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North Coast Region

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To: **Christine Wright-Shacklett, Senior Engineering Geologist**
THP File

From: **Jonathan Wellington Warmerdam, Environmental Scientist**
Cherie Blatt, Sanitary Engineering Associate

Date: **October 7, 2002**

Subject: **Inspection Memorandum for Timber Harvest Plan 1-02-155 MEN**
John Hanes (Landowner)
German East End (THP Name)

Timber Harvest Plan (THP) Information:

Watershed: Navarro

County: Mendocino

303d-Listed: Sediment and Temperature;

Calwater No.: 1113.500105;

Legal Description: Section 32,33,3; Township 12N,13N; Range 14W;

Total Acreage: 275

Silviculture (acres): Selection 25; Group Selection 75; Seed Tree Removal Step 175;

Yarding Method: Ground Based (Tractor, Rubber Tired Skidder), Cable (High Lead, Skyline);

Erosion Hazard Rating: Moderate, High;

Site Preparation: NA

Winter Operations: NA

Watercourse/Supply: Class II and III watercourses;

Road Construction/Reconstruction: NA

Landing Re/Construction: NA

Proposed In-Lieu Practices: NA

General THP Summary:

A pre-harvest inspection (PHI) was conducted on Timber Harvest Plan (THP) 1-02-155 MEN on July 29, 2002. Also present during the inspection were: Mike McKay of the California Department of Forestry (CDF); Dave Longstreth of the California Geologic Survey (CGS); Thomas Engelhardt of the California Department of Fish and Game (DFG); Ken Wood, Registered Professional Forester (RPF); and John Hanes, the landowner. The primary purpose of the North Coast Regional Water Quality Control Board (Regional Water Board) staff for attending the inspection was to evaluate protection of waters of the State from the proposed timber operations. The weather was warm and sunny.

The THP is located in southern Mendocino County, approximately 6 air miles southwest of the town of Boonville. The entire plan area drains into the Navarro River watershed which is recognized as containing anadromous salmonids including *Onchorynchus kisutch* (Coho Salmon) and *Onchorynchus mykiss* (Steelhead Trout). Both species are federally listed as threatened although the Central Coast Evolutionary Significant Unit of Coho Salmon is now State listed as endangered. The watershed is listed under Section 303(d) of the Clean Water Act as impaired due to excessive sediment and high temperatures. Separate Total Maximum Daily Loads for the impairments have been developed by the U.S. Environmental Protection Agency for the Navarro River watershed.

Onsite Observations:

Approximately 2 miles of appurtenant road for the THP area is also utilized under a previously submitted THP named "Ranch Rough" (1-02-118 MEN which was withdrawn and resubmitted as 1-02-175 MEN). At the time of the inspection for the "German East End" THP, an erosion control plan was being developed by the RPF for the section of road that is common to both THPs. Due to the current erosion control plan development efforts, the review team initially bypassed that section of road, and instead, began the inspection on the segment of appurtenant road specific only to this THP.

The unmapped THP Point 14 is a Class III watercourse crossing that is located along the "Top Jeep Ridge Road to Hog Ranch Road" section of the appurtenant road. This crossing is disclosed on pages 15.02 and 45 of the THP as "12-inch culvert-Class III." The crossing is shot-gunned several feet beyond the road fill slope and has resulted in erosion of the road fill and/or the watercourse channel. This crossing was disclosed in the THP without mention to the potential and/or active erosion. The THP contains general "ranch road maintenance guidelines" on page 44, but does not include specific language disclosing this erosion site, nor does it propose site-specific mitigations to address the associated problems. Approximately two or more cubic yards of sediment appear to have been eroded from this site* based on conservative ocular estimates.

