

Response to Comment S6-58

Once a CMZ has been located, Green Diamond will store that information in its GIS database. GIS site verification of CMZs will be conducted prior to initiating harvest-related activities in the vicinity of established CMZs. See also the response to Comment S6-56.

Response to Comment S6-59

See the response to Comment S6-20, regarding the respective roles of the Permit applicant and the Services in the development of an HCP. The Services believe that the Plan, which includes a definition of SSS, meets ESA section 10(a) approval criteria (see Master Response 8).

2. Any sites that show the potential attributes of a CMZ based on GIS analysis will be further analyzed using aerial photographs, maps, and historic field information.
3. The final determination of the boundaries of all CMZs within the Plan Area will be based on field verification with the oversight of a team of experts that may include a hydrologist, fluvial geomorphologist, geologist, and **qualified** fisheries biologist representing the Simpson and the Services.
4. Following field verification, the CMZs will be **flagged** in the field and mapped on Simpson's GIS. A more permanent system of field marking to designate the extent of CMZs should be accomplished. Flagging is very short lived in the field.

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6.2.2 Slope Stability Measures

6.2.2.1 Steep Streamside Slopes

6.2.2.1.1 Identification

During THP layout, Simpson will identify all **steep streamside slopes leading to Class I or II watercourses, watercourse transition lines, outer edges of CMZs, or outer edges of floodplains** with the following characteristics within the proposed THP area: DFG believes the steep streamside slopes (SSS) definition is too narrow, in that the slopes must "...be located immediately adjacent to a stream channel..." DFG has observed steep streamside slopes, capable of delivery of sediment to watercourses, border many riparian settings where the toe of slope is not "immediately adjacent" to a stream channel.

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<u>HPA Group</u>	<u>HPAs</u>	<u>Initial Slope Gradient</u>
Smith River	Smith River	Greater or equal to 65%
Coastal Klamath Blue Creek	Coastal Klamath	Greater or equal to 70%
Korbel	Mad River North Fork Mad River	Greater or equal to 65 %
	Little River Coastal Lagoons Redwood Creek Interior Klamath	
Humboldt Bay Eel River	Humboldt Bay	Greater or equal to 60%

6.2.2.1.2 Initial Maximum Slope Distance

Where steep streamside slopes have been identified within the THP area, Simpson will create a Steep Streamside Slope (SSS) zone with the following initial maximum widths:

Response to Comment S6-60

See response to Comment R1-75. Regarding Plan enforceability, see Master Response 14.

SSS Zone Slope Distance from Watercourse Transition Line (feet)

<u>HPA Group</u>	Class I	Class II-2	Class II-1
Smith River	150	100	70
Coastal Klamath	475	200	100
Korbelt	200	200	70
Humboldt Bay	200	200	70

6.2.2.1.3 SSS Outer and Inner Zone Distances

1. The SSS zone will be comprised of an inner zone (Riparian Slope Stability Management Zone [RSMZ]) and an outer zone (Slope Stability Management Zone [SMZ]).
2. The width of the RSMZ will be the same as the applicable RMZ set forth in 6.2.1.1, except where a qualifying slope break exists within the outer zone. ~~that distance the RSMZ may only extend to the slope break. A "qualifying slope break" is an a decline interruption of slope gradient of at least 5 percent for at least 100 feet, or otherwise of sufficient degree and scale, agreed upon by Simpson and either the Services or California Geologic Survey (CGS), to prevent reasonably impede sediment delivery to watercourses from shallow landslides originating above the slope break. Roads, landings, or other management related features will not be allowed as qualifying breaks in slope.~~

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The term "qualifying slope break" needs a more enforceable definition, and the term "reasonably impede" will be difficult to enforce, and DFG suggests the above language.

3. The width of the SMZ will be either the remainder of the distance to a qualifying slope break or to the maximum SSS distance from the watercourse for that HPA group, whichever is shorter.

6.2.2.1.4 RSMZ Inner and Outer Zone Distances

1. The RSMZs will be comprised of an inner zone and an outer zone. The outer zone distance(s) should be stated here.
2. The inner zone of RSMZs on all Class I watercourses will be **at least 70 feet**, ~~except where a qualifying slope break exists within that distance the RSMZ inner zone may only extend to the slope break, and the outer zone, if any, will be the remainder of the applicable RMZ distance except where a qualifying slope break exists within that distance. Why was 70 feet chosen? Why not 100 feet?~~
3. The inner zone of RSMZs on all Class II watercourses will be **at least 30 feet**, ~~except where a qualifying slope break exists within that distance then the RSMZ~~

Response to Comment S6-61

Comment noted. Green Diamond will retain the proposed overstory retention of 75% in the outer zone of the RSMZ because the conservation measures were developed and designed to address reduction in slope stability from loss of root strength. The Services have noted that there will be little difference between the different canopy standards in the actual ground application.

Response to Comment S6-62

The Services note that 70 percent is the minimum retention level and additional conifer retention may occur in some SMZs.

~~inner zone may only extend to the slope break, and the outer zone, if any, will be the remainder of the applicable RMZ distance except where a qualifying slope break exists within that distance. Why was 30 feet chosen? Why not 50 feet?~~

Class I and Class II RSMZ inner zone widths should not be reduced for qualifying breaks in slope.

6.2.2.1.5 Prescriptions for RSMZs in Coastal Klamath and Blue Creek HPAs

In the Coastal Klamath and Blue Creek HPAs, Simpson will not conduct harvesting in RSMZs.

6.2.2.1.6 Prescriptions for RSMZs in All HPAs except Coastal Klamath and Blue Creek

1. On Class I and Class II-2 watercourses, Simpson will not conduct harvesting on the inner zone of the RSMZ and there will be 85% overstory canopy retention in the outer zone of the RSMZ.
2. On Class II-1 watercourses, Simpson will retain 85% **conifer** overstory canopy in the inner zone of the RSMZ **where it exists. Where it does not exist, no conifer harvest will occur.** ~~and 70%/75%~~ overstory canopy **will be retained** in the outer zone of the RSMZ. DFG believes there may be too many overstory canopy retention standards to be applied in the AHCP with the addition of "75%". For enforcement and tree selection during harvest plan layout, DFG recommends a standard of two overstory canopy percentages; 85% and 70%.

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6.2.2.1.7 Default Prescriptions for SMZs

1. ~~The initial silviculture~~ prescription employed within SMZs will be single tree selection, as that term is defined in the Glossary of the Plan, **except at no time will post harvest overstory canopy in the SMZ be less than 70%.** The SMZs should be afforded at least 70% overstory canopy where it exists. In hardwood dominated stands, significant conifer removal may occur under selection silviculture. In conifer dominated SMZs, the retention of 70% overstory canopy may be compatible with selection silviculture, or may require some additional conifer retention.
2. Even spacing of unharvested trees will be provided where the trees are available to allow it, and all ~~hardwoods will be retained.~~ DFG supports hardwood retention, but is concerned with enforceability since conifer removal under selection silviculture may damage or require felling of some hardwoods. It may be possible to provide percentage retention (e.g. 90%) for the hardwood basal area and stems. All species and size classes of conifer represented in pretreatment stands will be represented post harvest. ~~where feasible.~~
3. There will be only one harvesting entry in the SMZ during the term of the Permits.
4. Where no SMZ is identified, the standard default prescriptions for RMZs will apply.

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Response to Comment S6-63

The Services believe that an RG and RPF are adequate to evaluate the road alignment within the RSMZ or SMZ where they cannot be avoided or where major road reconstruction is required.

Response to Comment S6-64

As noted in AHCP/CCAA Section 6.2.2.5, training will be administered by a California RG or a Certified Engineering Geologist (CEG) and will initially follow the guidelines provided at the 1998 and 1999 California Licensed Forester Association (CLFA) Geology and Mass Wasting Workshops.

