



Humboldt Redwood
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February 13, 2009

Ms. Catherine Kuhlman
California Regional Water Quality Control Board
North Coast Region
5550 Skylane Blvd, Suite A
Santa Rosa, CA 95403

Subject: Enrollment of THP 1-04-242 HUM (Unit 3) in the Freshwater Creek WWDR, "Tier II"

Dear Ms. Kuhlman:

HRC is requesting Tier II enrollment under Watershed-Wide Waste Discharge Requirement (WWDR) Order No. R1-2006-0041 for unit 3 of THP 1-04-242 HUM. This unit is comprised of 27.4 acres of Selection (13.7 clear-cut equivalent acres). Total acres currently enrolled or proposed for enrollment under Order No. R1-2006-0041 Tier II is shown in the Attached Pre-Harvest Planning Report provided by Forester, Mr. Wayne Rice. The Erosion Control Plan (ECP), Form 200 and an annual waste discharge enrollment fee have already been submitted for this THP.

Landslide risks associated with this plan were evaluated in compliance with the Freshwater Creek and Elk River WWDR Permit Acreage Enrollment and Compliance Monitoring Program Quality Assurance Project Plan (Version 2.0, September 1, 2006) approved by the Executive Officer of the North Coast Regional Water Quality Control Board. This approach uses commonly accepted standards for geologic practices in forest management (Sidle et al. 1985, Soeters and Van Western 1996, and Sidle and Ochiai 2006) to assess factors known to contribute to landslides, such as steepness of slope, slope convergence, hydrology, geologic features, and visibly unstable areas. Overlapping and complementary scientific techniques combining state-of-the-art digital elevation model (DEM) slope stability models, field investigation, and terrain analysis were used in this assessment.

In summary the unit is predominantly underlain by Franciscan Complex sedimentary rocks. Located near the Freshwater Fault, numerous dormant, likely faulting related, large scale earthflows are mapped to underlie the unit as well. The slopes appear relatively stable in response to the turn of the century ground based yarded clearcutting. No landslides were observed in the unit during our review for the THP. The partial harvest with mixed tractor and cable yarding focused to areas removed from watercourses is not anticipated to significantly increase the potential for mass wasting. No additional changes were made to the THP in response to this evaluation.

The THP proposes an uneven-age silviculture retaining 100 sqft of basal area. Sub-merchantable trees and those with specific wildlife value characteristics (e.g., cavities, large limbs, broken tops, snags, etc.) will be retained within the harvest area to the extent feasible. Cable yarding is approved for the entire unit. Post-harvest no site preparation will occur.

Greater detail regarding this landslide hazard assessment is provided in the attached *THP Unit Review for Tier 2 Enrollment*. The licensed geologist involved with the Tier 2 landslide risk evaluation has concluded the proposed harvest operation, if implemented as planned and approved, will result in a negligible increase in potential for post-harvest landsliding; and thereby meets the applicable Zero Delivery of landslide related sediment performance standards of NCRWQCB Orders R1-2006-0041 and R1-2008-0071.

Please do not hesitate to contact me should you have any questions or comments regarding this application for enrollment into WWDR (Order No. R1-2006-0041).

Respectfully,



Wayne D. Rice,
RPF
Humboldt Redwood Company, LLC

Attachments:

Professional Certification of Design
THP Unit Review for Tier II enrollment
Pre-harvest Planning Report
Unit Specific ECP
Maps

Professional Certification of Design

I, Tagg S. Nordstrom, P.G. 7950, 2/16/09,
Signature license # Date



Place licensed seal here

hereby certify, in accordance with North Coast Regional Water Quality Control Board (NCRWQCB) Order Nos. R1-2006-0039 and R1-2006-0041, that the attached application and the description of THP modifications, and the materials submitted along with:

THP No. 1-04-242 HUM (Fresh 1) Unit # 3

- a. are in accordance with accepted practices, and recognized professional standards;
- b. comply with the requirements of the Monitoring and Reporting Program No. R1-2006-0103, approved by the Executive Officer of the North Coast Regional Water Quality Control Board; and
- c. provided that the THP is properly implemented, operated, and maintained, are adequate for the THP to meet the applicable Zero Net Delivery performance standards of NCRWQCB Orders R1-2006-0039, R1-2006-0041, and R1-2006-0103, insofar as such performance can reasonably be predicted by accepted engineering geologic practices.

The opinions presented in the subject THP have been developed using that degree of care and skill ordinarily exercised, under similar circumstances, by reputable engineering geologists practicing in this or similar localities. No other warranty, expressed or implied, is made as to the professional advice included in this report.

THP: Fresh 1 THP 04-242 Unit # 3 2-12-09

Tools Used in This Assessment	Figure Number
Elevation Map with 10 ft Contours (HRC LiDAR)	1
SHALSTAB (Montgomery and Dietrich, 1994 and Palco, 2006) / Slope Class / Hillshade Maps	2
CGS Geology and Geomorphic Features (CGS, 1999)	3
Mass Wasting Potential Map (Palco, 1999)	4
Aerial Photo Map (HRC, 2007)	5
HRC Elk River WA deep-seated LS inventory (Palco, 2001)	6
Road Condition Map	7

Please see back of enrollment for references

Geological Summary (information presented from existing bodies of work):

Figure 3 shows the unit predominantly underlain by sedimentary rocks of the central belt of the Franciscan Complex. The eastern and western tips of the unit are underlain by Franciscan Mélange material. The contacts are mapped as dormant faults.

Figure 3 also maps the unit to be within the margins of a dormant (over 1-mile wide) earthflow. The side slopes of the well entrenched Class II watercourse confluence within the northern portions of the unit are mapped as debris slide slopes.

Figure 6 shows the northern half of the unit to be underlain by a northwest trending, moderate hazard landslide. A second

moderate hazard landslide is mapped south of the unit. The right lateral margin of the landslide has been identified as the northern channel side slope of the Class II watercourse that defines the southern boundary of the unit. The scarps of the moderate hazard landslides are mapped within the unit and essentially represent the flanking slopes to the watercourses.

Hillslope shade (Figure 2) shows the slope forms to be uniform with slightly irregular surface topography. Convincing morphology documenting earthflow morphology is not observed and may be in response to small of a scale of viewing.

The area has been clearcut and ground based yarded sometime around the turn of the century and commercially thinned in the last 20 years. No new roads are proposed for construction to access the unit to accommodate the harvesting of the timber.

The unit has been divided into two polygons for discussion purposes.

Summary of Changes to THP Prescriptions Based on Tier II Analysis in this Unit:

Geologic Review	Forestry Silviculture/Site Prep Plan	Operational Design Plan
3-1	<p>Silviculture has been amended to selection harvest with 100 sq. feet basal area retention.</p> <p>Site prep has been amended to none.</p>	No change to approved THP.
3-2	<p>Silviculture has been amended to selection harvest with 100 sq. feet basal area retention</p> <p>Site prep has been amended to none.</p>	No change.

THP Unit: # 3
Polygon: 3-1

A) General Observations	B) Harvest Related Impacts and Hillslope Sensitivity
<p>The polygon is triangular in shaped. The polygon is bound to the north and south by Class II watercourses. The eastern boundary is a road. Slope morphology is regionally convex with subtle swales. The slope morphology is typically not consistent with dormant landslide morphology. The polygon also includes a Class III watercourse in the east.</p> <p>The boundary Class II watercourses converge in the west. The northern Class II watercourse channel is moderately well defined with side slope inclinations consistently between 30 and 50%. A short, isolated segment in the east includes slope inclinations exceeding 60%. The watercourse is protected within a 75-foot buffer that includes a 30-foot no harvest zone adjacent to the creek. The remainder of the buffer is proposed for a harvest that will retain at least 60% canopy closure (selection) post harvest. The selection buffer has been expanded to 100 feet from the watercourse where the slope inclinations in the east have exceeded 50%.</p> <p>The Class II watercourse defining the southern boundary of the polygon is well entrenched with broad and wide channel side slopes. The channel sideslope inclinations consistently occur between 20 and 40% with a few locations in the east ranging up to 50%. The watercourse has been protected with a 75-foot buffer that includes a 30-foot no harvest zone adjacent to the watercourse and the remainder of the buffer maintaining at least 60% percent canopy closure.</p> <p>The Class III watercourse located in the eastern portion of the polygon appears moderately well defined for the creek classification. The side slopes appear long and vary in inclination from 20 to 40% where within</p>	<p>The degree of incision of the watercourses suggests that the large mapped deep seated landslides are very old.</p> <p>The initial clearcut harvesting during the turn of the century did not appear to reduce slope stability to failure thresholds. This is proven by the lack of historic, harvest related landslides within the polygon.</p> <p>The initial harvest also does not appear to have reactivated the dormant underlying landslide.</p> <p>The large buffers adjacent to the watercourse should act as a surface impediment to the downslope transport of harvest generated sediment and/or mass wasting.</p> <p>The limited number of Class III watercourse (1) suggests that the soils are well drained, therefore reducing the potential to develop significant pore pressures that may increase the potential for mass wasting.</p> <p>The debris slide slope mapping on Figure 3 likely identifies that slopes are more steeply inclined and if failure were to occur, the sediment would likely be delivered to the downslope watercourse. Based on the provided HCP watercourse buffers, we do not anticipate that these activities will result in a marked increase in the potential for mass wasting. It should be noted that the debris slide slopes within the operational portions of the polygon did not return</p>

