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Ken Ellison
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2550 Ventura Avenue
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Re: File No. UPE04-0040, Gualala Instream Gravel Mining, Gualala Redwoods

Dear Mr. Ellison:

The Friends of the Gualala River have asked me to comment on the proposed Mitigated Negative Declaration (UPE04-0040) for the instream gravel mining on Gualala Redwoods properties on the South Fork of the Gualala River and Wheatfield Fork of the Gualala River and associated amendment to the Sonoma County Aggregate Resources Management Plan and the Sonoma County Surface Mining and Reclamation Ordinance.

I was the Hydrologist for the Mendocino County Water Agency (MCWA) from May 1989 to November 1994. One of my primary duties was to advise the Mendocino County Board of Supervisors on the appropriateness of in-stream gravel extraction operations on various rivers in Mendocino County. I have a Masters in Physical Science specializing in Hydrology from Chico State University. Since 1994 I have been a consulting Hydrologist. I have also taught Hydrology at California State University, Monterey Bay.

Project Description

The proposed Mitigated Negative Declaration describes the project as follows. Gualala Redwoods is requesting the renewal of a permit for instream gravel mining and processing in the South Fork of the Gualala River and Wheatfield Fork of the Gualala River. The Gualala River has been 303d listed for both sediment and water temperature. The instream mining and processing will be on Gualala Redwoods property. The project is described as being 3.8 miles north of Stewart's Point.

A previous use permit was issued under Resolution No. 95-0617 for the aggregate mining and processing operation and expired on April 17, 2005. The requested permit will last for 10 years beginning on the date of approval. At the end of the 10 year permit period another renewal can be applied for. A lease agreement between Gualala Redwoods, Inc. and Bedrock, Inc is in effect for the instream mining and

processing operations. The address of the processing site is 39900 Annapolis Road. The proposed hours of operation are from 7:00 a.m. to 10:00 p.m. Monday through Saturday.

The expired permit allowed instream gravel extraction from 1.9 miles of the mainstem of the Gualala River, 9.5 miles of the South Fork of the Gualala River and 5.5 miles of the Wheatfield Fork of the Gualala River. The proposed permit will focus on instream gravel extraction from 12 bars along a 6.9 mile portion of the South Fork of the Gualala River and a 1.4 mile portion of the Wheatfield Fork of the Gualala River. The processing will be done at the same location, 39900 Annapolis Road.

In order to approve the adaptive management strategy, an amendment to the Sonoma County Aggregate Resource Management Plan and the Sonoma County Surface Mining and Reclamation Ordinance revising standards for the mining reach of the Gualala River is also requested.

The proposed project will require a Corps 404 permit, a NMFS Section 7 Biological Opinion, a 401 permit from the North Coast Regional Water Quality Control Board (RWQCB) and a 1600 Streambed Alteration permit from the California Department of Fish and Game (CDFG).

Summary of Comments

Instream gravel extraction disrupts a river's dynamic process of adjusting its width, depth and gradient in a way that allows it to transport the sediment load supplied to it by the watershed. Continuous gravel extraction from 1960 through 2006 (47 years) has removed 1,139,000 cubic yards (706 acre-feet) of gravel from the South Fork of the Gualala River in the vicinity of Valley Crossing. Fundamental geomorphic theory developed by Leopold, Wolman, Miller and many others suggests that if the 1,139,000 cubic yards (706 acre-feet) of material had not been removed from the river channel, the depositional areas would have built up to form geomorphic floodplains (2-5 year flood surfaces) and the active channel would have narrowed. A narrower active channel would transport a higher sediment load and the current depositional areas would have appeared less aggraded or may have even become transport reaches. Riparian vegetation would have been able to become denser and more vigorous. The banks of the narrower active channel would have been closer to the low-flow channel. The low-flow channel would have received more shade from the banks of the narrower active channel and from the more vigorous riparian vegetation which would have produced cooler water temperatures.

Thus, instream gravel extraction has kept the river out of balance with its sediment load giving it the appearance of being aggraded. The aggraded appearance of the South Fork and the fact that instream gravel extraction has reduced the sediment transport capacity of the South Fork of the Gualala River to below the amount supplied by the watershed are factors that lead to the listing of the Gualala River watershed as impaired regarding sediment.

The proposed instream gravel extraction project would contribute to the cumulative impact of the removal of about 1,139,000 cubic yards (706 acre-feet). This is an unavoidable adverse environmental impact. This unavoidable adverse impact has not been discussed by either the proposed Mitigated Negative Declaration (MND), the EIP Associates 1994 EIR for Gualala Redwoods or by the Sonoma County Aggregate Resource Management (ARM) plan, which is specific to the Russian River. Therefore, an EIR is required for the proposed project.

The proposed permit term is 10 years. At the end of the permit period, another renewal can be applied for. The future renewal of the project is a reasonably foreseeable project under CEQA and should therefore needs to be evaluated in light of a cumulative impact under checklist item 17b. The MND has failed to analyze the impact of renewing the proposed permit.

The Mitigated Negative Declaration (MND) does not require a particular extraction methodology to be used. The MND says that the "horseshoe skim" method will be the primary method but the applicant has proposed six extraction methodologies, including the horseshoe skim. The MND does not mention or evaluate the environmental impacts of "horseshoe skimming" or the other methodologies proposed by the

applicant. In addition, there is nothing in the MND that would prevent the applicant from utilizing additional unevaluated extraction methodologies. Since the MND has not evaluated the potential of each of the other proposed extraction techniques to cause significant adverse environmental impacts additional study is required. Since all of the extraction techniques have not been evaluated it not known if additional mitigations are required. Therefore, an EIR should be required.

An assumption has been made that annual average gravel replenishment rate on the gravel bars represents a safe sustainable level of extraction. This has not been acknowledged and it has not been demonstrated to be accurate. The safe and sustainable level of gravel extraction is probably only a portion of the annual average replenishment rate. The assumption that the average annual replenishment rate is safe and sustainable is an important contributing factor that works to prevent the river from coming into balance with its supplied sediment load. Continually extracting the annual replenishment prevents the river from adjusting its channel geometry to allow it to transport the sediment load supplied by the watershed. Preventing the river from coming into balance with its sediment load is an adverse cumulative environmental impact.

The proposed project and the MND allow material to be extracted that is deposited above the minimum baseline elevation of each bar. Mitigation Measure Bio-6, together with SCSMR ordinance 26A-09-020(f)(1-5), sets the minimum baseline elevation to be the surface that slopes away from the summer water surface at a 2% slope. The water surface adjacent to a gravel bar can vary up to two or three feet from summer to summer. In the summer after a dry winter, the elevation of the limit of extraction is lower than in the summer after a wet year.

The baseline elevation for a dry year will be lower than for an average or wet year. The gravel that is extracted during a dry year will come from long-term storage and from the material that was deposited on the gravel bar surface during the winter of the dry year. The stored material is the gravel in the layer between the dry year extraction baseline and the extraction baseline of the previous year. The formula for this relationship is:

Dry Year Extraction Volume = Replenishment Volume + Volume from Change in Baseline Storage

In dry years the amount of coarse sediment carried by the river is small. Thus, in a dry year, most of the extracted material will come from storage. A layer that is 1.0 feet thick has a volume of 1,613 cubic yards per acre. The project description given in the MND says that, “The proposed extraction footprints encompass approximately 14.4 acres.” Suppose the water surface adjacent to each of the 12 bars the applicant proposes to focus extraction on dropped 1.0 foot between two successive years then, the change in extraction baseline *alone* would allow the removal of 23,232 cubic yards (14.4 acres x 1613.3 cubic yards per acre per foot of depth). O’Conner (2003) and EIP Associates’ (1994) both estimated the average annual replenishment rate to be about 16,000 cubic yards per year. So the amount of material available for extraction from a one foot lowering of the minimum baseline elevation is 145% of the average annual replenishment estimated by O’Conner and by EIP.

No discussion has been provided, in the MND, to explain how the minimum baseline elevation was determined or how the adhering to the baseline elevation will prevent adverse environmental impacts. The MND is incomplete since it has not demonstrated that it will prevent significant adverse environmental impacts from occurring.

Using the summer water surface to establish the minimum baseline for extraction ensures that operator will be allowed to remove material in dry years but does not prevent the potential for significant adverse impacts from occurring.