Regarding comparison with the Pacific Lumber Company HCP, see Master Response 6. See the response to Comment S6-20 regarding the respective roles of the Permit applicant and the Services in the development of an HCP. The Services believe that the Plan, which includes the definition of “headwall swale,” meets ESA section 10(a) approval criteria, which are discussed in Master Response 8.

6.2.2. 1.8 Tree Falling for Safety and Cable Yarding

Simpson may fall trees within RSMZs and SMZs for worker safety and to create cable yarding corridors of up to 25 feet in width. **Trees felled in the RSMZ inner zones will be retained in the RSMZ and, to the extent feasible, felled toward or into the watercourse. Felling trees toward or into the watercourse would be considered not feasible where unsafe (as determined by the faller, LTO, or RPF), where in-channel LWD is already abundant, or where the risk of sediment delivery is greater than the benefit to the channel, as determined by a qualified fisheries biologist.**

6.2.2.1.9 Road Construction

Simpson’s road construction will avoid RSMZs and SMZs where feasible. Where such zones cannot be avoided or where major road reconstruction is required, the road alignment within a RSMZ or SMZ will be evaluated by a registered geologist (RG), **and** a registered professional forester (RPF), **and registered civil engineer** with experience in road construction in steep forested terrain. With the over 3,600 miles of roads on Simpson lands, Simpson should retain the professional services of at least one registered civil engineer with experience in forest road construction. DFG believes this is necessary given the emphasis on road treatments throughout the proposed AHCP.

S6-63

6.2.2.2 Headwall Swales

6.2.2.2.1 Identification

During THP layout, Simpson will identify all headwall swales within the proposed THP area based on a SHALSTAB computer model analysis (>1/4 ac) using at least a 10m DEM and a q/T less than or equal to -2.8) coupled with field observations and verification of characteristic slope attributes by an appropriately trained RPF or RG. The boundaries of a SHALSTAB-identified headwall swale may be adjusted according to field observations by an **appropriately trained RPF or RG, specifically trained through classroom instruction and field observations of existing headwall swale features and potential failure sites.** What will define “appropriately”? There is a difference in the definition of a headwall swale in this AHCP compared to the Palco HCP. Why does this difference exist, and is it a significant difference?

S6-64

6.2.2.2.2 Default Prescription

The default prescription for headwall swales is uniform across the Plan Area and is not subject to adaptive management. The default prescription for headwall swales should be no harvest, and single tree selection allowed only if field reviewed by a Certified Engineering Geologist (CEG), and any allowed harvest should be no more intensive than single tree selection with 70% overstory canopy retention. If the default prescription is single tree selection, it should be subject to adaptive management should monitoring demonstrate single tree selection to be ineffective.

6.2.2.2.3 Silvicultural Prescription

Response to Comment S6-65

See response to Comment S6-62.

Response to Comment S6-66

See response to Comment S6-63.

Response to Comment S6-67

The Services agree with the commenter that all deep-seated landslides may not be identified by this first criterion alone. However, with the other criterion, the majority of the deep-seated landslides are expected to be identified during the THP layout process.

1. The silviculture prescription employed on a field verified headwall swale will be single tree selection (as defined in the Glossary of the Plan).
2. Even spacing of unharvested trees will be provided where the trees are available to allow it, and all hardwoods will be retained.
3. All species and size classes represented in pretreatment stands will be represented post harvest where feasible.
4. There will be only one harvesting entry in headwall swales during the term of the Permits.

S6-65 [Refer to DFG comments regarding single tree selection in SMZs in section 6.2.2.1.7. DFG has the same concerns regarding canopy and hardwood retention in headwall swales.

6.2.2.2.4 Tree Falling for Safety and Cable Yarding

Simpson may fall trees on a field verified headwall swale for worker safety and to create cable yarding corridors of up to 25 feet in width.

6.2.2.2.5 New Road Construction

Simpson's new road construction will avoid field verified headwall swales wherever feasible. Where such areas cannot be avoided or where road reconstruction is required, the terrain will be evaluated by a RG and RPF, and a **registered civil engineer** with experience in road construction in steep forested terrain. With the over 3,600 miles of roads on Simpson lands and some new road construction planned in all HPAs, Simpson should retain the professional services of at least one registered civil engineer with experience in forest road construction. This is necessary given the importance of road treatments throughout the proposed AHCP.

S6-66 [

6.2.2.3 Deep-Seated Landslides

6.2.2.3.1 Identification

During THP layout, an appropriately trained RPF or RG, will identify all active deep-seated landslides within the proposed THP area that meet one of the following two criteria by using published landslide maps, aerial photographs and field observation:

First Criterion: A scarp or ground crack that exhibits at least three inches of horizontal displacement or at least six inches of vertical displacement that typically exposes bare mineral soil, but that may be partially revegetated, and where field observations clearly indicate that the movement occurred within approximately the past 50 to 100 years; or

S6-67 [These criteria may be too simple to identify all active deep-seated landslides. The feature could be obscured by vegetation or inaccessible terrain.

Second Criterion: A convex, lobate landslide toe that exhibits evidence of activity within approximately the past 50 to 100 years. The toe of landslides will not always be lobate.

Response to Comment S6-68

As noted in AHCP/CCAA Section 6.2.2.3.2, where neither criterion in AHCP/CCAA Section 6.2.2.3.1 is exhibited, other conservation measures in the Plan may be implemented and the CFPRs will apply to all parts of deep seated landslides. It should also be noted that although the potential for activity still exists on dormant deep-seated landslides, most deep seated landslides tend to fail incrementally, rather than in the catastrophic manner of a shallow landslide. Further, see the response to Comment S6-20 regarding the respective roles of the Permit applicant and the Services in the development of an HCP. The Services believe that the Plan, which include the measures relating to deep-seated landslides, meets ESA section 10(a) approval criteria (see Master Response 8).

Response to Comment S6-69

See response to Comment S6-68.

Response to Comment S6-70

See response to Comment S6-68.

For instance, some may end along a section of a road, and some may have the convex lobe of the toe removed by active stream erosion.

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Why must a deep-seated landslide be active to be protected? It is reasonable to expect some deep-seated landslides are dormant, but prone to failure with altered hillslope hydrology and terrain in addition to canopy removal and exposure to stressing storms as the result of road construction or timber harvest. Use of these criteria alone increases the risk of inappropriate harvesting on deep-seated landslides and triggering mass wasting should a stochastic event occur.

6.2.2.3.2 Default Prescription for Active Deep-seated Landslides

1. Where neither criterion in 6.2.2.3.1 is exhibited, other conservation measures in the Plan may apply and the California FPRs will apply, but no default prescription will be required. The California FPRs will also apply to all parts of deep-seated landslides.
2. The default prescription for deep-seated landslides is uniform across the Plan Area and is not subject to adaptive management.

6.2.2.3.3 Harvesting near Active Deep-seated Landslides Identified by the First Criterion

S6-69

Where an active deep-seated landslide exhibits the first criterion stated in 6.2.2.3.1, Simpson will not harvest **downslope or within 25 feet upslope** from the identified scarp or ground crack. This distance is inadequate protection; 25 feet does not even represent the diameter of a second growth conifer crown. Even-age management with broadcast burning, skid trail construction, and cable corridors to within 25 feet of the top of an active deep-seated landslide will leave, at best, a single row of trees along the top of the feature and may significantly alter slope hydrology, transpiration, and increase water delivery to the feature. Hillslope saturation and wind throw may be expected to cause some of these trees to fall as well. Even-age silviculture to within 25 feet of a scarp or ground crack will increase the risk of deep-seated landslides and triggering mass wasting should a stochastic event occur. No mention is made of protecting the sides or surface area of the feature. More substantial protection of the sides, surface area, and the top of the feature need to be included.