A) General Observations	B) Harvest Related Impacts and Hillslope Sensitivity
<p>the operational portions of the unit. The Class III watercourses will retain all channel trees in addition to at least 75 sq. ft. of retention for the matrix selection. This harvest is targeting a retention closer to 100 sq. ft.</p> <p>The geometry and well entrenched geomorphic definition of the watercourses suggests that if mass wasting is underlying the unit, the mass wasting is very old allowing for the downcutting of watercourse channels. The general downslope direction of the polygon is to the northwest.</p> <p>One pixel (30'X 30') of elevated SHALSTAB has been modeled within the polygon. The pixel is located roughly 100 feet upslope of the Class II watercourse and is proposed for selection harvest. Mass Wasting potential for the unit has been modeled as low.</p> <p>No landslides were recorded in the THP during development and agency review. This contradicts the mapping presented in Figure 3 of debris slide slopes adjacent to the Class II confluence. The majority of these mapped slopes are located within the RMZ for the Class II watercourse thereby limiting the harvest and the methods of yarding.</p> <p>The stand appears to have been commercially thinned within the last 10 to 20 years. The harvest was conducted with ground based tractors. The stand is predominantly redwood (80%).</p>	<p>high values of SHALSTAB.</p>

THP Unit: # 3
Polygon: 3-1

C) Forestry / Silviculture Plan	D) Operational Design Plan
<p>THP approved silviculture was originally clearcut, but has been amended to selection silviculture with a targeted retention of 100 ft² BA/A due to a management change. A 30 foot no cut Class II RMZ inner band and a 60% canopy retention outer band 100 feet upslope of the watercourse,</p> <p>Site preparation has been amended to none due to selection silviculture.</p>	<p>THP approved yarding method is tractor with an option of cable or helicopter. This is conducive to the typically moderate to gently inclined slopes. A slope dependent equipment exclusion zone (EEZ) exists 75 to 100 feet from the Class III watercourse. Tractors will not be allowed within this buffer further reducing the potential for site disturbance that may increase the potential for shallow mass wasting.</p>

THP Unit: # 3
Polygon: 3-2

A) General Observations	B) Harvest Related Impacts and Hillslope Sensitivity
<p>The polygon includes the southern 2/3 of the harvest unit. The polygon is typically a very broad, moderately defined convex ridge trending northwest. The polygon is bound to the north by a moderately well define Class II watercourse that is also mapped (Figure 6) as the left lateral margin of a further north landslide. The southern boundary is also a Class II watercourse of similar geomorphic characteristics. The southern Class II watercourse is mapped (Figure 6) as the right lateral margin of a further south dormant landslide. The polygon is bound to the east and west by existing main haul roads.</p> <p>Slope inclination varies from 10 to over 60%. The average is likely</p>	<p>The lack of observed landslides within the polygon suggest that the impacts resulting from the initial ground based clearcut did not exceed mass wasting thresholds.</p> <p>The portions of the polygon that include elevated values of SHALSTAB are mapped adjacent to watercourses, but when evaluated against topography, it is observed that travel distances are significantly longer due to the western drainage of the slopes. This means that the travel path of a failure is longer and would require traveling through considerably more forested stand (RMZ outerband) to reach</p>

A) General Observations	B) Harvest Related Impacts and Hillslope Sensitivity
<p>around 30 to 40%. The steeper segments are located along the south-facing flanking slopes of the ridge, upslope of the southern Class II watercourse and consistent with Figure 6 scarp mapping.</p> <p>The northern Class II watercourse is broadly entrenched. The watercourse is protected with a 30-foot no harvest buffer adjacent to the creek and a selection harvest buffer that extends 75- to 100-foot dependent upon slope inclination. The retention within the outerband of the watercourse will result in at least 60% canopy closure post harvest.</p> <p>The southern Class II watercourse is within a more prominently defined and incised channel. This results in a greater occurrence of more steeply inclined channel side slopes. The watercourse is protected with a 30-foot no harvest buffer adjacent to the creek and a selection harvest buffer that extends 75 to 100 feet in length and is dependent upon slope inclination. The retention within the outerband of the watercourse will result in at least 60% canopy closure post harvest.</p> <p>No Class III watercourses are located within the polygon.</p> <p>Elevated values of SHALSTAB are modeled within the unit atop the moderately inclined slopes south of the ridge and drain to the west. Field review of the elevated SHALSTAB (value 2) did not display evidence of recent or historical mass wasting.</p> <p>Mass Wasting Potential (MWP) is modeled low for the polygon.</p> <p>No historic landslides were identified in the polygon during THP preparation and agency review.</p> <p>Skid roads exist within the more gently inclined slopes within the</p>	<p>the watercourse.</p> <p>The selection harvesting of the redwood dominated stand is not likely to result in a significant increase in the potential for mass wasting and where the canopy is sufficiently reduced the cut stumps will likely sprout.</p>

A) General Observations polygon.	B) Harvest Related Impacts and Hillslope Sensitivity
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THP Unit: # 3

Polygon: 3-2

<p>C) Forestry / Silviculture Plan</p> <p>THP approved silviculture was originally clearcut, but has been amended to group selection silviculture with a targeted retention of 100 ft² BA/A due to a management change. A 30 foot no cut Class II RMZ inner band and a minimum 60% canopy retention outer band 100 feet upslope of the watercourse.</p> <p>Site preparation has been amended to none due to selections silviculture.</p>	<p>D) Operational Design Plan</p> <p>As approved in the THP, this area is tractor with a cable or helicopter option. This appears to be reasonable with use of existing skid roads where slopes are inclined greater than 50% and the RMZ for the Class II watercourses also implemented Equipment Exclusion Zones. We provide no changes.</p>
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References:

- CGS, 1999, Geology and Geomorphic Features Related to Landsliding, Freshwater Creek, Humboldt County, California, DMG OFR 99-10, dated 1999. http://redirect.conservation.ca.gov/CGS/information/publications/database/Publications_year.asp
- Montgomery, D.R. and W.E. Dietrich, 1994. A physically based model for the topographic control on shallow landsliding. *Wat. Resour. Res.* 30: 1153-1171. For specific details regarding the model used in this evaluation, please see Palco, 2006. Additional information from the model authors is available at the following website: <http://socrates.berkeley.edu/~geomorph/shalstab>
- HRC, 2007, Ortho-photo rectified aerial photographs flown by 3Di West, Eugene Oregon,
- HRC, 2008. Freshwater Creek and Elk River WDR Permit Acreage Enrollment and Compliant Monitoring Program, NCRWQCB R1-2006—0039 and R1-2006-0041, Quality Assurance Project Plan, Version 3.0. Policy document submitted to NCRWQCB dated June 7, 2006.
- Palco (The Pacific Lumber Company), 2002, The Pacific Lumber Company (PALCO) Prescriptions Based on Watershed Analysis for Freshwater Creek, California, August 15, 2002.
- PALCO, 1999, Habitat Conservation Plan, Vol. 2 Part D, Landscape Assessment of Geomorphic Sensitivity, Public Review Draft.

Brief descriptions of the models used in this evaluation:

SHALSTAB was first described in Dietrich and Montgomery (1994). SHALSTAB is a simple, physically-based model based on the Mohr-Coulomb failure law that can be used to map shallow landslide potential. The model calculates the potential for failure using gridded digital elevation data. The simplicity of the model lies in the formulation of slope stability parameters that allow the model to be run parameter-free using default values suggested by the authors or determined by local measurement. Because the model uses no field measurements of critical characteristics that determine slope stability, the evaluation of potential instability is only an approximation. In applying SHALSTAB for Tier 2 enrollment, HRC has run the model on a 10-m spatial grid using LiDAR elevation data and applied the parameters as suggested by the model authors. HRC's application of the method and parameters are described in PALCO (2006).

Mass Wasting Potential (MWP) modeling is a cursory regional assessment that numerically values soil, slope inclination, geology type, and geomorphology with respect to past mass wasting. The sums of the values specific to an area are measured against a set ranking system that extends from very low to extreme. The models intent is to highlight areas of high potential for instability at the planning level. The model's use at the site specific level is limited in that pedogenic soil types are used, not textures, the geologic formations

utilized provide one value for all of the incorporated facies, and the model is heavily biased if past mass wasting has occurred or has been mapped as occurring in the area.