There is no cap on the total volume that can be extracted each year or over the life of the permit. Removing just 1.0 foot of gravel from the extraction areas on each of the twelve main gravel bars proposed for extraction generates 23,200 cubic yards. The annual average replenishment rate was estimated to be 16,000 cubic yards by both O’Conner (2003) and EIP (1994). Removing material in

excess of the annual replenishment rate has the potential to cause significant adverse impacts. The MND has not discussed why it is not necessary to limit the amount of material extracted each year. Removing all of the material above an arbitrary baseline prevents the river from adjusting it width, depth and gradient (channel geometry) to allow it to transport the sediment load supplied by the watershed.

The proposed project has not been granted a Section 404 permit by the Corps nor has NMFS prepared a Biological Opinion for the proposed project. On other instream gravel extraction operations, NMFS has demonstrated an interest in preparing bar-by-bar, current-year sediment budgets instead of using average annual replenishment estimates.

Vague Project Description

The project description in the proposed Mitigated Negative Declaration (MND) is vague and incomplete. The entire Gualala River watershed is listed as impaired for water temperature under section 303d of the Clean Water Act. The MND needs to disclose this fact and discuss how the proposed project will affect water temperature in relation to the 303d listing.

The hours of operation are specified to be 7:00 a.m. to 10:00 p.m. but the time of year that operations are allowed is not specified in the description.

The MND project description mentions that the expired use permit limited annual extraction volumes to 24,000 cubic yards. But the proposed use permit does *not* set a maximum annual extraction rate. Failure to set a clearly defined limit to the annual extraction rate has the potential to lead to the over-harvesting of gravel (aggregate) from the South Fork of the Gualala and the Wheatfield Fork of the Gualala River. It is possible that after extraction each bar conforms to the specified final configuration but that the total volume of material from all bars exceeds the annual replenishment rate. If the extraction rate exceeds replenishment adverse impacts such as streambed incision may occur downstream of the permit area.

The MND states that,

> The proposed permit will **focus** on instream gravel extraction from 12 bars along a 6.9 mile portion of the South Fork of the Gualala River and a 1.4 mile portion of the Wheatfield Fork of the Gualala River. (Emphasis added)

The MND project description does not limit the extraction to the 12 (twelve) bars but says that extraction will *focus* on the 12 bars. The location and extent of the 12 bars are not clearly defined in the MND project description. Failure to limit extraction to specific clearly defined locations has the potential to result in adverse environmental impacts. For example, in a dry year the volume of material on the 12 bars may be insufficient to meet the operator's commitments to supply gravel. Since extraction is not specifically limited to the 12 bars the operator may chose to remove material from other bars in addition to the 12 bars. The total amount of material removed from all extractions sites in a given year may exceed the replenishment rate and result in incision the following winter or during some future storm event.

The project description does *not limit* the extraction technique to the horseshoe method of mining. The project description states that: "The primary extraction technique will utilize the horseshoe method of mining. " The horseshoe method of mining is **not** required by the permit. The Gualala Redwoods *Gualala River Instream Mining Operation Application for Permit Renewal and Revised Reclamation Plan, June 2007* specifies that at least six (6) types of gravel extraction techniques would be used. The MND project description allows any type of extraction technique. The failure to clearly specify the extraction technique may result in adverse environmental impacts resulting from inappropriate mining methods. The potential adverse impacts from inappropriate mining techniques will be discussed in the Biological Assessment section.

The project description states that an *adaptive management approach* will be followed which may lead to changes in the project at a future date. Adaptive management, as proposed in the MND, thwarts the full disclosure aspect of CEQA. Potentially significant changes to project may be allowed without public

review or without a proper assessment of the potential for the changes to result in adverse impacts from the project.

One of the stated goals of the adaptive management approach is to reduce monitoring costs. The reduction of monitoring costs should not be a primary consideration of the monitoring program. The monitoring program required by the use permit should focus on obtaining the information to determine if any adverse impacts are occurring as a result of the project.

The project description in the MND says that employing the proposed adaptive management strategy requires amendments to the Sonoma County Aggregate Resource Management Plan (ARM Plan) and the Sonoma County Surface Mining and Reclamation Ordinance (SCSMR). The MND fails to clearly state that the proposed new mining standards are not allowed under the SCSMR ordinance. The changes in allowed mining standards have the potential to adversely impact the environment.

The wording of the proposed amendments to the Sonoma County Aggregate Resource Management Plan (ARM Plan) and the Sonoma County Surface Mining and Reclamation Ordinance (SCSMR) is not provided in the MND and the proposed amendments are not listed in the *Incorporated Source Documents* section of the MND. The amendments to the ARM Plan and to the SCSMR ordinance are specific to this project and so would appear to be part of the project description. Failure to include the wording of the amendments to the ARM Plan and to the SCSMR ordinance would appear to be contrary to the full disclosure intent of CEQA.

Biological Resources

Item 4 of the Environmental Checklist is the *Biological Resources* section. The direct and indirect impacts of instream gravel mining are discussed in this section.

The proposed biological mitigation measures are vague, inadequate and inconsistent. The wording of Mitigation Measure Bio-1 conflicts with Mitigation Measure Bio-7.

> **Mitigation Measure Bio-1**: No bar skimming and/or road spur construction activities shall be carried out between February 1 and July 9 if there are tree stands within a quarter of a mile of the site.

Mitigation Measure Bio-7 specifies that,

> Mining shall be done on dry bars during the period of low flow, between June 1 and October 1, the time frame specified in the County Mining Ordinance and the Corps 404 permit for instream excavations.

The wording of Mitigation Measure Bio-1 could be construed to mean that if there were no tree stands within a quarter mile of a site it would be permissible to mine the bar between February 1 and July 9. The confusion caused by the inconsistent wording on Mitigation Measures Bio-1 and Mitigation Measure Bio-7 could result in the operator engaging in bar mining activities prior to June 1. Operations on bars prior to June 1 may result in adverse impacts to steelhead trout and would violate the SCSMR ordinance.

Mitigation Measure Bio-1 is not clear since the definition of what constitutes a "tree stand" is not given. Mitigation measures that are poorly defined may be incorrectly interpreted by the operator and so can not be considered effective at preventing adverse environmental impacts.

The wording of Mitigation Measure Bio-2 conflicts with Mitigation Measure Bio-7.

> **Mitigation Measure Bio-2**: If protocol surveys for spotted owls have been conducted within a quarter mile of the gravel bars and spur roads and owls are not found, then extraction and spur road upgrade operations may commence on May 15.

Mitigation Measure Bio-7 specifies that,

> Mining shall be done on dry bars during the period of low flow, between June 1 and October 1, the time frame specified in the County Mining Ordinance and the Corps 404 permit for instream excavations.

Mitigation Measure Bio-2 states that extraction operations are allowed on May 15 which conflicts with the June 1 to October 31 time frame for extraction activities specified by the SCSMR ordinance.

To date, the Army Corps of Engineers has not issued a 404 permit for the proposed instream gravel mining on the South Fork of the Gualala River so it is not clear what the phrase, "… and the general Corps 404 permit for instream operations.", refers to in Mitigation Measure Bio-7.

The National Marine Fisheries Service (NMFS) issued a Biological Opinion regarding the Sonoma County ARM plan and found that the mining techniques in the ARM plan did not constitute Best Management Practices (BMPs). The Sonoma County ARM plan is specific to the Russian River. The Sonoma County ARM plan has not been demonstrated to apply to the Gualala River watershed.

Marbled murelet surveys were conducted north of Bar 310 and in the vicinity of the processing plant at Valley Crossing (confluence of the South Fork of the Gualala and the Wheatfield Fork). No mention was made of marbled murelet surveys upstream of Valley Crossing on either the Wheatfield Fork or the South Fork of the Gualala. Mining operations are proposed on both Forks of the Gualala River upstream of the confluence (Valley Crossing) but it is not clear that marbled murelet surveys were done upstream of Valley Crossing. In order to support a conclusion of "no impact" the MND should clearly demonstrate exactly where marbled murelet surveys were performed.

Fisheries

The MND notes that steelhead trout (*Oncorhynchus mykiss*), a federally listed species, inhabit the South Fork of the Gualala River and are therefore at risk from the proposed instream gravel mining operations. The MND notes that coho salmon (*Oncorhynchus kisutch*) historically were present in the South Fork of the Gualala and its tributaries but are no confined to the North Fork.

