the required cross sectional area. Align ford with original channel. Excavate through the existing landing, creating a U-shaped channel 5' wide by 2' deep. Lay back the channel edges and line with rock. Install a rock spillway at least 5' wide and 25' long to the channel bottom. The ford and spillway must extend beyond the existing fill material.

- *The culvert will be at least 36" diameter by 40' long and must extend beyond the existing fill material. Install to stream grade.*

Crossing 47: (West Operations Map) **CSD= 25 cu.yd.** Class III watercourse crossing of seasonal road. Install culvert 30" diameter by 40' long at stream grade. Excavate inlet. Lay back perched fill on left side.

Crossing 48: (West Operations Map) **CSD= 15 cu.yd.** Class II watercourse crossing of seasonal road. Cut bank failed and redirected channel, scouring road edge. Install culvert 36" in diameter by 40' long in line with original channel. Excavate culvert inlet. Inslope road and drain toward culvert. Regain 3' of road width at existing fill failure area with large rock, at least 2-3' diameter, keyed in to fill, from road edge to channel. Excavate fill failure material and use on site.

Crossing 49: (West Operations Map) Class II spring drains across a seasonal road. Install a culvert 18" in diameter by 20' long.

Crossing 51: (West Operations Map) Class II watercourse is diverted down seasonal road and has cut a channel/gully through a landing. Install a culvert 36" in diameter by 40' long in line with the original channel at stream grade. Install critical dip. Reroute road around the existing channel/gully where flagged.

Crossing 52: (West Operations Map) Class II watercourse crossing of jeep road. Install a rock ford, 30' wide by 15' long by 1' deep. Remove perched fill from the downstream side of the road.

Crossing 53: (East Operations Map) Class III watercourse crossing of jeep road. Install a rock ford 30' wide by 18' long by 1' deep. Outslope and install rolling dips above, see map point 163.

Crossing 55: (East Operations Map) Head of class III watercourse is just below the road at a natural drainage point. Install rock ford 20' wide by 20' long by 6" deep. Align with channel. Install rolling dip above ford where flagged.

Crossing 56: (East Operations Map) Class III watercourse crossing of jeep road. Install rock ford 20' wide by 20' long by 6" deep. Align with channel.

Crossing 57: (East Operations Map) Class III watercourse is diverted down jeep road. Install rock ford/rolling dip in line with channel 20' wide by 20' long by 6" deep. Install additional rolling dip above ford.

Crossing 60: (West Operations Map) Class III watercourse is diverted along a seasonal road and creates a gully on the fill slope. Install culvert 24" diameter by 40' long with the outlet as far down the fill slope as possible. Install energy dissipator at the outflow. Install a rock spillway to the bottom of the fill slope if the outlet is not already there.

Crossing 61: (West Operations Map) Class II watercourse crossing of a seasonal road. Install a culvert 42" diameter by 40' long. Rock armor the fill face on the down stream side.

Crossing 62: (West Operations Map) Class III watercourse crossing of a seasonal road. Install rock ford 10' wide by 12' long and 6" deep with a rock spillway 5' wide by 12' long.

Crossing 63: (West Operations Map) Temporary skid trail crossing of a dry Class III Watercourse. The crossing shall not be used from October 15 through April 30. Following operations treat the skid trail with slash that is packed with a tractor for at least 50 feet from the watercourse channel. Refer to item 18, Soil Stabilization Measures and Item 26, Class III Watercourses.

Crossing 64: (West Operations Map) Temporary skid trail crossing of a dry Class III Watercourse. Install a temporary culvert or a pre-chockered humbolt crossing. Remove perched fill from the down stream side of the crossing. The crossing shall not be used from October 15 through April 30 and shall be removed prior to October 15 or overland flow, whichever is earlier. Following operations treat the skid trail with slash that is packed with a tractor for at least 50 feet from the watercourse channel. Refer to Item 18, Soil Stabilization Measures and Item 26, Class III Watercourses.

Crossing 65: (East Operations Map) Temporary skid trail crossing of a dry Class III Watercourse. Install a temporary culvert or a pre-chokered humbolt crossing. The crossing shall not be used from October 15 through April 30 and shall be removed prior to October 15 or overland flow, which ever is earlier. Following operations treat the skid trail with slash that is packed with a tractor for at least 50 feet from the watercourse channel. Refer to Item 18, Soil Stabilization Measures and Item 26, Class III Watercourses.

Crossing 110.1: (West Operations Map) Class III watercourse crossing of a seasonal road. Install a rock ford 10' wide by 15' long and 6" deep with a rock spillway 8' wide by 10' long.

Crossing 306: (East Operations Map) CSD= 12 cu. yd. Class II watercourse fed by a spring crossing of a seasonal road. Existing 12" culvert is undersized. Install a culvert 24" diameter by 40' long at stream grade and in line with channel. Rock armor the culvert inlet.

Crossing 308: (East Operations Map) CSD= 111 cu. yd. Class III watercourse flows down an inside ditch to a ditch relief culvert on a seasonal road. Install a culvert 24" diameter by 80' long at stream grade. Install a trash rack at the inlet. Install a critical dip.

Crossing 309: (East Operations Map) CSD= 47 cu. yd. Class II spring flows into an inside ditch to a ditch relief culvert on a seasonal road. Existing 18" culvert is rusted and failing. Replace with a culvert 24" diameter by 40' long. Install to stream grade and in line with the spring and natural channel. Install a rock energy dissipator at the outflow.

Crossing 310: (East Operations Map) CSD= 82 cu. yd. Class II watercourse crossing of a seasonal road. Existing 30" culvert is rusted. Replace with a culvert 30" diameter by 60' long. Install to stream grade. Remove perched fill from the downstream and upstream side of the crossing and end haul to a stable location.

Crossing 311: (East Operations Map) CSD= 96 cu. yd. Class II watercourse crossing of a seasonal road. Existing 24" culvert is undersized and misaligned causing scouring of the road fill. Replace with a culvert 36" diameter by 80' long. Install to stream grade and in line with the stream channel.

Crossing 312: (East Operations Map) CSD= 79 cu. yd. Class II watercourse crossing of a seasonal road. Existing 24" culvert is rusted. Replace with a culvert

36" diameter by 80' long. Install to stream grade.

Crossing 322: (East Operations Map) **CSD= 78 cu. yd.** Class II watercourse crossing of seasonal road has undersized and rusting culvert. Replace the 18" diameter culvert with a culvert 30" diameter by 60' long. Install to stream grade.

Crossing 323: (East Operations Map) Class III watercourse crossing of a seasonal road. A bank seep is pooling in the inside ditch. Install a rock ford 20' wide by 25' long and 6" deep with a rock spillway 5' wide by 20' long.

1-08NTMP-006 SON

EROSION CONTROL PLAN

Erosion Control Plan

This ECP has been developed for the entire plan area. Erosion control is designed to prevent and minimize discharge or threatened discharge of sediment from controllable sediment discharge sources (CSDS) into waters of the state to the degree necessary to avoid a violation of water quality requirements or other provisions of the Categorical Waiver Order R1-2004-0016.

Sediment discharge sources include but are not limited to, failing or failed watercourse crossings, road failures, road surfaces, landslides, unstable features discharging to or near watercourses, unstable watercourse banks, soil stockpiles, storage of waste, skid trails, landings, exposed harvest units, or any other locations discharging waste or earthen materials. Definition from R1-2004-0016: "Controllable sediment discharge source" means sites or locations, both existing and those created by proposed timber harvest activities, within the Project area that meet all the following conditions:

1. is discharging or has the potential to discharge sediment to waters of the state in violation of water quality requirements or other provisions of these General WDR's, 2. was caused or affected by human activity, and 3. may feasibly and reasonably respond to prevention and minimization management measures.

Implementation Schedule

Subsequent NTOs shall specify implementation schedule for stabilization of CSDS sites. Refer to specific CSDS sites for priority for treatment. Priority was determined based on potential sediment volumes (5-10 cy = 1, 11-50 cy = 2, 51+ cy = 3), proximity to watercourses (w/in 20' = 1, w/in 10' = 2, adjacent = 3), imminence of failure (w/in 10+ years = 1, w/in 5 years = 2, w/in 1 year = 3), and aquatic values present (Class III = 1, Class II intermittent = 2, Class I/II permanent = 3). Total values of 4-7 is low priority, 8-10 is moderate priority, 11+ is high priority.

Inventory of Controllable Sediment Discharge Sources

The RPF performed an on-the-ground inventory of Controllable Sediment Discharge Sites (ECP sites) in 2007 for the NTMP area. The STAR inventory system was used to estimate relative potential sediment delivery. The inventory of controllable sediment discharge sources within the NTMP are Watercourse Crossings, and Map Points, that are identified as ECP sites in the descriptions below. Sites listed below are located on the referenced Timber Operations Maps.

ECP Site	Priority Rating	Expected Date of Treatment	Cubic Yards of potential deliverable sediment to be controlled under the NTMP
Crossing 1	10-moderate	2009	5
Crossing 3	10-moderate	2009	10
Crossing 4	11-high	2009	10
Crossing 6	9-moderate	2009	5
<i>Crossing 7</i>	<i>9-moderate</i>	<i>2009</i>	<i>5</i>
<i>Map Point A</i>	<i>11- high</i>	<i>2009</i>	<i>50</i>
Map Point B	7 - low	2009	20
Map Point C	10-moderate	2009	5
Map Point E	11-high	2009	30
Total			90

The Watercourse Crossings and Map Points are part of this Erosion Control Plan. The volume of controllable sediment discharge at Crossings and Map Points which are not listed in the table above was not quantifiable at the time of the assessment. Some of these sites are causing chronic surface erosion and/or are draining improperly having the potential to cause erosion, the nature of which is not certain at this time. Other sites are mitigations to proposed operations in this plan, which are designed to prevent erosion.