Table 1. Proposed 2009 Harvest in Freshwater Creek

THP Name	THP Number	Unit Number	Silviculture				CC Equivalent	Hazard	
			CC	ROW	CT	SEL		Low	High*
Little 34	08-048	1				22.4	11.2	22.4	0.0
Little 34	08-048	3				30.3	15.2	27.4	10.8
McCready Ridge	07-132	1	0	0	0	15.6	7.8	15.6	0.0
McCready Ridge	07-132	2	0	0	0	15	7.5	13.1	7.3
Around gills	05-077	4		3.1		36.2	21.2	38.6	2.7
Mid Incline	05-123	1		0.4		26.2	13.5	4.8	83.7
Mid Incline	05-123	2				31.5	15.8	31.5	0.0
Mid Incline	05-123	3				28.7	14.4	24.4	16.4
Fresh 1	04-242	2				36.1	18.1	34.3	6.9
Fresh 1	04-242	3				27.4	13.7	27.1	1.2
Little Fresh	05-176	1				36.3	18.2	30.1	23.8
Little Fresh	05-176	2				20	10.0	12.4	29.2
Little Fresh	05-176	3				5.7	2.9	5.7	0
Little Fresh	05-176	5				39.6	19.8	39.6	0.0
Little Main	05-085	2				29.7	14.9	14.3	59.1
Little Main	05-085	3				25.3	12.7	16	35.7
Little Main	05-085	7				33.3	16.7	19.5	53.0
Whiskey	08-041	1				20.9	10.5	20.6	1.2
Whiskey	08-041	2				23.5	11.8	23.2	1.2
Whiskey	08-041	3				35.4	17.7	29.6	22.4
Whiskey	08-041	4				32	16.0	32	0.0
Whiskey	08-041	5				11.3	5.7	9.5	6.9
						Total	294.7		

*The acres represented here have been converted to High Hazard Acres by multiplying by 3.8404.

Highlight indicates a THP and Specific Unit to be enrolled prior to establishing an enforceable Zero Discharge Monitoring Plan (Tier I). Weighted Acreage Totals are listed below to demonstrate compliance with the Staff Landslide Model limit of 144 Harvest Acres in Freshwater Creek. Other THP Units will be enrolled after approval of the aforementioned Monitoring Plan

No Highlight Indicates a THP and Specific Unit to be enrolled after establishment of an enforceable Zero Discharge Monitoring Plan (Tier II).



Indicates tier 1 for ROW and tier 2 for remainder of the unit

Total Clear Cut Equivalent Acres enrolled or submitted for enrollment	145.1
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Table 2. Summary of THPs to enrolled prior to establishment of Zero Discharge Monitoring Plan for Freshwater Creek

THP Number	Unit Number	Harvest Acres	Hazard	
			Low	High*
08-048	1	22.4	22.4	0.0
05-077	4	3.1	3.1	0.0
05-176	5	39.6	39.6	0.0
08-041	1	20.9	20.6	1.2
08-041	2	23.5	23.2	1.2
08-041	4	32.0	32	0.0
Totals		141.5	143.3	

Table 3. Summary of THPs by Yarding System and Site Preparation for Freshwater Creek

THP Name	THP Number	Unit Number	Yarding System			Site Preparation	
			Ground Based	Yarder	Helicopter	Mechanical	Broadcast
Little 34	08-048	1	3.9	18.5			
Little 34	08-048	3	6.9	23.4			
McCready Ridge	07-132	1	0	15.6			
McCready Ridge	07-132	2	10.1	4.9			
Around gills	05-077	4	17.7	20.5			
Mid Incline	05-123	1	0	26.2			
Mid Incline	05-123	2	11.5	23			
Mid Incline	05-123	3	0	28.7			
Fresh 1	04-242	2	10.9	25.2			
Fresh 1	04-242	3	0	27.4			
Little Fresh	05-176	1	0	36.3			
Little Fresh	05-176	2	7.3	12.7			
Little Fresh	05-176	3	0	5.7			
Little Fresh	05-176	5	0	39.6			
Little Main	05-085	2	0	29.7			
Little Main	05-085	3	0	25.3			
Little Main	05-085	7	0	33.3			
Whiskey	08-041	1	20.9	0			
Whiskey	08-041	2	11.7	11.8			
Whiskey	08-041	3	9.3	26.1			
Whiskey	08-041	4	19	13			
Whiskey	08-041	5	0	11.3			

Humboldt Redwood Co. LLC

Erosion Control Plan (ECP) for
the “Fresh 1” THP

1-04-242HUM

Updated ECP – for purpose of identifying **Tier 2** erosion control sites specific to units 2 & 3 (2009 enrollment requests); site G51 (Road X65.44) and site G59.5 (Road X65.4486) are erosion control sites located on the spur road system leading specifically to These unit.

This plan is being included in the THP to partially meet the requirements of the North Coast Regional Water Quality Control Board Watershed-wide Discharge Requirements. (**WWDRs**)

All operational portions of this ECP
that are to be enforced through the Forest Practice Rules
have been included in Section II of the THP.

Version **20080226**

Humboldt Redwood Company LLC Erosion Control Plan (ECP)

This document addresses the requirements of the California Regional Water Quality Control Board, North Coast Region Order No. R1-2006-0041 (Freshwater Creek) for an Erosion Control Plan (ECP) related to timber harvest activities on Non-Federal lands in the North Coast Region (Sec. III D2 and D3). The responsible party for this ECP is Humboldt Redwood Co. LLC P.O. Box 712 Scotia, CA 95565 (707) 764-2330.

This ECP is submitted for: THP Name: **Fresh 1**
Contact Person: **Jon Woessner** Phone: **(707) 764-4376**

The landowner is committed to a wide variety of measures to prevent and minimize the discharge or threatened discharge of sediment from controllable sediment discharge sources as part of this project into the waters of the state in violation of applicable water quality requirements. Prevention and Minimization of Controllable Sediment Discharge Sources associated with this project are identified in the *Controllable Sediment Sources* table. The specific conditions of sediment discharge sources and a summary of prevention and minimization measures (Section I) are identified in the table. General prevention and minimization measures for the project (Section II) are incorporated in the ECP by reference.

The RPF and/or the RPF Designee have conducted an inventory of potential "controllable sediment discharge sources" within the project area. As defined in California Regional Water Quality Control Board Order No. R1-2006-0041 (Freshwater Creek).

"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 applicable water quality requirements or other provisions of these WWDRs,
2. was caused or affected by human activity, and
3. may feasibly and reasonably respond to prevention."

Upon guidance of the North Coast Regional Water Quality Control Board (NCRWQCB) staff, discharge from the source must be likely to occur during the life of the Timber Harvesting Plan (THP) and WWDR. (Holly Lundborg, personal communication)

The inventory method consisted of an appurtenant road survey, aerial photos and ground assessments of the harvest units, and a complete ground assessment of all watercourses and associated stream protection zones.

The schedule for implementing the prevention and minimization management measures for the controllable sediment sources will be consistent with the duration of the THP. These measures will be implemented in accordance with the priority level assigned to each site. High priority sites will be addressed first with low priority sites to follow. Work at all sites will be accomplished prior to THP expiration. The general prevention and minimization measures will be implemented concurrent with operations.

I. Inventory and Treatment of Controllable Sediment Sources

All controllable sediment sources are listed in the attached "Erosion Control Plan" table. These sources have been assigned a treatment priority of low, medium or high based on: 1) potential for significant sediment delivery to a Class I, II or III channel; 2) treatment immediacy (a subjective combination of event probability and sediment delivery); and 3) treatment cost-effectiveness.

The Prioritization for implementing prevention and minimization measures for road-related and non road-related controllable sediment sources is based upon guidance provided in Order No. R1-2006-0041 (Freshwater Creek)

Highest priority is assigned to the largest sediment discharge sources that discharge to waters that support domestic water supplies or fish. HRC's prioritization method considers this guidance, and combines it with consideration for accessibility and level of imminent risk of significant sediment discharge. Sources that receive a high priority rating will be treated by a date certain as noted in the Controllable Sediment Sources table. Sources that receive a low or medium rating are determined to have a low to moderate risk of imminent discharge and will be treated prior to completion of the THP, or as otherwise indicated.

Non-road related controllable sediment sources can include skid road crossings, yarding furrow, skid road in watercourse, perched skid road fill, skid road rutting, landslide, layouts, railroad grade, incline, etc.

Information specific to Controllable Sediment Discharge Sources is listed in the Controllable Sediment Sources Table, below. An explanation of information provided in that table is provided below.

II. General Prevention and Minimization Measures for Controllable Sediment Discharge

In addition to the site specific measures detailed above, the general measures proposed in this project, either as required by another State or Federal regulating agency, or as a matter of HRC policy, will prevent or minimize future sediment delivery. These measures include, but are not limited to measures incorporated in the THP Section Items as follows:

THP Section II:

- Item 14 – Describes silvicultural prescriptions
 - (i) Site Preparation – Disclosure of selected site preparation treatments and mitigation measures
- Item 16 – Harvesting Practices – Describes yarding systems, equipment utilized, equipment limitations, and drainage facility installation timing
 - Inclusive through (m) – equipment use limitations and mitigation
- Item 18 – Soil Stabilization – waterbreak requirements, mitigation to minimize soil disturbance and sediment transport
- Item 20 – Ground Based Equipment Use Location
- Item 21 – Ground Based Equipment Use in Sensitive Areas – locations, descriptions of operations, limitations and mitigation measures
- Item 22 – Alternative Practices to Harvesting and Erosion Control
- Item 23 – Winter Operations – Provides descriptions of limitations and mitigation measures required during winter period operations and Winter Operating Plan
- Item 24 – Roads and Landings – Describes road and landing construction and reconstruction operations, limitations, drainage relief structure installation, mitigation measures, road maintenance, inspections and wet weather road use restrictions
- Item 25 – Site Specific Measures to Reduce Adverse Impacts and Special Instructions to the LTO
- Item 26 – Watercourse and Lake Protection (WLPZ)
- Item 27 – "In Lieu" WLPZ Practice(s)
- Item 28 – Downstream Water Users Notification and Domestic Water Supply Protection
Description of protection measures
- Item 29 – Sensitive Watershed – Identifies whether the plan is located in a designated sensitive watershed and mitigation measures
- Item 29 – 1 Hillslope Management (HCP 6.3.3.7) – Describes HCP hillslope management measures required as per watershed analysis

