

California Regional Water Quality Control Board
North Coast Region

Order No. R1-2014-0036

Waste Discharge Requirements
For
Discharges Related to Timber Harvesting and Related Land Management Activities
Conducted by Humboldt Redwood Company, LLC
In the
Jordan Creek Watershed
Humboldt County

The California Regional Water Quality Control Board, North Coast Region, (hereinafter Regional Water Board) finds that:

1. The Jordan Creek watershed encompasses approximately 3,072 acres (4.8mi²) and is a tributary to the Eel River in the Scotia hydrologic subarea (HSA) of the Lower Eel River hydrologic area. Jordan Creek converges with the Eel River approximately 3.5 miles upstream of the town of Scotia and approximately 21 miles from where the Eel River flows into the Pacific Ocean.
2. On February 27, 2008, the Regional Water Board Executive Officer requested that Pacific Lumber Company (PALCO), which at the time owned 3,011 acres of the Jordan Creek watershed now owned by Humboldt Redwood Company (HRC), submit a Report of Waste Discharge (ROWD) describing a management plan to address cumulative watershed effects in Jordan Creek.
3. In October 2008, HRC purchased PALCO's timberlands throughout Humboldt County, including the entire acreage in the Jordan Creek watershed previously owned by PALCO. The Request for a ROWD applies to HRC as the new owner.
4. On September 13, 2013, pursuant to Water Code section 13260(a), HRC submitted a ROWD for its timber harvesting and related management activities on lands in the Jordan Creek watershed in Humboldt County. HRC manages its Jordan creek timber holdings for growing conifer and hardwood trees for the production of saw and chip logs and other renewable forest products such as bio-fuel, split products, firewood, and burls.
5. The ROWD includes HRC's proposed long term strategy for their management activities in the Jordan Creek watershed, maps and appendices. HRC's management plan includes measures designed to prevent or minimize water quality impacts from its management activities in the Jordan Creek watershed. The ROWD addresses the following activities:
 - Silviculture and rate of harvest;
 - Measures to prevent or minimize controllable sediment discharge from roads, skid trails, landslides, and other sources related to timberland management;

- Identification and treatment of controllable sediment discharge sources (CSDSs);
 - Methods for road use, construction, reconstruction, decommissioning, and repair and maintenance;
 - Retention of riparian vegetation to preserve and restore shade and prevent increases in solar radiation;
 - In-stream and riparian zone habitat restoration by repositioning and stabilizing existing in-stream large wood and riparian zone conifers planting; and
 - Watershed trend monitoring.
6. On October 29, 2013, the Regional Water Board determined that the ROWD was incomplete due to the lack of a restoration plan. The ROWD discusses in-stream restoration but does not include a restoration plan. Regional Water Board staff recognize that channel conditions in much of Jordan Creek have improved greatly since 1997, however, excess sediment persists in the channel of much of Jordan Creek, and riparian vegetation does not provide shade or recruitment of large wood at levels approximating natural conditions.
7. Section 8 of the ROWD discusses potential restoration options, including placing or stabilizing large wood in stream channels that are impaired by excess sediment to enhance natural fluvial processes and accelerate recovery. Rather than rely on a permit condition to initiate watershed restoration Humboldt Redwood Company is working cooperatively with the Regional Water Board, Eel River Watershed Improvement Group, California State Parks, and other interested stakeholders, and has made reasonable progress in the development of the stream and riparian restoration plan, that includes enhancement of large wood in Jordan Creek and planting conifers in the riparian zone to promote future large wood recruitment thereby completing the ROWD process. The benefit of this approach is that projects would remain eligible for both grant funding as well as expedited permitting process available through California Department of Fish and Wildlife (CDFW) Fisheries Restoration Grant Program. The Regional Water Board is currently working with CDFW and other governmental and non-governmental agencies to find ways to streamline the permitting process and expedite approval for such restoration projects.

Jordan Creek Harvest History

8. PALCO began clearcut harvesting old-growth redwood and Douglas-fir timber in the Jordan Creek Watershed in the early 1940s. By 1954 nearly 24% (748 acres) of the watershed had been logged and 6 miles of road constructed.

9. Intensive logging of the old growth forest occurred in Jordan Creek between 1954 and 1966, when nearly 70% (2,096 acres) of the watershed was harvested using a combination of clearcut and intensive partial harvesting methods. During this period 18 miles of logging roads were constructed throughout much of the watershed, including on steep stream side hillslopes.
10. No harvesting occurred between 1966 and 1974. A period of modest harvesting occurred between 1974 and 1987, during which 10% (317 acres) were clearcut and tractor yarded, and 0.9 miles of road were constructed.
11. From 1987 to 1994, PALCO harvested second growth and residual old growth timber on approximately 32% (963 acres) of the watershed, again using a combination of clearcut and partial harvesting silviculture methods. During this second period of logging, much of the hillslopes that had been tractor logged in the first entry were cable logged, which is considered to cause less ground disturbance than tractor logging. An additional 4.8 miles of road were constructed during this time.
12. Several large storm events since the 1950s including the regionally significant 1964 storm event triggered episodes of widespread landsliding from slopes disturbed by logging and logging road construction practices. Many of the landslides formed debris torrents that deposited large volumes of sediment in streams, widened stream channels, and removed much of the riparian vegetation. The most recent of these large landslide triggering events occurred during a series of storms in December 1996 and January 1997 and severely impacted several miles of the mainstem and major tributaries of Jordan Creek.
13. In December 1997, the California Department of Forestry and Fire Protection (CAL FIRE), Department of Fish and Game, California Geological Survey (CGS), and the Regional Water Board determined, based on field observations and aerial photograph data, that Jordan Creek was one of five watersheds significantly cumulatively impacted by sediment discharges after the 1996/1997 storms. The other watersheds included, Stitz and Bear Creeks, which are also tributary to the Lower Eel River, and Freshwater Creek and Elk River which are tributary to Humboldt Bay approximately 25 miles to the north.
14. In 1999 Pacific Watershed Associates (PWA) released the results of its sediment source investigation for the Jordan Creek watershed (Appendix B). During the 43 year-period between 1954 and 1997, approximately 504,800 yd³ of sediment from debris landslides, 130,200 yd³ of sediment from torrent track scouring, 66,800 yd³ of sediment from streamside bank erosion, and 190,040 yd³ of sediment from road-related erosion were delivered to Jordan Creek; a total of 891,840 yd³.