Right of Way Road. *The road from Martinelli Road accessing the NTMP at Crossing 2 is a non-appurtenant private road and the plan submitter has no control or ownership of this road, only a right of way. Continuous use for timber operations is highly unlikely, as harvests will occur periodically, anticipated to be every 15 years. This road will be upgraded to the extent allowed by the easement across those lands, and shall be properly drained after use including rolling dips, out sloping and pulling road berms, reshaping the Class III rock ford crossing, stabilizing any disturbed soil within the WLPZ. No winter operations are proposed on the NTMP, and the road is seasonal so the road will not be used during wet weather or saturated soil conditions.*

Monitoring Plan

Crossings and map points will be monitored by the plan submitter to ensure effectiveness during the 3 year maintenance period following completion of each NTO. Refer to the crossing and area descriptions below for specific construction requirements. *The RPF shall inspect the reconstructed roads and new and stabilized crossings and Map Points listed above after each storm event greater than 5 inches in 48 hours, and at least two times (second visit after March 15) between October 15 and May 1 during the 3 year maintenance period after road reconstruction, and immediately report any significant instability found that threatens water quality to Water Quality and Cal Fire. An annual monitoring report shall be submitted to NCRWQCB by June 30 each year of the maintenance period. If a slope instability event occurs that is affecting water quality as determined by the RPF, the plan submitter shall have a CEG (qualified professional) inspect the specific area and determine an immediate and a long term stabilization plan which will be submitted to NCRWQCB and Cal Fire as an amendment to the plan prior to June 30 of the calendar year. The RPF is responsible for tracking rainfall totals.*

WATERCOURSE CROSSINGS

New culverts are sized for a 100 year flood event using the California Nomograph Method and factor in local conditions. Culverts will have rock armored downspouts/energy dissipators installed and critical dips installed where appropriate to prevent side hill or stream channel erosion. Rock used for stabilization measures shall be of sufficient size to stay where placed, and not be moved off site during peak flows. Rock size will be a minimum of 6 inches in diameter unless otherwise specified.

Crossing #1 (ECP): A jeep/ATV trail crossing of a Class III Watercourse. Minor downcutting is occurring on the road edge. *Install a small berm on the downslope side of the crossing to ensure flow remains in the channel. Install a flume inlet (18" diameter capacity) and 30' plastic flex pipe staked in that out-flows onto a woody debris energy dissipator.*

Crossing #2: Permanent road crossing of a Class III Watercourse. Install a 30" by 60' plastic culvert to allow for approximately 5-6' of fill at this turn in the road which is located at the start of Map Point A road reconstruction. Install a trash rack to prevent culvert plugging.

Crossing #3 (ECP): Permanent road crossing of a Class III Watercourse. Install a 24" by 60' culvert. Realign watercourse below culvert and return to natural location. Rock the channel on the southern edge against new road fill (Map Point B). Armor knick point in channel to prevent downcutting.

Crossing #4 (ECP): *Jeep road access to maintain a domestic water spring box. The undersized 14" culvert has been replaced under an emergency DFG notification in fall 2008 with a 24" by 30' culvert. Culvert alignment was straightened to reflect stream flow and prevent flow from undermining south bank. Use clean rock for the following work. Rock armor the inlet and outlet using 9"+ rock placed in keyed locations. Install a rock armored critical dip over the top of the culvert so that in the event of culvert failure flows run over the culvert and into the channel. Pull back approximately 2 to 3 feet depth and height of perched fill on the road edge located at the lower end of the culvert outlet for a distance of 20'. Rock armor the edge of this fill, the channel bed and the opposite bank starting from the edge of channel to a height of 24" for a distance of 20' using 1'+ rock. (refer to attached sketch on page 39.1 and the Civil Engineer's report regarding this crossing).*

Crossing #5: New permanent road crossing of a Class III Watercourse. Install 18" by 30' culvert. Install rock dissipater 4' long and 4' wide at outlet.

Crossing #6 (ECP): Jeep road crossing of a Class III watercourse. Install permanent 24" by 30' culvert with rock dissipater at outlet. Replaces old wooden 6" culvert.

Crossing #7 (ECP): Jeep road crossing of a small Class III watercourse. *Install a rocked rolling dip 8 feet road length by 10 feet road width, approximately 6 inches deep with 3" minus rock. Install a slight berm on the east side of the crossing to contain flow in the natural channel and keep it from flowing back onto the jeep road.*

Crossing #8: *Proposed road crossing of a Class II watercourse. Stream is seasonally dry. Stream grade is less than 4%. Currently the banks are actively eroding during high flows and bank material washes downstream and plugs the undersized culvert on the County Road. Two crossings options may be constructed: a temporary crossing or a permanent bridge. Spoils and past debris cleanout placed near the channel shall be removed from the streamside to an area where they cannot deliver to a watercourse.*

Temporary Crossing: *Between June 1 and October 15, install a temporary dry crossing by ramping down new road approaches at a 20% grade to cross channel at the current channel depth (approximate depth from bank to channel is 3 feet). If water is present install a 12 inch temporary culvert. Rock road surface approaches for 25 feet on either side of channel with clean 1 ½ " rock to a minimum depth of 3" to prevent road surface erosion above the channel zone, and 1 ½ to 3" rock to a minimum depth of 3" within the channel zone . At the conclusion of operations, remove temporary culvert, and any loose soil that may have entered the channel, and slope back sideslopes of the approaches to 1:1 slope. Retain rock on road approaches. Seed and mulch exposed bank material prior to October 15.*

Bridge: *Install a permanent bridge (15-20 foot span) on cement sills with rock armoring on high and low ends of sills with 2' diameter rock to prevent bank erosion. Ensure bridge does not obstruct high flows and allows sufficient space for woody debris to float beneath it.*

MAP POINTS

Map Point A (WLPZ Road)- *The existing jeep road between Crossings #2 and #3 currently has a grade of 25-38%. This road will be reconstructed as a Permanent Road. Refer to the Geologic Report by CEG Matt O'Connor in Section V (pages 118-142.7) regarding this road referred to as the WLPZ Road. This road was originally constructed circa 1950 by the cut and fill method, and uncompacted fill was pushed over the side toward the Class II watercourse. Some fill reached the watercourse at Unstable Area G2, an apparent old fill failure, approximately 5 cubic yards in the proximity of the domestic water intake, but has not affected the watercourse as this point is downstream of the diversion described as Area E. Above the diversion at Area E, Unstable Area G10 appears to also be a fill failure that did reach and place sediment into the channel, approximately 20 yards, over 40 years ago. There is some downcutting through this material still occurring. Unstable Area G1, is described as a debris slide, and is adjacent to the Class II channel, and may in the past have deposited sediment in the watercourse, and could have been triggered by fill from the WLPZ road, approximately 20 cubic yards. Factors leading to soil instability and the potential for mass wasting are related to movement of the old fill into the watercourse. Saturation of fill and subsequent erosion of fill from concentrated runoff or soil saturation could occur without following the proper dispersion of runoff and protection of fill slopes designed for this road.*

The grade will be reduced to 25% on average by cutting down the steeper sections, and hauling this material to the stable ridgetop out area. Haul material will be spread over the ridgetop on slopes <20%, and will be used for fill at Area B. The road will be constructed with an outsloped surface that is an average of 12 feet wide. To gain road width and create a stable road bed will require cutting into the bank for a few feet in several places, and minor filling in several places. Fill

will be restricted to the stable portion of the full bench surface and will be watered and compacted in 1' lifts. The stable road bed will not include the existing outer jeep road edge which is uncompacted sidecasted fill. No trees between the road and the Class II watercourse will be harvested during re-construction, and WLPZ canopy retention levels for Class II watercourses will ensure adequate stocking of trees to provide root strength. Overhanging stumps and trees will be removed from the cutbank for safety concerns, except at Map Point I where two large residual redwood trees are located above the cutbank. The LTO will avoid these trees to the extent practical and safe.

To minimize potential for cut material and compacted fill material to reach the watercourse downslope of this road, install a combination of an anchored silt fence, straw wattles, webbed construction fence and straw bales at the edge of the road to be filled and below the road to be downcut prior to construction, and clean out loose fill as it builds up behind this fence to maintain the integrity of the fence. Additionally, when downcutting, inslope the road during construction and pull material back toward the inslope to keep it from moving onto the side slope and moving downhill into the watercourse. Slopes below the road will be inspected prior to the winter period by the RPF between 10/1 and 10/15, and loose material will be removed, bare soil will be seeded and mulched, and additional redwood trees will be planted in areas that have adequate free to grow light conditions that the tree will grow into the overstory. For the life of the NTMP no standing trees will be cut below this road to reduce potential of loss of root strength in this zone between the road and watercourse. The road surface will be rocked to a depth of 8 inches with 6" minus road rock. The new road grade has been flagged with orange flags located 5.5 feet above the new road surface. 15 flexible rubber waterbreaks will be installed in the road at locations pre-flagged up to Map Point F. A rock dissipater will be keyed into the end of the waterbreaks that is 4' wide, 4' long and 1' deep made of rock that is 6"+. Refer to attached diagram of rubber waterbreaks.

Cutslopes were examined by CEG O'Connor and appear to be stable with little or no increase of the height of the cutslope required during road reconstruction other than increase in height from lowering the road grade in several locations. To examine cutslopes and hillslope geology more closely, a California licensed geologist or engineer, with expertise in road construction or reconstruction and slope stability (qualified professional), shall review the road reconstruction proposed with the LTO in the field prior to starting work. Any additional geologic features that could affect road, cutbank, and old fill slope stability must be identified and evaluated during the road reconstruction. The qualified professional must be present during construction

and grading activities to provide professional advice during reconstruction work and identify adverse site conditions that may emerge during excavation that require modifications or additions to the design. Specific methods for stabilization of the cutslopes shall be determined at that time. Changes to the NTMP road construction plan require submittal of an "Asbuilt" report to reviewing agencies along with rationalization and justification for these modifications. All geologic factors must be considered by the qualified professional as listed in the CGS email dated February 9, 2009 (pages 38.4 & 38.5).

If during winter monitoring, sediment discharge sites are discovered, mitigation shall consist of stabilizing sediment to the degree practical as limited by wet weather access, but may include

placement of straw wattles, erosion control jute netting or equivalent blankets, hay, additional rock in erosion gullies, and other devices.

Map Point B- (ECP) Create a new switchback at Crossing #3 by moving the road to the south. Approximately 4 feet of fill will be necessary to reduce the grade of the road at the northern approach. The road will be insloped at the switchback for proper drainage into the new culvert at Crossing 3. The base of the road fill located below Crossing #3 will be rock armored with 1 foot+ rock for a length of 30 feet to prevent fill erosion. Fill will be watered and compacted in 1' lifts.