The MND notes that:

> Instream gravel extraction has the potential to cause significant direct and indirect impacts to spawning and rearing habitat and to individual fish. Potential direct effects of the proposed action include hydrocarbon contamination of aquatic habitat, stranding of individual salmonids on the extraction surface, crushing of eggs or individuals during bridge construction or removal, and interference with salmonid migration. Potential indirect effects for this proposed project include reduction in channel stability, decrease in substrate size, reduction in pool depth and area, decrease in riparian vegetation, intrusion of fine sediment into spawning gravel, increased water temperatures, and loss of velocity refugia.

The MND then discusses each of the direct and indirect potential "effects" (adverse impacts). The discussion of the potential direct and indirect adverse impacts is incomplete. The MND's failure to identify all potential adverse impacts from instream gravel extraction means that it is possible that one or more of the unidentified potential adverse impacts may be significant. If one or more of the unidentified impacts are significant their impacts will not be mitigated. Since the MND has not identified all potential direct and indirect adverse impacts from instream gravel mining it can not claim that the mitigations presented are sufficient to reduce the associated impacts from instream gravel mining to less than significant.

Additional potentially adverse impacts are identified in the following sections.

Stranding of individual salmonids

The MND proposes Mitigation Measures Bio-5 and Bio-6 to reduce the potential for stranding of individual salmonids on the extraction surface during the winter following gravel extraction operations on a bar.

> **Mitigation Measure Bio-5:** The operator will conduct post-extraction grading of gravel bar that eliminates depressions and maintains downstream slopes to facilitate even draining.
>
> **Mitigation Measure Bio-6**: The downstream 20% of the extraction area shall be graded and daylighted to the edge of water, which will allow bars to drain, further minimizing the potential for stranding.

Mitigation Measure Bio-6 is potentially harmful, as written. The phrase, "The downstream 20% of the extraction area shall be graded and daylighted to the edge of water," suggests that the buffer between the extraction area and low flow channel will be graded to the waters edge in the downstream 20% of the extraction area. Intrusion into the buffer area to implement Mitigation Measure Bio-6 has the potential to harm riparian vegetation and grading the buffer will remove the armor layer in the buffer and conflicts with Mitigation Measure Bio-12. Grading the buffer between the extraction area and the low flow channel will decrease the confinement of the low flow channel. A decrease of the confinement of the low flow channel will reduce the scouring action in the low flow channel and promote deposition leading to a loss of pool depth and area.

The goal of Mitigation Measure Bio-6 is already accomplished by Mitigation Measure Bio-5. Mitigation Measure Bio-6 should be deleted from the MND. Implementing Mitigation Measure Bio-6 has the potential to cause adverse environmental impacts from gravel extraction by increasing the potential to widen the low flow channel and cause a reduction in pool depth and area.

Crushing of Eggs or Individual Fish

To reduce the potential for the proposed project to crush salmonid eggs or individual salmonids the MND has formulated Mitigation Measure Bio-7.

> **Mitigation Measure Bio-7**: Crossing construction will commence on or after June 30 when the vast majority of steelhead eggs have already hatched and fry have emerged from the gravel. Mining shall be conducted on dry bars during the period of low flow, between June 1 and October 31, the time frame specified in the County Mining Ordinance and the Corps 404 permit for instream excavations. No gravel processing or stockpiling (with the exception of temporary stockpiles on the gravel bar for excavation and loading purposes) shall be done within the river channel. Processing operations, including crushing, washing, screening stockpiling, mixing and retailing shall be set back a minimum of fifteen feet from ordinary high water. Stockpiles, processing operations, and ancillary uses located within the 100 year floodplain between November 1 and June 1 shall be designed and operated to prevent on-site and off-site damage from floods. By November 1 of each year, all gravel mining shall cease, reclamation work on the gravel bar shall be completed, and all stockpiles and mining related equipment shall be removed from the ordinary high water channel.
>
> There shall be no work in the water other than installation of instream crossings and development of pools and wet alcoves where recommended by a Biological Opinion from NMFS. Instream work shall be performed in isolation of flowing water for the gravel bar skimming. The development of pools and wet alcoves may require working in wet conditions. NOAA Fisheries and CDFG technical and biological staff may require variations in which measures shall be implemented while working in the wetted areas within the channel. The operator shall comply with measures specified by NOAA and CDFG technical and biological staff as work progresses in the wetted areas. Practices to be used while working in flowing water in the excavation locations, may include, but are not limited to: 1) the use of coffer dams; 2) installing clean river gravel or sand bags across the channel

> and sealing them with sheet plastic or filter fabric to reduce flow; 3) silt curtains to slow flow and retain the heavier silt particles; and 4) moving fish to the nearest appropriate site.
>
> **Mitigation Measure Hydro-5**: Aggregate mining and reclamation activities shall be conducted in a manner which complies with the following performance criteria and project objectives:
>
> (e) Enhances aquatic habitat for salmonids in terms of spawning migration and juvenile rearing without adversely affecting other species by maintaining pool and alcove depths of 6 to 8 feet and/or maintaining a year/round open channel.

Creating "wet alcoves" has a high potential to cause channel instability. All gravel extraction should be done on dry bars above the low-flow water surface. Excavating below the low-flow water surface has the potential to increase the energy grade line down the bar and could result in the formation of a channel on the bar surface. If the armor layer is removed from a portion of a bar by gravel extraction and the downstream end of a bar is lowered further through the creation of a "wet alcove" a nickpoint could be created in the "wet alcove" that could migrate upstream across the extraction area. Nickpoint migration is more likely if alcoves are dug to a depth of 6 to 8 feet.

The worst case would be for the low-flow channel to shift to the bar surface. A low-flow channel that crossed the bar surface would have no shade and would tend to increase water temperature, a low-flow channel crossing a bar surface has little or no cover to provide habitat for salmonids, conditions in the abandoned low-flow channel could become unsatisfactory for salmonids.

No excavations below the low-flow water surface should be allowed except for minor incidental excavation required for the installation of summer crossings. As written, Mitigation Measure Bio-7 has a high potential of causing channel instability. Retention of Mitigation Measure Bio-7 has the potential to cause a significant adverse environmental impact.

Interference with Salmonid Migration

The MND points out that a temporary stream crossing could present a problem to salmonid migration if it is not properly installed. However, the MND fails to recognize that instream gravel extraction can create conditions on riffles that become barriers to salmonid migration. Instream gravel extraction can produce wide flat areas of low relief at approximately the elevation of the low-flow water surface. The finished surface of an extraction site reduces the local sediment transport capacity of the river and induces deposition. Downstream the river will erode additional material to compensate for the upstream deposition. The downstream erosion could widen a riffle in the low-flow channel by removing material from its sides. Water flowing over the wider riffle would spread out and become shallower. Fish and Game (CDFG) refers to riffles that are migration barriers as "critical riffles". The shallow riffle (critical riffle) could become a migration barrier to adult steelhead over a certain range of streamflow.

Water diversion to meet processing water needs for the processing plant could reduce streamflow and create a barrier at riffles downstream of the diversion where none existed before the pumping. A cumulative impact could occur if the instream extraction operations created a wide riffle and the process water diversion reduced the streamflow enough to make it a critical riffle. The MND has not considered this potential impact.

Channel Stability

Instream gravel extraction can produce relatively immediate effects on channel stability and cumulative long-term impacts on channel stability.

Cumulative Impacts to Channel Stability

Continuous gravel extraction from the South Fork of the Gualala River since 1960 has disrupted the natural geomorphic processes of the South Fork of the Gualala River. Gravel extraction tends to create

wide flat areas that promote deposition. According to widely accepted fluvial geomorphology principles (Leopold, Wolman, Miller, 1964, *Fluvial Processes in Geomorphology*), if no gravel extraction had occurred from 1960 to 2005 the width, depth and gradient of the active channel would have adjusted to be able to transport the sediment load supplied by the watershed. The active channel would have been expected to narrow through a process of bar deposition leading to the development of a geomorphic floodplain, that is, a floodplain that would be inundated about every 2 to 5 years.

The continuous extraction of gravel from the South Fork of the Gualala River has reduced the sediment transport capacity of the river. Sediment transport capacity is directly proportional to the product of the water depth and the water surface slope. For a given discharge and channel slope, a narrow channel with higher banks has a higher sediment transport capacity than a wider channel with lower banks. The reduction in sediment transport capacity of the South Fork of the Gualala River may have reduced the depth and area of pools and may have contributed to a simpler channel structure than would have occurred without the continuous gravel extraction.

