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STATE OF CALIFORNIA

BEFORE THE STATE WATER RESOURCES CONTROL BOARD

In the matter of: Hearing on Water Rights Application 30166 El Sur Ranch	**CLOSING BRIEF** Hearing Date: June 16, 2011 Time: 9:00 AM

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I. INTRODUCTION

Parties California Sportfishing Protection Alliance (a protestant), Center for Biological Diversity and Ventana Wilderness Alliance request that the State Water Resources Control Board (SWRCB) strike a fair balance between allowing a productive livelihood for Applicant while protecting public trust resources and ensuring a reasonable and beneficial use of water.

Applicant James J. Hill III, an heir to the Great Northern railroad fortune and resident of a Pebble Beach estate, is not farming El Sur ranch for a livelihood. While it is true that Hill raises cattle on the ranch, the ranch is not a substantial, let alone primary, source of income, and Hill has never claimed otherwise.[1] Thus, while Applicant's flood irrigation of pasture is certainly the *cheapest* form of food production for cattle, it is clearly not the only form available. Nor is it unreasonable to expect a ranch to use a certain amount of alternative food production, or there would be no other ranching in the region absent Hill's advantageous situation.

This closing brief focuses on public trust resources, hydrogeology, and beneficial use aspects of Hill's proposed diversion as of the Fourth Amendment to the application. These sections demonstrate that the permit should not be based on an "impacts test," because Applicant's studies systematically exclude impacts to both biological resources and river hydrology, and fail to demonstrate why more water is needed than prescribed in Water Code § 1004.

In conclusion, these parties respectfully ask the Board to permit Applicant's diversion based on a need for greater efficiency than currently practiced, and a determination that its

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1 As part of its beneficial use determination, the Board may consider the ongoing economic viability of the operation. Here, it is reasonable for the Board to conclude that the "viability" of a subsidized operation is entirely in the eyes of the person providing the subsidy, and not for the Water Board to imagine the economics *as if* the ranch were indeed a profit-making enterprise.

Seen differently, the applied-for water rights are worth exponentially more than any income Hill generates from cattle. Particularly given the large increase in requested diversions compared with historical use, it is reasonable for the Board to conclude that the <u>value of the water rights</u> should be considered the primary economic driver here, not the production of cattle, and beneficial use adjudged accordingly: based on irrigated pasture, used not used for economic gain but either (a) as a temporary target for the future transferable value of the appropriative rights themselves, (b) as waste, or (c) both.

diversion is governed by Water Code § 1004, with additional permit conditions, proposed in testimony and at hearing by Mr. Dettman and Mr. Shutes, ensuring a minimum by-pass flow and other protective habitat conditions as well as long-term study and monitoring.

II. PUBLIC TRUST RESOURCES

Introduction

The Big Sur river supports abundant public trust resources, including a threatened central coast steelhead population. These resources will be further endangered if the proposed application is approved unless suitable permit conditions, such as those provided by CDFG or CSPA et al, are also implemented. As explained below, the impacts to steelhead are unaccounted for in Applicant's studies, making the "impacts test" devised by Applicant unsuitable as a basis for the final permit.

A. The SWRCB has a responsibility to protect public trust resources, including those present in the Big Sur River.

The public trust doctrine is a common law legal doctrine originally appearing in the Roman Code of Justinian and later equated with the "king's right," or right-of-way, over navigable waterways. (*National Audubon Society v. Superior Court of Alpine County ("Audubon")* 33 Cal. 3d 419, 434 (1983).[2]) The present-day doctrine vests the right to use and protect navigable waterways, including the Big Sur river, with the people of the state, who then entrust the management and protection of these rights to the state in its capacity as a police power; hence the term "public trust." California was endowed with the rights and responsibilities of use and protection of public trust resources at the time of statehood, and in 1971 the California Supreme Court held that this duty extended to the protection of

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2 Of particular relevance to the present case, the public trust doctrine is distinguishable from the tidelands trust doctrine, which was at issue in the U.S. Supreme Court decision *Summa Corp. v. California Ex Rel. State Lands Commission et al.* (1984) 466 U.S. 198. *Summa Corp.* held that for lands granted prior to statehood under Mexican law, then confirmed in patent proceedings conducted pursuant to statute (implementing the Treaty of Guadalupe Hidalgo), the state must have raised its public easement or trust over tidelands during the patent proceedings. In contrast, traditionally navigable waters (such as the Big Sur river), were not challenged in *Summa,* and such waters remain under the jurisdiction of the state, both due to the state's inherent interest in navigable waters and due to the public navigation itself generating a prescriptive right. (*See City of Los Angeles v. Venice Peninsula Properties* (1988) Cal. App. 3d 1522, 1534.)