THP Section V:

- Sediment Reduction from Roads and THP Sediment Production--Including Table 1 – “Sediment Delivery for Units and Roads for this THP,” references, letter regarding Road related sediment assessment for this THP with the calculations of deliverable net cubic yards of sediment, calculations and PWA information related to the THP project area when available

Maps attached:

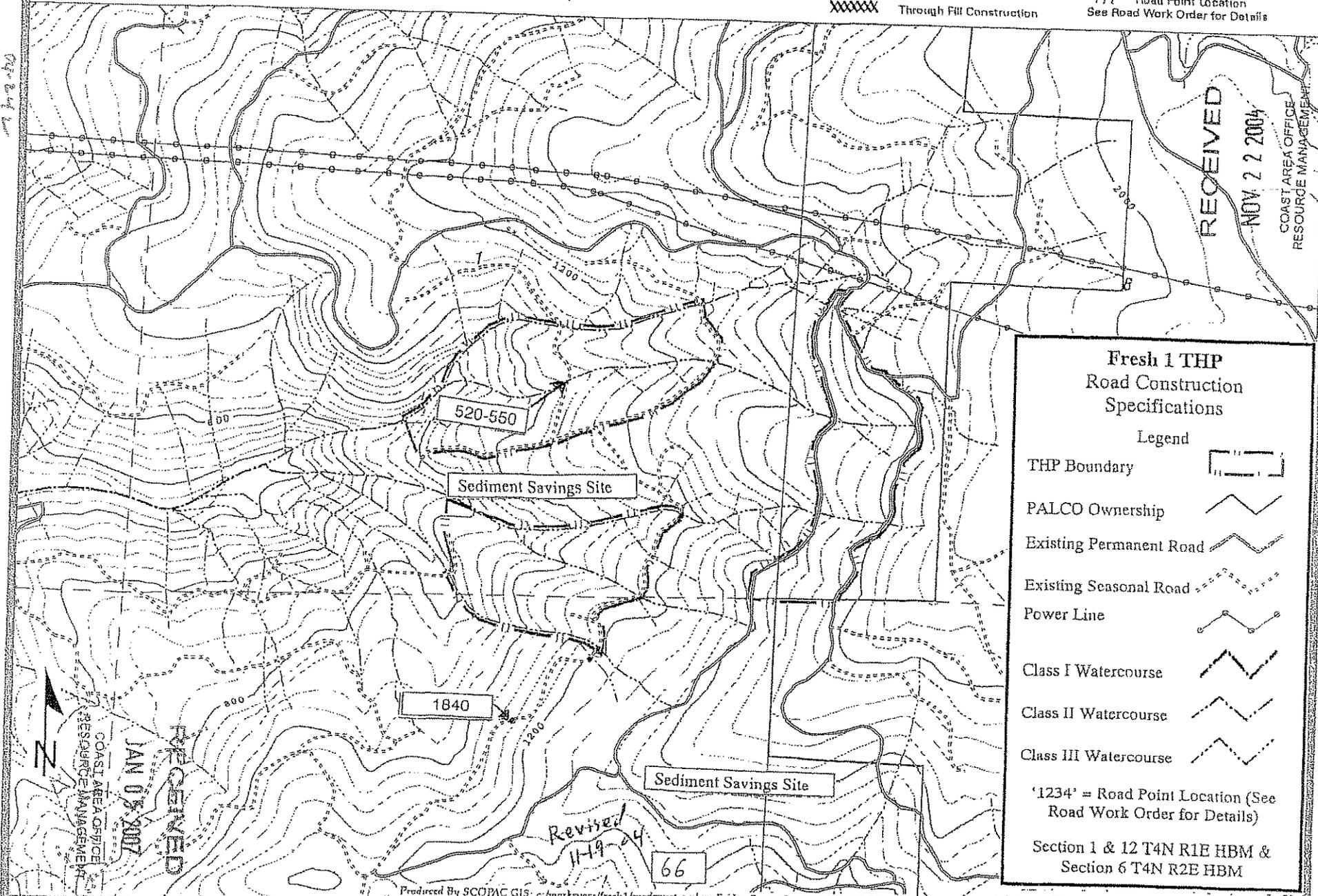
- ECP Site Locator Map

Fresh 1 Road Construction Specifications

Data as of September 10, 2004

PART OF PLAN

- ||||| Full Bench Construction
- ||||| Cut and Fill Construction
1/2 Cut and 1/2 Fill
- XXXXXX Through Fill Construction
- Keyway Construction
Fill Bottom-up Compaction
- "772" Road Point Location
See Road Work Order for Details



Fresh 1 THP Road Construction Specifications

Legend

THP Boundary	[Symbol]
PALCO Ownership	[Symbol]
Existing Permanent Road	[Symbol]
Existing Seasonal Road	[Symbol]
Power Line	[Symbol]
Class I Watercourse	[Symbol]
Class II Watercourse	[Symbol]
Class III Watercourse	[Symbol]

'1234' = Road Point Location (See Road Work Order for Details)

Section 1 & 12 T4N R1E HBM &
Section 6 T4N R2E HBM

III Inspection Plan and Reporting Requirements

A. Inspection Plan

The Inspection Plan is designed to ensure that all required management measures are installed and functioning prior to rainfall events; that the management measures are effective in controlling sediment discharge sources throughout the winter period; and that no new controllable sediment discharge sources developed.

B. Qualified and trained professionals will conduct all specified inspections of the project site to identify areas causing or contributing to a violation of the applicable water quality requirements or other provisions of these WWDRs. The responsible party for inspection and reporting is **Mike Miles (707) 764-4173**.

C. No inspections are required in Project Areas where Timber Harvest Activities have not yet commenced.

D. Project Areas where Timber Harvest Activities have commenced and no winter period Timber Harvest Activities have occurred inspections will be conducted each year and throughout the duration of the Project while Timber Harvest Activities occur.

a. The Project is covered under WWDRs and the following inspection requirements will begin at the startup of timber harvest activities within the Project area:

- i. By November 15 to assure Project Areas are secure for the winter period;
- ii. Once following ten (10) inches of cumulative rainfall commencing on November 15 and prior to March 1, as worker safety and access allows; and
- iii. 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 discharges sources have developed.

b. Project Areas with Winter Period Timber Harvest Activities will conduct inspections of such Project Areas while Timber Harvesting Activities occur and the Project is covered under the WWDRs as follows:

- i. Immediately following cessation of winter period Timber Harvest Activities to assure areas with winter Timber Harvest Activities are secure for the winter;
- ii. Once following ten (10) inches of cumulative rainfall commencing on November 15 and prior to March 1, as worker safety and access allows; and
- iii. 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 discharges sources have developed.

c. Inspection reports will identify where management measures have been ineffective and when repairs and design changes will be implemented to correct management measure failures.

d. After completing the required inspections, and when it has been determined new controllable sediment discharges sources have developed, the ECP, implementation schedule, and inspection plan will be updated, if required, consistent with the WWDRs and submit the updated documents to the Regional Water Board to maintain coverage under the WWDRs. If the approved amendment is found to be out of compliance with the WWDRs, the Project will be amended to be consistent with the provisions of the WWDR within 30 days, or coverage under the WWDRs will be terminated. The Project will then be required to seek Project coverage under an individual WDR.

e. Equipment, materials, and workers will be available for rapid response to failures and emergencies, implement, as feasible, emergency management measures depending upon field conditions and worker safety for access.

- D. If during the inspection or during the course of conducting timber harvest activities, a violation of an applicable water quality requirement or conditions of WWDRs is discovered, the following procedures will be followed:
- a. When it has been determined that discharges are causing or contributing to a violation or an exceedence of an applicable water quality requirement or a violation of a WWDR prohibition:
 - i. Corrective measures will be implemented immediately following the discovery that applicable water quality requirements were exceeded or a prohibition violated, followed by notification to the Regional Board by telephone as soon as possible but no later than 48 hours after the discharge has been discovered. The notification will be followed by a report within 14 days to the Regional Board, unless otherwise directed by the Executive Officer, that includes:
 - 1. the date the violation was discovered;
 - 2. the name and title of the person(s) discovering the violation;
 - 3. a map showing the location of the violation site;
 - 4. a description of recent weather conditions prior to discovering the violation;
 - 5. the nature and cause of the water quality requirement violation or exceedence or WWDR prohibition violation;
 - 6. photos of the site characterizing the violation;
 - 7. the management measure(s) currently being implemented;
 - 8. any maintenance or repair of management measures;
 - 9. any additional management measures which will be implemented to prevent or reduce discharges that are causing or contributing to the violation or exceedence of applicable water quality requirements or WWDR prohibition violation; and,
 - 10. The signature and title of the person preparing the report.
 - 11. The report will include an implementation schedule for corrective actions and describe the actions taken to reduce the discharges causing or contributing to violation or exceedence of applicable water quality requirements or WWDR prohibition violation.
- E. For other inspections conducted where violations are not discovered, a summary report will be submitted to Executive Officer by June 30th for each year of coverage under the WWDRs or upon termination of coverage. The summary report, at a minimum will include the date of inspections, the inspector's name, the location of each inspection, and the title and name of the person submitting the summary report.