15. In 1999 PALCO signed their Habitat Conservation Plan, which modified logging and road construction practices.
16. By 1999 there were 29 miles of roads within the Jordan Creek watershed. Between 1999 and 2007 PALCO harvested 32% (957 acres) of the watershed and built 1.2 miles of road. No harvesting has occurred in the watershed since 2007.
17. In October 2008, HRC obtained ownership of PALCO's timberland holdings throughout Humboldt County, including the 3,011 acres in Jordan Creek. Since acquiring the property, HRC has implemented a silvicultural management strategy throughout their ownership that predominantly utilizes partial harvesting methods, such as selection silviculture. Partial harvesting results in post-harvest conditions that are less susceptible to mass wasting and increased erosional processes as compared to clearcut harvesting.

Total Maximum Daily Loads and Basin Plan Water Quality Standards

18. In 1992, United States EPA added the Lower Eel River to the Clean Water Act section 303(d) impaired waters list due to elevated sedimentation/siltation and temperature, as part of listing the entire Eel River basin. In 2007, the EPA established Total Maximum Daily Loads (TMDLs) for sediment and temperature for the Lower Eel River. TMDLs are set at levels necessary to achieve the applicable water quality standards, which consist of beneficial uses, water quality objectives, and an anti-degradation policy.
19. Jordan Creek is within a designated impaired watershed and therefore, subject to the EPA-established TMDLs for sediment and temperature for the Lower Eel River¹. The sediment TMDL identifies estimated sediment loading rates from natural and anthropogenic sources. The sediment TMDL identifies landslides as the dominant sediment producing process and finds that timber harvesting and roads are the primary source of management related sediment discharge. The sediment TMDL estimates the amount of sediment that can be delivered to streams within the watershed (tons per square mile per year) without exceeding water quality standards. Reductions in the estimated sediment load from a recent time interval is another way to describe the sediment TMDL loading allocations. Since sediment loading rates for Jordan Creek are best understood for the most recent decades, the sediment TMDL load allocation of a 65% reduction of the sediment load for the period 1989-2003 will be used to track TMDL progress.

¹ U.S. Environmental Protection Agency (USEPA), 2007, Lower Eel River Total Maximum Daily Loads for Temperature and Sediment.

20. The sediment TMDL recommends reducing landslide risk from timber harvest related activities, performing road assessments and upgrading deficient roads, and modifications to restoration activities based on monitoring results. It is anticipated that implementation of HRC's management strategy as outlined in the ROWD, with modifications as needed based on ongoing monitoring and assessment, will result in a reduction of anthropogenic sediment discharges from roads and landslides sufficient to achieve TMDL load allocations.
21. The temperature TMDL identifies loss of riparian shade due to landslides and timber harvest as one of the predominant factors causing temperature impairment of the Lower Eel River watershed. The temperature TMDL load allocations consist of protection or restoration of natural shade to assure compliance with water quality standards. It is anticipated that implementation of the riparian protection and restoration measures will achieve temperature load allocations and will result in compliance with the temperature objective.
22. The provisions described in findings 32 through 42 are expected to achieve TMDL load allocations specified above. Compliance with the provisions of this Order is the regulatory mechanism for HRC to comply with the Lower Eel River watershed sediment and temperature TMDLs.
23. Pursuant to the Water Quality Control Plan for the North Coast Region (Basin Plan), including State Water Resources Control Board Resolution No. 88-63, the existing and potential beneficial uses of waters potentially affected by HRC's management activities in the Jordan Creek watershed include:
 - a. Cold Freshwater Habitat (COLD)
 - b. Wildlife habitat (WILD)
 - c. Rare, Threatened, or Endangered Species (RARE)
 - d. Migration of Aquatic Organisms (MIGR)
 - e. Spawning, Reproduction, and/or Early Development (SPWN)
 - f. Flood Peak Attenuation/Flood Water Storage (FLD)
 - g. Wetland Habitat (WET)
24. The primary beneficial uses of concern for this Order are 1) COLD, defined as a use that "supports cold water ecosystems including, but not limited to, preservation or enhancement of aquatic habitats, vegetation, fish, or wildlife, including invertebrates.", and 2) SPWN, defined as a use that "support high quality aquatic habitats suitable for reproduction and early development of fish.". This Order focuses on salmonids as the aquatic species that are most sensitive to elevated sediment and temperature conditions. Evidence of salmon population declines is contained in the listing of all the major species under the Endangered Species Act by the National Marine Fisheries Service. Salmon populations are listed under their geographic area. The Endangered Species Act listing that applies to the Lower Eel River is as follows:

- Southern Oregon/Northern California Coast coho salmon Evolutionary Significant Unit (ESU)
- California Coastal Chinook salmon ESU
- Northern California steelhead Distinct Population Segment (DPS)

Waste Discharge Requirements

25. Water Code section 13260 subdivision (a) requires that any person discharging waste or proposing to discharge waste within any region that could affect the quality of the waters of the state, other than into a community sewer system, must file with the appropriate Regional Water Board a Report of Waste Discharge (ROWD) containing such information and data as may be required.
26. Pursuant to Water Code section 13263, the Regional Water Board may prescribe requirements as to the nature of any proposed or existing discharge with relation to the receiving water conditions. Requirements shall implement any relevant Basin Plan requirements and take into consideration beneficial uses and water quality objectives reasonably required to protect such uses, and other relevant factors.
27. These Waste Discharge Requirements (WDR or Order) address non-point source activities which have the potential to discharge wastes that affect waters of the State from only those portions of Jordan Creek owned and managed by HRC—and rights-of-ways over roads on lands owned by others—totaling approximately 3,011 acres (Figure 1-2 of the ROWD), or 98% of the watershed. The potential water quality impacts are associated with erosion and sediment delivery, and changes to riparian systems that may reduce shade and affect water temperatures. This Order includes requirements that prevent or minimize sediment discharges and requirements that prevent increases in water temperature by limiting harvesting adjacent to streams and implementing measures to hasten natural channel recovery processes.