6.2.2.3.4 Harvesting near Active Deep-seated Landslides Identified by the Second Criterion

S6-70

Where an active deep-seated landslide exhibits the second criterion stated in 6.2.2.3.1, Simpson will not harvest on the toe or within 25 feet upslope from the inflection point of the convex, lobate landslide toe. Even-age management with broadcast burning, skid trail construction, cable corridors, etc. to within 25 feet of the top of an active deep-seated landslide will leave, at best, a single row of trees along the toe of the feature. Hillslope saturation and wind throw may be expected to cause some of these trees to fall as well. Even-age silviculture to within 25 feet upslope of a landslide toe will increase the risk of the feature delivering sediment to watercourses. What would the harvest prescription be below the toe? What would the harvest prescription be for the rest of the feature? Any prescription for this setting should not include even-age

Response to Comment S6-71

As used in the AHCP/CCAA, the terms “shallow-seated landslide” and “shallow-rapid landslide” are interchangeable. However, some shallow-seated landslides are not rapid events and, as well, the term “shallow” can be used in a relative context to describe landsliding rather than describing an absolute depth, as described in the glossary. Therefore, to clarify the terminology, Green Diamond has revised the definition of “shallow-seated landslides” in the AHCP/CCAA Glossary (Section 10):

“~~Predominately rapid event~~ Relatively shallow landslides, that are typically confined to the overlying surficial-mantle of colluvium and weathered bedrock (in some instances competent bedrock) that commonly leave a bare unvegetated scar after failure. These landslides, also known as shallow rapid landslides, most commonly occur as may include debris slides, debris/flow/torrents, channel bank failures, and rock falls.”

Response to Comment S6-72

Road-related shallow landslides will be identified for treatment during the detailed Road Assessments (AHCP/CCAA Section 6.3.3.2.3) and have specific conservation measures in AHCP/CCAA Section 6.2.3.1.

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harvesting. A site-specific prescription should be developed through evaluation by a CEG and consultation regarding resource risk with a qualified fisheries biologist.

6.2.2.3.5 Tree Falling for Safety and Cable Yarding

Simpson may fall trees on active deep-seated landslides for worker safety and to create cable yarding corridors of up to 25 feet in width. Trees felled in SSS's for worker safety and to create cable yarding corridors should be retained on site.

6.2.2.3.6 New Road Construction

Simpson will not construct new roads on or across active deep-seated landslide toes or scarps, or on steep (greater than 50% gradient) areas of dormant slides, without approval by a RG and a RPF with experience in road construction in steep forested terrain.

S6-71

6.2.2.4 Shallow Rapid Landslides Are these the same as shallow-seated landslides, as defined on page 10-9 in the glossary?

This conservation measure will apply to only those shallow rapid landslides that are field verified to be active or which are likely to be reactivated by harvesting, and that have a reasonable potential to deliver sediment directly to a watercourse, and that are at least 200 square feet in plan view. This conservation measure will not apply to road related failures. Road related failures will be addressed by the road maintenance plan. There are locations where road construction or drainage has caused accelerated landslide activity of an existing shallow-seated landslide. What will the conservation measure be for road related failures of existing shallow-seated landslides?

S6-72

1. The default prescription for landslides that do meet the above listed criteria will be no cut within the landslide boundaries, and a minimum of 70% overstory canopy within 50 feet above a slide and 25 feet on the sides of a slide. Site-specific geologic review of this default prescription, pursuant to Sections 6.2.2 and 6.3.2, may result in an alternative prescription for shallow rapid landslides.
2. Simpson's new road construction will avoid landslides that meet the above listed criteria wherever feasible. Where such areas cannot be avoided or where major road reconstruction is required, the terrain will be evaluated by a RG and RPF with experience in road construction in steep forested terrain.

6.2.2.5 Training

1. RPFs writing timber harvesting plans for Simpson will be trained to address issues relating to the conservation measures set forth in 6.2.2.
2. The training will be administered by a California RG or a Certified Engineering Geologist (CEG) and will initially follow the guidelines of the 1998 and 1999 CLFA Geology and Mass Wasting workshops.

6.2.2.6 Application of Prescriptions and Alternatives

Response to Comment S6-73

While the Services agree that a PHI is advisable to address site-specific issues as they relate to some THPs, the ESA does not authorize the Services to require that any particular measure be adopted or imposed. The ESA requires only that its criteria for Permit issuance be met. Issuance criteria are discussed in AHCP/CCAA Section 1.4.1, EIS Section 1.3 and Master Response 8. The selection of specific prescriptions is a matter of the Permit applicant's discretion (HCP Handbook at 3-19). The Services' role in designing the conservation program is to "be prepared to advise" during the development of the Plan and to judge its consistency with the ESA approval criteria once the application is complete (HCP Handbook at 3-6 and 3-7). The Services believe that Green Diamond's Operating Conservation Program, which includes AHCP/CCAA Section 6.2.2.6, meets ESA section 10(a) approval criteria.

- S6-73 [1. **During THP development**, (This should also include during a PHI when review team participants identify a feature) Simpson's RPF will do one of the following when he or she determines that any portion of the THP meets the steep streamside slope, headwall swale, or deep-seated landslide definitions:
- a. Impose the default prescription applicable to that feature as set forth above, or
 - b. Retain a California RG to:
 - 1) Evaluate the likelihood that timber harvest operations will cause, or significantly elevate the risk of causing or reactivating landslides within the prescription zone that will likely result in sediment delivery to watercourses;
- and
- 2) Work with the RPF to prepare a more cost-effective, site-specific alternative to the default prescription designed to minimize that likelihood, which will have the benefit of minimizing and mitigating potentially significant impacts on the Covered Species from sediment delivery resulting from landslides caused or exacerbated by timber harvest operations.
2. A qualified biologist will be involved in evaluating the potential biological consequences whenever a more cost-effective alternative to the default prescription is proposed.
3. The alternative to the default prescription may be applied to any SMZ (except an RSMZ), field verified headwall scarp, or deep-seated landslide. **The proposed alternative will be subject to review and approval by the Services or CGS before being written into the THP.**
4. THPs for which a geologic report was prepared and the conclusions of which allowed for alternatives to replace the default prescriptions will be flagged as such when submitted for review by CDF and other agencies. A THP map and letter of notice that describes the alternative **proposed** to replace the default prescriptions will be sent to the Services when a THP with such an alternative is proposed.
5. **Alternative prescriptions will be monitored for effectiveness in the Mass Wasting Assessment.**

6.2.3 Road Management Measures

6.2.3.1 Road Assessment Process and Priority for Repair

6.2.3.1.1 Road-related Sediment Source Identification

Response to Comment S6-74

Green Diamond will identify road related sediment sources in accordance with the subwatershed RWU priority set forth for the Lower Klamath River basin and the rest of the Plan Area (see AHCP/CCAA Section 6.2.3.1.1). Priorities will be further refined at the end of the five-year reassessment of future sediment yields (see AHCP/CCAA Sections 6.3.3.2.2 through 6.3.3.2.5).

Response to Comment S6-75

The commenter appears to have misunderstood the use of the aerial photographs. The aerial photographs will not be used in lieu of field assessments. Rather, each road feature that exhibits potential to deliver sediment to a stream will be recorded on aerial photographs.

Response to Comment S6-76

AHCP/CCAA Sections 6.2.3.3 through 6.2.3.8 describe the criteria for determining treatable erosion. Other criteria that could also apply include site accessibility and worker safety standards.

Simpson will identify road-related sediment sources in accordance with the sub-watershed road work unit (RWU) priority set forth in this subsection for the Lower Klamath River basin and the rest of the Plan Area.

6.2.3.1.2 Aerial Photo Analysis and Maps

1. Simpson will conduct an analysis of historical aerial photos to identify all the roads **(except for skid trails)** that were constructed in each watershed.
2. **Where available** ~~When possible~~, photographic coverage from a number of years will be selected to "bracket" major storms in the watershed.
3. From the information gained in the photo analysis, detailed land use and erosion history maps, including road location and road construction history, will be developed. A timeframe for this development should be included here.