THP Point 15 is a Class III watercourse crossing that is also located along the "Top Jeep Ridge Road to Hog Ranch Road" section of the appurtenant road. This crossing is disclosed on pages 15.02 and 45 of the THP as "18- inch culvert-Class III." The crossing is shot-gunned and has

begun to erode the road fill slope and the watercourse channel. This crossing was disclosed in the THP without mention to the potential and active erosion. The crossing condition has potential to erode approximately two or more cubic yards of sediment if left in the existing condition*. Again, this estimate is considered conservative and was based on ocular measurement estimates.

A segment of the appurtenant road located between the "German Gap Road" and the THP boundary crosses a Class III watercourse without having any constructed crossing to prevent erosion. The location is addressed in the THP by the statement "*Rock Dip*" (described as Point 17, Page 45 of the THP), although it is not mapped, does not classify the feature as containing a watercourse, nor are there any specifications on how the watercourse crossing may be constructed. The watercourse currently flows across the road surface and has eroded a gully through the road prism. The gully erosion is estimated to have delivered approximately two cubic yards of sediment to the watercourse*. Recent grading activities have resulted in the deposition of approximately two additional feet of loose, fine-grained material onto the buried watercourse at the road crossing location. Additionally, the grading resulted in the sidecast of road material over the road surface to a place that will likely discharge into the watercourse. Estimates of the potential delivery of the sidecast material into the watercourse were not made.

The unmapped THP Point 20 on the appurtenant road between the "German Gap Road" and the THP boundary is described on Page 45 as: "*New 12-inch culvert installation at grade or down to bedrock in Class III water flow / draw in bank slip area*". This feature was identified during the PHI as a Class III watercourse diversion down the seasonal road and a large landslide. The watercourse is diverted out of the natural channel, flows down the road for approximately 50 feet, and then eroded a gully off the outside edge and below the road. The gully extends for several hundred feet (approximately 300 feet) down the hillslope and then disappears out of view from the road. The gully varies in width between 4-6 feet wide and 2-4 feet deep. The diversion gully was only partially followed downslope, so it was not determined during the PHI if the diversion gully is hydrologically connected to a watercourse. Due to the size and length of the gully that was observed, and considering that the natural channel parallels the gully within 100 feet, it is expected that the diversion has resulted in a discharge to a watercourse. The potential sediment discharged to a downslope watercourse is conservatively estimated at approximately 100 cubic yards or more. Water was flowing down the gully at the time of the PHI. The referenced "bank slip" feature was measured by a CGS representative as an active landslide that extends approximately 250 feet horizontally along the road, and approximately 180 feet above the road. Fresh discontinuous scarps that vary from one to two feet in height were observed approximately 150 feet above the road. A depressed bench area (possible sag pond) was observed above the scarps. The CGS representative indicated that the slide continued below the road and water appears to be draining out of the slide where the road cuts into slide debris. Erosion of the road fill and the instability of the hillslope threatens to discharge earthen material to the watercourse.

An unmapped Class III watercourse was identified during the PHI near THP map point 12. The watercourse has been diverted out of the natural channel and down an inside ditch for approximately 50 feet. A culvert captures the flow and discharges into an erosion gully formed

by the diversion. The gully is generally 2-3 feet deep and 3-4 feet wide and extends approximately 200 feet down to the natural watercourse. The THP does not address the watercourse, the diversion, or the erosion site. Conservative estimates suggest that at least 22 cubic yards of sediment have been delivered to waters of the State as a result of the watercourse diversion*.

The landowner has recently installed two new culverts at the crossings of Class II watercourses (Crossing Points 14 and 16 of the THP). The THP states that both 18-inch culverts are permanent and existing but based on the freshly exposed soils and minimal leaf deposition surrounding the crossing, they both appeared to have been installed this year. The crossings were both installed incorrectly. Neither culvert appeared to have been installed at grade with the watercourse. The landowner had sidecast approximately 5 cubic yards of earthen material over each of the culvert outlets to an area that could deliver to the watercourses. It is estimated that approximately 2.5 cubic yards of sediment could deliver to these watercourses during future storm events*. Rough field measurements by the CGS representative of 3 times bankfull area (Cafferata et. al, 2000) indicate that larger culverts are needed to adequately accommodate large storm events (i.e., 100-year storm). This presents a threat of discharge of earthen material to the watercourse if failure or partial failure of the culverted watercourse crossings occurs during storm events. According to the DFG representative, both culverts were installed without Fish and Game 1603 Permits.