Applicable State and Federal Regulatory Programs That Apply to Activities Covered by these WDRs

28. HRC management activities in the Jordan Creek watershed are also subject to local, State, and Federal laws, policies and ordinances. These include but may not be limited to the following:
 - California Forest Practice Act (Pub. Resources Code, § 4511 et seq.) and Forest Practice Rules (FPRs) (Cal. Code Regs., tit. 14, §§ 895-1115.3);
 - A multi-species state and federal Habitat Conservation Plan (HCP) approved in 1999 by California Department of Fish and Game (now California Department of

- Fish and Wildlife), National Marine Fisheries Service, and United States Fish and Wildlife Service;
- Lake or Streambed Alteration Agreement (Fish & Game Code, §1602).
29. CAL FIRE is the state agency responsible for overseeing timber harvesting activities through implementation of the FPRs. Landowners proposing to harvest timber are required to have an approved Timber Harvest Plan (THP), prepared by a Registered Professional Forester (RPF), prior to starting timber harvesting activities. Pursuant to the FPRs, the Regional Water Board, California Department of Fish and Wildlife (CDFW), California CGS, and other agencies are also responsible agencies that review THPs and provide recommendations to CAL FIRE as part of a "Review Team." CAL FIRE's THP approval process is the functional equivalent to the California Environmental Quality Act (CEQA) review process. The Regional Water Board will continue to participate as a Review Team member for individual THPs proposed in Jordan Creek.
30. This Order is intended to work in conjunction with, and to supplement, existing regulations in order to implement Basin Plan water quality standards and restore the beneficial uses of water in the Jordan Creek watershed. To that effect, the Regional Water Board relies in part on enforceable provisions of the FPRs and HRC's HCP that are related to protection of water quality, including the updated 2004 Lower Eel and Eel Delta watershed prescriptions, which are included specifically or by reference as enforceable provisions of this Order.

Management Plan and Practices

TIMBER HARVESTING

31. Logging and associated activities have the potential to impact water quality. The potential for impacts to occur is highest in the period following disturbance, with a delay of several years for the period of maximum vulnerability due to loss of root strength. Impacts diminish over time as vegetation grows back and disturbed soil stabilizes. This recovery period varies for different processes. In order to limit the potential for impacts to water quality, it is necessary and appropriate to limit the total area within a watershed that is in a condition prone to water quality impacts following harvest and establish an upper limit to the watershed area that can be harvested in any ten-year period following adoption of the Order.

Many studies have been conducted to try to better understand the relationship between rate of harvesting and cumulative watershed effects that result from a complex interaction of many different factors. Such factors include: inherent watershed characteristics, such as geology and geomorphology; external natural

processes such as climate and timing of stochastic events (i.e. large storms, earthquakes, fires); types of management practices; and extent of watershed area disturbed (i.e. rate of harvest). The rate of harvest in a watershed is an important management variable. Several studies cite specific thresholds for the rate of harvest, above which, cumulative impacts become more likely to occur. Studies have linked specific processes to watershed impact, such as increased peak flows (Lisle et al. 2000, Lewis et al. 2001), landslide related sediment discharge (Reid, 1998), road density (Cedarholm et al. 1981, Gucinski et al. 2001, Trombulak et al, 2000), or clearcut equivalent acres (USDA Forest Service, 1974). Appropriate harvest rate thresholds necessary to avoid cumulative watershed impacts presented in the scientific literature, expressed as watershed area harvested over time (typically percent per year or per decade), vary greatly. The report of the scientific review panel on California Forest Practice Rules and salmonid habitat (Ligon et al, 1999) recommended harvest rates between 30% and 50% clearcut equivalent acres per decade, depending on site specific variables, harvesting prescriptions, past watershed disturbance, and other factors (Reid, et al, 2010; Klein, 2012; and Cafferata, 2013).

Section 5.1 of the ROWD provides an estimate of forested acres to be actively harvested and managed over the next ten years in Jordan Creek watershed. HRC anticipates harvesting no more than 25% (750 acres) of the total watershed area over the next decade using primarily Selection and Group Selection silviculture. An additional 4% (125 acres) will be harvested utilizing Variable Retention and Rehabilitation of Understocked Areas. Lastly, Sanitation Salvage may be utilized to respond to unforeseen acts of nature, such as insect infestation, disease, flood, or wildfire. Ground based yarding will be restricted to slopes $\leq 40\%$, with high-lead and full suspension cable yarding on slopes greater than 40%. Based on current conditions in the watershed, the proposed silviculture methods, the proposed level of geologic review and hillslope protection measures, management practices designed to prevent or minimize sediment discharge, the specific requirements established in this Order, and the Regional Water Board's ongoing oversight of HRC's management activities, staff finds HRC's proposed maximum harvest to be protective of water quality standards within the Jordan Creek watershed. This harvest rate is not intended to establish a rate of harvest applicable to other timberlands owned by HRC outside of the Jordan Creek watershed.

Section 1(A)(2) requires that HRC limit timber harvesting in the Jordan Creek watershed to no more than 30% of the watershed area over any ten year period following approval of this Order.

LANDSLIDE PREVENTION

32. Section 4 of the ROWD identifies existing sediment sources with the Jordan Creek watershed. These sources are landslide-related, road erosion related, and streamside bank erosion related.
33. These sediment sources and their underlying causes are discussed in Sections 4.1. Timber harvesting can increase rates of shallow landslides on vulnerable slopes due to decreases in root strength and increased soil moisture. Tree roots can enhance the strength of shallow soils, increasing the soil's ability to resist failure. When trees are harvested, their roots gradually decay, reducing the reinforcement they provide and increasing the potential for shallow landslides. The loss of root strength gradually increases over a period of several years, with the critical period of maximum loss occurring approximately 5 to 15 years after harvesting, depending on species and intensity of harvesting. As new roots grow into the space previously occupied by the older root system, the support they provide gradually increases. Partial harvesting of resprouting species such as redwood or tanoak is thought to minimize the degree and duration of the period of diminished root strength. This is due the fact that the roots of those trees do not die back completely after the tree is cut down and that a significant percentage of trees are retained after harvesting.

Interception, evaporation, and evapotranspiration of rainfall by forest canopy can reduce the volume of precipitation that infiltrates and remains in soils. Harvesting trees can therefore result in increased soil moisture and runoff, which can contribute to landsliding and increased erosion. Vulnerability to shallow landsliding processes varies throughout a hillslope, primarily as a function of soil depth, slope gradient, contributing drainage area, subsurface hydrology, and soil characteristics.