S6-74 [

6.2.3.1.3 Field Inventories

1. Simpson will conduct field inventories to **comprehensively** identify and quantify road-related sediment sources. During the field assessment, aerial photographs will be used to **assist in recording** ~~record~~ the location of each road feature that exhibits potential to deliver sediment to a stream. Many locations, including high-priority, high-volume sites, will be obscured by canopy or ground cover. In road crossing locations subject to debris torrenting, quantification of road related sediment sources should consider the amount of sediment that could be lost from the crossing **and** the amount that could be delivered from the torrent track if the crossing fails.
2. A **data form** will be completed for each potential sediment delivery site, and the data form will be stored in a database. **The database will be made accessible to the Services upon request.**

S6-75 [

6.2.3.1.4 Documentation of Fish-Passage Problems

Simpson will document **and prioritize for treatment sufficient to eliminate as soon as practicable** any potential **adult or juvenile anadromous** fish passage problems, including culverts that are impeding fish passage, during the field inventory.

6.2.3.1.5 Development of Prescriptions for Reducing Road-Related Sediment Delivery to Watercourses and Hydrologically Connected Drainage Facilities and Structures, Erosion Control and Prevention of Road Related Erosion

Simpson will develop a prescription for erosion control and erosion prevention ~~for each~~ source of treatable erosion that is identified **by Simpson or the Services during the initial five year assessment period, and at any time over the life of the plan when existing or newly created sites are discovered.** Low priority sites should be included in this prescription. What criteria will be used to determine what is "treatable"? The prescription for each site will involve temporary or permanent decommissioning, or road upgrading for the Simpson's Management Road system, and will include **at a minimum** the following ~~kinds of~~ information:

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Response to Comment S6-77

The prioritization program (see AHCP/CCAA Section 6.2.3.1, *Road Assessment Process and Priority for Repair*) is intended to identify volumes of future sediment delivery and treatment immediacy. Regarding minimization and mitigation to the maximum extent practicable, and how the Plan as a whole, rather than on a measure-by-measure basis, must meet the Permit issuance criteria, see Master Response 8.

- a description of the problem and treatment
- types of equipment needed
- equipment hours
- hand labor **hours needed** for culvert installation
- **culvert and downspouts specifications**
- seeding, ~~and~~ mulching, **and/or other erosion control methods**
- estimated costs for each work site
- estimate of expected sediment savings

Road Work Unit Prioritization for the Plan Area, excluding the Lower Klamath Basin
(Table not scanned. See page 6-20 and 6-21 of the Plan)

6.2.3.1.6 Prioritization of Implementation of Treatment Prescriptions

Simpson will prioritize road-related sediment sources for treatment as "high," "moderate" or "low" based on a balancing of the following factors: (1) volume of future sediment delivery; (2) treatment immediacy; and (3) treatment cost-effectiveness.

6.2.3.2 Implementation Plan

1. Simpson will memorialize the prescriptions to be applied and the priority of application in an implementation plan. The plan should be included in 6.2.3.2, and should be subject to review and approval by the Services.
2. Implementation will be carried out consistent with the Road Decommissioning Standards (6.2.3.3) and the Management Road Upgrading Standards (6.2.3.4).
3. Implementation of **prescriptions for all** road treatment sites identified as "high" or "moderate" priority, **and those low priority sites with the potential to individually or cumulatively deliver significant amounts of sediment** ~~of all sites~~ will be carried out during the term of the Permits.

The treatment of sites should include low priority sites that are currently delivering sediment and those with the potential to become moderate or high priority sites over the life of the plan. We believe failure to treat such low priority sites will result in chronic adverse sediment discharges to watercourses throughout the plan area, contribute to cumulative sediment effects, and allow many of the low priority sites to deteriorate to become the next moderate or high priority sites. Chronic turbidity associated with discharges from low priority sites may result in reduced over wintering growth and survival of juvenile salmonids and adversely affect out migrant production. In view of these potential biological impacts, as discussed in Volume 1, Section 5.3.4, failure to include treatment of low priority sites does not minimize and mitigate to the maximum extent

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Response to Comment S6-78

See the response to Comment S6-73 regarding the respective roles of the Permit applicant and the Services in the development of an HCP. The Services believe that the Plan, which includes the accelerated road plan, meets ESA section 10(a) approval criteria (see Master Response 8).

Response to Comment S6-79

See response to Comment S6-78. Approximately 48 percent of the potential sediment from high and moderate risk sediment delivery sites will be treated during the first 15 years of the Plan, and the remaining 52 percent of the potential sediment from such sites will be treated over the last 35 years of the Plan. Since \$37.5 million will treat approximately 48 percent of the high and moderate risk sites, then approximately \$40.6 million will treat the remaining 52 percent of high and moderate risk sediment delivery sites over the next 35 years.

Regarding updates of the road inventory, the Services note that one purpose of the road maintenance and inspection plan (AHCP/CCAA Section 6.2.3.9) is to address changes in the status of sites (previously inventoried or from new road construction). As stated in AHCP/CCAA Section 6.3.3.8, an initial estimate of approximately 45 percent of all roads will be maintained annually following inspection each year. Maintenance will follow a three-year rotating schedule. As stated in AHCP/CCAA Section 6.2.3.9, Green Diamond will prioritize repairs that are needed based on treatment immediacy. Emergency inspections as described in AHCP/CCAA Section 6.2.3.10 will address changes in the status of sites as a result of major storm events.

practicable Many low priority sites are only one major storm event away from becoming moderate or high priority sites.

Once personnel and equipment are mobilized to a particular road segment, it becomes more cost effective to treat the low priority sites at that time. We believe Simpson has treated low priority sites in this manner in the past.

6.2.3.2.1 Acceleration of Implementation Plan

1. Simpson will provide for an average of \$2.5 million per year (to be inflation adjusted in 2002 dollars for each year of the acceleration period) for the first 15 years of the Permits' 50-year term (the "acceleration period") to implement the treatment of high and moderate priority sediment sites identified in the implementation plan, for a total of \$37.5 million (unless the acceleration period is adjusted as provided in 6.2.3.2.3). Based on DFG's understanding of the costs per mile required to treat THP-related road sediment sites, we believe this may be insufficient funding to accomplish the 15 year sediment objective, and may result in continued unmitigated significant road related sediment input to salmonid habitat should the funding cap be reached before the site treatment volume is achieved. See also our comment under #2, below
2. All funds provided by Simpson to treat high and moderate sites during the acceleration period, including high and moderate sites on roads appurtenant to THPs, will be counted toward the \$2.5 million per year commitment.

There is some uncertainty as to whether Simpson's funding of \$2.5 million per year for 15 years will be sufficient to achieve treatment of 46% of the identified sediment in that time frame. For example, DFG was informed by Simpson that approximately six miles of road upgrades completed as DFG recommended mitigation for a single timber harvesting plan in the Smith River HPA cost approximately \$600,000. This amount is equal to approximately 24% of the Simpson proposed accelerated annual budget of \$2.5 million per year for 15 years to treat high and moderate sites, but represents less than 0.2% of Simpson's road system. Although road rocking, elimination of diversion potential, replacement and installation of culverts including ditch relief culverts, and other measures were also completed as part of the upgrading, the removal of sediment from locations that would qualify as "high" or "moderate" priority sites under the plan would have represented a significant portion of this work.

There appears to be no discussion of the estimated amount of funding needed to treat the remaining sites from year 15 to year 50 of the plan. Considering the over 3,800 miles of roads in the plan area it may not be possible to achieve the remaining sediment reduction objective from years 15 to 50. The road inventory should also be updated periodically to account for changes in the status of existing treatment sites and to account for the creation of new sites, particularly after years with one or more major storm events.

A commitment to an annual minimum volume of sediment removal and minimum number of miles per year of road upgrading and decommissioning should be

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Response to Comment S6-80

Green Diamond is committed to the implementation of the prescriptions and conservation measures described in the Operating Conservation Program (AHCP/CAA Section 6.2). The minimization and mitigation measures, along with the conservation benefits identified in the Plan, meet, the ESA Section 10 criteria for Permit issuance. See Master Response 8.