A site specific example of the disruption of the river's form caused by continuous gravel extraction can be seen at the bar just upstream of the bridge over the South Fork of the Gualala River upstream of the Wheatfield Fork confluence. The disrupted state of the bar is described in the Gualala Redwoods' application (8/17/2007) on page 17.

> In addition to the decrease in channel slope in the Valley Crossing area, the channel width underneath the bridge over the South Fork is significantly narrower than that along the extraction bar upstream. The channel constriction created by the bridge abutments results in a backwatering condition at very high flows, which encourages sediment deposition on the bar upstream.

If no gravel extraction had occurred during the last 47 years, it is likely that the width of the extraction bar upstream of the bridge would be narrower than it is today.

In the reach of the South Fork of the Gualala River between the Wheatfield Fork and the North Fork, it is likely that the greatest cumulative impact has occurred in the vicinity of the most consistently mined bars through direct removal of material. However, cumulative impacts from continuously extracting gravel occur at other sites in the reach.

A narrower active channel would be expected to result in more shade over the low-flow channel and therefore cooler water temperatures. A narrower active channel would increase shade by allowing tall trees to develop closer to the low-flow channel, and more riparian vegetation may have developed. A narrower active channel may also result in a narrower low-flow channel, especially adjacent to consistently mined bars.

The following calculation demonstrates that a significant amount of material has been removed from the active channel of the South Fork of the Gualala River by instream gravel extraction. According to the EIP Associates 1994 EIR, gravel has been continuously extracted from the South Fork of the Gualala River, particularly from the Valley Crossing area, since the 1950s. Table 1 shows that approximately 742,000 cubic yards were extracted from the South Fork of the Gualala River in the vicinity of Valley Crossing during a 29 year period between 1960 and 2005. No information about the volume of extraction available for 1972-1983 or for 1991-1995-2005, a total of 17 years. The average annual extraction volume for the 29 year period with records is 24,000 cubic yards. Assuming that the average annual was extracted during each of the 17 years with no records, gives a total extraction volume of 412,000cubic yards for the period of no records. Therefore, the approximate total volume of gravel extraction from 1960 to 2005 is approximately 1,139,000 cubic yards which is equivalent of 705 acre-feet of gravel.

The cumulative impact of removing approximately 1,139,000 cubic yards of gravel from the South Fork of the Gualala River constitutes a significant geomorphic impact as defined by the EIR for Gualala Aggregates by EIP Associates in 1994:

Table 1. Estimated total gravel extraction from the South Fork of the Gualala River from 1960 to 2005. Source is Table 1 on page 8 of O'Conner and Rosser, 2003. The source for the 2003-2006 extraction volumes is the Mitigated Negative Declaration.

Time period	Approximate Extraction Rate cubic yards/year	Number of Years in Time Period	Approximate Total Extraction Volume cubic yards	Approximate Total Extraction Volume acre-feet	Bed Elevation Change (ft)	Comments
1950's	1,000 to 5,000				1.5	Logging road construction
1960-1964	20,000	5	100,000	62.0	-1	Commercial extraction
1965-1971	40,000	7	280,000	173.6	-0.75	Sea Ranch development
1972-1983	Unknown	12				
1984-1990	23,000	7	161,000	99.8	-1	At Clipper Mill Bridge
1991-1995	Unknown	5				
1996-2002	12,000	6	72,000	44.6	0.1	Previous Permit period
2003-2005	22,760	5	113,800	70.5		Bed Rock, Inc.
	Years with Records	30	726,800	450.5		
	Annual Average		24,227	15.0		
	Year without Records	17	411,853	255.3		
	Total Number of Years	47	1,138,653	705.8		

> … causes a change to the sediment transport regime of the river, and therefore affects the river channel's size, shape, planform or profile to the extent that the performance or stability of adjacent structures is affected, property is lost**, the quantity or quality of fish and wildlife habitat is substantially changed**, or the quality and quantity of surface or groundwater supplies is substantially affected. (Emphasis added)

The MND has not addressed the cumulative impact of removing approximately 1,139,000 cubic yards of gravel from the active channel of the South Fork of the Gualala River on the stability of the channel, the shape of the channel, the extent of riparian vegetation, the depth and area of pools, the extent and quality of fish habitat, including summer water temperature, and the amount of floodplain habitat.

Short Term Impacts to Channel Stability

The MND proposes to mitigate the potential adverse impacts on channel stability from the proposed instream gravel extraction through the use of a single mitigation measure, Mitigation Measure Bio-12.

> **Mitigation Measure Bio-12**: To minimize adverse effects on channel stability and spawning gravel availability, the horseshoe extractions will leave at least the upper one-third of the bar intact and employ an edge of water buffer that is equal to 20% of the active channel width, or as required by NMFS on a case by case basis. These buffer areas are armored and will help maintain riffle and channel stability and route bedload around the extraction site at less than the effective discharge flows.

Page 19 of the MND reveals that the active channel is 100 to 300 feet wide. Therefore, the edge of water buffer required by Mitigation Measure Bio-12 varies in width from about 20 feet to about 60 feet depending on the actual active channel width at the extraction site. The purpose of the buffer required by Mitigation Measure Bio-12 is to retain a strip of undisturbed bar with an armored surface to help maintain channel and riffle stability. The integrity of the buffer required by Mitigation Measure Bio-12 is undermined by Mitigation Measure Bio-6 which calls for grading the buffer between the extraction area and the low flow channel in the downstream 20% of the extraction area.

Mitigation Measure Bio-12 applies only to "horseshoe extractions. The Project Description states that: "The primary extraction technique will utilize the horseshoe method of mining." The horseshoe method of mining is **not** required by the permit. The *Gualala River Instream Mining Operation Application for Permit Renewal and Revised Reclamation Plan, June 2007*, submitted by Gualala Redwoods, specifies that at least six (6) types of gravel extraction techniques would be used. The six extraction techniques listed in the Gualala Redwoods, Inc's application (June 2007) are:

- Secondary Channel Skim
- Horseshoe Skim
- Traditional Skim
- Inboard Skim
- Alcove
- Oxbow Extraction

Mitigation Measure Bio-12 applies only to "horseshoe extractions" and is therefore insufficient to ensure channel stability since the other proposed extraction techniques may require different mitigation measures to prevent significant adverse impacts. Mitigation measures must be developed for the other instream mining methods that might be used during the life of the permit. The MND should discuss each of the extraction techniques proposed by the applicant and identify where and when each extraction technique is to be used. The applicant intends to focus gravel extraction on 12 gravel bars but has not said that

extraction would only occur on those 12 bars. Consequently, extraction may be expected to occur wherever it is economically practical.

The CEQA review process is supposed to make sure that the project is conducted in a manor that does not cause significant environmental impacts. The sediment (bedload) transport process of a river is very dynamic and responses to very site specific conditions. The dynamic nature of the sediment transport process requires that site specific extraction plans and mitigation measures be prepared. Conceptual, broad-brush descriptions of extraction methods and mitigations are not sufficient to ensure that not adverse environmental impact will occur.

The potential for a significant adverse impact to arise from the proposed gravel extraction depends not only on the type of extraction technique to be employed but also on the specific location that is to be mined. The configuration of each gravel bar and its relationship to the flow dynamics of the river is unique. For example, there are transverse bars in several locations on the South Fork and Wheatfield Fork. A transverse bar crosses the low flow channel diagonally whereas an attached lateral bar runs roughly parallel to the low flow channel. The head of an attached lateral bar fits the definitions used in the Sonoma County Surface Mining and Reclamation ordinance. The head of an attached lateral bar helps to steer water and bedload around the bar.

The NMFS has consistently demonstrated an understanding that the dynamics of sediment (bedload) transport requires that detailed, site-specific extraction plans and mitigation measures be drawn up on a bar-by-bar basis when preparing their Biological Opinions during Section 7 Consultations.