HRC's management strategy will utilize a combination of methods to identify vulnerable portions of the watershed and management activities that have the potential to trigger landslides. The objectives of the landslide reduction strategies are to avoid or restrict harvesting on vulnerable slopes and limit the overall intensity and areal extent of harvesting. Taken together, this combination of strategies is designed to minimize the potential for increased sediment discharge from timber harvest related landslides. These are discussed in greater detail below and include:

- No harvesting within 100 feet of Class I and II streams; additional harvesting restrictions up to 300 feet from the stream or to the break in slope; and review by a licensed geologist;
- Use of a shallow landslide model (SHALSTAB) and review of all proposed harvest areas and road construction by licensed geologist in order to identify vulnerable slopes and characterize landslide hazards, assess the risk of sediment discharge, and develop prescriptions to reduce the landslide risk;

- Maintain and update an inventory of landslides in the watershed to expand understanding of landslide patterns in the watershed and the effectiveness of management measures, and to revise them as necessary;
 - Implement feasible stabilization measures to prevent or minimize ongoing sediment discharge from landslides;
 - Use of partial harvesting methods that retain a significant component of post-harvest root strength;
 - Establish a harvest rate limit of 30% of the watershed harvested in any ten-year period in order to limit the area in post-harvest condition of reduced root strength at any given time.
34. HRC has used a shallow landslide hazard model, SHALSTAB, to identify potential high landslide hazard areas within all of its holdings in the Jordan Creek watershed and has prepared a map showing those areas. SHALSTAB combines hillslope angle and topographic convergence from a digital elevation model (DEM) to identify potential high landslide hazard areas. Regional Water Board staff have reviewed the hazard map derived from the SHALSTAB model, and determined that use of the model is an appropriate tool to help in the preliminary identification of areas that may warrant additional geologic review and restricted or limited harvesting.

Section I(B)(1) - (2) of the Order requires that during the planning phase of every THP, a Professional Geologist (PG) will review pertinent published technical data with the intent of identifying potential high landslide hazard areas. Following the evaluation of technical data, ground based geologic investigations will be conducted as needed to verify mapped landforms and previously unobserved features, and to develop site-specific prescriptions. Additionally, HRC must submit to Regional Water Board staff a report describing the site-specific prescriptions and an explanation as to how their incorporation into timber operations will reduce the potential for sediment discharge.

35. Section 6.3 of the ROWD describes how HRC will prevent the denuding of streambanks of riparian vegetation and the filling in of channels with sediment from new and reactivated landslides and debris torrents. This will be accomplished by conducting detailed THP geologic reviews, which include the use of SHALSTAB mapping of potential high landslide hazard areas, field verification, review of published geotechnical data, regional geomorphic maps and stereoscopic aerial photograph evaluation, and use of the *Hillslope Management Checklist*.

Appendix D of the ROWD describes hillslope prescriptions from HRC's HCP that were developed to minimize management related landsliding from steep streamside slopes as a result of watershed analysis for the Lower Eel River, which includes Jordan Creek. The analysis identified landforms most commonly associated with landsliding, based

on slope, geologic substrate, and land use history and provides prescriptions to either avoid or limit harvesting on high hazard areas.

Regional Water Board staff have reviewed the hillslope prescriptions and find that they are a reasonable approach to avoiding or limiting harvesting on vulnerable slopes and are an important component of their overall strategy to minimize management related landsliding.

Section 1(B)(4) requires that HRC implement the hillslope prescriptions from the ROWD, including the following:

- a. No harvesting within 100 feet of Class I and II watercourses;
 - b. Any harvesting within a headwall swale connected to a Class I, II, or III watercourse shall retain an adequate number of living trees equivalent to a minimum of 150 square feet of basal area per acre;
 - c. No ground based equipment, with the exception of at existing roads and equipment crossings, and permitted new road construction within:
 - 150 feet of a Class I watercourse,
 - 100 feet of a Class II watercourse,
 - 50 feet of a Class III watercourse, or to the closest hydrologic divide;
 - d. A checklist for foresters preparing timber harvest plans to assist them in identifying vulnerable slopes and provide criteria for review by a PG.
36. Landslide related sediment discharge from hillslopes disturbed by management activity can persist episodically for many years after the initial impact. Appendix A of the ROWD includes an inventory of active landslides observed after the 2003 and 2006 storm seasons prepared by a PG. Seventy-two of the 83 landslides (87%) identified in the inventory in Appendix A were reactivations of older landslides. Understanding landslide patterns in the watershed and the effect of land management on slope stability can be used to minimize ongoing landslide related sediment discharge and identify restoration opportunities.
37. Section 4.1.1 of the ROWD describes HRC plans to conduct field evaluations and aerial photograph interpretation, update and maintain the landslide inventory, and identify new landsliding activity. The ROWD specifies that HRC will acquire and maintain updated, high-angle color stereo pair aerial photographs to update the landslide inventory at an interval of no greater than 5 years.

Section 4.1.2 of the ROWD gives a brief outline of HRC'S current landslide inventory, prioritization strategy, and source remediation schedule. The strategies described above are designed to minimize the potential for harvest related landslides by avoiding or limiting harvesting on vulnerable areas.

Section 1(B)(5) of the Order requires HRC to maintain the landslide inventory as described in the ROWD.

Section 1(B)(6) of the Order requires HRC to develop and submit a landslide restoration plan to determine if feasible erosion control measures can be implemented to minimize future delivery. Potential erosion control measures may include, but are not limited to: re-vegetation (e.g. tree planting, seeding, willow waddles), excavation, drainage modification, and buttressing or armoring of unstable areas. The landslide restoration plan is to be submitted to the Regional Water Board Executive Officer for approval by October 15, 2015.

ROAD MANAGEMENT

38. Logging roads can alter hillslope hydrologic processes and increase sediment discharge from surface and gully erosion and landslides. Sediment TMDLs adopted for watersheds throughout the North Coast Region have identified logging roads as one of the most significant sources of anthropogenic sediment discharge. Roads can contribute to landsliding by undermining and over steepening slopes and placing fill material on steep slopes. Roads also intercept and concentrate shallow groundwater and surface runoff, which can cause gully erosion and saturate vulnerable slopes, increasing the potential for failure. Road crossings of watercourses are subject to the force of high stream flows and failure usually results in direct delivery to streams. Timber harvesting and associated road construction and use have historically left disturbed areas throughout the landscape that have the potential to discharge sediment over extended periods of time. These legacy sites, which are referred to as controllable sediment discharge sources (CSDS), may include failing or failed watercourse crossings, road failures, road surfaces, landslides, unstable watercourse banks, soil stockpiles, skid trails, landings, exposed harvest units, or any other site discharging or threatening to discharge waste or earthen materials in violation of water quality requirements.