Response to Comment S6-81

See the response to Comment S6-73 regarding the respective roles of the Permit applicant and the Services in the development of an HCP. The Services believe that the Plan, which includes the road inventory schedule, meets ESA section 10(a) Permit issuance criteria (see Master Response 8).

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made enforceable under the plan, in combination with the treatment of a minimum number of high, moderate, and low priority sites. Without this commitment, fewer sites requiring more funding could exhaust available funds each year and result in not achieving Simpson's accelerated road-related sediment objective. Failure to achieve the sediment objective could result in continued high sediment delivery to habitat of the Covered Species and not fully mitigate and minimize sediment impacts over the life of the plan.

Additionally, Section 5.3.4 stresses the importance of well maintained road systems that are hydrologically disconnected from watercourses, yet there is no commitment in Section 6.2 to achieving this hydrologic disconnection in a measurable (e.g. miles per year), enforceable fashion.

3. During any of the first three years of the acceleration period, Simpson may provide for substantially more or less than \$2.5 million, as long as a total of \$7.5 million (inflation adjusted in 2002 dollars for each year) has been provided by the end of the three-year period. As discussed above, the estimated amount of funding for road related sediment reduction for the last 35 years of the plan, and assurance of availability of sufficient funds to treat all sites, should be disclosed.
4. On an annual basis the \$2.5 million per year will be adjusted proportionally to reflect the current acreage of the Plan Area in relation to the acreage of the Initial Plan Area.

6.2.3.2.2 Five-year Assessment of Future Sediment Yield

1. At the end of the first five year period of the Permits, Simpson will refine its estimate of the amount (in cubic yards) of future sediment yield from high and moderate priority sites on roads owned or controlled by Simpson within the Plan Area.
2. For RWUs that have not yet been totally inventoried at the time of the five-year assessment, a stratified random sampling approach will be utilized: 15 to 20% of the roads will be sampled in 0.5-mile segments. It is imperative Simpson complete the road inventory in five years to provide the best estimate of the long term costs associated with site treatment. It is not clear that a stratified random sample is sufficient given the diversity of watershed geology, past road construction techniques, and variability in legacy road features and fill volumes across the plan area. A few "bad" sites can significantly increase treatment estimates. Even with a completed road inventory, errors in volume estimates and cost overruns are common when treating sites. For example, It is not always possible to know where original grade is and what kind of groundwater will be encountered when removing a failed Humboldt crossing.
3. If the refined estimate is within 5% of the original estimate (i.e., is from 6,118,000 cubic yards to 6,762,000 cubic yards), then Simpson will continue to provide for \$2.5 million per year for the remaining ten-year term of the acceleration period.

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6.2.3.2.3 Revisions to Acceleration Period Based on Five-year Assessment

Response to Comment S6-82

See response to Comment S6-78.

Response to Comment S6-83

The intent of the definitions for temporarily and permanently decommissioned roads is not for enforceability, but to acknowledge that temporarily decommissioned roads are expected to be used again in the future (typically not for at least 20 years). As stated in AHCP/CCAA Section 6.3.3.2.1, treatment of permanently decommissioned roads are essentially the same as the treatment for temporarily decommissioned roads. Also see the Glossary (AHCP/CCAA Section 10.2).

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1. If the refined estimate is greater than 5% more than the original estimate of future sediment yield from high and moderate priority road sites, then the commitment to provide for \$2.5 million per year for the remaining term of the acceleration period will be proportionally increased in 1% increments to add up to an additional 1.5 years to the acceleration period (i.e., Simpson will provide for up to \$3.75 million more over an additional 1.5 years). DFG is concerned this treatment funding cap may result in insufficient funds to achieve the needed level of road upgrading. If, for example, the revised estimate is higher by 15% and the associated treatment costs were \$10 million more, Simpson would still fund only up to an additional \$3.75 million. The availability of less than half of the money necessary to treat the sites would result in a sediment reduction that is less than half of the original objective, which was to reduce road site sediment delivery by approximately 46%. This may not be sufficient to achieve the sediment reduction objective, may not fully mitigate and minimize the impacts of the proposed action to the maximum extent practicable, and may significantly adversely affect trending toward recovery of the Covered Species.
2. If the refined estimate is greater than 5% less than the original estimate of future sediment yield from high and moderate priority road sites, then the commitment to provide for \$2.5 million per year for the remaining term of the acceleration period will be proportionately reduced in 1 % increments to subtract up to 1.5 years from the acceleration period (i.e., Simpson will provide for up to \$3.75 million less and the remaining acceleration period will be reduced by up to 1.5 years).

6.2.3.3 Road Decommissioning Standards

The following will apply to all temporarily and permanently decommissioned roads:

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Clear, enforceable definitions of the following terms should be included here and in Section 10.2 of the plan:

- Temporarily decommissioned road;
- Permanently decommissioned road

6.2.3.3.1 Time of Year Restrictions

1. Simpson will not carry out road decommissioning during the winter operating period (October 16th through May 14th), except that road decommissioning may occur from October 15th through November 15th if "unseasonably dry fall" occurs (less than four inches of cumulative rainfall from September 1st through October 15th), **it is not raining, has not rained in the previous 24 hours, there is a less than 30 percent chance of measurable precipitation in the next 48 hours, and the following occurs:**
 - a. Each project site is completed that operational day with erosion control measures installed; or

- b. If a site requires multiple days for completion, a long-range forecast of no rain for the next five days has been issued **and basic erosion control and stormwater management measures have been installed at the site by the end of each working day.**
 - c. **Prior to conducting road decommissioning work per a. and b. above, road surfaces and drainage facilities (e.g. culverts and ditches) on roads leading to the road decommissioning work site(s) will be permanently and effectively hydrologically disconnected from watercourses.**
- 2 Sites that require multiple weeks for completion will not be started during the winter period. **"Multiple weeks" means work requiring more than seven consecutive calendar days to complete, including installation of all erosion control measures.**

6.2.3.3.2 Watercourse Crossings

1. Simpson will remove **all fill, culverts, other drainage structures and organic material** from all watercourse crossings.
2. The excavation will extend down to the original channel bed, with the excavated channel at least as wide as the original channel.
3. The side slopes will be sloped back to the original angle, **2:1 (2 horizontal to 1 vertical) or flatter**, or a stable angle (**defined as an angle at which sliding, raveling, bank failure, slumping, or other slope erosion feature does not occur post treatment**) and spoil material transported to a stable location **where sediment cannot reach a watercourse or hydrologically connected facility.**
4. **Comprehensive** ~~Appropriate~~ erosion control measures **including but not limited to such as seeding and mulching at** will be utilized **at all sites** to facilitate revegetation of excavated crossings. **Minimum standards for seeding and mulching operations are 30 pounds per acre of seed and a minimum mulching depth of two inches, covering at least 90% of the surface area.**
5. **All crossing sites will be inspected within one year of removal and after one winter period. All sites accessible to personnel and equipment where sliding, raveling, bank failure, slumping, or other slope erosion has resulted in sediment discharges to watercourses will be re-treated prior to the next winter period.**

6.2.3.3.3 Unstable Areas

1. Simpson will pull back unstable or potentially unstable road or landing fill identified during the road assessment process and deposit spoil in a stable location **where sediment cannot reach a watercourse or hydrologically connected facility.**

Response to Comment S6-84

See the response to Comment S6-73 regarding the respective roles of the Permit applicant and the Services in the development of an HCP. The Services believe that the Plan, which includes the addressing road surface runoff, meets ESA section 10(a) Permit issuance criteria (see Master Response 8).

Response to Comment S6-85

See response to Comments R1-58, R1-96 and R1-112. Furthermore, the Services' role is to evaluate consistency of an HCP as a whole with the ESA approval criteria. Issuance criteria are discussed in EIS Section 1.3, AHCP/CCAA Section 1.4.1, and Master Response 8. The Services believe that Green Diamond's Operating Conservation Program (AHCP/CCAA Section 6.2), which includes the measures contained in AHCP/CCAA Section 6.2.3.3.5, meets these criteria. Also see Master Response 14 regarding Plan enforceability.