If helicopter operations are proposed for this project, please find attached a Columbia Helicopters, Inc. (CHI) Fuel Spill Prevention and Cleanup Plan For Columbia Helicopters Field Operations.

Explanation of Information Included in the Controllable Sediment Sources Table	
Column Heading	Explanation
Site No.	Site identification unique to project area
Site Type	A description of the existing site. Example: Humboldt Crossing; Culvert Crossing; Unstable Fill; Unstable Cut Slope; Diversion Potential.
Estimate of Potential Erosion	A quantitative estimate of the volume, in cubic yards, of the total amount of potential erosion/displacement of soil that will occur should the site entirely fail. PALCO often uses a methodology developed by Pacific Watershed Associates to estimate erosion, which assumes 100% delivery of calculated volume—use of this method for individual sites is noted in Site Description.
Potential Sediment Delivery Percent	An estimate of the relative potential for sediment delivery expressed as a percent of the total amount of Potential Erosion that will be discharged to waters of the State should the site fail.
Sediment Prevention Volume	The volume, in cubic yards, of sediment discharge estimated to be prevented by implementation of the prescribed treatment. Volume represents the Estimate of Potential Erosion multiplied by the Potential Sediment Delivery Percent.
Priority for Treatment	Treatment priority reflects the immediacy of sediment discharge and the relative risk to the receptor, should the site fail. Low priority sites are ones that will not likely deliver significant amounts of sediment during the life of the WWDR permit, and will be treated prior to filing of THP work completion report, which does not exceed 5-years following THP approval date. Medium or high priority sites indicate potentially imminent discharge, and the timing of treatment is indicated in Implementation Schedule column.
Implementation Schedule	Indicates the timing of implementing the prevention and minimization measures listed in the Treatment column.
Site Description	Provides sufficient information that describes the existing condition of the site and factors that inform the chosen treatment methods and implementation schedule. This information will include a description of how the existing condition of the site (ie. stable or unstable) will be affected by different storm events, and whether sediment discharge is imminent. For example, an unstable site could easily discharge significant amounts of sediment in a small storm, thus the treatment priority should be higher. Conversely, a stable site that may take one or more very large storms to trigger discharge could be lower treatment priority. If PWA method is used to calculate erosion/delivery volumes, it will noted here.
Treatment	Sediment discharge prevention and minimization measures that will be implemented at the site, including treatment specifications if necessary.

Attachments:

- ECP Table

Erosion Control Plan

Site	Site Type	Est. Potential Erosion (Cu.Yards)	Est. Potential Delivery (Cu.Yards & %)	Priority for Treatment	Implementation Schedule	Site Description	Treatment
Project fresh 1							
Rd X65.44 Station 1840 Site G51 ID 1978998227	Culvert Maintenance	67	67 100%	Med	Prior to THP Final Completion.	Plugged culvert, clean CMP outlet.	Clean CMP outlet.
Rd X65.4486 Station 520 Site G59.5 ID -1026592463	Failing Fill	265	265 100%	Low	Prior to THP Final Completion.	Excavate unstable fill.	Excavate unstable fill.
Total Estimated Yard		332	332				

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 RESOURCE MANAGEMENT

Figure 1

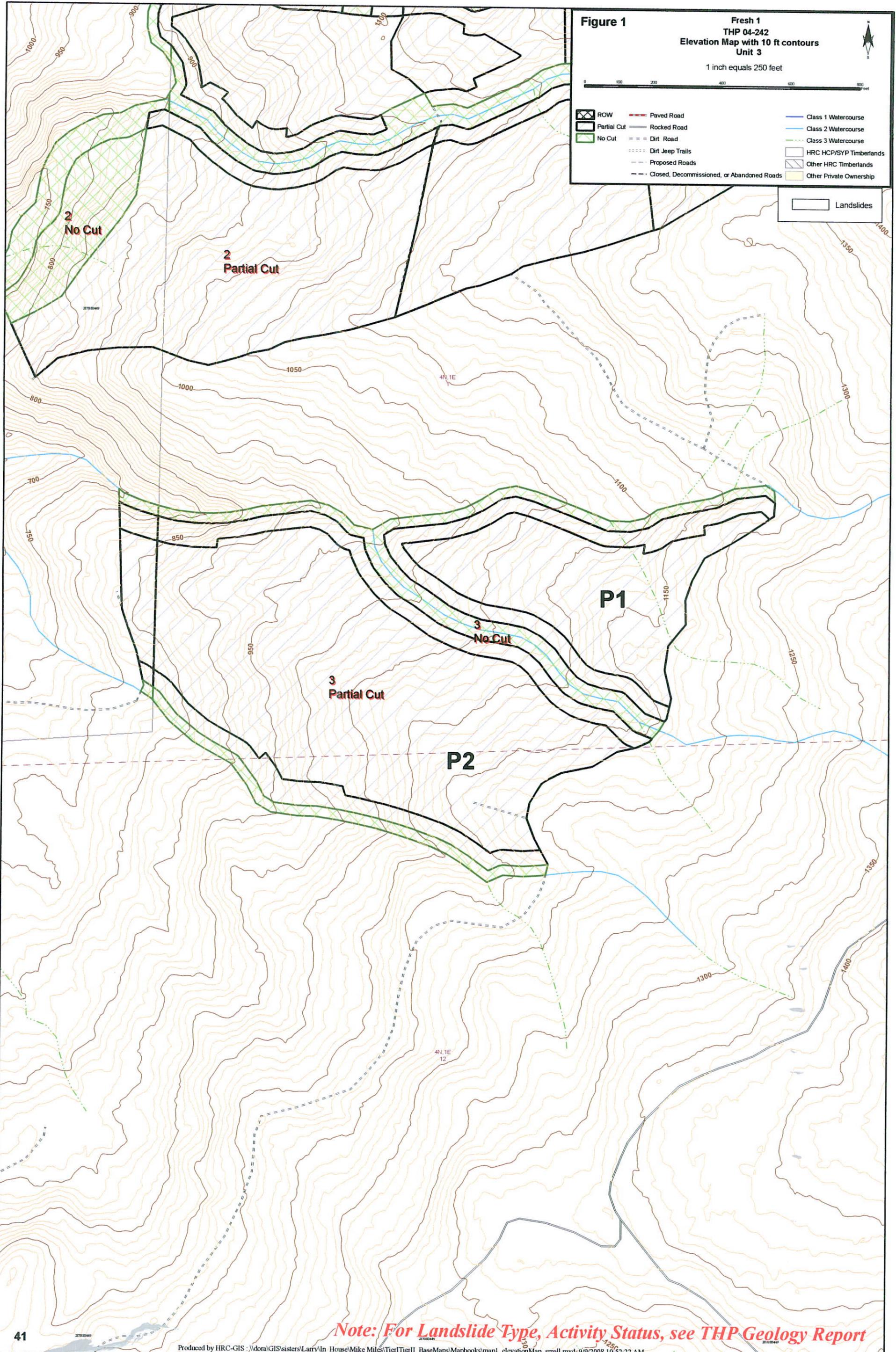
Fresh 1
THP 04-242
Elevation Map with 10 ft contours
Unit 3

1 inch equals 250 feet



- ROW
- Partial Cut
- No Cut
- Paved Road
- Rocked Road
- Dirt Road
- Dirt Jeep Trails
- Proposed Roads
- Closed, Decommissioned, or Abandoned Roads
- Class 1 Watercourse
- Class 2 Watercourse
- Class 3 Watercourse
- HRC HCP/SYP Timberlands
- Other HRC Timberlands
- Other Private Ownership