Map Point C-(ECP). The jeep/ATV trail is next to the Class III Watercourse and flow from the watercourse has been diverted onto the trail in several locations. Move the fallen woody debris located in the watercourse channel to the northeast along the edge of the jeep road to re-open the watercourse channel. Pull the existing road berm onto the road and use material to outslope the trail and install rolling dips at 60 foot intervals to reduce potential future erosion.

Map Point D- Existing seasonal road is within 30 feet of the head of a Class III Watercourse for 40 feet of road length. The area between road and the watercourse is well vegetated with a heavy duff cover, and soils are stable. Outslope the road and rock the road surface with 6 inches of 1-3" rock for 40 feet.

Map Point E- (ECP) *See Diagram for Area E and Crossing 4.* A Class III Watercourse was diverted from the natural channel approximately 50 years ago to route water around a domestic water subsurface spring box. The gully carrying the watercourse is relatively stable with some minor down-cutting occurring.

- *To stabilize this site and prevent downcutting, install a permanent (oversized) 24" by 50' diameter flexible plastic culvert staked in place with fence posts in the gully to carry the flow. Remove woody material from the gully and upstream of the culvert inlet to Crossing 3. To ensure flow into the head of the culvert, attach a metal winged inlet with edges of wings armored with 9" + diameter rock(sized to remain in place for 100 year event) to a height of 20". In the event of culvert failure, armor the fill below the culvert: install small dip in the culvert rock inlet wall at the location of the old channel, and from this dip down to the bottom of the old channel line the current fill slope by hand with 9"+ rock in a U-shape 48" wide to carry potential flows down past the spring box. Install trash rack above culvert and clean all loose floatable woody debris from the channel up to Crossing #3. Install a rock energy dissipater (9"+ rock) 3' wide by 3' long at the outflow of the culvert in a U-shaped design. Refer to attached diagram of Map Point E and specifications for the culvert inlet and outlet, and the fill armoring. Refer to the Civil Engineer's report regarding Area E.*
- *Armor the downstream edge of the channel bank where the old channel meets the new channel with 9"+ diameter rock for a section 5' in channel length to a height of 2.5' and depth of at least 1' of rock.*
- *Install a 24 inch by 10 foot culvert in the watercourse below the junction of a Class III Watercourse entering from the north (upstream of crossing #4) where flagged to prevent downcutting. Use 9"+ diameter rock (sized to remain in place for 100 year event) for the outlet spillway in a U-shaped design with flow then entering the culvert at Crossing #4.*
- *The jeep road leading up to this site is within the WLPZ, and will not be used for timber harvesting, but will be used to access this site for corrective work. The road was built in some locations within the watercourse channel and in others directly adjacent to the channel. Currently some minor bank cutting is occurring. Ensure proper drainage of the road after use by reinstalling waterbreaks and outsloping where feasible, with critical dips installed in locations where stream diversion onto the road could occur. Where bank cutting is apparent, repair by armoring road edge*

with 9"+ diameter rock.

Map Point F- Begin of outsloped road and end of installation of flexible rubber waterbreaks.

Map Point G- New Permanent Road will be outsloped, and has a 15% grade. Install a rock rolling dip where flagged.

Map Point H- New Permanent Road will be outsloped, and has a 16-18% favorable grade for approximately 350 feet.

Map Point I- Two residual redwood trees on cutbank shall be retained by the LTO if practical and safe.

Map Point J - Three residual redwoods, one with a basal hollow, shall be retained for wildlife benefits as requested during a previous site visit by CDFG.

Map Point K - Landing in WLPZ of a Class II watercourse and 150 foot long existing WLPZ skid trail that will be used only between the period June 1 to October 15. These facilities are necessary as timber on the corner of the property cannot be effectively lifted up off the ground by cable yarder to clear the watercourse, and much less damage to the stream and riparian vegetation will occur from minimal tractor logging and log loading in this location. The landing is on an existing flat that has been used for equipment storage in the past. The landing is very flat, and potential for sediment reaching the watercourse is very low when mitigated. Mitigation includes seeding and straw mulching all disturbed soils or permanently rocking the landing location prior to October 15, and restricting use of the landing to once in a 10 year period. The skid trail is an existing trail/jeep road that is on a flat bench 20 to 40 feet from the watercourse. There is a natural berm between the trail and the creek which will prevent sediment from reaching the watercourse. The trail will be used only once in a 10 year period at the same time as the WLPZ landing. Mitigation to stabilize the trail will be seeding and mulching or tractor slash packing prior to October 15.

ROADS AND LANDINGS

24. Will any roads be constructed? Yes No, or reconstructed? Yes No. If yes, check items a through g. Will any landings be constructed? Yes No, or reconstructed? Yes No. If yes, check items h through k:
- a. Yes No Will new or reconstructed roads be wider than single lane with turnouts?
 - b. Yes No Are logging roads proposed in areas of unstable soils or known slide-prone areas?
 - c. Yes No Will new roads exceed a grade of 15% or have pitches of up to 20% for distances greater than 500 feet? Map must identify any new or reconstructed road segments that exceed an average 15% grade for over 200 feet.
 - d. Yes No Are roads to be constructed or reconstructed, other than crossings, within the WLPZ of a watercourse? If yes, completion of THP Item 27 a. will satisfy required documentation.
 - e. Yes No Will roads be located across more than 100 feet of lineal distance on slopes over 65%, or on slopes over 50% which are within 100 feet of the boundary of a WLPZ?
 - f. Yes No Will any roads or watercourse crossings be abandoned?
 - g. Yes No Are exceptions proposed for flagging or otherwise identifying the location or roads to be constructed?
 - h. Yes No Will any landings exceed one half acre in size? If any landing exceeds one-quarter acre in size or requires substantial excavation the location must be shown on the map.
 - i. Yes No Are any landings proposed in areas of unstable soils or known slide prone areas?
 - j. Yes No Will any landings be located on slopes over 65% or on slopes over 50% which are within 100 feet of the boundary of a WLPZ?
 - k. Yes No Will any landings be abandoned?
25. If any section in item 24 is answered yes, specify site-specific measures to reduce adverse impacts and list any additional or special information needed by the LTO concerning the construction, maintenance and/or abandonment of roads or landings as required by 14 CCR Article 12. Include required explanation and justification in NTMP Section III.

EXCEPTION ROAD SEGMENTS AND ROAD POINTS

For explanation and justification of exceptions, refer to the addenda in NTMP Section III beginning on page **345**. Site-specific measures for each of the exception an in-lieu road segments or points are included under each road description in the **Table 2.4** beginning on page **62**. The locations of these sites are also shown on the **Roads and Mitigation Points Map** beginning on page **186** in the map section following NTMP Section II. The following is an itemized listing of the exception road segments and points by item number:

24 b. Logging roads proposed in areas of unstable soils or known slide-prone areas

These truck road segments include road segments located on dormant slides and on/or adjacent to active slides (as described by the consulting RG). Most of these road segments are located on areas that were classified by the RG as dormant. Refer to the individual road segments described in **Table 2-4** beginning on page **62** for mitigations and protection measures.

Road 2 at **2.1/G-1** (*active*).

Road 3 at **3.9** (*unstable road bank*).

Road 5 along upper segments.

Road 10 near **5.2**.

Road 8 segments along Kirkbride Ridge, north of **8.5** & adjacent to **G-12** & **G-13** (*active*).

Road 9 east of **8.5**.

Road 11 segment from **11.1** to point where it turns east up Miller Ridge.

Road 12 along its entire length.

Road 13 along its entire length.

24 b. continued

Road 14 east of **14.1**.

Road 15 along entire length including **G-8 & G-9** (*active*).

Road 16 along most of its length.

Road 17 along most of its length.

Road 19 at its south end near **G-1** (*active*).

Road 20 along about 80% of the distance beginning at **5.4**.

Road 21 from **21.2** west to the end.

Road 23 at **23.1/G-11** (*active*).

24 c. Roads exceed a grade of 15% or have pitches of up to 20% for distances greater than 500 feet.

Segments of the following roads have grades steeper than 15%. Refer to the individual road segments described in **Table 2-4** beginning on page **62** and to protection measures described under Road Location, Design & Implementation on page **54**.

Road 5 segment **5b** between **5.2** and the ridge to the east has grade >15%, segment **5c** exceeds 15% for up to 300 feet.

Road 8 two segments on Kirkbride Ridge have segments >15% for 200 – 300 feet.

Road 9 averages about 20% for most of its length of approximately 1750 along a ridge.

Road 11 has two approximately 250-foot segments >15% on Miller Ridge.

Road 14 has an approximately 200-foot segment >15% just east of junction with **Road 13**.

Road 15 has segments on either side of **15.6** >15% for 200-300 feet each.

Road 16 has the first 300 feet east of **16.1** with a grade of 15-20%.

24 d. Roads to be constructed or reconstructed, other than crossings, within the WLPZ of a watercourse.

The following roads have segments that are located within the WLPZ at locations other than at crossings. These are all existing stable road prisms that are already in use as permanent access roads, or that require only minor reconstruction and grading to improve the existing drainage of the road. Refer to the **Water Resources Maps** beginning on page **191** to view the approximate locations of roads within stream protection zones. Refer to the individual road segments described in **Table 2-4** beginning on page **62**, to protection measures described under Road Location, Design & Implementation on page **54**, and to the protection measures prescribed for in-lieu WLPZ roads under Item 27 on page **126**.

Segments of **Roads – 1, 2, 3, 4, 7, 8, 11, 14, 15, 17, 19, 21, & 23**.

24 e. Roads to be located across more than 100 feet of lineal distance on slopes over 65%, or on slopes over 50% that are within 100 feet of the boundary of a WLPZ.

The following roads have segments that are either located across slopes over 65% for more than 100 feet: Refer to the individual road segments described in **Table 2-4** beginning on page **62** and to protection measures described under Truck Roads - Construction, Reconstruction and Maintenance on page **56**.

24 e. continued

Road 8 across 65% sideslopes for about 300 feet just east of **3.5** and across 70% sideslopes for about 250 feet between **8.2** and **8.3**.