Response to Comment S6-86

The Services believe the standards provided in AHCP/CCAA Section 6.2.3.4, which are enforceable, are clear and that definitions of "road upgrading" and "upgraded road" are not necessary. See Master Response 14 regarding Plan enforceability.

- 2. **Effective** ~~Appropriate~~ erosion control measures such as seeding and mulching will be utilized **at all sites (including disposal sites)** to facilitate re-vegetation of unstable areas.

6.2.3.3.4 Road Surface Runoff

- 1. Simpson will establish maintenance-free surface drainage for temporarily and permanently decommissioned roads. **Maintenance-free surface drainage will not discharge sediment to watercourses or hydrologically connected drainage facilities.** Ditch relief culverts and inboard ditches on temporarily decommissioned roads are subject to plugging, failure, and sediment delivery to watercourses without frequent maintenance inspections and repair. All inboard ditches and ditch relief culverts should be removed (including fill), and where feasible the adjacent road segment outsloped with rolling dips.
- 2. Inside ditches and springs and seeps will be properly drained and **hydrologically disconnected from watercourses** with deep cross-drain ditches.
- 3. Localized outsloping will be utilized **wherever** as necessary to ~~adequately~~ drain the road surface.
- 4. Permanently decommissioned roads will be ripped and planted with commercial tree species where appropriate to reestablish timber production.

6.2.3.3.5 Erosion Control

Simpson will perform seeding, mulching and planting, and installation of energy dissipation (rock armor or woody debris) **wherever sediment from decommissioned roads may reach watercourses or hydrologically connected drainage facilities.** ~~when determined necessary by qualified and trained personnel for additional control erosion on the decommissioned roads.~~ The ~~strikeout~~ language does not appear enforceable.

6.2.3.4 Management Road Upgrading Standards

~~An enforceable definition of road upgrading and an upgraded road should be included here and in Section 10.2 of the plan.~~

6.2.3.4.1 Time of Year Restrictions

Simpson will not conduct road upgrading during the winter operating period, except as stated in 6.2.3.4.2 and 6.2.3.4.3.

6.2.3.4.2 Dry Fall

- 1. Road upgrading may occur from October 16th through November 15th if "unseasonably dry fall" occurs (less than four inches of cumulative rainfall from September 1st through October 15th), **it is not raining, has not rained in the**

Response to Comment S6-87

The specification of “larger” Class II watercourses where crossings will not be installed or replaced is because of feasibility, where significant surface flows could prevent effective diversion of flow around the work site. Watercourse crossings would not be installed or replaced on any Class II watercourse that precludes effective diversion of flow around the work site.

With regard to State law issues referenced in the comment, to the Services knowledge, the applicant has not sought take authorization from the CDFG, although the Fish and Game Commission has begun the formal process for listing Coho salmon under the California ESA. Issuance of Federal ESA permits to Green Diamond does not excuse Green Diamond from its obligation to comply with all other applicable laws, including the California ESA, other provisions of the State Fish & Game Code and CEQA.

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previous 24 hours, there is a less than 30 percent chance of measurable precipitation in the next 48 hours, and the following restrictions are followed:

- a. Each project site is completed that operational day with **effective** erosion control structures installed **and functional**; or
 - b. If a site requires multiple days for completion, a long-range National Weather Service forecast of no rain for the next five days has been issued, **and**
 - c. **Prior to upgrading watercourse crossings per a. and b. above, road surfaces and drainage facilities (e.g. ditches) leading to the crossings, will be permanently and effectively hydrologically disconnected from the crossings.**
2. Sites that require multiple weeks for completion will not be started during the winter period unless there is an emergency situation. **“Multiple weeks” means work requiring more than seven consecutive calendar days to complete, including installation of all erosion control measures.**

6.2.3.4.3 Early Spring Drying

Simpson may conduct road upgrading from May 1st through May 14th when "early spring drying" has occurred (no measurable rainfall occurred within the last 5 days and no rain forecasted by the National Weather Service for the next 5 days) and the following restrictions are followed:

- 1. Watercourse crossings on Class I and ~~larger~~ Class II watercourses (watercourses where significant surface flows could prevent effective diversion of flow around the work site) will not be installed or replaced; and DFG believes the majority of Class II watercourses are large enough that replacements should not be scheduled until the summer period. An SAA will be required from DFG for any such work, and may contain additional conditions.
- 2. Erosion control supplies are retained on-site and **effectively** applied to each completed site by the end of that operational day.
- 3. **Prior to upgrading watercourse crossings per 1. and 2. above, road surfaces and drainage facilities (e.g. ditches) leading to the crossings, will be permanently and effectively hydrologically disconnected from the crossings.**

6.2.3.4.4 Road Upgrading Methods

Where road upgrading is the recommended treatment in the implementation plan, Simpson will follow the applicable location, design, timing, and construction standards of 6.2.3, the methods stated in 6.2.3.4.5 through 6.2.3.4.9, and be generally governed by the techniques described in Weaver and Hagans (1994) unless and until a more "state

of the art" manual is published and mutually agreed upon by Simpson and the Services for application.

6.2.3.4.5 Design Flow

1. All culverted watercourse crossing replacements will be designed to **effectively pass handle** a 100- year return interval flow event **without shearing, separating, plugging, collapsing, piping, failure of outlet structures, or loss of crossing fill mass.**
2. The design flow will be calculated using the Waananen and Crippen (1977) method for areas greater than or equal to 80 acres. The Rational Method (Chow 1964) will be used when the drainage area for a crossing is less than 80 acres.
3. Culverts will be sized to pass the 100-year flow event, **including sediment and debris**, without overtopping (HW/D = 1.0).
4. Culverts that are functioning properly but are undersized according to the standards will be **replaced** ~~upgraded~~ if (a) the existing culvert's capacity is not within 15% of the design flow and (b) the headwater depth to culvert diameter ratio is less than 2.0.
5. Other flow design estimation methods developed in the future for the North Coast Region may be substituted if comparable **and approved by the Services.**

6.2.3.4.6 Fish-bearing Watercourses

1. Simpson will install bridges on fish-bearing watercourses where feasible.
2. When a bridge installation is not feasible, a countersunk or bottomless culvert will be installed at a grade ~~on-grade~~ that will provide **unrestricted** upstream and downstream fish passage for **all life history stages throughout the year.** Installed culverts will ~~not reduce or restrict the active channel flow.~~

6.2.3.4.7 Washed Out and/or Replacement Culverts

1. Simpson will upgrade ~~washed out~~ culverts (**defined as improperly functioning culverts due to crossing failure, stream diversion, culvert plugging, shearing, separation, undercutting, or collapsing**) and those replaced on previously temporary decommissioned roads to the same installation standards as new roads. **Washed out culverts will be replaced as soon as feasible and in a manner minimizing risk to aquatic resources to the maximum extent practicable. Relative compaction of 95% will be achieved a minimum 2 feet around the culvert, and culvert back fill will consist of 3/4" minus graded rock. The remaining fill over the replacement culvert will achieve at least 90% relative compaction.**
2. Any buried logs or other large organic debris will be removed from the crossing fill **and the replacement culvert set to original stream grade.**

6.2.3.4.8 Reshaping

1. Simpson will reshape the existing roadbeds **where if necessary to improve surface drainage. Improving surface drainage is necessary wherever road surface runoff or runoff from any drainage facility is hydrologically connected to watercourses. Improving surface drainage is also necessary wherever filter strip properties are ineffective, evidenced by a visible sediment buildup across the forest floor between the drainage point off the road surface or drainage facility and watercourse, or where water from such locations is higher in turbidity than the receiving water and may reach the receiving water.**
2. Reshaping is restricted to the time periods described for road upgrading except it will not be conducted ~~during the early spring drying period (May 1st through May 14th)~~ **prior to June 1. Reshaping will avoid blading or grading inside ditches unless the purpose is to install rolling dips to hydrologically disconnect the ditchline from crossings, or to outslope the road.**