Landslides



Note: For Landslide Type, Activity Status, see THP Geology Report

Figure 2

Fresh 1
Twp 04-242
Shalstab 10 mts grid / Slope Class Map
Unit 3

1 inch equals 250 feet

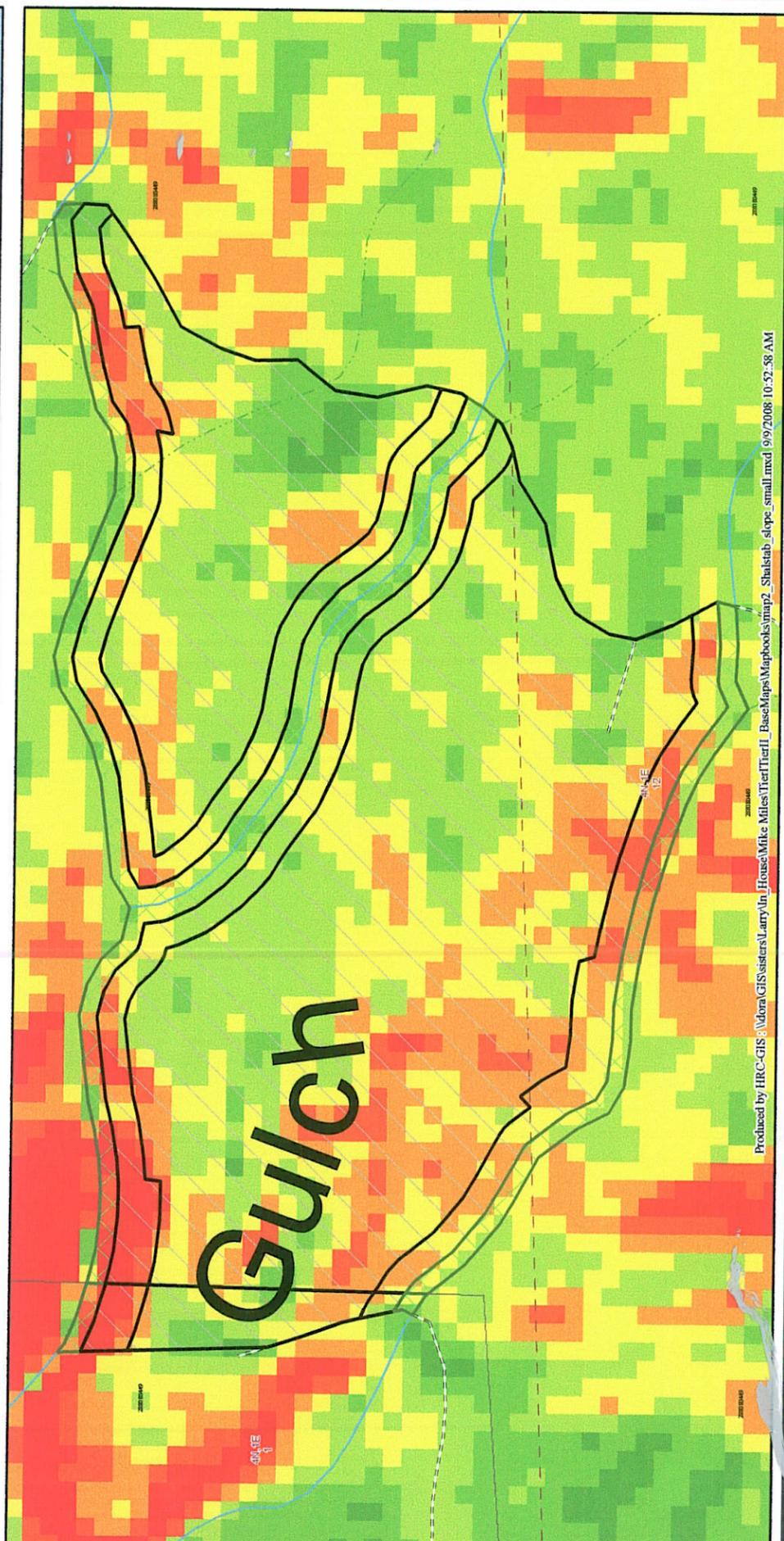
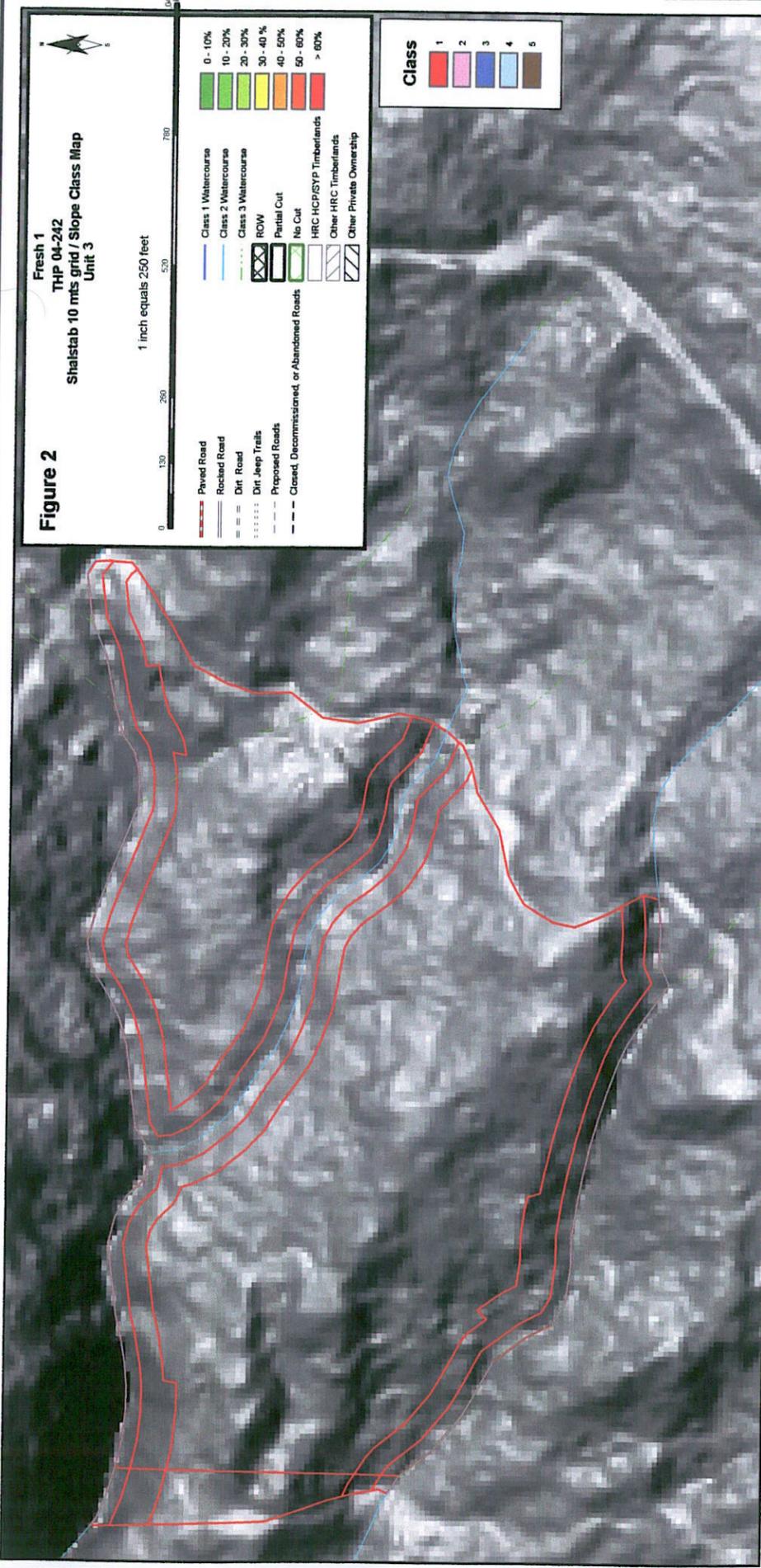
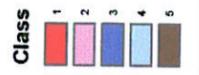
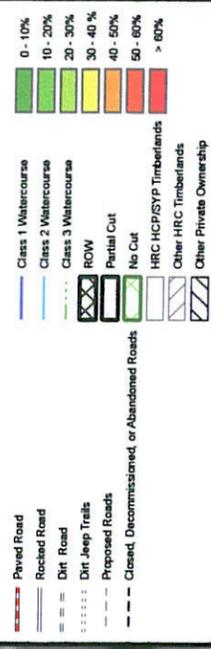
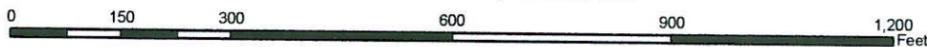