CSDSs are those sites that meet all of the following conditions:

- a. is discharging or has the potential to discharge sediment to waters of the state in violation of water quality standards or other provisions established herein;
- b. was caused or affected by human activity; and
- c. may feasibly and reasonably, respond to prevention and minimization management measures.

The current inventory of all known CSDSs and road maintenance requiring active or preventive erosion control work is included in a master list in Appendix C of the ROWD. There are 59 road and 2 off-road CSDSs that represent 10,827 yd³ of potentially deliverable sediment if left untreated. The majority of the 61 CSDSs are

associated with “closed” non-stormproofed roads and are currently inaccessible to standard 4-wheel drive vehicles due to either pulled or failed crossings. HRC has scheduled all 61 sites to be treated by the end of year 2017. As part of the scheduled treatment, HRC will reopen the closed roads in order to access the 61 sites. Reopened roads will be stormproofed, as per the HCP requirements, as work on the crossings is completed.

There are an additional 12 low risk, non-delivering preventative maintenance sites, all located on permanent, rocked, storm-proofed roads. These sites along with associated scheduled preventative maintenance have also been included in Appendix C of the ROWD.

39. Erosion Control Plans (ECPs), in which landowners identify, evaluate, and treat CSDS, are an important component of a strategy to prevent or minimize ongoing sediment discharge, and also contribute towards achieving sediment TMDL load allocations. Section 4 of the ROWD describes HRC’s strategy to develop and implement ECPs for their timberland in the Jordan Creek watershed.

Section I(D) of the Order requires that HRC prepare and submit ECPs to address any CSDS not on a road or inventoried and treated pursuant to Sections I(B) (the landslide restoration plan) or I(C) (the road management plan) of the Order. These sites shall be inventoried and scheduled for treatment during timber harvest plan development and treated concurrently with timber harvesting in the vicinity.

These CSDSs will be subject to the following:

- a. Each site shall be inventoried in an ECP, which will include: a description of the current condition of each site, an estimate of the potential sediment volume that could discharge from the site, a narrative description of the proposed management measures, and a schedule for implementation.
 - b. Inventoried sites must be treated in accordance with the established ECP schedule.
 - c. The ECP shall be submitted to the Regional Water Board for review with the timber harvest plan it is associated with.
 - d. If treatment of such sites “strands” any other CSDSs, HRC does not relinquish responsibility for also treating the stranded sites. For logistical reasons, it is recommended that measures be taken to prevent sites from becoming stranded.
40. The ROWD describes HRC’s overall approach to preventing and minimizing controllable sediment discharge from roads. Section 6.2 of the ROWD describes the planned control of sediment from roads and other sources utilizing the requirements of the HRC HCP. Appendix E of the ROWD describes prescriptions to control sediment discharge from roads from Section 6.3.3 of HRC’s HCP. In particular, HCP Section 6.3.3

sets out standards and guidelines for road construction, reconstruction, and upgrades; measures to be taken to prevent and minimize sediment delivery to watercourses during road maintenance; the scheduling of inspections to be conducted on an annual basis and in response to large storm events; wet weather road use restrictions; and requirements for the treatment of exposed soils in riparian areas including timing of that treatment. These prescriptions included as Specific Requirements in Section I(C)(1) of this Order, specify the following measures designed to prevent or minimize sediment discharge from roads:

- Minimize concentration of surface runoff;
- Minimize potential for watercourse diversion at crossings;
- Minimize the length of road surface draining directly to watercourses;
- Remove potentially unstable fill material to the extent feasible;
- Inspect and maintain roads annually;
- Restrict wet weather road use.

Section 1(C)(2) of the Order requires that HRC shall upgrade all roads that currently do not meet the standards described above by October 15, 2017.

Section 1(C)(3) of the Order requires that HRC maintain and update the inventory of CSDSs from roads as described in Section 4.2 and Appendix C of the ROWD. Section I(C)(4) of the Order requires that by October 15, 2017, HRC shall treat those road related CSDSs currently identified in the inventory included in Appendix C of the ROWD.

Section 1(C)(5) of the Order requires that HRC shall inspect all roads within their Jordan Creek ownership at least annually and following triggering storm events as specified in the ROWD. New road-related sediment sources that are identified during the inspections will be treated within one year of being identified.

RIPARIAN PROTECTION AND TEMPERATURE

41. Timber harvesting can affect water temperature directly by removal of trees that provide shade to stream and riparian zones, and indirectly by increasing sediment production from road erosion, landslides, and other erosion processes that result in pool filling and shallower stream conditions which are more prone to heating. The debris torrents that occurred in Jordan Creek in the 1950s, 1960s, and 1990s filled portions of the mainstem channel with sediment and obliterated much of the vegetation that had provided shade to the stream and riparian zone. It also resulted in a wider shallower channel, which is more susceptible to temperature changes than deeper narrower streams. Analysis from the temperature TMDLs developed for

temperature impaired waterbodies throughout the North Coast Region have consistently found elevated water temperatures to be the result of increased exposure to solar radiation due to loss of stream shade and alteration of stream channels in response to elevated sediment loads.

Section 6.0 of the ROWD describes HRC's *Sediment and Adverse Stream Temperature Prevention and Minimization Strategy* for Jordan Creek. Section 6.1 outlines the implementation of the Lower Eel River/Eel River Delta (LEED), 2004, prescriptions contained in Appendix D. These prescriptions are designed to maintain and restore riparian forests for the benefit of shade canopy and large woody debris recruitment through restrictions and/or specific requirements for timber harvest and road construction/re-construction activities in riparian areas, steep streamside slopes, and unstable areas.

Section I(B)(2) of the Order requires that, as per the LEED prescriptions, HRC shall not harvest within 100 feet of Class I and II watercourses. Prohibiting all harvesting within 100 feet of Class I and II watercourses will promote regrowth of riparian canopy that was lost to earlier land activities or destroyed by debris torrents. This level of protection is adequate to preserve and restore natural shade to these watercourses in the Jordan Creek watershed.