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At THP Point 30, a crossing failure has discharged a large quantitiy of sediment to a Class II watercourse that was subsequently washed downstream. Initially, it appears that a holding pond or an in-stream landing was constructed at the road crossing. The construction utilized two segments of culvert (each approximately 20 feet long) that were coupled together to drain water through a wide segment of fill prism. The Registered Professional Forester who wrote the THP stated that this feature could have been a man-made holding pond similar to an existing pond located at Crossing 27. If this feature was a holding pond, the road would have acted as a dam impounding water from the watercourse. The area where the pond would have been is now filled with sediment and hydrophytic vegetation. The inlet for the culvert is located slightly below the

road grade. At the time of the inspection, the outer section of the culvert could be seen approximately 50 feet downstream in the stream channel. The upper section of the culvert and coupling were still held in the road prism and remnant fill remained on the top surface of both. The distance from the bottom of the coupling to the watercourse is approximately 15 feet. The horizontal failure width from the coupling is approximately 25 feet. It appeared that the outer fill prism had failed and taken half of the culvert downstream. Vertical scarps define the edge of the road prism. If left as is, the road prism will continue to fail into the watercourse and has potential to deliver at least 100 cubic yards or more of sediment into waters of the State during future winter periods. Very conservative estimates suggest that approximately 30 cubic yards of sediment were delivered from the crossing*. Sediment discharged from the crossing failure was estimated solely on the fill that would have been in place around the upper section of culvert, and does not include the larger fill volume that may have encompassed the lower culvert segment.

The THP was recommended for withdrawal during the PHI based upon the extent of non-disclosure and lack of adequate mitigation of existing erosion sites. Items that were not disclosed or addressed in the THP included, but were not limited to: erosion sites along the appurtenant road system and within the THP area, watercourses, watercourse diversions, one slide, and incorrectly designed watercourse crossing construction.

The THP 1-02-155 MEN was withdrawn on August 2, 2002. It is unknown at this time if the THP will be resubmitted or if the existing erosion sites associated with the plan will be mitigated.

Beneficial Use Impacts:

Section 3 of the Basin Plan contains water quality objectives that are considered of particular importance at protecting the beneficial uses from unreasonable affect due to discharges from logging, construction, or other associated activities. One of the objectives states: "*waters shall not contain substances in concentrations that result in deposition of material that causes nuisance or adversely affect beneficial uses*." The discharge of earthen material has resulted in the formation of bottom deposits of sediment in a number of onsite and/or downstream watercourses in quantities deleterious to fish, wildlife, and other beneficial uses of water.

Two of the beneficial uses of particular concern within the watershed are salmonid spawning and rearing, as listed in the Water Quality Control Plan for the North Coast Region (Basin Plan). Current scientific studies indicate that chronic and episodic fine sediment discharge and deposition to fish bearing streams reduces the viability of salmonid production. Several studies show evidence of impacts to coho salmon from excess fine sediment. Sediment pollution directly affects salmonids in many ways. Initial effects occur to spawning redds created within gravels on the channel bottom (Everest et al., 1987). Fine sediment less than 0.85 mm can intrude into redds and smothers eggs while sand-sized particles (<6.4 mm), cover spawning redds, and prevents salmon fry emergence.

Embeddedness is an important indicator of the quality of gravels where eggs incubate and young salmon use to hide, and where aquatic insects, a key salmonid food, are reared. Embeddedness

is defined as "*the degree that larger particles (boulders, rubble, or gravel) are surrounded or covered by fine sediment. Usually measured in classes according to percentage of coverage of larger particles by fine sediments* (California Department of Fish and Game 1998)." In healthy streams with good spawning habitat, embeddedness values are 25% or less. Rill and gully erosion from roads, watercourse diversions, culvert failure, and improper road drainage all contribute to substrate embeddedness or bottom deposits.