Road 10 across 70% sideslope for about 200 feet to the north of the landing at **5.2**

Road 11 across 65% sideslope for about 150 feet along the broad western end of Miller Ridge.

Road 12 across 50% to 65% sideslopes for about 500 feet southeast of junction with **Road 11**

Road 14 across 70% sideslope for about 250 feet to the northeast of **14.1**

The following roads have segments that are located across slopes over 50% that are within 100 feet of the boundary of a WLPZ:

Road 8 across 65% sideslopes for about 300 feet just east of **3.5** and across 70% sideslopes for about 250 feet between **8.2** and **8.3** within 100 feet of Class II WLPZ for Pot Gulch.

Road 10 across 70% sideslope for about 200 feet to the north of the landing at **5.2** within 100 to 150 feet of the Class I WLPZ of Muir Creek.

Road 11 across 60% sideslope for about 100 feet and across 55% slopes for about 150 feet above the Nason Creek Class I WLPZ at the broad western end of Miller Ridge.

Road 14 across 70% sideslope for about 250 feet to the northeast of **14.1** with the northern most 50 feet above the Sondag Creek Class II WLPZ.

All of the proposed new road alignments and reconstruction of existing roads were reviewed in the field by SHN's staff geologist. Recommendations made by the RG were incorporated into this plan. Refer to a copy of the geology report beginning on page **545** in NTMP Section V.

24 f. Roads or watercourse crossings to be abandoned.

Most of **Road 18** (from **18.1** to **18.5**) and two segments (**5a** & **5d**) of **Road 5** will be abandoned. Refer to the detailed **Road Description And Mitigations, Table 2.4**, later in this section for the road abandonment plan for each.

24 i. Landings proposed in areas of unstable soils or known slide prone areas.

No landings are proposed for use or construction on any active slide as mapped by the CEG. However, nearly all of the existing and potential landing sites along the road system to the east of Nason Creek as well as sites along **Roads 5, 6, 8, 9, 10, and 20** on the west side of Nason Creek are located on areas mapped as dormant slides. The landings on these dormant slide areas will have installation of proper drainage facilities as a primary concern if they are used. Some may not be used, but will have drainage problems corrected when harvest operations occur in those areas. Detailed instructions for drainage and erosion control structures will be included in the NTO when it is submitted for timber operations in these areas.

The explanation and justification for the exceptions to the standard practices listed above are included as addenda to item 24 in NTMP Section III. Where exceptions to item 24 constitute an in-lieu practice such as in item 24 d, they are addressed under item 27 later in Section II and as addenda to item 27 in NTMP Section III. The description of the areas where the exceptions and in-lieu practices occur and the site-specific protection/mitigation measures are included in **Table 2.4** beginning on page **62**.

WATER QUALITY AND TIMBER OPERATIONS INCLUDING PROPOSED ROAD WORK

14 CCR 916.3 [936.3, 956.3]

The quality and beneficial uses of water shall not be unreasonably degraded by timber operations. During timber operations, the timber operator shall not place, discharge, or dispose of or deposit in such a manner as to permit to pass into the water of this state, any substances or materials, including, but not limited to, soil, silt, bark, slash, sawdust, or petroleum, in quantities deleterious to fish, wildlife, or the quality and beneficial uses of water. All provisions of this article shall be applied in a manner which complies with this standard.

(a) When there is reasonable expectation that slash, debris, soil, or other material resulting from timber operations, falling or associated activities, will be deposited in Class I and Class II waters below the watercourse or lake transition line or in watercourses which contain or conduct Class IV water, those harvest activities shall be deferred until equipment is available for its removal, or another procedure and schedule for completion of corrective work is approved by the Director.

(b) Accidental depositions of soil or other debris in lakes or below the watercourse or lake transition line in waters classed I, II, and IV shall be removed immediately after the deposition or as approved by the Director.

(c) The timber operator shall not construct or reconstruct roads, construct or use tractor roads or landings in Class I, II, III or IV watercourses, in the WLPZ, marshes, wet meadows, and other wet areas unless when explained and justified in the THP by the RPF, and approved by the Director, except as follows:

- (1) At prepared tractor road crossings as described in 914.8(b) [934.8(b), 954.8(b)].*
- (2) Crossings of Class III watercourses which are dry at the time of timber operations.*
- (3) At existing road crossings.*
- (4) At new tractor and road crossings approved as part of the Fish and Game Code process (F&GC 1600 et seq.)*

DESCRIPTION OF EXISTING AND PROPOSED ROADS

There are approximately 6 miles of existing permanent and seasonal roads within the Twin B Ranch NTMP area that are currently in useable condition or proposed for reconstruction under this plan. These roads are presently used primarily for access to the valley residential areas on the Miller property and the adjacent Cook property to the north. The roads are also used for recreational use by the Miller family and their guests.

In addition to the currently used roads, there are 5 to 6 miles of old logging roads that were built in the 1950's or before, which are not currently in use. Typical of the roads built in the pre-Forest Practice Act era; these unused existing roads are located primarily in, or alongside, watercourses. Most of these old roads are unusable because the watercourse crossings have been washed out or sections of the streamside road prisms have collapsed and been washed away. Where the old truck roads and skid roads are stable and suitably located, these segments will be reconstructed and incorporated into the proposed road system. Where the old roads are not suitable, they will be left unopened or formally abandoned if necessary. Where a road is to be abandoned, it will be done so as part of a harvest entry in the area. A total of approximately 6 additional miles of road reconstruction and new construction is proposed under this NTMP.

At present, there are no useable truck roads accessing the half of the ranch on the east side of Nason Creek (south fork of Blue Rock Creek). Most of the upslope areas on the west side of the ranch also lack roaded access. In order to implement this plan and to provide adequate management and fire access to the majority of the ranch areas, a new road system has been designed. The new system will use portions of the old road system where possible. Many other sections of the old road system will be abandoned or left undisturbed if they are stable. The existing useable roads coupled with the new and reconstructed roads will provide management access to the currently inaccessible upslope areas of the Twin B Ranch on both sides of Nason Creek.

The new road system has been situated primarily along the ridgetops and on upslope benches away from watercourses. The new road system, when complete will total approximately 12.7 miles in length. The roads in the new system will have gradients of ranging from 0% to 25%. The system will be composed of permanent roads, seasonal roads with permanent crossings and seasonal roads with seasonal crossings. The new seasonal roads will be used for timber and non-timber management access. It will not only allow for access for timber harvesting, but will also provide access for timber stand rehabilitation, mechanical brush control, tree planting, pre-commercial thinning, erosion control structure installation, fire control and administrative control. The road system will be available for recreational use as well as for timber and other land management uses. However, any recreational use of the road system will comply with the same protection measures as provided for timber management use under this plan. Additional discussion and descriptions of existing and proposed roads is included in NTMP Section III.

The new and existing roads and road sections have been assigned road numbers for ease of discussion under this plan. Please refer to the Roads and Mitigation Points Map for the road designations and locations.

ROAD LOCATION, DESIGN & IMPLEMENTATION

Not all of the proposed road system may be built immediately. New roads and road segments may be constructed as necessary when an area is opened for management activities. To the extent possible, the proposed roads have been located in order to avoid unstable side-slopes and to minimize the number of watercourse crossings. New road alignments were routed along ridgetops and across low gradient watercourse crossings wherever possible in order to minimize site disturbance, increase long-term stability and reduce the amount of annual maintenance. This strategy resulted in a number of road segments with short pitches of 15% to 20% and in one or two instances, pitches of up to 25%. These steep pitches usually occur on existing roads or skidtrails located along ridges. The reconstruction and use of these steeper existing trails and roads will have less potential for negative impact than new construction at alternative locations on steep sideslopes. The following protection measures apply to steep road segments:

- Seasonal logging road segments longer than 200 feet that exceed 15% shall be waterbarred at the Extreme EHR spacing (refer to page **29**).
- Permanent logging road segments longer than 200 feet that exceed 15% shall be rocked.

Where it was necessary for road alignments to be located across unstable areas, the best routes available were sought out and mitigation measures prescribed to minimize the risk of destabilizing these areas. A Registered Geologist (RG) evaluated the proposed road system and harvest areas. The RG agreed with the placement of the proposed road system (refer to the report in NTMP Section V) and recommended additional mitigation measures that were incorporated into this plan.

Most of the road alignments that were located across dormant slide complexes are found on the eastern half of the ranch. The proposed alignments on the dormant slides are situated on benches, usually close to the toe of a scarp. These alignments are the only means to access large areas of the ranch for management access and fire protection. Wherever roads are located on potentially unstable areas, additional mitigation measures are specified in this plan.

Watercourse crossings have been kept to a minimum. Where crossings do occur, they employ rock-armored dips or low water fords rather than culverts wherever possible to do so. Other general road building mitigation measures that are over and above the standard FPR's have also been included to provide additional protection for soil and water resources as well as to maintain current growing space and reduce the long-term upkeep costs of the road system.

Standard road building and erosion control structure installation procedures and maintenance procedures that are prescribed for use in this plan are included in the following pages. These measures are based on the Forest Practice Rules and the applicable standards contained in the Handbook for Forest and Ranch Roads prepared by Weaver and Hagans for the Mendocino County Resource Conservation District. The Millers have been provided with a copy of the Handbook. Where appropriate, relevant portions of the handbook are incorporated into this plan by reference or reproduced and included as an attachment in NTMP Section V.

GENERAL STANDARDS FOR TRUCK ROAD AND LANDING CONSTRUCTION AND MAINTENANCE

The following standards are to be used in the maintenance, construction and reconstruction of landings and the truck road system on the NTMP area of the Twin B Ranch. These general standards are to be employed except for where another site-specific mitigation measure is prescribed under the road plan. Unless explained and justified as an exception under this plan, all standard Forest Practice Rules (2004 version) apply to the road construction and maintenance occurring under this plan.

Fall and Spring Operating Periods

There are intervals outside of the officially defined 'Winter Period' (November 15 – April 1) where restrictions apply to operations during periods of wet weather. These intervals are:

- The **Fall Operating Period**: That interval from October 15 through November 14. This period deals with the installation of erosion control structures and places restrictions on road use.
- The **Spring Operating Period**: That interval from April 2 to May 1. This period deals with the installation of erosion control structures and places limitations on road use.