Extraction Baseline

Mitigation Measure Bio-6 requires grading the downstream 20% of the buffer between the low-flow channel and the extraction surface to the edge of water. The SCSMR ordinance gives the basic requirements for gravel bar skimming. Sec. 26A-09-020(f)(1) requires a 2% cross-slope starting at the waters edge and rising away from the low-flow channel. The 2% cross slope away from the low-flow channel is the extraction baseline for a bar. Tying the extraction baseline (final bar grade) to the elevation of the water surface of the gravel bar promotes the occurrence of cumulative impacts from over extraction of gravel by bar skimming. The water level on June 1, after a dry winter, will tend to be lower than in wet years. The monitoring data presented in the O'Conner report (July 2003) shows that the water surface elevation at a cross section can vary by as much as two or three feet from year to year. The baseline elevation for a dry year will be lower than for an average or wet year. The gravel that is extracted during a dry year will come from long-term storage and from the material that was deposited on the gravel bar surface during the winter of the dry year. The stored material is the gravel in the layer between the dry year extraction baseline and the extraction baseline of the previous year. The formula for this relationship is:

Dry Year Extraction Volume = Replenishment Volume + Volume from Change in Baseline Storage

In dry years the amount of sediment, especially gravel, carried by the river is small. Thus, in a dry year, most of the extracted material will come from storage. A layer that is 1.0 feet thick has a volume of 1,613 cubic yards per acre. The project description given in the MND says that, "The proposed extraction footprints encompass approximately 14.4 acres." Suppose the water surface adjacent to each of the 12 bars the applicant proposes to focus extraction on dropped 1.0 foot between two successive years then, the change in extraction baseline *alone* would allow the removal of 23,232 cubic yards (14.4 acres x 1613.3 cubic yards per acre per foot of depth). O'Conner (2003) and EIP Associates' (1994) both estimated the average annual replenishment rate to be about 16,000 cubic yards per year. So the amount of material available for extraction from a one foot lowering of the minimum baseline elevation is 145% of the average annual replenishment estimated by O'Conner and by EIP.

The water surface elevation adjacent to a bar may vary from one year to the next because the streamflow varies between years. However, the water surface elevation may also lower because of a change in the

low-flow channel such as erosion of the crest of the riffle that controls the water surface next to the bar or because the low-flow channel has shifted to a new location bypassing the control riffle.

Removing excessive amounts of material in dry years increases the sediment trap efficiency of the bar and tends to induce a greater deposition the following year than may have occurred without the excess prior dry year extraction. Deposition on a skimmed bar can induce downstream channel erosion similar to the channel erosion caused by "hungry water" below a reservoir.

Significant channel changes tend to only occur in years with larger peak discharge events. Changes in dry years tend to be associated with the deposition of fine material, since the smaller peak discharge events in a dry year can not mobilize large volumes or sizes of material. Armor layers are more effective in dry years so the channel bed is better able to resist erosional forces and the erosional forces present in dry years are smaller.

The extraction baseline should not be determined by the annual water surface elevation at each bar nor should it be determined by the water surface elevation during the first year of extraction. Either of these methods could lead to over-extraction during dry years. The extraction baseline should be determined through add ional study done for a project specific EIR.

An additional study of the current conditions in the river is also needed. The 2003 O'Conner report is based on survey data collected between 1996 and 2002. The impact of gravel extraction in 2002 through 2004 under permit has not been assessed by a study of changes in the river based on the monitoring cross sections. In addition, the impact of gravel extraction without a county permit in 2005 and 2006 has not been properly assessed either.

Decrease in Substrate Size

The MND discusses the potential for the extraction techniques to increase the amount of fine material deposited on the extraction surface and the direct removal of spawning size. The MND also mentioned the potential for abrasion to decrease particle size in the downstream direction. For a short river such as the Gualala only the softer rocks would experience significant downstream fining through abrasion.

One process that can decrease in substrate size in the Gualala River is exposure of clay deposits through channel incision. Well logs from Elk Prairie on the North Fork of the Gualala River reveals that the deep alluvium below the river contains beds of clay (NCWAP, Geology Report, Fuller et. al. 2002). The clay may have been deposited in an estuary or other low energy environment. The cross section data presented in the O'Conner Report (2002) show that the thalweg on Cross Section 30 at the Bridge Bar has an elevation of about 39 feet above sea level. The USGS 7.5-minute topographic shows that the 40 foot contour line crosses the North Fork of the Gualala River just upstream of its confluence with the Little North Fork near Elk Prairie. Therefore, it is reasonable that clay deposits may underlay the bed of the South Fork of the Gualala between The North Fork and the Wheatfield Fork (Valley Crossing).

In the mid-1990's I observed exposures of clay in and adjacent to the low-flow channel at the USGS gauging station on the Garcia River and in the low-flow channel downstream where the Garcia River leaves the trace of the San Andreas Fault and turns west to head towards the ocean. In 1992 Bedrock excavated trenches in the Garcia River and encountered a clay layer just below the thalweg, immediately downstream of the USGS gauging station. The clay layer that Mr. Hay encountered while running the excavator was deeper than the reach of the excavator bucket. Therefore, it appears reasonable to expect that clay deposits could be exposed in the low-flow channel of the South Fork and Wheatfield Forks of the Gualala River through modest channel incision.

The Pajaro River runs along the border between Santa Cruz and Monterey counties. A clay layer below the river bed prevents water from the river recharging the Pajaro Valley aquifer. The Pajaro Valley is a wide flat alluvial valley of relatively low elevation. The clay layer below the Pajaro River demonstrates that such layers can bet quite extensive. Without direct observation, it is not possible to determine if the

South Fork of the Gualala has a clay layer below all or a portion of its bed. But the Garcia River and the Pajaro River demonstrate that clay layers can and do exist below California rivers.

Exposed clay in the low-flow channel decreases the quality of steelhead habitat. The MND has not evaluated the potential of this impact to arise from instream gravel extraction on the South Fork of the Gualala River.

Reduction in Pool Depth and Area

The MND notes that Halligan (2003) found that all pools in the study reach, corresponding to segments 1 and 2 of the EIP (1994) study of the channel, were deeper than 2 feet and formed 46% of the channel area. The EIP Associates EIR (1994) reported that pools deeper than 8.1% of the study reach was occupied by pools deeper than 2 feet. The MND associates the greater presence of deeper pools with the instream gravel operations of Gualala Aggregates. However, a cause and effect relationship between an expansion of pools deeper than 2 feet and the presence of instream extraction has not been demonstrated. A much more likely explanation is that that six out of the seven years from 1988 through 1994 were relatively dry and did not produce any significant discharge events so that sediment transport was confined predominantly to the low-flow channel resulting in the loss of pool volume. Figure 1 shows the maximum 5-day rainfall total for each water-year from 1985 through 2007 (23 years). On the other hand, the winter of 2002-2003 (2003 water year) had the fourth greatest 5-day maximum rainfall total which probably caused a discharge event large enough to scour the accumulated fine material from the pools. In addition, the 2003 water-year precipitation was above average and the 1994 water-year precipitation was below average, so the summer streamflow in 2003 was probably higher than in 1994 which would also cause an increase in pool depth.

The MND claims that Mitigation Measure Bio-12 will reduce the potential adverse impact of instream gravel extraction on pool depth and area to less than significant by providing buffers at the head of the bar and adjacent to the low-flow channel. However, the presence of buffers does not mitigate the effects of extraction during a dry year. As discussed in the section about the extraction baseline, grading the bar to the low-flow water surface in a dry year removes material in storage and the material that was deposited on the bar. In a dry year there may be no flow over the head of the bar. Deposition on the extraction surface may be due to water entering the extraction surface at the downstream end of the bar and moving in the upstream direction. The spreading of the flow into the extraction area may cause deposition in the low-flow channel and possibly in the thalweg as the flow spreads out, reducing the pool area in the low-flow channel adjacent to the extraction area.

The MND has not analyzed the effect of each of the extractions techniques during dry years, during average years and during wet years.

Increased Water Temperature

The MND failed to note that the entire Gualala River watershed is listed as impaired for water temperature under section 303d of the Clean Water Act.

The MND discusses the scenario where a summer freshet flows over the gravel bars and is warmed. The MND fails to discuss the potential for gravel extraction to cause the low-flow channel, either at the extraction site or downstream, to shift and go down the center of a gravel bar. If the low-flow

The cumulative effect of the continuous gravel mining since the 1960's prevented the South Fork of the Gualala River from adjusting its width, depth and gradient to carry the sediment supplied to it by the watershed. If the continuous gravel mining had not removed about 1,139,000 cubic yards it is likely that the active channel may have narrowed. The narrower active channel would have provided more shade to the low flow channel and the water temperature would presumably have been cooler. The MND does not examine this cumulative impact.