6.2.3.4.9 Additional Ditch Relief Culverts

Simpson will install additional ditch relief culverts to **at least** meet the maximum spacing specifications of 6.2.3.6.12. **Additional ditch relief culverts will be installed to achieve effective hydrologic disconnection of drainage facilities while maintaining hillslope stability. The following will apply to all ditch relief installations:**

1. **Ditch relief culverts will be installed with 95% relative compaction of fill.**
2. **Ditch relief culverts will be installed with the outlet at the base of the fill to the maximum extent feasible.**
3. **Ditch relief culverts will not have diversion potential or, where unavoidable, diversion potential will be additionally effectively mitigated, including but not limited to the following: over sizing; rock armoring ditches, road surfaces and diversion outfall points; and increasing culvert frequency.**
4. **All ditch segments between the last ditch relief culvert and the crossing will be effectively rocked to prevent ditch downcutting, road shoulder erosion, erosion of the toe of cut slopes bordering the ditch, and to reduce sediment delivery to the crossing,**
5. **Energy dissipaters consisting of appropriately graded and properly installed rock will be used instead of half round outlet downdrains, where feasible. Where not feasible, half rounds will be at least one standard diameter larger than the culvert, securely anchored to the culvert, and securely anchored for their entire length with an anchor assembly consisting of pipe stakes and coupling bands.**

Response to Comment S6-88

The Services' role is to evaluate consistency of an HCP as a whole with the ESA Section 10 Permit approval criteria. Issuance criteria are discussed in EIS Section 1.3, AHCP/CCAA Section 1.4.1 and Master Response 8. The Services believe that Green Diamond's Operating Conservation Program (AHCP/CCAA Section 6.2), including the proposed measures contained in AHCP/CCAA Section 6.2.3.4.9, meets these criteria.

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6. **Ditch relief culverts will not discharge directly to downslope watercourses through channelized flow. Where hydrologic disconnection is not feasible, additional rock energy dissipaters and other state of the art erosion control measures will be installed.**

The above additional language is based on DFG observations and documentation of significant problems associated with ditch relief spacing, installation, and function throughout the plan area.

6.2.3.5 New Road Construction and Road Reconstruction Standards

6.2.3.5.1 Single-use THP Roads

Simpson will classify new **and reconstructed** roads designed for a single-use in a THP as temporary, and decommission the roads upon completion of operations.

6.2.3.5.2 Seasonal Restrictions

Simpson will not construct new roads or reconstruct roads during the ~~winter~~ period October 16th through June 1 ~~May 14th~~. **Partially constructed or re-constructed roads will be hydrologically disconnected and treated with erosion control prior to October 15 sufficient to be effective until at least June 1 of the following year.**

6.2.3.5.3 Clearing Width

Simpson will provide a clearing with a width which is based on the slope of the ground (it must be able to adequately displace organic material so that organics are not incorporated in the fill) and the presence of green trees (to avoid having fill material butt up against green trees), and will normally range from 75 to 100 feet. **Unstable or potentially unstable cut slopes exposed by clearing operations will be fully stabilized, drained, and maintained to prevent sediment from being discharged to watercourses. Trees felled within RMZs during clearing operations will be retained in the RMZ and where practicable placed in the channel under the direction of a qualified fisheries biologist.**

6.2.3.5.4 Tree Removal.

1. Simpson will clear all trees over 12 inches dbh within five feet of the top of the cut slope.
2. Trees greater than 12 inches dbh within five feet of the top of the cut slope may be retained if they will not be susceptible to windthrow or of being undercut.

6.2.3.5.5 Slash and Debris

1. Simpson will not incorporate slash and other debris from road construction into the road prism, fills or sidecast material.
2. When feasible, slash and **other native** debris will be placed parallel to the toe of road fill slopes as a filter windrow.

Response to Comment S6-89

Definitions of secondary and mainline roads have been added to the glossary (AHCP/CCAA Section 10.2).

Response to Comment S6-90

The Services' role is to evaluate consistency of an HCP as a whole with the ESA Section 10 Permit approval criteria. Issuance criteria are discussed in EIS Section 1.3, AHCP/CCAA Section 1.4.1 and Master Response 8. The Services believe that Green Diamond's Operating Conservation Program (AHCP/CCAA Section 6.2), including the proposed measures contained in AHCP/CCAA Section 6.2.3.5.8, meets these criteria.

- 3. Slash will not be bunched against residual trees or placed in locations where it may gain entry into Class I, II or III watercourses.

6.2.3.5.6 Organic Layer

On slopes greater than 35%, Simpson will substantially remove the organic layer of the soil prior to fill placement.

6.2.3.5.7 Location

- 1. Simpson will make every **feasible** attempt to avoid locating roads on steep slopes, inner gorge or steep toe slopes, headwall swales, ~~or~~ debris slide slopes, and deep-seated landslides, **and in areas prone to cut slope failures due to frequent groundwater interception**, and will follow the slope stability measures when it is not possible to avoid these features. **When such sites are unavoidable, a registered civil engineer with experience in design and construction of forest roads in Humboldt or Del Norte Counties will provide technical review to further reduce the potential for sediment discharges to watercourses.**
- 2. Wherever feasible, roads will be located on or close to ridge tops or on benches where the road prism can be built with the least soil displacement.
- 3. **New and reconstructed** roads will be constructed **or reconstructed** so the road network will not drain directly into watercourses (i.e., will be hydrologically disconnected).

6.2.3.5.8 Road Width Specifications

- S6-89 [1. Simpson will construct management roads to have a running surface width of 16 to 18 feet (mainline roads) and 14 to 16 feet (secondary roads). An enforceable definition of mainline road and secondary road should be included here and in Section 10.2.
- 2. Mainline and secondary roads will **be outsloped to the maximum extent feasible except for occasional segments of typically have a combination of outsloped and crowned road construction plus an inside ditch where needed to drain seep and springs, appropriate** and occasional turnouts. Road outsloping to the maximum extent feasible is one of the most effective means of reducing road sediment delivery.
- S6-90 [3. Temporary roads will have a width of 14 to 16 feet, will ~~typically~~ be outsloped with rolling dips, will be planned and designed for a single harvest entry, and will be decommissioned upon completion of harvest operations, **including complete and effective hydrologic disconnection from watercourses.**
- 4. Exceptions to the road width specifications will be made where necessary considering topographic constraints, landing locations, turnouts, engineered berms, and curve widening, as measured in 200 foot lineal segments. Greater

Response to Comment S6-91

The Services' role is to evaluate consistency of an HCP as a whole with the ESA Section 10 Permit approval criteria. Issuance criteria are discussed in EIS Section 1.3, AHCP/CCAA Section 1.4.1 and Master Response 8. The Services believe that Green Diamond's Operating Conservation Program (AHCP/CCAA Section 6.2), including the proposed measures contained in AHCP/CCAA Section 6.2.3.5.10, meets these criteria. Also see Master Response 14.2 regarding Plan enforceability.

widths will be allowed to satisfy requirements of alignment, safety, and equipment. Curves will be widened to an additional width based on the following:

Radius Additional Width

100+ feet radius + three feet

75-100 feet radius + five feet

50-74 feet radius + eight feet

6.2.3.5.9 Road Construction within RMZs

1. Simpson will not construct new roads or reconstruct roads within RMZs with the exception of watercourse crossings or spur roads off of existing roads within RMZs which would be designed to extend outside the RMZ.
2. Simpson will not build new roads or reconstruct roads that parallel watercourses within RMZs.