For restrictions that apply to use of roads during these periods refer to road use schedule (**Table 2.3**) on page **33** under Item 18 of NTMP Section II.

Truck Roads - Construction, Reconstruction and Maintenance

1. Where the proposed road alignment transects slopes greater than 50%, the road shall be constructed on a full bench cut. Excavated spoil shall be end-hauled and disposed of in a stable location on slopes less than 35% and without direct access to watercourses. Slash from grubbing and other organic material shall be placed below the road to intercept any soil that may cascade off the slope during road construction. The road width shall be constructed as narrow as possible, while still wide enough to accommodate the largest equipment utilized in the timber harvest operations. A maximum road width between 12 and 16 feet is anticipated in most of the proposed new road segments.
2. Where the road transects slopes less than 50%, the road may be constructed on a balance cut-and-fill or a $\frac{3}{4}$ -bench unless otherwise specified under this plan section. On those areas that will receive fill material and that have average side slopes in excess of 45%, the area shall be cleared of vegetation to a depth of at least 6" and the fill shall be keyed, benched, and compacted into firm soil or bedrock as per the standard Forest Practice Rules. Fill placed on slopes less than 45% can be sidecasted unless otherwise specified under this plan section.
3. All proposed road construction shall be outsloped and built without berms unless otherwise specified under this plan section. New road prisms shall be constructed with a 3%-4% outsloped surface. Existing roads will be graded and converted to an outsloped condition where appropriate to do so. Where the grades on seasonal roads exceed 8%, waterbars shall also be installed according to the specifications under item 18, NTMP Section II in order to prevent erosion of the road surface. Where roads are located along ridgetops, they shall be constructed such that the runoff can be directed to alternate sides of the ridge so that drainage is not concentrated in just one watershed.
4. Culverts shall be sized for a 100-year level flood event and shall be of a full length sufficient to extend beyond the fill. If installed in a fish-bearing stream, installation shall be done so as to allow fish passage under all flow regimes. Wherever the potential for plugging of culverts due to woody debris or rocks is present, trash racks shall also be installed at the time of crossing installation.
923.3, 943.3, 963.3 (g) Any new permanent culverts installed within class I watercourses shall allow upstream and downstream passage of fish or listed aquatic species during any life stage and for the natural movement of bedload to form a continuous bed through the culvert and shall require an analysis and specifications demonstrating conformance with the intent of this section and subsection.
5. A DFG stream bank alteration agreement (1603 permit) shall be obtained, where applicable, prior to commencement of crossing installation construction. This generally means on all Class I and Class II watercourses. A 1603 agreement application (DFG Form FG2023 and Form FG2024) that addresses the 1603 crossings of this plan is included under item 38, NTMP Section II.
6. Permanent all-season roads within WLPZ's shall be rocked and shall receive regular and storm period inspection and maintenance.
7. Seasonal roads that are occasionally used during the winter period or when wet shall be rocked where needed to provide a stable running surface (i.e. no road surface deformation). Seasonal roads used during the winter period shall be upgraded to provide permanent drainage structures (rolling dips, cross-drains or drivable waterbars) and permanent crossing structures (culverts or rocked fords). These roads shall receive inspection at least once during the winter period and shall receive at least annual maintenance.

8. Seasonal roads not to be used during the winter period shall be constructed so that regular and storm period maintenance is not needed to prevent sediment discharge into watercourses. These roads may be accessed by use of ATV during the winter period. Four-wheel-drive vehicles will not be allowed to use seasonal roads during the winter period except during protracted rainless periods when road surfaces are not saturated as defined in the Forest Practice Rules or for emergency situations.
9. Where inside ditches are used, adequate cross-drainage shall be installed to prevent downcutting of the inside ditch or the creation of gullies at the cross drain discharge points. No less than a 12"-diameter culvert shall be used for cross drains. Cross drain culverts shall be installed at a gradient of 2% steeper than the inside ditch gradient and shall be placed at approximately a 30 degree angle from the ditch line. A drop inlet shall be installed where the cut bank is steep. Ditch depth should be approximately 12" below the road surface to prevent diversion of runoff onto the road surface. Culverts shall be placed at least 12" below the road surface.
10. As the roads proposed for reuse under this NTMP are opened and maintained, they shall be outsloped and left without berms, where feasible, unless otherwise specified under this section.
11. From October 15 to May 1, operation of trucks and heavy equipment on roads and landings shall be limited to those with a stable operating surface (see definition under item 23, NTMP Section II).

Landings - Construction and Reconstruction

1. Landing size shall be no larger than ¼-acre unless shown on the yarding map. Landing size shall be kept to as small a size as possible while still providing adequate log handling capacity and insuring the safety of the logging crew. No landings larger than ½-acre are proposed for this plan. If a landing larger than ½-acre is necessary, it shall be amended into the plan at that time.
2. Adjacent residual stocking and leave trees shall be adequately protected from yarding damage. Where pile burning is to occur, slash shall be piled near the center of the landing at least 10 feet away from residual trees. An adequate fire-line shall be constructed before the dozer is pulled off the job. Slash shall not be piled against residual live trees or snags.
3. New landings shall not occur on slopes in excess of 45%.
4. Fill used to construct landings and roads shall be kept free of slash and other organic debris to prevent future settling and slumping of the fill.
5. Upon completion of harvest activities, landings shall be adequately drained to prevent accumulation and ponding of water. If pile burning is not to be done and the landing is not scheduled for use in the near future, the landing surface should be protected by *walking in* slash or by grass seeding at the RPF's option. Where landings are not likely to be used again, the area shall be planted with a tree species suitable for that site.

Truck Roads - Use and Maintenance

The existing permanent road and seasonal roads used for year around access to the residences in the valley are first priority for annual and periodic inspection and maintenance. These include **Roads 1, 2, and 3**. Except for the **Road 3** wet ford on Cow Creek, all of these roads have permanent CMP culverts at watercourse crossings and for cross draining of inside ditches where they occur. All of these roads are used for light vehicle traffic year around. All culverts and ditches on these roads should be inspected at least yearly prior to October 15. Problem areas should be repaired before the winter storms begin. Once winter sets in, inspection of culverts on the main road and at known problem spots should be done before and after large storms. It may also be necessary to inspect certain culverts during large storms to prevent plugging and failure. If at all possible, even light vehicle use should be curtailed when the roads are completely saturated.

During the non-winter period, grading to achieve an outsloped running surface and additional rocking of road segments with steep grades should be done when economically feasible. Preferably, road maintenance and construction should be done in the late spring or early summer when there is adequate moisture in the soil to facilitate compaction. However, care should be taken not to over grade the road surface. Ditches should be graded only when and where necessary to clear restrictions that impede runoff to the point that the road surface will be adversely affected. Vehicle speed at all times of the year should be kept to a minimum (no more than 15 mph) to prevent dust, loss of road surface and to prevent *washboarding*. Culverts and ditches should be upgraded and or repaired as specified in the Road Plan.

The new and reconstructed seasonal roads proposed under the NTMP were designed to require minimal maintenance. Dipped crossings and waterbars do not need the same level of maintenance and inspection as culverts. However, each road should be inspected at least once a year to ensure the integrity of erosion control structures and to fix problem areas as they occur. Any recreational use of these seasonal roads should comply with the same protection measures specified for timber management use as described in this plan.

There are a number of Class III temporary crossings on seasonal truck roads that are proposed for use under this plan. For non-winter period use, the LTO may grade the roads and use temporary fills at these Class III crossings during log hauling and timber operations. Following the completion of operations or before October 15th, whichever comes first, the temporary crossings shall be dipped out and stabilized as per item 18, NTMP Section II. If the road is used during the winter period when water is present in the watercourse or if the submitter opts to upgrade the road to permanent status for year around access, a suitably sized culvert (100-year return level of flow) shall be installed according to the standards included in Handbook for Forest and Ranch Roads. If a watercourse crossing originally included in this plan as a temporary crossing is to be upgraded to permanent status, an amendment to the plan shall be filed with CDF.

LTO(s) RESPONSIBLE FOR ROADS & LANDINGS RECONSTRUCTION, CONSTRUCTION, AND MAINTENANCE

The Administrating RPF shall designate the LTO(s) responsible for roads and landings reconstruction, construction, and maintenance in the NTMP/NTO area(s) and on appurtenant road(s); this action shall be in the form of a minor deviation (*14 CCR 1040*) submitted in writing to the Director prior to any road and landing reconstruction, construction and maintenance. If multiple LTO's are listed, their responsibilities shall be defined in the minor deviation. If the RPF listed in the NTMP does not have the authority under NTMP Item 13(c) to submit minor deviations (commonly called minor amendments) the Plan Submitter shall be responsible for accomplishing this measure. This measure is to clarify the LTO(s) responsible for road and landing reconstruction, construction, and maintenance.

WATER DRAFTING

Water drafting from Muir Creek and Nason Creek near existing truck road crossings (Map Points **3.1**, **11.1**, **7.1**, and the dam on **Road 2**) may be used as watersources for dust abatement. Depending on the time of the year and the flow, one or more of the domestic watersources may also be used as dust abatement watersources. The location(s) to be used as dust abatement watersources will be specified in each NTO. Where natural streams are used as a watersource, the water level and flow of these watercourses shall not be decreased by more than 10%. Any water drafting from Class I watercourses will be done only under DFG approval in the form of a 1603 agreement. Water diversion from Class 1 watercourses shall meet the CDF&G screening and approach velocity criteria. These criteria are summarized as follows:

- Pump intakes shall be screened with mesh, perforated plate, or pipe with openings 3/32 inches or smaller.
- The velocity of water entering the intake (approach velocity) will not exceed 0.33 feet/second.
- Any logging road approaches within a WLPZ to the drafting location shall be rocked or stabilized with suitable material providing equal or greater erosion protection than rocking.
- Modifications to drafting locations will minimize removal/disturbance to the streambank, streambed, and existing vegetation.

Anticipated time-period in which water drafting will occur is from May 1 to November 1. The exact timing will depend on weather conditions during harvest operations as well as the time of year that timber operations are conducted.