environmental and recreational values. (*Audubon,* 33 Cal.3d at 434, *citing Marks v. Whitney* (1971) 6 Cal. 3d 251, 259)[3]. The *Audubon* case held that the State Water Resources Control Board had a duty to ensure public trust protections in its oversight of the water rights process, while "surrendering that right of protection only in rare cases when the abandonment of that right is consistent with the purposes of the trust." (*Audubon,* 33 Cal. 3d at 441.)

Thus when the SWRCB issues a water rights order, it is charged with "an affirmative duty to take the public trust into account in the planning and allocation of water resources, and to protect public trust uses *whenever feasible*." (*Id.* at 446; emphasis added.) As it is entirely feasible to protect public trust uses in the present matter, the SWRCB should do so and issue an order preventing harmful biological impacts to threatened steelhead and other public trust resources. (*See also* Shutes rebuttal testimony, Tr. 7-11-11 at 190:10.)

B. The Big Sur River features abundant Public Trust Resources, including federally threatened steelhead.

Senior fisheries Biologist David H. Dettman was contracted by CSPA, CBD and VWA to assess the biological resources of the lower Big Sur River and evaluate and propose protective permit conditions for the applicant's diversions. (Direct Testimony of David H. Dettman, CSPA/CBD-100, and Tr. 7-8-11 at 30.)[4] Mr. Dettman testified that the area encompassing the lower reach of the Big Sur river is "one of the most scenic and treasured areas for preserving biological diversity," and features numerous public trust resources, including "isolated populations of unique species found nowhere else in California." (Tr. 7-8-11 at 34;. CSPA/CBD-100 at 3; *citing* PBS&J (2009); CSPA/CBD-102 (photographs of study reach).) One such unique species is the Central Coast Steelhead, classified as "threatened" under the federal Endangered Species Act and found only in central coast streams in this state. (CSPA/CBD-100 at 3.) Other threatened or endangered public trust

[3] Agriculture is not one of the uses within the scope of the public trust.
4 For 17 years Mr. Dettman was responsible for management of fishery habitat on the Carmel river for the Monterey Peninsula Water Management District; his qualifications are described in CSPA/CBD-101 and Tr. 7-8-11 at 32.

resources include silver salmon, the California red-legged frog, and a number of birds including the California condor and Western snowy plover. (*Id.*)

C. Big Sur River's Steelhead Abundance, Size and Habitat Has Declined.

i. Big Sur River Steelhead Population and Size Have Declined

As of 1994, the Big Sur river remained "highly functional" for steelhead production. (Tr. 7-8-11 at 34; CSPA/CBD-100 at 4:17, *citing* Titus, Erman and Snider.) Yet in 1998, the Center for Ecosystem Management and Restoration ("CEMAR") determined that a substantial decline in population occurred in the Big Sur river steelhead population. (Tr. 7-8-11 at 35; CSPA/CBD-100 at 5:1, *citing* CEMAR at Table 3, p.191).[5] Reductions in steelhead population within the Big Sur is also evident from comparing Dr. Titus' 1994 study and Dr. Hanson's studies taken a decade later. (Tr. 7-8-11 at 58: 4.) According to Dettman, this downward trend in steelhead population is not consistent with other coastal streams, particularly when compared with populations in the Carmel River, making Applicant's pumping a likely contributor to impacts. (Tr. 7-8-11 at 58: 9-19.)

Applicant's own data supports the CEMAR conclusion regarding declining steelhead habitat and contradicts a conclusion that the steelhead habitat is healthy and abundant.[6] (Dettman Rebuttal Testimony, CSPA/CBD-110 at 1; and ESR-21 at paragraph 6.) In fact, Hanson's 2004 and 2007 data show a low density of steelhead in the lagoon, averaging only .51 fish per linear foot and 280 fish total. (Tr. 7-11-11 at 196; CSPA/CBD-110 at 2; *see also* CSPA/CBD-106.) In contrast, the Carmel river produced over *ten times* that number-- a

5 Separately, applicant's attorney attempted to discredit the CEMAR report, claiming she could not find support for its conclusion that the Big Sur steelhead population had declined. Applicant's inability to find proof for a conclusion it does not support can hardly be considered proof of *discrediting* the CEMAR report-- particularly when the report's conclusion is supported by local fishermen and both Dr. Titus and Mr. Dettman, two highly qualified biologists making independent assessments in this matter. (*See* Tr. 7-8-11 at 49-50 (noting Titus and Dettmans' independent research and conclusions.)