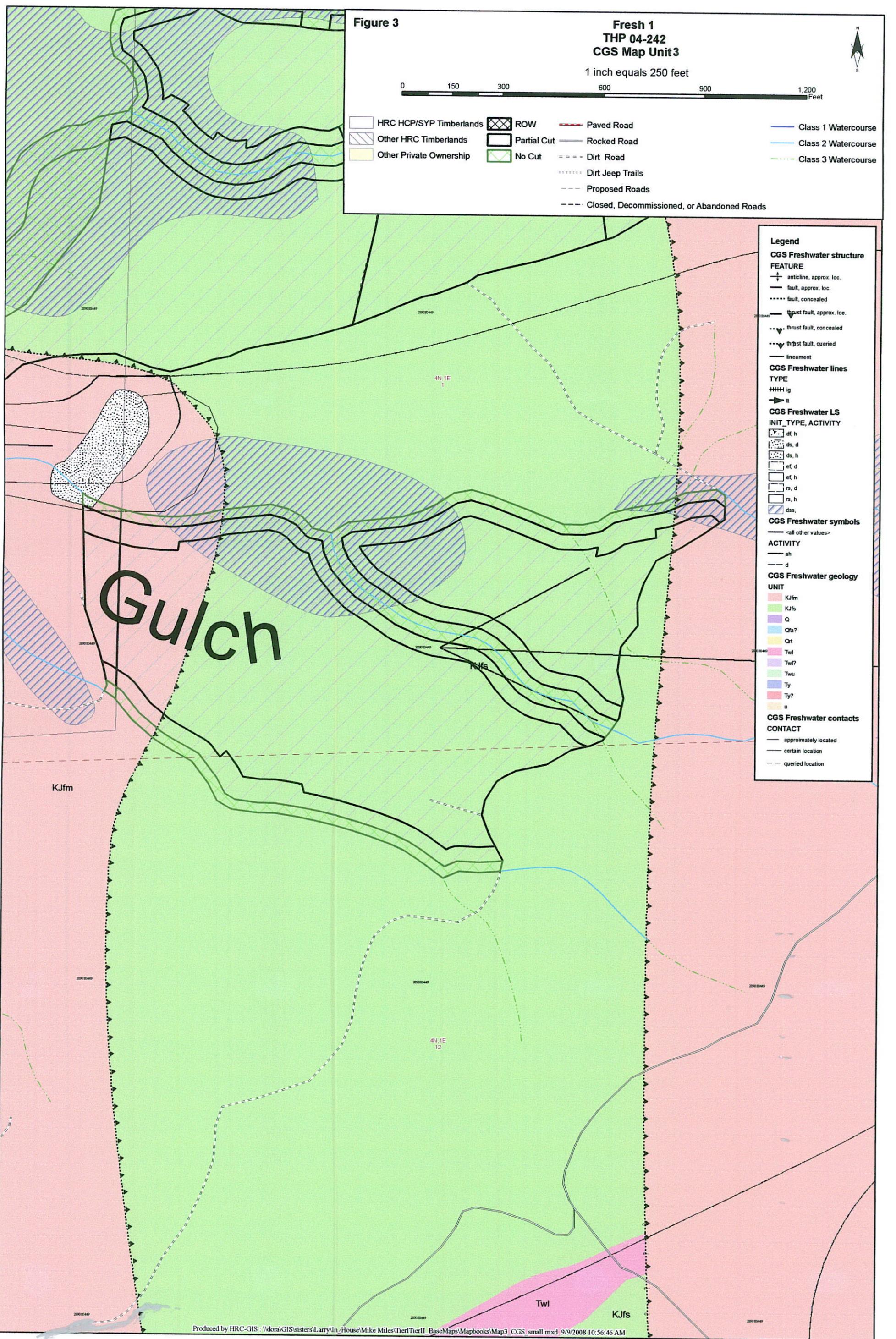
Figure 3

Fresh 1
THP 04-242
CGS Map Unit 3

1 inch equals 250 feet



- | | | | |
|-------------------------|-------------|--|---------------------|
| HRC HCP/SYP Timberlands | ROW | Paved Road | Class 1 Watercourse |
| Other HRC Timberlands | Partial Cut | Rocked Road | Class 2 Watercourse |
| Other Private Ownership | No Cut | Dirt Road | Class 3 Watercourse |
| | | Dirt Jeep Trails | |
| | | Proposed Roads | |
| | | Closed, Decommissioned, or Abandoned Roads | |



- Legend**
- CGS Freshwater structure**
- FEATURE**
- anticline, approx. loc.
 - fault, approx. loc.
 - fault, concealed
 - thrust fault, approx. loc.
 - thrust fault, concealed
 - thrust fault, queried
 - lineament
- CGS Freshwater lines**
- TYPE**
- ig
 - ii
- CGS Freshwater LS**
- INIT_TYPE, ACTIVITY**
- df, h
 - ds, d
 - ds, h
 - ef, d
 - ef, h
 - rs, d
 - rs, h
 - dss,
- CGS Freshwater symbols**
- <all other values>
- ACTIVITY**
- ah
 - d
- CGS Freshwater geology**
- UNIT**
- KJfm
 - KJfs
 - Q
 - Qfa?
 - Qrt
 - Twl
 - Twl?
 - Twu
 - Ty
 - Ty?
 - u
- CGS Freshwater contacts**
- CONTACT**
- approximately located
 - certain location
 - queried location

Gulch

KJfm

4N, 1E
12

Twl

KJfs

Figure 4

Fresh 1
THP 04-242
Mass Wasting Potential
Unit 3

1 inch equals 250 feet



- | | | |
|-------------------------|---------------------------|--|
| HRC HCP/SYP Timberlands | Class 1 Watercourse | Paved Road |
| Other HRC Timberlands | Class 2 Watercourse | Rocked Road |
| Other Private Ownership | Class 3 Watercourse | Dirt Road |
| ROW | DS & Amphitreatre / Slope | Dirt Jeep Trails |
| Partial Cut | | Proposed Roads |
| No Cut | | Closed, Decommissioned, or Abandoned Roads |
- Potential**
- Very Low
 - Low
 - Moderate
 - High
 - Very High
 - Extreme

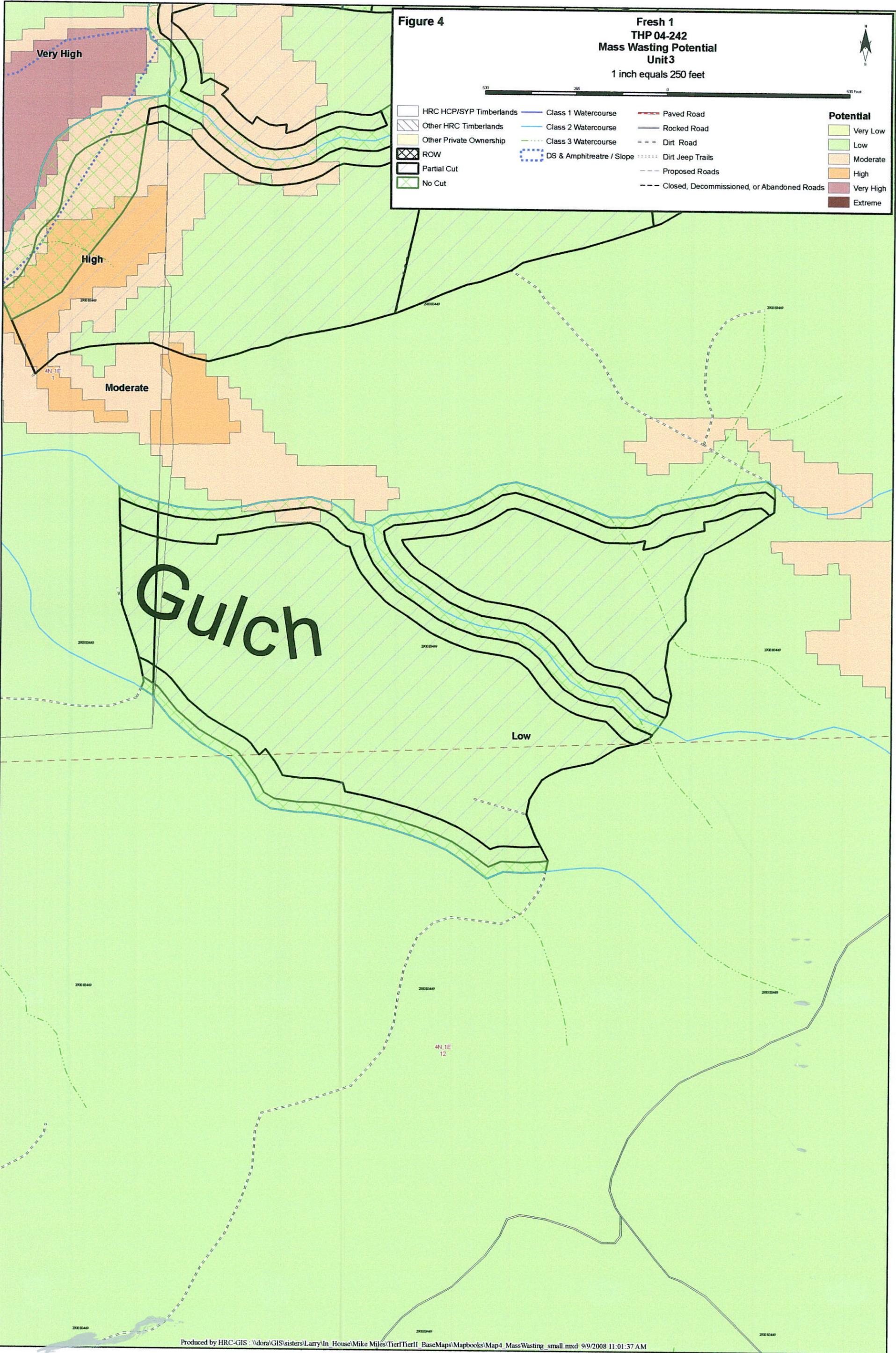


Figure 5

Fresh 1
THP 04-242
Aerial Photo Map - Unit 3

1 inch equals 250 feet

- | | | | | | | | |
|--|-------------------------|--|-------------|--|---------------------|--|--|
| | HRC HCP/SYP Timberlands | | ROW | | Class 1 Watercourse | | Paved Road |
| | Other HRC Timberlands | | Partial Cut | | Class 2 Watercourse | | Rocked Road |
| | Other Private Ownership | | No Cut | | Class 3 Watercourse | | Dirt Road |
| | | | | | | | Dirt Jeep Trails |
| | | | | | | | Proposed Roads |
| | | | | | | | Closed, Decommissioned, or Abandoned Roads |