BORROW PITS AND ROCK SOURCES

The ***Surface Mining and Reclamation Act of 1975 (SMARA)*** specifically exempts from bonding and report preparation excavations or grading exclusively for the purpose of obtaining materials for roadbed construction and maintenance conducted in connection with timber operations or forest management on land owned by the same person or entity where the excavations or grading are greater than 100 feet from a Class I or 75 feet from a Class II watercourse. The exemptions are available only if slope stability and erosion are controlled. However, the ***California Environmental Quality Act (CEQA)*** requires the disclosure of all potential environmental impacts. Additionally, case law recognizes that the spirit of **SMARA** must be met for exempt activities.

There is currently one known existing borrow pit on the Twin B Ranch. It is located on the ridge near the end of **Road 5** along the south property line at map point **5.5**. It was last utilized by the previous owner of that parcel on road construction associated with **THP 1-95-196 MEN**. The area is stable, well drained, and well away from any watercourses. The amount of competent material still available at this site is not known, but this quarry will likely be used to some extent in the road construction planned for the south end of the ranch.

Three other potential rock sources were identified during plan preparation. These are located at the following map points:

5.7 – A rock outcrop just northwest of the existing borrow pit and adjacent to **Road 5**.

11.2 – A rock outcrop about 300 feet east of Nason Creek. Located at the end of a short spur off **Road 11**.

17.3 – A rocky linear feature running north to south at the end of **Road 17**. The area at the end of **Road 17** could serve as a rock source and landing.

The existing borrow pit and any new quarries that are developed in the future shall be treated to maintain slope stability and to prevent the erosion of the sediment from the site and its introduction into watercourses down slope. The protection measures for each quarry site that is developed shall be site-specific and address the conditions and problems that exist at each location. Before a new quarry site is first excavated, the RPF shall meet with the landowner, the LTO or other contractor who will be responsible for mining then site.

The standard erosion control measures prescribed under **Item 18** on page **25** and minimizing the amount of nearby site disturbance will normally be adequate to protect slope stability and prevent the introduction of sediment into the watercourses downslope from the site. Additional measures such as the creation of a settling pond, the installation of silt fencing or strawbale dams, and grading the area to drain back into the quarry site may be needed on a site-specific basis.

The landowner, the RPF or his designee shall inspect each active quarry site before October 15th and again after the first major rain of the winter period to verify the effectiveness of the erosion control measures that were installed. If necessary, corrective measures shall be implemented at that time. This inspection would most logically be carried out during the annual inspections of the road system and erosion control structures. Once a quarry site is no longer to be used, it shall be graded for proper drainage and revegetated with suitable grass seed mixes, native hardwoods or conifers that are suited to the soil conditions of the site.

ROADS AND MITIGATION POINTS

The remainder of NTMP Item 25 contains a road-by-road description of each of the existing and proposed roads and the mitigation points located on or near each road. To facilitate review and implementation, an enlarged section of the plan map with the road segment and map points that are referenced is included at the beginning of each road description. Each road description includes site-specific construction, reconstruction, abandonment or maintenance measures as well as site-specific mitigation measures for the road points, drainage structures, watercourse crossings, unstable areas and other nearby map points that are addressed.

These site-specific measures are based on a 1998-2001 survey of the existing roads and erosion control structures, field notes made by the RPF and NRM staff during plan layout and a 3-day field review by NRM and SHN professional staff (foresters and geologists) conducted in the early winter of 2000-2001. Input was also received during a 1999 field review of road location and layout with Jeff Bath, a local general engineering contractor who has performed major road maintenance on the ranch in the past. The Class I watercourse crossings were reviewed in a field preconsultation with Rick Macedo of DFG on October 6, 1999. CDF Forest Practice staff members Jeanette Pedersen, Craig Pedersen and Jim Wright as well as DMG staff geologists Julie Bawcom, John Schlosser and Dave Longstreth were also consulted during plan development.

Refer to **ROADS AND MITIGATION POINTS MAP** for the location of the areas referenced below.

Refer to **EHR MAP** for the locations of the areas classified as having a **HIGH EHR**.

The **ROADS AND MITIGATION POINTS MAP** shows the locations of culverts, watercourse crossings and the other mitigation points discussed in **Table 2.4** on the following pages.

For additional and more detailed information on road construction and maintenance, refer to the publication Handbook for Forest and Ranch Roads prepared by William E. Weaver, PhD and Danny K. Hagans of Pacific Watershed Associates for The Mendocino County Resource Conservation District. The book is available at the Mendocino County offices of the Natural Resource Conservation Service.

TABLE 2.4 - ROAD PLAN

LOGGING ROADS 1 thru 23

Description of Construction / Reconstruction. Associated Unstable Areas, Mitigations, Watercourse Crossings, Abandonment Plans, Maintenance, & Other Comments

ROAD #	NTMP Page #
1	64
2	68
3	70
4	74
5	76
6	81
7	83
8	86
9	88
10	90
11	91
12	93
13	95
14	97
15	99
16	103
17	105
18	107
19	109
20	110
21	111
22	112
23	113

The **MASTER LEGEND** is reproduced below to facilitate use of the road map included in the discussion of each of the plan area roads:

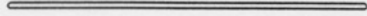


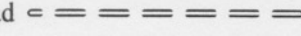




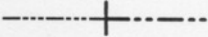
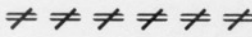




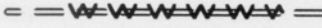

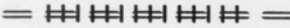



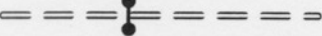


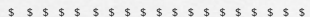
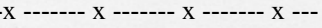
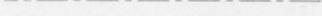

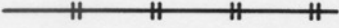
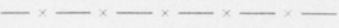




<u>ROADS</u>	<u>WATER RESOURCES</u>
Existing Permanent Truck Road <i>Native Material</i>  <i>Rocked</i> 	Class I Watercourse 
Existing Seasonal Truck Road <i>(Open or Requiring Minor Dressing)</i> 	Class II Watercourse 
Proposed Seasonal Road <i>(New Construction)</i> 	Class III Watercourse 
Proposed Reconstruction 	Watercourse Classification Change 
Proposed Road Abandonment 	Spring 
Road Mitigation Point (Road #).(Point #)	Seep or Wet Area 
Road Segment Designation 	Pond 
WLPZ Road Segment 	Domestic Watersource DW# 
Exception Road segment 	Water Storage Tank 
Haul Route 	Slides and Unstable Areas 
Gate 	Domestic Water Lines 
Begin/End Road Segment 	ATV Access/Skid Trail 
Fence 	
Property Line 	
Located Property Corner <i>(1/4 corner, etc.)</i> 	
NTMP Boundary 	
Fence Line 	
Telephone Line 	
Potential Borrow Pit 	
Class 1 Structure <i>(Intended for Human Habitation)</i> 	
Class 2 Structure <i>(NOT Intended for Human Habitation)</i> 	

Table 2.4 – Road Points, Culverts, Watercourse Crossings and Mitigation Points

Refer also to **ROADS AND MITIGATION POINTS MAP** for Map Point Locations and Master Legend
Map polygons in-filled with fine dots are areas of High EHR. Those with vertical lines are slides.

ROAD 1

Length – 6,000' **Elevation Change** – 450' **Average Grade** \cong 8% **Width** – Single lane with turnouts.

Road Prism – Varies from Full bench to cut & fill. Mostly with inside ditch, but some areas converted to outsloped.

Surface – Native material w/ rock on the steep segments to facilitate safe winter use.

FPR Classification – Permanent truck road within the plan area. 944 feet of Class II WLPZ road segment (two existing Class II permanent crossings (CMP) with the balance of the WLPZ road segments being parallel to the watercourse).

Notes & Comments:

Existing primary, year around, ranch access road for three properties. **Road 1** serves as the primary Twin B Ranch access from Bell Springs Road as well as the access road for the Cook (formerly Philbrick) parcel. Although the Miller family owns the property near the point where **Road 1** joins the Bell Springs Road, the road passes through the Scott 40 located between Bell Springs Road and the plan area. **Road 1** is a high priority for maintenance and improvements since it is used to access two year-around residences and two recreational residences. The plan proposes to upgrade the road surface over time and to continue outsloping the road prism where possible. Rocking of the steep segments and curves will also be continued as necessary. As the road is maintained and upgraded for harvest operations, crossdrain-spacing will be upgraded to the intervals recommended by **The Handbook for Forest and Ranch Roads**.