6.2.3.5.10 Surfacing for Roads

1. Simpson will not use roads during the winter period for hauling (logs and rock) unless they have surfacing specifications of a minimum compacted depth of 12 inches of rock.
2. Only rock that is durable and does not break down with vehicle or heavy equipment use will be applied to road surfaces. Durability is subjective and difficult to enforce. Even with 12 inches of "durable" rock applied, the gradation of rock, condition of the road surface receiving the rock, the soil moisture conditions of the road at the time of application, depth of lifts in which the rock is applied and compacted, type of equipment used to compact the rock, frequency of use, antecedent rainfall, and soil type will all collectively determine the effectiveness of rocking in terms of preventing the rutting and pumping of fines up through the rock to the road surface.

More specific, detailed, enforceable language needs to be developed and implemented, including clear and enforceable definitions and specifications, before road rocking can even approach effectively minimizing and fully mitigating sediment runoff to watercourses due to wet weather hauling. DFG also encourages Simpson to identify, prioritize, and strategically pave those road segments receiving the heaviest winter hauling use and subject to the most deterioration and delivery of sediment to habitat of the Covered Species.

3. During the winter period, unless the road surface is dry or hydrologically disconnected from watercourses and drainage facilities, Simpson will not use vehicles, including trucks and all terrain vehicles, on unsurfaced roads for administrative purposes unless the roads have rock applied, and such application is sufficient as needed to prevent rutting of the road surface, displacement of road surface, loss of traction, and/or runoff of waterborne

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sediment in amounts sufficient to cause a visible increase in turbidity in any ditch or road surface which drains into a Class I, II, or III watercourse.

6.2.3.5.11 Final Grades

Simpson will ensure that final grades of new roads do not exceed 15% except to avoid unstable slopes, steep slopes, inner gorges, inner gorge crossings, or to access a suitable watercourse crossing location, as measured in minimum 100 feet increments. **Road grades will be as low as feasible in all applications.**

6.2.3.5.12 Overhanging Cut Slopes

Simpson will remove all overhanging cut slopes.

6.2.3.5.13 Existing Road Bank Cuts

For new road construction in areas where existing road bank cuts have exhibited failures, Simpson will evaluate **each location** ~~site-specific situations~~ and apply measures **at all such sites delivering or threatening to deliver sediment to a watercourse or drainage facility which is hydrologically connected to a watercourse.** ~~as appropriate such as~~ **Measures will include, but not be limited to, one or more of the following:** seeding and mulching, rock buttressing, **outsloping, ditch rocking, sub-drain installation,** and erosion mats to ensure cut bank stability and to minimize erosion **which may reach a watercourse.**

6.2.3.5.14 Use of Through Cuts

Simpson will avoid the **construction, reconstruction and use** of through cuts wherever feasible. In areas where **construction, reconstruction and use** of through cuts cannot be avoided (e.g. to avoid steep slopes, unstable slopes) **the following will apply:**

1. **Rock will be applied to the road surface in the through cut,** (See DFG comments to 6.2.3.5.10 regarding rocking).
2. **Permanent ditch-outs with adequate outlet filtration areas to prevent the discharge of sediment to watercourses or hydrologically connected drainage facilities** will be installed at the beginning and end of the through cut.
3. **Ditchlines in through cuts which lead directly to watercourses or which lead to drainage facilities which cannot be hydrologically disconnected prior to discharging to watercourses will be rock armored to prevent downcutting and to dissipate energy.**
4. **Ditchlines receiving through cut runoff which cannot be hydrologically disconnected from watercourses will be rocked from the outlet of the through cut to the watercourse.**

6.2.3.5.15 Slope Cut Design and Treatment

Response to Comment S6-92

The Services' role is to evaluate consistency of an HCP as a whole with the ESA Section 10 Permit approval criteria. Issuance criteria are discussed in EIS Section 1.3, AHCP/CCAA Section 1.4.1 and Master Response 8. The Services believe that Green Diamond's Operating Conservation Program (AHCP/CCAA Section 6.2), including the proposed measures contained in AHCP/CCAA Section 6.2.3.5.15, meets these criteria.

~~Except for certain soil types or site conditions that require vertical cut slopes (e.g. Tonini soils, rock outcrops), slope~~ **Slope cuts will be designed and constructed to minimize the risk of slope failure, soil disturbance, excessive excavation, and sediment delivery to watercourses. Where known slope cut failure risks exist, a registered civil engineer with experience in design and construction of forest roads in Humboldt or Del Norte Counties will provide technical review of proposed slope cuts to feasibly reduce the potential for sediment discharges to watercourses. Where slope cut failures discharge or may discharge sediment into watercourses or hydrologically connected drainage facilities, some or all of the following treatments will be installed as soon as feasible:**

1. **Hydrologic disconnection of the slope failure from watercourses**
2. **Slope layback (flattening)**
3. **Rock buttressing**
4. **Sub-drain installation**
5. **Ditch armoring**
6. **Frequent and effective application of erosion control materials**
7. **Removal of cut failure material to a stable location away from watercourses or hydrologically connected drainage facilities.**

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Based on experience inspecting road cuts on commercial timberlands, DFG believes slope treatment is an area where enforceable design specifics need to be included. Improper location and design of slope cuts can lead to large scale delivery of sediment to watercourses. Technical review by a registered civil engineer with experience in design and construction of forest roads can feasibly reduce the frequency and magnitude of slope cut failures.

6.2.3.5.16 Deposit of Excess Material

1. For areas requiring "end-haul" or **disposal of excess material** ~~some degree of "waste management"~~ Simpson will deposit the excess material in a stable location where sediment will not deliver to any watercourses **or hydrologically connected drainage facilities.**
2. Waste material will be seeded and mulched prior to October 15th in the year it is produced.

6.2.3.5.17 Bench Construction

On side slopes greater than 50%, where the length of the road section is greater than 100 feet, Simpson will construct fills greater than four feet in vertical height at the outside shoulder of the road on a bench that is excavated at the proposed toe of the fill and is wide enough to compact the first lift and subsequent lifts in approximately one-

Response to Comment S6-93

See response to Comment S6-92.

Response to Comment S6-94

See Master Response 14 regarding Plan enforceability.

foot intervals from the toe to the finished grade. **Relative compaction of fills will be at least 90%.**

6.2.3.5.18 Fill Construction

Simpson will construct **all** fills in lifts not to exceed one foot, **at appropriate soil moisture conditions, and will achieve 90% relative compaction with a sheep's foot or other conventional compacting equipment.** ~~to minimize erosion using~~ **Techniques** such as insloping, berms, rock armoring (where appropriate), or other suitable methods **will be used to minimize erosion.**

6.2.3.5.19 Rocked Roads

S6-93 [**On roads that are rocked or to be rocked,** (see DFG comments to 6.2.3.5.10 regarding rocking) Simpson will ~~use a combination of~~ **outslope new or reconstructed roads except for occasional segments of** and crowned roads with inboard ditches where **it is necessary to drain seeps and springs.** ~~appropriate on roads that are to be rocked.~~

6.2.3.5.20 Roads Crossing Watercourses

Where roads cross watercourses, Simpson will ensure that the road prism has a gradual transition to an insloped vertical curve as the road approaches and leaves the crossing.

6.2.3.5.21 Native Surface Roads

Except for insloping per 6.2.3.5.20, and unless specifically otherwise approved by the Services, Simpson will only use an outsloped road prism with rolling dips needed to maintain existing hillslope hydrology ~~generally use an outsloped road prism for native surface roads.~~

6.2.3.5.22 Turnouts

- S6-94 [
1. Simpson will place turnouts at ~~reasonable~~ intervals along the alignment and **they** will be located where a ~~minimum~~ of excavation will be necessary to increase the road width. These terms should be better defined. They are not enforceable.
 2. Turnouts will not be constructed if fill is required on side slopes for their construction.
 3. **Turnouts will be considered part of the road.**

6.2.3.5.23 Soil Moisture Conditions

Simpson will not construct **or reconstruct** roads **when the following conditions exist:**

1. **When soil moisture conditions are not suitable to achieve 90% compaction of fills, or**