IN-STREAM RESTORATION

42. Channel conditions in much of Jordan Creek have improved since 1997. Monitoring in-stream and riparian conditions began in 1998, and has continued to the present. Monitoring data presented in Appendices F and F2 of the ROWD, as well as interpretations of aerial photographs from 2003, 2006, and 2010 and field observations support the finding that conditions have improved since the storm event in December 1996. Natural stream processes have removed and redistributed sediment deposited by debris torrents in 1996 and riparian vegetation is returning. Habitat conditions are becoming more suitable for salmonids along much of the main stem and major tributaries, pool depth and frequency has increased, fine sediment fraction has decreased, and riparian canopy cover is increasing.

However, despite the improvements in stream conditions, excess sediment persists in much of the channel. Riparian vegetation does not provide shade at levels approximating natural conditions, and existing in-channel large wood as well as potential future large wood is lacking. Large wood performs important functions in stream channels: sorting sediment, scouring pools, and providing cover for fish. Individual pieces of large wood are episodically transported downstream during high, turbulent flow conditions, becoming temporarily lodged at new locations in the channel until they eventually decay or exit the watershed. Large wood can catch

other pieces, creating a log jam. As large wood moves through a stream, it changes flow dynamics, which can scour sediment stored in the channel and banks. These are natural processes that are necessary for properly functioning streams and for the creation of habitat for salmonids.

HRC is presently collaborating with the Eel River Watershed Improvement Group (ERWIG), Humboldt Redwood State Park (HRSP), the Regional Water Board, and other stakeholders to develop an in-stream riparian restoration plan to improve fish habitat in the lower reaches of Jordan Creek, particularly to address current lack of rearing habitat.

MONITORING AND REPORTING

43. HRC shall maintain coverage by submission of an annual work plan and summary report as described below, demonstrating compliance with the conditions and provisions established by the WDR. The annual work plan describing management activities planned for the coming year is necessary, along with an annual summary report describing management activities conducted during the previous year and including an update and evaluation at an interval of no more than every five years.

A Monitoring and Reporting Program (Attachment 1) is necessary to:

- track progress of activities conducted in compliance with waste discharge requirements;
- evaluate the effectiveness of HRC's management plan in protecting and recovering the beneficial uses of water; and
- provide feedback on HRC's management activities planned for the upcoming year in the Jordan Creek watershed.

CALIFORNIA ENVIRONMENTAL QUALITY ACT

44. In accordance with the California Environmental Quality Act (Public Resources Code section 21000 et seq.) (CEQA), the adoption of this Order is a "project" and the Regional Water Board is the lead agency responsible for approving the project. On May 23, 2014, the Regional Water Board provided notice of intent to adopt a mitigated negative declaration (SCH No. 2014052073 for the project (California Code of Regulations title 14, § 15072.)
45. The initial study and mitigated negative declaration reflect the Regional Water Board's independent judgment and analysis. The Regional Water Board has reviewed and considered the initial study, mitigated negative declaration, comments received on the environmental documents, and any proposed changes incorporated into the project or required as a condition of approval to avoid significant effects to the environment. Based on the whole record before it, including consideration of

comments received and the contents of the initial study and Mitigated Negative Declaration, the Regional Water Board finds there is no substantial evidence showing that adoption of this Order will have a significant effect on the environment that cannot be mitigated or avoided. Mitigation measures necessary to reduce or eliminate significant water quality impacts are included as conditions of approval in the Order, and the Regional Water Board is adopting a Monitoring and Reporting Program as a condition of its approval.

The Regional Water Board conducted a public hearing on August 14, 2014, in Santa Rosa, California, considered all evidence in the record concerning this matter, and adopted the negative declaration and mitigation monitoring and reporting plan. The documents or other material, which constitute the record, are located at 5550 Skylane Blvd, Suite A, Santa Rosa, CA 95403. The Regional Board will file a Notice of Determination within five days from the issuance of this Order.

State Water Board Resolution No. 68-16 ("Statement of Policy with Respect to Maintenance of High Quality Waters in California") establishes that whenever the existing quality of water is better than the quality established in state policies, including the Basin Plan, such existing high quality water must be maintained to the maximum extent possible consistent with the maximum benefit to the people of the state. Any change to existing high quality waters is allowed only if it has been demonstrated to the Regional Water Board that: 1) any change will be consistent with maximum benefit to the people of the state; 2) will not unreasonably affect present and anticipated beneficial uses of such water; and 3) will not result in water quality less than that prescribed in the Basin Plan. The policy further requires that dischargers meet waste discharge requirements which will result in the best practicable treatment or control of the discharge necessary to assure that pollution or nuisance will not occur and that the highest water quality consistent with maximum benefit to the people of the state will be maintained.

This Order is consistent with Resolution No. 68-16. It sets forth conditions and measures designed to prevent sediment discharges to waters of the state and improve temperature conditions in affected streams to the extent feasible. When implemented properly, these conditions and measures will result in a benefit to water quality. Compliance with this Order will lead to attainment of applicable water quality requirements and the reasonable protection of beneficial uses. The implementation of all cost-effective and reasonable management measures required by this Order to prevent or minimize sediment discharge and protect and restore riparian shade will result in protection of water quality and compliance with the Basin Plan. The monitoring and reporting plan required under this Order will ensure effectiveness of the measures and will allow identification and correction at sites where such management measures are not functioning as intended. These requirements will result in the best practicable treatment or control of the discharges, will assure that pollution or nuisance will not occur, and the highest water quality consistent with maximum benefit to the people of the state is maintained.