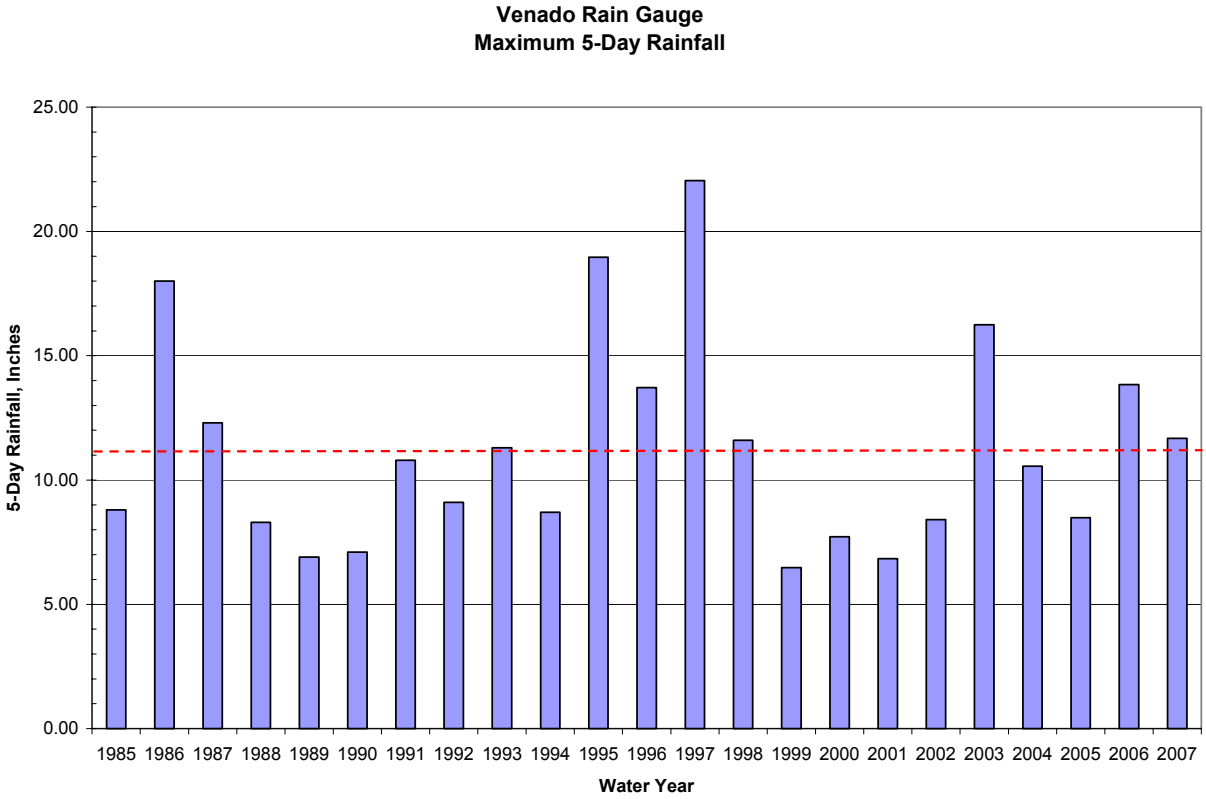

Figure 1. The maximum 5-day total rainfall for each water year from 1985 through 2007 at the Venado rain gauge near the eastern edge of the Gualala River watershed. The maximum 5-day rainfall total is better correlated with the maximum annual water discharge than the total annual rainfall is. The dashed line is the average maximum 5-day rainfall (11.21 inches) for the period of record. The maximum 5-day rainfall for six out of the seven years between 1988 and 1994 were below average. The maximum 5-day rainfall for 2003 was the 4th highest for the period of record (23 years).

Hydrology and Water Quality

Item 8b discusses whether the project would substantially deplete or interfere with groundwater supplies. The project directly diverts water from the South Fork of the Gualala River. The MND compares the estimated total volume of wash water, 2.1 acre-feet per year, to the average annual discharge of the river, a meaningless comparison. The more meaningful comparison is the maximum diversion rate and the summertime discharge in the South Fork of the Gualala River. The USGS operated the South Fork of the Gualala River near Annapolis, CA stream gauging station (11467500) between 1951 and 1971. The station resumed operation in during 1991-1993. The stream gauge was located approximately one-half

mile downstream of the confluence of the South Fork and the Wheatfield Fork of the Gualala River (Valley Crossing).

The minimum recorded streamflow at the station was 0.47 cubic feet per second (cfs) or 210 gallons per minute (gpm). Since juvenile steelhead trout use the South Fork of the Gualala River even a small diversion during a dry period could cause a significant adverse impact to steelhead trout. The MND does not contain information about the maximum diversion rate. Therefore, the MND does not contain the information necessary to determine if the diversion has the potential to directly cause and adverse impact to the environment and to steelhead trout in particular.

The Sea Ranch diversion is just downstream of the USGS gauging station. The MND has not investigated whether the combined pumping for gravel processing water and the diversion for the Sea Ranch has potential to cause a cumulative adverse impact to the streamflow and steelhead trout in the South Fork of the Gualala River.

Cumulative Impacts

The 1994 Program EIR for the Sonoma County ARM Plan, which is specific to the Russian River, concluded that instream gravel mining

> 17b Yes. Potentially significant impact identified and analyzed in prior Program EIR. Potential impacts that are individually limited but cumulatively considerable were identified in the area of air quality, noise, and aesthetics. Mitigation is proposed that would reduce the impacts to less than significant levels.

The disruption of the dynamic adjust process of the South Fork of the Gualala River by continuous instream gravel mining, as discussed above in the section on *Channel Stability,* has not been recognized by the MND as an unavoidable cumulative impact. The disruption of the river's dynamic adjustment process by gravel mining has produced significant changes in the form of the river and the quantity and quality of aquatic habitat compared to the likely condition of the river without continuous mining.

Monitoring

The channel cross section monitoring for the proposed project is similar to that done for the 1995 permit. The physical monitoring of the river channel done under the expired 1995 permit was inadequate to characterize the channel and to detect any adverse changes in the channel, especially away from the extraction sites. O'Conner (2003) notes that:

> Cross section surveys have been carried out on the Gualala River over a significant period of time; however, prior to 1995, few of the cross sections had permanent monumented benchmarks. The location of cross section surveys conducted under monitoring provisions of the gravel mining permit typically varied from year to year, depending in large part on where the mining operations occurred. This lack of consistent cross section locations **limits the usefulness of the data** when interpreting changes in bed elevations through time. (Emphasis added).

The cross sections at every bar should be surveyed every year in the spring if no mining occurs that summer. If mining occurs during the summer ten cross sections should be surveyed before extraction operations commence and after they end for the year. Cross sections at riffles crests within 10 active channel widths of the bar should be surveyed every year, in addition to the cross sections on the bars and cross sections 400 feet upstream and downstream of the extraction bar. The cross section monitoring required by the MND and the SCSMR ordinance is inadequate to detect any adverse impacts from the gravel extraction. The adverse impacts may not occur in the same year as the extraction operations.

Conclusion

The Mitigated Negative Declaration for the proposed instream gravel mining on the South Fork of the Gualala River and the Wheatfield Fork of the Gualala River is seriously flawed.

- The MND does not identify all unavoidable adverse impacts.
- The MND does not recognize that the proposed project contributes to cumulative adverse impacts.
- The MND does not identify foreseeable future projects that will contribute to significant unavoidable impacts.
- The MND does not does not mitigate the impacts from all potential extraction methodologies used by the proposed project.
- Several of the proposed mitigation measures conflict with each other.
- Not all potential impacts of the project have been adequately mitigated.
- The current condition of the river has not been established. The O'Conner report (2003) was based on cross section data collected between 1996 and 2002. No analysis of data collected between 2003 and 2007 has been presented in the MND.

An EIR should be required for the proposed project.

Sincerely,

Dennis Jackson
Hydrologist

cc: Dick Butler, NOAA Fisheries
David Hines, NOAA Fisheries
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Peter Straub, Corps
Jane Hicks, Corps
Scott Wilson, CDFG
Stacey Martinelli, CDFG
Serge Glushkoff, CDFG

Sec. 26A-09-020. Instream mining standards.

In addition to the general mining standards set forth in Section 26A-09, the following standards shall be applied to instream mining operations and related processing and stockpiling activities unless superseded by new standards adopted by the board of supervisors based on new information and analysis arising from the ongoing instream monitoring activities.