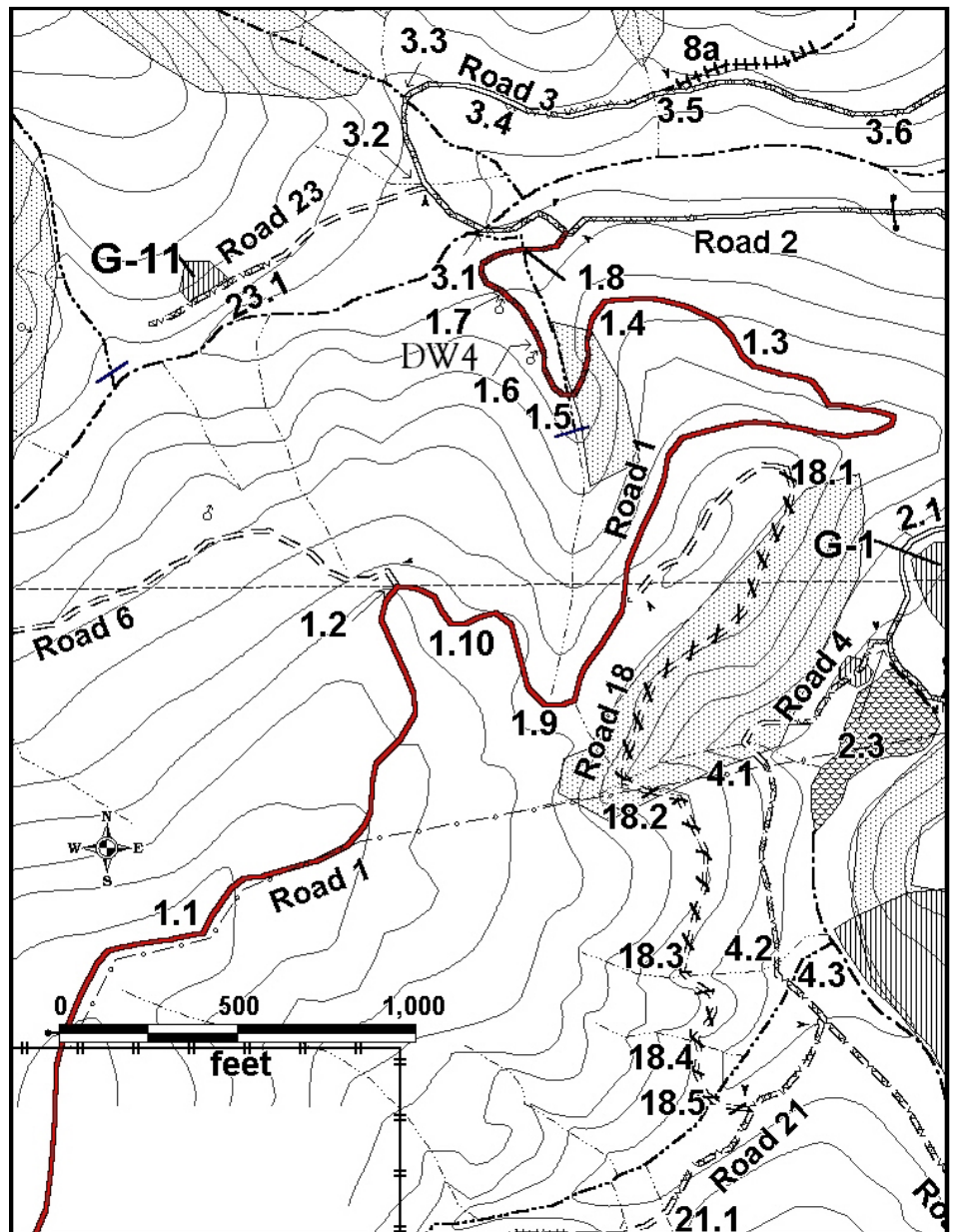


Table 2.4 – ROAD 1: Points, Culverts, Watercourse Crossings and Mitigation Points.

MAP POINT	DESCRIPTION AND MITIGATIONS
1.1	<p>Description: Existing road with inside ditch and cross-drain. A 15-inch CMP is installed. This culvert drains approximately 400 feet of inside ditch. The road gradient is 10%. The drain is working well however the inlet is starting to fill in with sediment and debris.</p> <p>Treatment: Clean culvert inlet before winter season each year. Do routine inspections during winter season and maintain as needed, especially before and during large storms.</p>
1.2	<p>Description: The ROAD 1 inside ditch drains down the surface of Road 6 for about 80 feet to the west of the junction. The flow from the Road 1 ditch then flows off the surface and onto the north side of Road 6 where it ultimately reaches a Class III tributary to Cow Creek. This crossing drains approximately 700 feet of inside ditch.</p> <p>Treatment: Redirect the flow from the Road 1 ditch directly across Road 6 in a dipped crossing just west of the intersection. Reestablish the dipped crossing following the use of ROAD 6 during harvest activities in the area.</p>
1.3	<p>Description: Existing inside ditch cross-drain. A relatively new 15-inch CMP was installed at a 90° angle to the road ditch line. When functional, the culvert drained approximately 200 lineal feet of inside ditch. The road gradient above the cross-drain is about 12% with a slight outslope in some sections. The inside ditch has filled in with sediment and debris. The inlet to the culvert has completely filled in and the pipe is plugged. Runoff from the inboard ditch has been flowing down the surface of the road and onto the slope below near the culvert outlet causing rilling and a nick point at the outside edge of the road. The runoff has resulted in minor small rilling of the road surface.</p> <p>Treatment: Excavate inside ditch for 85 feet upslope from the cross drain. Reinstall a 15-inch culvert at a 30° angle from the ditch line according to the specifications provided in The Handbook for Forest and Ranch Roads. Install a t-post trash rack at the inlet. Install an energy dissipater at the culvert outlet.</p>
1.4	<p>Description: Approximately 300' of inside ditch drains directly into the Class II watercourse at map point 1.5. The road gradient is 12%. Slopes below road are 60%-70% and would be downcut if a ditch relief culvert were to be installed. The road grade is too steep to sufficiently outslope for total control of surface drainage.</p> <p>Treatment: Rock the road surface with 1½" minus angular rock for at least 190 feet upslope from map point 1.5. Rock armor the inside ditch with 6- to 12-inch rock to prevent downcutting and to dissipate the energy of runoff flow in the ditch. Evaluate the mitigation measure during first winter after installation. If necessary, install sediment fences, sediment traps or rock check dams in the ditch above the culvert intake.</p>

Table 2.4 – ROAD 1: Points, Culverts, Watercourse Crossings and Mitigation Points.

MAP POINT	DESCRIPTION AND MITIGATIONS
1.5	<p>Description: Class II crossing. An 18-inch CMP culvert and an old 8-inch iron pipe are installed at the crossing. The 18-inch culvert is currently working well. The 8-inch pipe is clogged. The watershed above the crossing totals about 16 acres, however, the uppermost 6 acres is currently intercepted by the Road 1 inside ditch and drained off to the east into Muir Creek above the dam. This drainage pattern appears to have been in place for at least 20 years.</p> <p>Treatment: Add a trash rack and maintain the existing culvert. The existing pipe is adequately sized for a 100-year level storm (Rational Method). However, when the upper 6 acres are drained back into the Class II watercourse after the implementation of proposed mitigation measures at map point 1.9 upstream, the flows during the first winter should be observed to validate the culvert sizing calculations. When the culvert is ultimately replaced, a 24-inch oversized pipe should be installed to help reduce the chance of plugging and failure of the crossing.</p> <p>A 1603 agreement should be obtained before replacing this culvert.</p>
1.6 and 1.7	<p>Description: A spring/bank-seep complex above and in the Road 1 cutbank are located on the west side of the road and are drained by the inside ditch. The spring is an old roadside domestic watercourse known as the "barrel spring." The inside ditch runs from the uppermost spring at map point 1.6 for 500 feet before leaving the road. A second spring feeds into the ditch at map point 1.7. The inside ditch drains to Cow Creek by way of a throughcut in the cutbank at the curve just below map point 1.7. The throughcut dissipates the runoff from Road 1 and the springs onto an old skid trail above Cow Creek. The skid trail is well vegetated and the runoff dissipates into the duff and understory vegetation where it is filtered by the existing vegetation before flowing on into Cow Creek, a Class I watercourse. The skid trail is in the Class I WLPZ and will not be reopened or disturbed. Moderate downcutting of the inside ditch along Road 1 has occurred. The skid trail area below the throughcut is stable.</p> <p>Treatment: Install a 15-inch culvert (CMP or plastic) as a cross-drain below the spring at map point 1.6. Install as per the specifications provided in The Handbook for Forest and Ranch Roads.</p> <p>Armor the first 50 feet of the inside ditch from the outlet side of the throughcut back up toward map point 1.7. Add a strawbale dam, rock armor or large woody debris on the old skid road below the outlet to help further dissipate the outflow from the ditch.</p> <p>A 1603 agreement should not be needed for the work proposed at this point.</p>

Table 2.4 – ROAD 1: Points, Culverts, Watercourse Crossings and Mitigation Points.

MAP POINT	DESCRIPTION AND MITIGATIONS
1.8	<p>Description: Class II watercourse crossing about 300 feet below crossing at map point 1.5. An 18-inch culvert is installed. The culvert appears to be working well. The stream channel has a low gradient of about 5%, but has downcut 12 to 18 inches into the soil surface just above and below the crossing, forming a channel with raw, nearly vertical banks. The incised channel is about 24" – 36" wide. From below the crossing at map point 1.8, the channel turns west and flows into Cow Creek along the inboard ditch of Road 3.</p> <p>Treatment: Where there is adequate equipment access, lay back the stream banks above the crossing with a backhoe or excavator for the first 80' -100' to an approximately 1:1 slope. Seed and mulch the new stream banks as per standard erosion control measures included under item 18, NTMP Section II.</p> <p>A 1603 agreement should be obtained before replacing the culvert.</p>
1.9	<p>Description: Outlet for about 600 lineal feet of inside ditch. Road grade above outlet averages about 8%. The inside ditch picks up road runoff and surface runoff from the areas above the road that would normally flow to Cow Creek by way of the Class III/Class II watercourse to the north of this point. The outlet dumps the water off to the east toward Muir Creek upstream from "Lake Louise." The sideslopes below the outlet range from 50% to 80%. The gully formed by the ditch outlet washed out a portion of the prism of the old road (ROAD 18) located downslope.</p> <p>Treatment: During the first 10-year cutting cycle and in the course of maintaining and upgrading ROAD 1, the runoff for the road segment above map point 1.9 should be directed back into the Class II watercourse. An 18-inch CMP crossdrain should be installed at the point where the road crosses the natural channel. Another 18" CMP crossdrain should be installed at a point approximately 300' up the road. The culverts shall be placed such that they do not concentrate runoff onto fill slopes or unvegetated areas. Energy dissipaters should be used at the outflow. Refer to The Handbook for Forest and Ranch Roads for proper installation methods.</p>
1.10	<p>Description: Marks the upper point of the inside ditch described above under map point 1.9 above.</p> <p>Treatment: See map point 1.9.</p>

Table 2.4 – Road Points, Culverts, Watercourse Crossings and Mitigation Points

Refer also to **ROADS AND MITIGATION POINTS MAP** for Map Point Locations and Master Legend
Map polygons in-filled with fine dots are areas of High EHR. Those with vertical lines are slides.

ROAD 2

Length – 6,126 ′ **Elevation Change** – 330 ′ **Average Grade** \cong 2% **Width** – Single lane with turnouts.

Road Prism – Varies from Full bench to cut & fill. Mostly with inside ditch, but some areas converted to outsloped.

Surface – Native material.

FPR Classification – Permanent truck road within the plan area. 1,580 feet of WLPZ road segments (one crossing with the balance being road segments parallel to the watercourse). Access controlled by gate about ¼-mile east of junction with **Road 1** and **Road 3**.