THEREFORE, pursuant to California Water Code, the Regional Water Board hereby approves and adopts Order No. R1-2014-0036, and directs the Executive Officer to file all appropriate notices. Humboldt Redwood Company, LLC, hereinafter referred to as HRC, shall comply with the following:

I. SPECIFIC REQUIREMENTS

A. Timber Harvesting

1. HRC shall not utilize the clearcutting harvest method as defined in California Code of Regulations, title 14, section 913.1.
2. Harvesting of HRC timberland in the Jordan Creek watershed using Selection and Group Selection silvicultural methods shall not exceed 25% (750 acres) of the total acres owned within the watershed over any ten-year period.
3. Harvesting of HRC timberland in the Jordan Creek watershed using Variable Retention and Rehabilitation of Understocked Area silvicultural methods shall not exceed 4% (125 acres) of the total acres owned within the watershed over any ten year period.
4. Harvesting of HRC timberland using the Sanitation Salvage silvicultural method may be used to respond to unforeseen acts of nature (i.e. outbreaks of disease, widespread insect attack, wildfire, wind, flood, etc.).
5. These silvicultural methods and harvest rates, as well as an overall harvest rate no greater than 30% over any ten-year period shall apply unless revisions are made by the Regional Water Board.

B. Landslide Prevention and Riparian Protection

1. During the planning phase of every THP, a Professional Geologist shall review pertinent published technical data which may include but is not limited to landslide inventories, regional geomorphic maps, stereoscopic aerial photographs, and SHALSTAB landslide potential maps with the intent of identifying high landslide hazard areas. Following the evaluation of technical data, ground based geologic investigations shall be conducted as needed to verify mapped landforms and previously unobserved features.
2. HRC shall prepare and submit an engineering geologic report to the Regional Water Board for all THPs in Jordan Creek. The report shall be prepared by a California Licensed Professional Geologist in conformance with the guidelines of California Department of Conservation Division of Mines and Geology (now California Geologic Survey) Note 45 to evaluate the potential impacts of the proposed harvesting to water quality. At a minimum, the geologic report shall

- characterize geologic hazards, evaluate the risk posed to the beneficial uses of water by the management activity, and develop appropriate mitigation. The report may be submitted before or during the timber harvest plan review process conducted by CAL FIRE, or by request of the Executive Officer.
3. The Regional Water Board staff shall provide comments within 45 days of submittal of the report and if deemed necessary, may request additional information or require additional conditions be incorporated to further reduce or mitigate the potential for sediment discharge. If additional information or mitigation is required, HRC shall not proceed with the proposed activity until HRC demonstrates that the potential impacts to the beneficial uses of water will be adequately mitigated.
 4. HRC shall conduct timber harvesting in accordance with the recommendations of the California licensed Professional Geologist and the LEED prescriptions contained in Appendix D of the ROWD, which include the following:
 - a. No harvesting within 100 feet of Class I and II watercourses;
 - b. Any harvesting within a headwall swale connected to a Class I, II, or III watercourse shall retain the number of living trees equivalent to a minimum of 150 square feet of basal area per acre;
 - c. No ground based equipment, with the exception of at existing roads and equipment crossings, and permitted new road construction within:
 - 150 feet of a Class I watercourses,
 - 100 feet of a Class II watercourse,
 - 50 feet of a Class III watercourse, or to the closest hydrologic divide.
 5. HRC shall maintain and update the landslide inventory included in Appendix A of the ROWD according to the specifications described in Section 4.1.1 of the ROWD and as outlined in the Monitoring and Reporting Program in Attachment 1 of this Order.
 6. By October 15, 2015, HRC shall submit to the Regional Water Board Executive Officer, a Landslide Restoration plan to prevent and minimize ongoing sediment discharge from landslides. The plan shall be designed to evaluate and if feasible, prioritize, implement, and monitor measures to prevent or minimize sediment discharge from active landslides. The Landslide Restoration plan shall at a minimum include the following components:
 - a. Identify landslides that have the potential to discharge sediment to waters of the state in violation of the water quality standards;
 - b. Evaluate the feasibility of measures to prevent or minimize sediment discharge from these landslides, that may include, but are not limited to: re-

vegetation (e.g. tree planting, seeding, willow waddles), excavation, drainage modification, and buttressing or armoring of unstable areas;

- c. A projected timeline for implementation of site specific prevention and minimization measures; and
- d. A plan to track and monitor the effectiveness of prevention and minimization measures.

C. Road Management

1. HRC shall implement management practices and specifications described in Appendix E of the ROWD to prevent and minimize sediment discharge from active roads.
2. By October 15, 2017, HRC shall upgrade all roads to meet the storm-proofed standard as described in Appendix E of the ROWD.
3. HRC shall maintain and update the inventory of CSDSs from roads, included in the ROWD in accordance with the methods described in Section 4.2 of the ROWD.
4. By October 15, 2017, HRC shall complete treatment of those road related CSDSs currently identified in the inventory included in Appendix C of the ROWD.
5. HRC shall inspect all roads within their Jordan Creek ownership at least annually between May 1 and October 15, as specified in Appendix E of the ROWD.
6. HRC shall inspect storm-proofed roads as soon as conditions permit following any storm event that generates 3 inches or more of precipitation in a 24-hour period, as measured at the Scotia rain gauge.
7. Within 30 days of identifying a new CSDS, HRC shall document the CSDS and notify the Regional Water Board. Within one year HRC will implement measures to prevent or minimize sediment discharge at any new controllable sediment discharge sources identified during the road inspections.

D. Erosion Control Plans

Any CSDS not on a road or inventoried and treated as part of the Road Management activities described in Section I(C) or the Landslide Restoration plan in Section I(B)(5) of this Order, shall be inventoried and scheduled for treatment during timber harvest plan development and treated concurrently with timber operations in the vicinity.

These CSDSs may include, but are not limited to: failing skid trail crossings, watercourse diversions inside harvest units, etc. Such sites will be subject to the following:

1. Each site shall be inventoried in an ECP, which will include: a description of the current condition of each site, an estimate of the potential sediment volume that could discharge from the site, a narrative description of the proposed management measures, and a schedule for implementation.

2. Inventoried sites must be treated per the site specific ECP schedule.
3. The ECP shall be submitted to the Regional Water Board for review with the timber harvest plan it is associated with.
4. If treatment of such sites “strands” any other CSDSs, HRC does not relinquish responsibility for also treating the stranded sites. For logistical reasons, it is recommended that measures be taken to prevent sites from becoming stranded.