(a) Permit Time-Frames. A mining permit for instream operations in a designated area shall be granted for a period not to exceed ten (10) years, at the end of which time it shall expire; provided, however, that no such permit shall be granted for a period of more than five (5) years if there have been significant violations of operating standards by the applicant on the mining site or adjacent mining sites within the past five (5) years. All mining permits for instream operations in designated areas shall be subject to annual adjustment by the director in the amount of materials which can be extracted from the mining site based on data obtained through the monitoring program established by the aggregate resources management plan.

A mining permit for instream operations in a non-designated area shall be granted for a period not to exceed one (1) year, at the end of which time it shall expire; provided however, that no such permit shall be granted which would result in extraction more than once in three (3) calendar years at any mining site.

(b) Location of Instream Mining.

(1) Multiyear instream operations are allowed only in "designated" portions of the Russian River, Big Sulphur Creek, Austin Creek, Sonoma Creek, and the Gualala River as shown in Figures 7-1 through 7-8 of the ARM Plan or as later amended. Multiyear instream operations outside of the referenced designated areas shall only be allowed where a vested right has been established pursuant to Article 26A-05 of this chapter.

(2) Instream mining may only be authorized in the "nondesignated" areas of the above streams and rivers only if the proposed operation qualifies for an exemption pursuant to Section 26A-05-010 of this chapter or provided that the following conditions are met:

(i) The board has not adopted a moratorium on new permits on the subject stretch of river;

(ii) The location is in zoning district compatible with the "MR" district pursuant to Section 26A-09-010 (a);

(iii) The permit authorizations are consistent with the time frames restrictions set forth in subsection (a) of this section;

(iv) Adverse environmental impacts are avoided, mitigated or minimized, and

(v) A finding is made that a significant public benefit will result from the proposed extraction.

(c) Public Benefit Criteria. For purposes of determining whether a proposed mining operation in a nondesignated area has a public benefit, each finding shall be made on a case-by-case basis by the hearing body after considering the environmental analysis and public testimony on the mining proposal. Public benefits may relate to flood control, bank protection, public water supply, fisheries, recreation, infrastructure, or riparian and aquatic habitat.

(d) Instream Mining Season. Instream operations are limited to the period from June 1st to November 1st, unless an earlier start date is acceptable to the CDFG as specified in the CDFG permit.

(e) Setbacks. The following setbacks shall apply to the excavation, stockpiling, and processing and retailing activities of instream aggregate operations.

(1) Processing operations, including crushing, washing, screening, stockpiling, mixing and retailing shall be set back a minimum of two hundred feet (200') from the low flow channel and fifteen feet (15') from ordinary high water. No asphalt or concrete plants are allowed within the ordinary high water area. No new processing operations shall be established within the floodway zone designated by the Federal Emergency Management Agency (FEMA) for the subject river or stream. Stockpiles, processing operations, and ancillary uses located within the 100-year floodplain between November 1st and June 1st shall be designed and operated to prevent on-site and off-site damage from floods.

(2) Notwithstanding subsection (e)(1) of this section, limited processing of aggregates may be authorized within the permitted or vested instream bar skimming areas on a temporary basis during the instream mining season subject to the following restrictions:

(i) In-channel processing shall be limited to operations where there is no other available means of processing or to operations conducted for a single project;

(ii) All processing on permitted bar areas shall be limited to screening and stockpiling;

(iii) All equipment is portable or mobile such that it can be completely removed;

(iv) Screening and incidental stockpiling operations shall not be conducted within two hundred feet (200') of the primary low-flow channel of any perennial or intermittent stream or fifteen feet (15') from the ordinary high water mark or areas of significant riparian vegetation identified for preservation in the permit approval or by the CDFG;

(v) Screening and incidental temporary stockpiling shall be allowed only during the period when in-channel extraction is permitted (June 1st to November 1st of each year unless a earlier start date and/or end date is acceptable to the CDFG and specified in the CDFG permit) with all equipment and stockpiles removed by November 1st of each year;

(vi) The processing equipment shall be screened from residences and canoeists to the maximum extent feasible as determined by the director;

(vii) Screening and stockpiling activities on bar areas within the approved extraction areas shall be subject to director approval each year based upon the previous year’s satisfactory compliance with all mining regulations and all permit conditions.

(3) Setback and area restrictions for instream operations: All excavation, loading, and grading activities associated with instream mining operations shall comply with the following:

(i) Equipment shall not be operated in water except as may be necessary to construct stream crossings subject to the requirements of Section 26A-09-020 (i) of this chapter;

(ii) Skimming operations shall be set back from the low-flow channel as may be required by site-specific conditions of approval, the CDFG, or other regulatory agencies with jurisdiction;

(iii) To preserve riparian habitat along existing banks or in the stream channel, skimming shall be set back from the ordinary high water mark thirty feet (30') or 2.5 times the height of the bank, whichever is greater. The edge of the setback shall be measured from the top of the bank toward the low- flow channel of the river. In addition, where significant stands of riparian vegetation have been identified by the CDFG within the channel, skimming and excavations activities shall leave such areas undisturbed;

(iv) These standard setbacks may be determined on a site by site basis by the director or their designee, in consultation with the CDFG;

(v) All setbacks and permitted and restricted areas shall be graphically shown on exhibits accompanying each instream approval or subsequent adjustments.

(f) Slope Constraints for Gravel Bar Skimming.

(1) Instream aggregate extraction will occur through the process of gravel bar skimming. Mining will not be allowed below a two percent minimum cross section slope measured from the water level at the edge of the flowing stream. Where two or more distinct channels exist on a site, the maximum two percent grade shall be measured from the water level of each channel.

(2) Where a minimum low water flow is not maintained in a stream or the stream goes dry in some years, the minimum baseline elevation and grades, below which mining is prohibited, shall remain as established in the original mining and/or reclamation plan approval.

For purposes of establishing a minimum baseline and slope on sites where bar skimming is proposed in a year when low water flow is not maintained and the stream goes dry, the minimum levels and grades shall be measured either from the water level on July 1st or from one foot above the thalweg. If the operators elect to measure from the water level on July 1st, they will be responsible for a survey tieing cross-sections to clearly marked benchmarks or survey controls and recording the water level and flow rate.

(3) Cuts in gravel bars at property lines or the edge of the mining shall be no steeper than two (2) horizontal to one (1) vertical in slope.

(4) Final grades for each bar skimming site shall be graphically shown on exhibits accompanying each instream approval and shall serve as the baseline minimum elevation which must be maintained by the bar skimming operation and below which no mining activities shall be allowed.

(5) Instream bar skimming operations shall not depart from the above slope standards except where authorized by vested right reclamation plans or the adopted ARM plan policies as amended over time.

(g) Subsequent Mining Contingent on Aggradation. After extraction has taken place on a permitted site for the first time pursuant to a multiyear permit, extraction in subsequent years shall be limited to prevent permanent lowering of the channel bed and thalweg. The permit and resource management department, in coordination with the Sonoma County water agency, will determine whether any aggradation or degradation has taken place since the initial mining based on data from the required ongoing instream monitoring activities.

Where aggradation is clearly shown to have occurred above the baseline minimum elevation established pursuant to Section 26A-09-020 (f) (4), additional mining will be allowed under the permit to remove only the amount of gravel deposited following the previous mining. However, further mining will not be allowed in subsequent years anywhere within the immediate mining site if the director determines, based upon consideration of all available monitoring data, that either of the following has occurred:

(1) There has been significant net river bed degradation below the base elevation over the site or within four hundred feet (400') up or down stream of the site; or

(2) The channel thalweg measurements show a significant degradation pattern over a period of two or more years, or two or more successive meander wavelengths which cannot be explained by flow levels, channel morphology and river fluctuation alone.

In such cases, mining shall be halted on an interim basis, to the extent necessary, and shall not recommence until the elevation of all affected areas of the channel within the permitted area or four hundred feet (400') up or down stream have recovered and aggradation above the established

baseline minimum elevation is evident. The mining plan may be modified prior to recommencement as deemed necessary by the director in consultation with the water agency and/or other qualified professionals to provide greater assurance that compliance with the baseline minimum elevation and any other site-specific performance standards will be attained. Modifications may include but not be limited to adjustments in the final grade slopes, setbacks, permitted areas, and reclamation plan.

(h) Authorized Activities with the Riparian Setback Zones.

(1) Separated oversize gravel used for bank armoring shall be placed in a location at or near the ordinary high water mark of the channel in a manner to be specified by the director in consultation with the CDFG.