Notes & Comments: Existing primary ranch access road for the Miller cabins and barn. The road originally continued south up to Cow Mountain ridgeline, but was washed out by Nason Creek at a point about ¼-mile south of the barn. High priority for maintenance and improvements since road is used for year around residence access and administrative access. Upgrade surface over time and continue to outslope where possible and rock the WLPZ segments. Road segment to the east of the dam on Muir Creek is a Class I WLPZ road for about 300 feet. The road surface in the WLPZ segment should be rocked. Over time, upgrade the inside ditch crossdrain spacing to the levels recommended in **The Handbook for Forest and Ranch Roads**.

Where applicable, the site descriptions and recommendations from the geology report prepared by SHN Consulting Engineers, March 12, 2001, is included for the map point or road segment described. The complete text of SHN's report is included as an attachment in NTMP Section V.

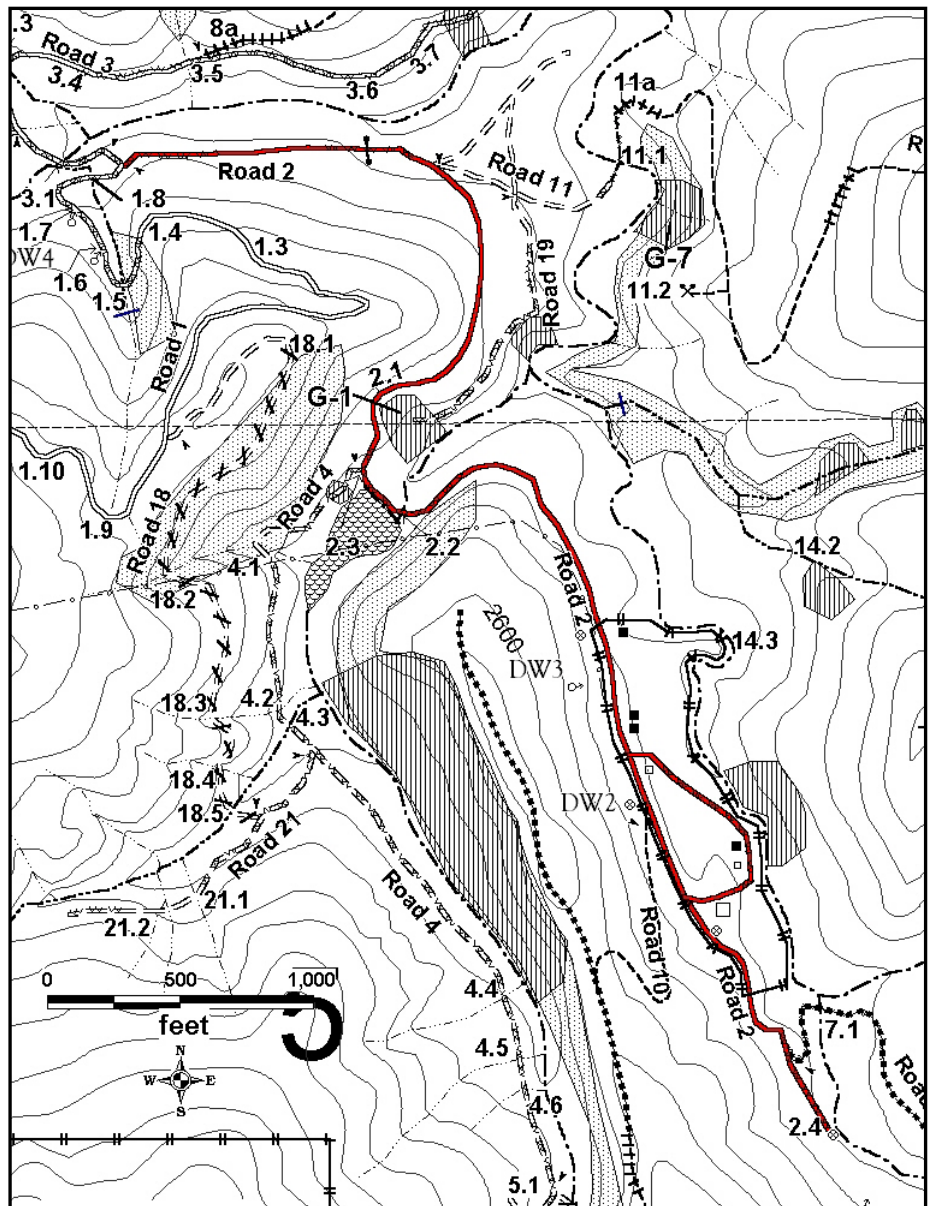


Table 2.4 – ROAD 2: Points, Culverts, Watercourse Crossings and Mitigation Points.

MAP POINT	DESCRIPTION AND MITIGATIONS
2.1/G-1	<p>Description: <i>"G-1 is a 75-100 foot wide, recently active rotational/translational slide. This slide is located just downstream of the old (early 1960s) earthen dam built across Muir Creek. A significant portion of the road grade associated with Road 2 was displaced, making it impassable. The diversion of storm water by the earthen dam upstream of G-1 appears to have contributed to the initiation of the slide. Diverted water eroded away and undercut the hillside's toeslope, initiating a slide on this moderate gradient hillside.</i></p> <p><i>"Most of the slide mass has consequently been removed (excavated and end hauled) by the landowner. Excavation of the slide mass produced an over-steepened cut slope adjacent to the outboard edge of Road 2. A 50-foot segment of the rebuilt road grade has recently dropped approximately 3 feet. Similar outboard edge failures are likely to occur. Sediment released by these failures will be retained on a large topographic flat located below Road 2 It is unlikely that sediment will directly enter the downslope watercourse. Seasonal maintenance will be required for this segment of Road 2, to minimize the potential of sediment delivery due to activity along the outboard edge of Road 2. The Project Forester has proposed replanting the unvegetated portions of the slide with hardwoods and conifers. The revegetation of the slide surface will lower the potential of future slide events."</i>¹</p> <p>Unstable area upslope from the existing road just before the point where the road crosses Muir Creek over the earthen dam. The road was closed at this point during the winter of 1997 due to a bank failure after a large storm. The road was reopened after the winter period and the cut slope at this point was laid back to a less severe gradient. An 18-inch CMP with a flume downspout was also installed at that time, relieving some of the flow carried by an inside ditch that drained to the area upstream from.</p> <p>Treatment: <i>Geo. Rec. #1: "Expand the surface of Road 2 at Site G-1 by excavating into the hillside. Do not sidecast material to widen the road surface. Due to the possibility of cut bank failures into the inboard ditch, the road surface should be outsloped."</i></p> <p>Install a curtain drain along the inside ditch of the road from the point near the crest of hill above the existing culvert down to the point where the road turns to cross the bridge and the dam. Plant fast growing hardwood and conifer trees on the slopes above and below the road. Straw mulch and seed the slope below the road.</p>
	<p>¹ Description and Treatment from report prepare by SHN Consulting Engineers, March 12, 2001</p>

Table 2.4 – ROAD 2: Points, Culverts, Watercourse Crossings and Mitigation Points.

MAP POINT	DESCRIPTION AND MITIGATIONS
2.3	<p>Description: Dry ford crossing of the Class IV pond spillway at the west side of the earthen dam. Used for crossing with heavy equipment and loads too large for the short bridge on Road 2 as is spans the spillway. The spillway is dry during most of the year except for large winter storms when the flow is too much for the pond's drop inlet near the east end of the dam. The spillway was partially rocked with 12"-to-24" rip-rap in 2003.</p> <p>Treatment: Monitor and maintain the existing approaches to the crossing to keep them from rilling. The remainder of the spillway shall be armored with rock large enough to resist movement during high flows (average rock size of 24 inches in diameter should be adequate).</p> <p>The bare soil banks around the reservoir shall be planted with conifers and/or hardwoods on an approximately 12-foot by 12-foot spacing (300 trees per acre +/-) to help stabilize the area around the pond. Grass seed shall also be applied to hold the soil in place until the trees become established.</p> <p>The recommended rip-rapping protection measures shall be done the first spring or summer following plan approval. The planting shall be done during the first planting season following the erosion control work.</p>
2.4	<p>Description: A section of the old WLPZ road at the end NTMP Road 2 was washed out by an outside bend in Nason Creek, probably in the 1964 flood.</p> <p>Treatment: Pull back the vertical, loose road-fill material directly above the watercourse at the end of Road 2. The steep banks at the failed road segment shall be laid back to a 1:1 (horizontal : vertical) gradient and protected from erosion with straw or slash mulch. The spoils shall be used to outslope the section of road between the failed road segment and the old landing to the north. The work shall be done during the first NTO that has an excavator present on the plan area. The RPF shall supervise these operations.</p>

2.2

Description: Nick point at outboard shoulder of WLPZ road segment just east of dam. The Class I channel is immediately below the CMP spillway that passes through the dam. The nick point is currently stable; however recent rock rip-rapping around the spillway has been partially undermined by high flows.

Treatment: Do not concentrate flow when grading the road at this point. Inspect each year and watch for signs of deterioration of condition. If nick point reactivates, rock armor below road.

The east spillway near map point **2.2** shall have additional rock armoring added on top of the existing armoring. The additional armoring shall extend up to the existing road surface at the top of the dam. The recommended rip-rapping protection measures shall be done the first spring or summer following plan approval.

2.3

Description: Dry ford crossing of the Class IV pond spillway at the west side of the earthen dam. Used for crossing with heavy equipment and loads too large for the short bridge on **Road 2** as it spans the spillway. The spillway is dry during most of the year except for large winter storms when the flow is too much for the pond's drop inlet near the east end of the dam. The spillway was partially rocked with 12" – 24" rip-rap in 2003.

Treatment: Monitor and maintain the existing approaches to the crossing to keep them from rilling. The remainder of the spillway shall be armored with rock large enough to resist movement during high flows (average rock size of 24 inches in diameter should be adequate).

The bare soil banks around the reservoir shall be planted with conifers and/or hardwoods on an approximately 12-foot by 12-foot spacing (300 trees per acre +/-) to help stabilize the area around the pond. Grass seed shall also be applied to hold the soil in place until the trees become established.

The recommended rip-rapping protection measures shall be done the first spring or summer following plan approval. The planting shall be done during the first planting season following the erosion control work.