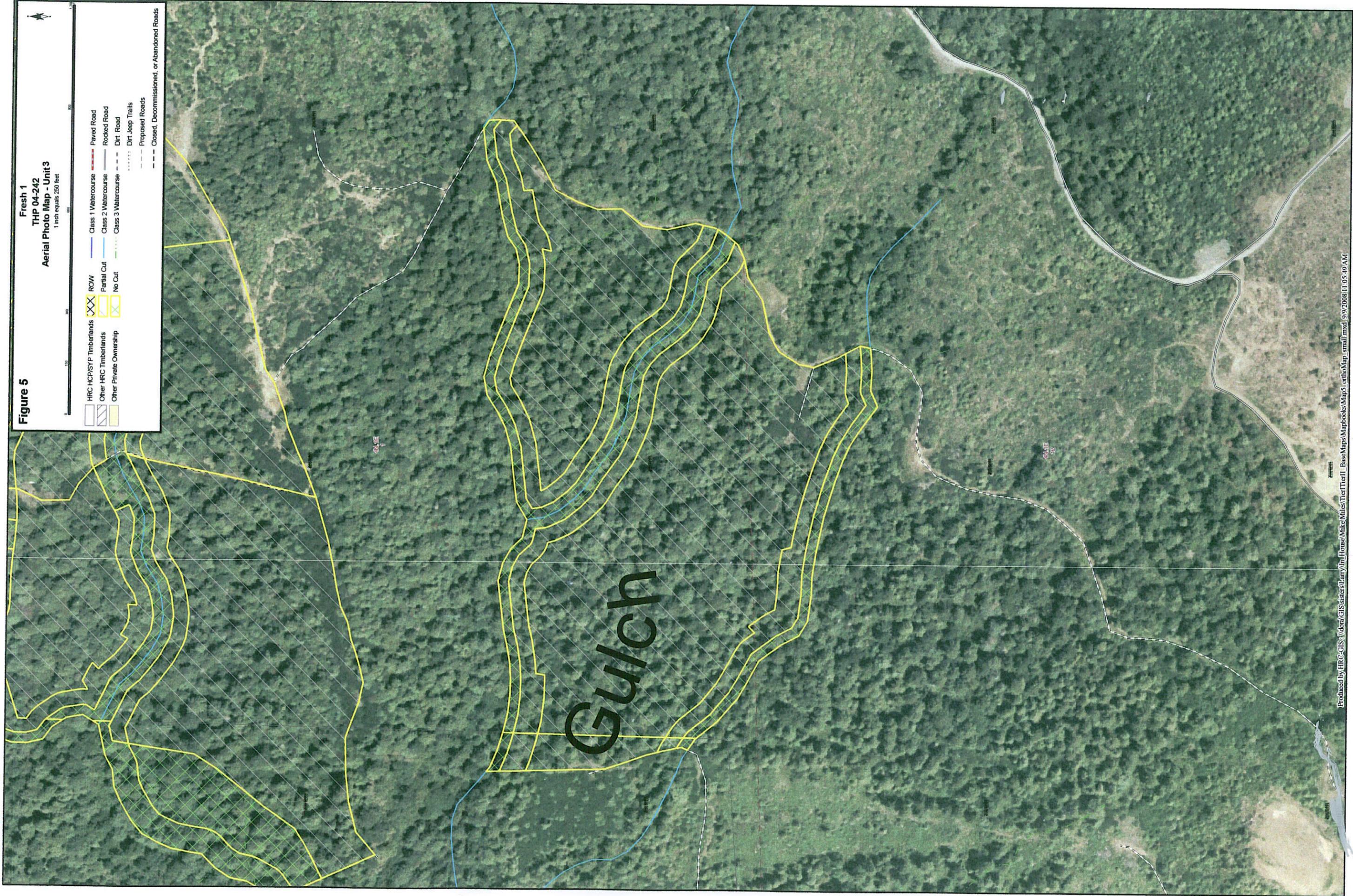
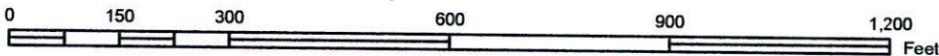


Figure 6

THP 04-242 Watershed Analysis Deep-Seated Landslide Inventory Unit 3



1 inch equals 250 feet



- | | | |
|-------------------------|---------------------|--|
| HRC HCP/SYP Timberlands | Class 1 Watercourse | Paved Road |
| Other HRC Timberlands | Class 2 Watercourse | Rocked Road |
| Other Private Ownership | Class 3 Watercourse | Dirt Road |
| ROW | | Dirt Jeep Trails |
| Partial Cut | | Proposed Roads |
| No Cut | | Closed, Decommissioned, or Abandoned Roads |

- Crown of Deep-Seated Landslides
- Hazard for Reactivation or Acceleration of Movement
REACT_HAZARD**
- N/A (landslides in grassland areas)
 - Very Low
 - Low
 - Low to Moderate
 - Moderate
 - High

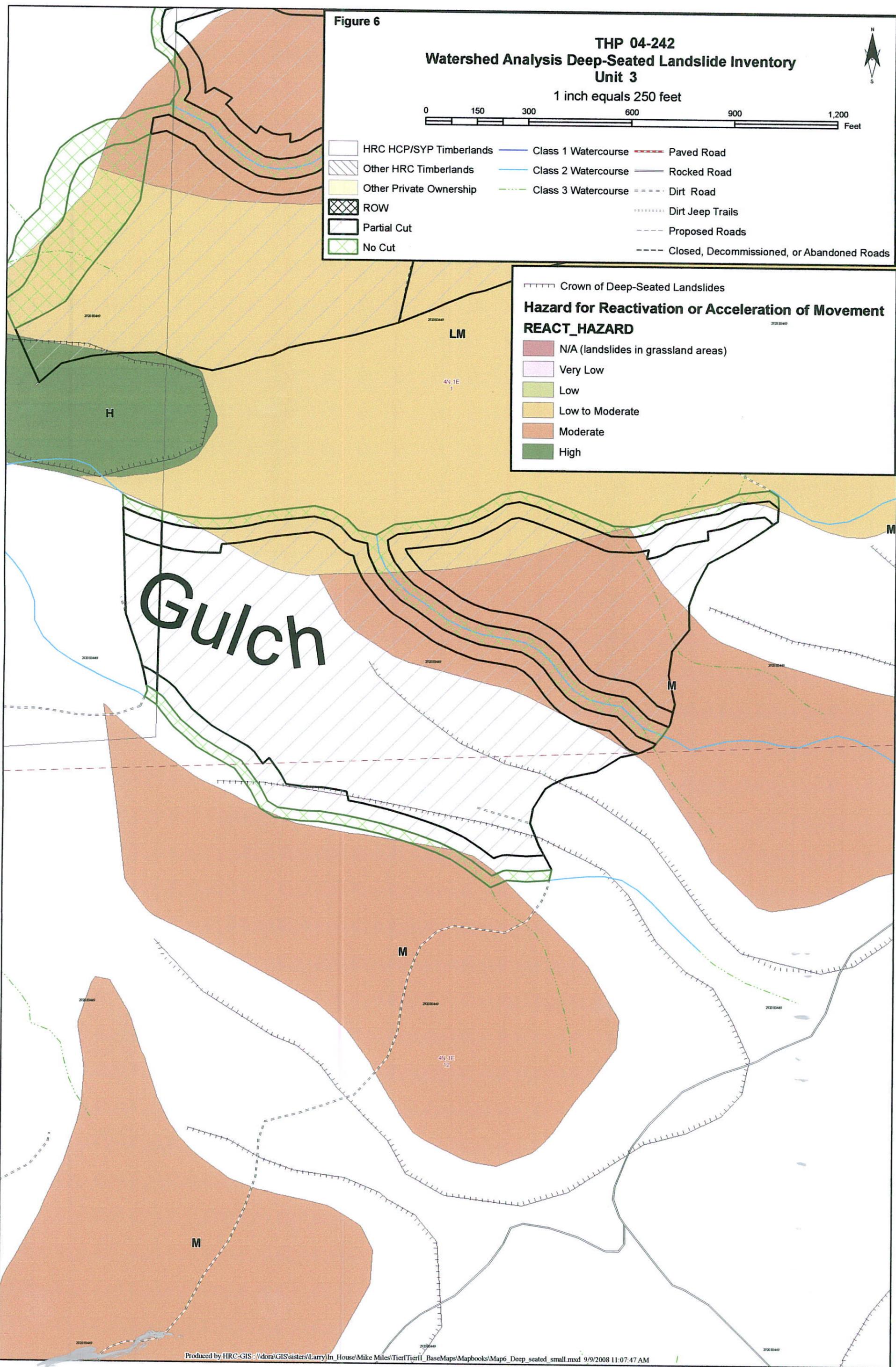


Figure 7

Fresh 1 THP 04-242 Road Map

1 inch equals 1,000 feet



- | | | | |
|-------------------------|--|----------------|----------------|
| HRC HCP/SYP Timberlands | Class 1 Watercourse | Paved Road | Stormproofed |
| Other HRC Timberlands | Class 2 Watercourse | Rocked Road | Upgraded |
| Other Private Ownership | Class 3 Watercourse | Dirt Road | Decommissioned |
| ROW | Dirt Jeep Trails | Proposed Roads | |
| Partial Cut | Closed, Decommissioned, or Abandoned Roads | | |
| No Cut | | | |