Primary pools provide critical summer habitat for steelhead and coho under low-flow conditions. California Department of Fish and Game's (DFG) California Salmonid Stream Habitat Restoration Manual indicates that the better salmonid streams may have as much as 40% of their total habitat length in primary pools. Primary pools are defined as those pools having a maximum depth of at least two feet in first and second order streams, and at least three feet in third and fourth order streams. The Navarro River watershed Technical Support Document for the Total Maximum Daily Load (TMDL) indicates that primary pool ratios in Rancheria Creek are 22% of the total habitat length. Within the tributary streams approximately 11% of total habitat is in primary pools. The THP is located within German Creek, a tributary to Rancheria Creek.

Observations indicate the elevation of all types of sediment inputs to the watercourses onsite and downstream of the THP area that affect beneficial uses. To prevent further impairment to the beneficial uses of the watershed, onsite sediment sources that threaten to cause further pollution or nuisance should be promptly addressed and mitigated.

Sediment Delivery and Potential Delivery Volume Estimates

Appurtenant Roads Delivery Sites

Top Jeep Ridge Road to Hog Ranch Road:

THP Point 14 (Class III watercourse; 12" culvert):
Sediment Delivered: Approximately 2 cubic yards below culvert outlet
Potential Sediment Delivery: Unknown

THP Point 15 (Class III watercourse; 18" culvert):
Sediment Delivered: Unknown
Potential Sediment Delivery: Approximately 2 cubic yards below culvert outlet

German Gap Road to THP Boundary

THP Point 17 (Class III watercourse; no designed crossing):
Sediment Delivered: Approximately 2 cubic yards at outside road edge
Potential Sediment Delivery: Unknown

THP Point 20 (Class III watercourse diversion; large slide):
Sediment Delivered: Unknown if the diversion connects to a watercourse
Potential Sediment Delivery: Greater than or approximately 100 cubic yards

Within THP Boundary:

THP Map Point 12:
Sediment Delivered: Approximately 22 yards from the diversion gully
Potential Sediment Delivery: Unknown

THP Map Point 14:
Sediment Delivered: Unknown
Potential Sediment Delivery: Approximately 2.5 cubic yards from sidecast fill

THP Map Point 16:
Sediment Delivered: Unknown
Potential Sediment Delivery: Approximately 2.5 cubic yards from sidecast fill

THP Map Point 30:
Sediment Delivered: Approximately 30 cubic yards
Potential Sediment Delivery: 100 cubic yards

Estimated Total Sediment Delivered: 56 cubic yards*
Estimated Potential Sediment Delivery: 207 cubic yards*

*All estimates of sediment delivered and potential sediment delivery are based on ocular measurements of erosion sites. No field measurements were conducted to quantify sediment delivered or having potential to deliver. As such, all estimates are conservative in nature and likely underestimate actual calculations.

References:

Cafferata et. al., 2000, Sizing Watercourses for 100-Year Flood Flows, Draft California Forestry Note No. 116.

California Department of Fish and Game, 1998. California Stream Habitat Restoration Manual. Third Edition. Inland Fisheries Division. Department of Fish and Game. Sacramento CA. 495p.

California Regional Water Quality Control Board, North Coast Region, 2000; Navarro River Watershed Technical Support Document for the Total Maximum Daily Load for Sediment; July 28, 2000.

Everest, F.H., R.L. Beschta, J.C. Scrivener, K.V. Koski, J.R. Sedell, and C.J. Cedarholm. 1987. Fine sediment and salmonid production: a paradox. p. 98-142 In: E. Salo and T. Cundy (ed). Streamside management and forestry and fishery interactions. University of Washington, College of Forest Resources, Contribution 57, Seattle, WA.