II. GENERAL REQUIREMENTS

- A. HRC shall comply with all applicable water quality standards, requirements, and prohibitions specified in the Basin Plan as modified, and policies adopted by the State Water Board.
- B. HRC shall allow Regional Water Board staff entry onto all land within the Jordan Creek watershed covered by the WDR including appurtenant roads for the purposes of observing, inspecting, photographing, video-taping, measuring, and/or collecting samples or other monitoring information to document compliance or non-compliance with this Order. If entry is unreasonably withheld, the Executive Officer may terminate the applicability of the Order and may result in enforcement action.
- C. HRC shall comply with all water quality-related HCP prescriptions, conditions included in an approved THP, and any additional mitigation measures identified and required pursuant to the CAL FIRE CEQA process.
- D. HRC shall comply with the Monitoring and Reporting Program R1-2014-0036 attached to this Order.
- E. HRC shall comply with all mitigation measures identified in the Mitigated Negative Declaration prepared to comply with CEQA.
- F. This Order does not authorize discharges from the aerial application of herbicides or pesticides. HRC shall submit a ROWD prior to any proposed aerial application of pesticides that could discharge to waters of the State.
- G. Water quality issues identified on any particular THP which are not resolved prior to THP approval by CAL FIRE, shall be resolved to the satisfaction of Regional Water Board Executive Officer, prior to commencement of that THP.
- H. HRC shall maintain copies of all correspondence and records collected and prepared to document compliance with this Order and provide access to Regional Water Board to review and copy.
- I. All activities covered by this Order must comply with local, state, and federal law.
- J. No discharge of waste into the waters of the state, whether or not the discharge is made pursuant to waste discharge requirements, shall create a vested right to

continue the discharge. All discharges of waste into waters of the state are privileges, not rights. (Water Code § 13263(g).)

- K. All amendments of THPs approved by CAL FIRE shall conform to the requirements and conditions set forth for the originally permitted Project. Failure to do so is a violation of the WDRs and subjects the Discharger to enforcement action and/or termination of permit coverage for the project.
- L. Prior to implementing any change to the project or activity that may have a significant or material effect on the findings, conclusions, or conditions of this Order, the Applicant shall obtain the written approval of the Regional Water Board Executive Officer.
- M. The Regional Water Board may add to or modify the conditions of this Order, with notice and as appropriate, as appropriate in response to monitoring results or to implement any new or revised water quality standards and implementation plans adopted and approved pursuant to the Porter-Cologne Water Quality Control Act or the Clean Water Act.
- N. Any person aggrieved by this action of the Regional Water Board may petition the State Water Board to review the action in accordance with Water Code section 13320 and California Code of Regulations, title 23, sections 2050 and following. The State Water Board must receive the petition by 5:00 p.m., 30 days after the date of this Order. Copies of the law and regulations applicable to filing petitions may be found on the Internet at:
http://www.waterboards.ca.gov/public_notices/petitions/water_quality or will be provided upon request.
- O. Discharges of waste not specifically regulated under this Order are prohibited except when in compliance with the Water Code.
- P. This Order does not apply to waste discharges that require a separate permit from the State or Regional Water Board or other agencies, such as activities that require a Clean Water Act section 404/401 permit, a National Pollution Discharge Elimination System (NPDES) permit, or a construction stormwater permit.
- Q. These WDRs may be modified, revoked and reissued, or terminated if the Executive Officer makes any of the following determinations:
 - 1. HRC is conducting activities that do not comply with any condition or provision of this Order;
 - 2. HRC is conducting activities that are reasonably likely to result, or has resulted in a violation or exceedence of any applicable water quality requirement;
 - 3. HRC is conducting activities that vary from the provisions of this Order such that those activities could adversely affect water quality;

- R. In the event of any violation or threatened violation of the conditions of this Order, the violation or threatened violation shall be subject to any remedies, penalties, process or sanctions as provided for under applicable state law.
- S. Should it be determined by HRC or the Regional Water Board that unauthorized discharge of waste are causing or contributing to a violation or an exceedence of an applicable water quality requirement or a violation of a WDR prohibition (below), the HRC shall:
1. Implement corrective measures immediately following discovery that applicable water quality requirements were exceeded or a prohibition violated, followed by notification to the Regional Water Board by telephone or email as soon as possible, but no later than 48 hours after the discharge has been discovered. This notification shall be followed by a report within 14 days to the Regional Board, unless otherwise directed by the Executive Officer, that includes:
 - a. The date the violation was discovered;
 - b. The name and title of the person(s) discovering the violation;
 - c. A map showing the location of the violation site;
 - d. A description of recent weather conditions prior to discovering the violation;
 - e. The nature and cause of the water quality requirement violation or exceedence or WDR prohibition violation;
 - f. Photos of the site documenting the violation;
 - g. A description of the management measure(s) currently being implemented to address the violation;
 - h. Any necessary maintenance or repair of management measures;
 - i. 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 WDR prohibition violation;
 - j. An implementation schedule for corrective actions; and,
 - k. The signature and title of the person preparing the report.
 2. HRC shall revise the appropriate technical report (i.e. ECP, Inventory, or other required information as applicable) immediately after the report to the Regional Board to incorporate the additional management measures that have been and will be implemented, the implementation schedule, and any additional inspections or monitoring that is needed.

T. Emergency Maintenance

If there is an imminent threat to life, property, or public safety, or a potential for sediment discharge with catastrophic environmental consequences, HRC will notify Regional Water Board staff of the emergency and the planned or implemented action within 48 hours. HRC shall meet with the Regional Water Board Executive Officer within six months of a major fire.

III. DISCHARGE PROHIBITIONS

- A. The discharge of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature into any stream or watercourse in the basin in quantities deleterious to fish, wildlife, or other beneficial uses is prohibited.
- B. The placing or disposal of soil, silt, bark, slash, sawdust, or other organic and earthen material from any logging, construction, or associated activity of whatever nature at locations where such material could pass into any stream or watercourse in the basin in quantities which could be deleterious to fish, wildlife, or other beneficial uses is prohibited.
- C. Discharges of waste, which are not otherwise authorized by waste discharge requirements, or other Order issued by this Regional Water Board or the State Water Resources Control Board, to waters of the state in violation of Basin Plan standards, are prohibited.
- D. Discharges must not cause or threaten to cause pollution, contamination, or nuisance.
- E. Discharges must not adversely impact human health or the environment or the beneficial uses of water set out in the Basin Plan.

Certification:

I, Matthias St. John, Executive Officer do hereby certify that the foregoing is a full, true, and correct copy of an Order adopted by the California Regional Water Quality Control Board, North Coast Region, on August 14, 2014.

Original signed by

Matthias St. John
Executive Officer