(2) Disturbance or removal of vegetation above the ordinary high water mark shall not exceed the minimum necessary to provide access to the mining site along a road no wider than fifteen feet (15').

(i) Instream Crossings. The installation, maintenance and removal of all stream crossings shall be in compliance with the applicable requirements of the Regional Water Quality Control Board and the CDFG. All stream crossings shall also comply with the following:

(1) The installation, maintenance and removal of the stream crossing shall not result in the roiling of water in excess of the requirements of Article II of Chapter 23 of this code;

(2) The installation, maintenance, and removal of the stream crossing shall not increase the turbidity of streams and rivers beyond accepted standards of the regional water quality control board or other regulatory agencies as amended over time;

(3) The stream crossing shall be such that water flow is not impaired and upstream or downstream passage of fish is assured at all times. Bottoms of temporary culverts shall be placed at or below stream channel grade. Culverts used for this purpose shall have no openings smaller than three feet (3') in diameter;

(4) The stream crossing and ramps shall only be built from material such as naturally occurring courser sands and gravels in the area which will cause little or no siltation;

(5) The stream crossing shall not be placed before June 1st and shall be removed no later than November 1st of each year unless an earlier start date and/or end date is acceptable to the CDFG and specified in the CDFG permit;

(6) The director shall be notified at least seven (7) days prior to commencement of the placement or removal of instream crossings;

(7) On recreational navigable rivers and streams, channel crossings require the use of raised structures so that the bridge span is a minimum of four feet (4') above the water line and at least eight feet (8') wide. All crossings shall be located so they can be readily navigated and to have clear upstream approaches and downstream exits to provide safe boating conditions. Crossings shall be adequately signed upstream to inform boaters and to identify portage options if necessary. Where crossings are required to pass shad, the span shall be at least twenty feet (20') long.

(j) Retention of Upstream Portions of Gravel Bars. Except as provided below, instream mining proposals within the Russian River shall leave the upstream bar area of each gravel bar unmined and undisturbed.

(1) The county may approve an applicant’s proposal to mine all or a portion of the upstream bar area where a study indicates that the requested mining methods and practices would be a superior management approach for a particular site. Such a study shall be prepared at the applicant’s

expense by a qualified county-approved expert, shall be submitted at the time of application, and shall include, at a minimum, the following information:

(i) Assessment of the proposed project site and river channel within one-quarter mile upstream and downstream of the site ("assessed areas") as to the present conditions relative to low-flow channel form and stability, flood flow capacity, channel degradation or aggradation, and lateral bank erosion;

(ii) Identification of all land uses along the river banks, including mining activities or operations, within the assessed areas, any erosion to outer banks which has occurred in the last five (5) years, and the potential for future erosion;

(iii) Vegetation types, sizes, and locations within the assessed areas;

(iv) Fishery habitat characteristics and quality within the assessed areas;

(v) Recommendations for setbacks, buffers, or other management practices needed to maintain stability of the low-flow channel, maintain or increase the existing flood-flow capacity, and minimize lateral bank erosion within the assessed areas;

(vi) Comparative analysis of the level of environmental mitigation and benefit which would be achieved if the upstream half of each gravel bar on the project site was left intact;

(vii) To the extent data is available, an analysis of cumulative impacts, if any, arising from the instream mining of the upstream half of a gravel bar within the assessed areas, which mining occurred subsequent to the adoption of the 1994 ARM plan.

(k) Russian River Gravel Mitigation Fund. All instream operations shall be required to contribute a fair-share amount to the Russian River gravel mitigation fund and/or carry out in-lieu mitigations as set forth in board of supervisor's resolution 95-0450, adopted April 11, 1995 or later amendments.

(l) Approval by Other Agencies. All instream mining operations shall comply with the applicable review, permit and approval requirements of other public agencies with jurisdiction as they may be amended over time. These include, but are not limited to, approval of a streambed alteration agreement with CDFG, a Section 404 permit from the U.S. Army Corps of Engineers, a Clean Water Act Section 401 certification, waiver and/or Waste Discharge Requirements from the Regional Water Quality Control Board. In addition, approval by the State Lands Commission must be obtained for stream crossings on sovereign lands and mining on sovereign lands owned by the state. All crossings require approval of a county permit according to the requirements of Ordinance 3836R and a streambed alteration agreement from CDFG.

(m) Groundwater Monitoring. Where multiyear instream permits are approved or renewed along the Alexander Valley Reach, operators shall be required to monitor groundwater levels as specified in the ARM plan or by site-specific conditions of approval and/or fund the collection and analysis of such data through the Russian River monitoring program.

(n) Other Streams. The annual amount to be removed from the designated portions of other streams shall be based on the natural gravel replenishment rate for the stream. All permits issued for mining in other streams shall state minimum absolute elevations for extraction as determined by the county in consultation with the Sonoma County water agency.

(o) Annual Operator Monitoring Requirements.

(1) Site-Specific Topographic Data. To monitor compliance with the site-specific baseline minimum elevation and final slopes, the stability of, or changes to, the stream channel morphology, and monitor the level of aggradation or degradation occurring on a site, all instream operators shall be required to submit spring and fall topographic cross-section data to the county.

Cross-sections shall be prepared at a minimum of every four hundred feet (400') over the mining site and four hundred feet (400') up and down stream. In addition, annual cross-section data shall:

(i) Be collected at bridge locations and at public well fields within four hundred feet (400') upstream or downstream of the mining site;

(ii) Be collected by a licensed surveyor;

(iii) Be tied into existing survey control network;

(iv) Be monumented at each end for use in subsequent years;

(v) Extend from top of bank to top of bank; and

(vi) Include underwater areas and thalweg shots.

Spring cross-section survey data shall be collected and submitted prior to July 1st of each year. Fall survey data shall be collected and submitted by the end of the calendar year. Data shall be collected and presented in a format acceptable to the Sonoma County water agency by a licensed land surveyor.

Alternatively, spring cross-section survey requirements may be waived or reduced by the director if comparable site-specific topographic data is provided by the Russian River monitoring program administered by the county, and the operator pays a fair-share of the monitoring program costs as determined by the county. In addition, the director may exercise such discretion as authorized by the ARM plan or later amendments to increase, reduce, and/or revise the above monitoring requirements to utilize alternate means of data gathering and compliance verification and to respond to the changing data needs of the monitoring and inspection program.

(2) All instream operations within the Russian River shall annually fund a fair-share, as determined by the county, of the Russian River monitoring program administered by the county pursuant to the ARM plan and Section 26A-13-010 of this chapter.

(3) Additional site-specific monitoring requirements may be required as a condition of a site-specific approval where the hearing body finds such additional monitoring requirements warranted in light of the site-specific environmental review.

(p) All aggregate operations shall be conducted in a manner consistent with the Federal Endangered Species Act (FESA) and the California Endangered Species Act (CESA). In those instances where an aggregate mining operation conducted in compliance with the requirements of this chapter is found to result or potentially result in “adverse modification” of the “critical habitat” area of a species listed as “endangered” or “threatened” pursuant to FESA or CESA, the standards and conditions set forth in this ordinance, or in permits approved pursuant to it, may be further modified by the director of the permit and resource management department to the extent allowed under Section 26A-11-020(h), to assure that the mining activities are conducted in a manner consistent with any federal or state recovery plans or site-specific biological opinions prepared pursuant to the above acts and do not result in an unauthorized “take” of the species.

(q) The director has the authority to approved proposed modifications in the standards or conditions of mining methods for the mining reach of Austin Creek to allow for implementation of adaptive management approach changes in consultation with the resource agencies with the following limitations:

(1) The change does not expand the area of the project,

(2) The change does not result in a substantial increase in activities or new activities not previously assessed,

(3) The change does not intensify or raise new environmental impacts not previously addressed in the environmental review, and

(4) The change assists the operations to better meet any performance criteria or project objective adopted with the

approval.

(r) Other Standards. For the mining reach of Austin Creek, the above standards may be modified by the decision-making body, only where it is demonstrated to the decision-making body, through site-specific environmental or other evidence, that the proposed mining methods and management practices (1) provide a superior management approach for the site and (2) that project design features and mitigations requirements will avoid adverse impacts or reduce them to a level of insignificance, while meeting all other goals, objectives and standards of the ARM plan. (Ord. 5511 § 2(a), 2004; Ord. No. 5165 § 1, 1999.)