6 The "green light, red light" approach implies that experts have provided a "green light" to impacting Big Sur steelhead habitat. This is emphatically not the case. Notably, Mr. Dettman frequently disagreed with the "green light" assessment of the Big Sur, and at least one Big Sur criteria is listed as yellow. (Tr. 7-11-11 at 149:13) But the entire "green light" discussion serves only to distract from extensive proof, as documented by Hanson and testified upon by Titus and Dettman, of poor steelhead habitat during low flow conditions in the study reach. Further, the "green light" reflects habitat conditions observed under unknown pumping conditions, while the increased pumping requested by Applicant is neither field-tested nor fully evaluated for impacts in the Big Sur river.

factor that cannot be accounted for merely by a difference in stream size, as it is reflected in average density as well. (Tr. 7-11-11 at 197-198; CSPA/CBD-110 at 2) In density terms, the Big Sur is "an order of magnitude lower" than in the Carmel river, averaging only .023-.026 fish per lineal foot in years measured by Hanson. (CSPA/CBD-100 at 2.) This disparity is illustrated by Mr. Dettman in CSPA/CBD-107.

This scientific analysis by Mr. Dettman is supported by several first-hand accounts provided by local fishermen, including testifying witnesses Brian LeNeve and Jim Cunningham. (*See* Testimony of Brian LeNeve and Jim Cunningham, Tr. 7-8-11 at 197-198 and 316-318). According to these and numerous other reports provided by fishermen, the steelhead and salmon populations in the Big Sur river are currently a tiny fraction of their former size. (*Id.*). While once abundant, the Big Sur steelhead population has declined so much in recent decades that these fishermen have stopped fishing. (*Id.* at 197:19; 318:5)

ii. Harmful Depth Levels Correspond to Applicant's Pumping Schedule

USGS flow data and Hanson's study demonstrate that low flow conditions in the river in September, 2004 caused insufficient depth to meet the .3 ft criteria and provide suitable passage over critical riffles for juvenile steelhead. (Tr. 7-8-11 at 40; Dettman Direct, CSPA/CBD-100 at 5:28; *comparing* Hanson (2005) at Figures 76-78 *with* USGS gauge data, May-Sept 2004 (Exh. CSPA/CBD-100 Appendix Figure 1.) Yet despite Applicant's characterization of 2004 as a "critically dry water year," (Tr. 6-16-11 at 228:21), the 2004 flows were not even in the bottom 25 percent. (Tr. 7-8-11 at 41.)

In contrast, 2007 was an actual critically dry year, and the stream not only did not meet minimum depth criteria, it "nearly dried up near El Sur's pumps." (*Id.* at 48.) During this time, steelhead abundance during low-flow periods was further limited to the lagoon. (CSPA/CBD-100 at 6:18-19 and Appendix Figure 3). In Dettman's opinion, the lower reach did not de-water entirely only because "pumping was curtailed just before the streams were most critical." (Tr. 7-8-11 at 48.) If pumping had continued it could have resulted in steelhead mortality. (*Id.*) At hearing, Dr. Hanson confirmed that these depths were unsuitable. (Tr. 6-16-11 at 229:13.)

iii. Small Changes in Streamflow Impact Depth/Stage and Diminish Habitat

Applicant essentially argues that its pumping represents such a small fraction of overall flow that it should not be held accountable for impacts to steelhead and public trust resources. (Tr. 7-11-11 at 201) As Mr. Dettman testified however, even a small reduction in streamflow can reduce the depth (stage) at a critical riffle enough to harm Steelhead habitat. This is demonstrated by comparing Applicant's depth data with the USGS flow data from the same period. (Tr. 7-11-11 at 202; CSPA/CBD-110 at 3; *citing* CSPA/CPD-108 and 109.) From this data, it appears that the .04 change in stage change may reduce flow by 45 percent. (*Id.* at 205; CSPA/CBD-109.) Therefore, Applicants pumping-related manipulations in streamflow must be assumed to impact stage, especially in summer months.

iv. Study Reach Suffers from Harmful Dissolved Oxygen Levels During Low Flows

A suitable level of dissolved oxygen (DO) is important in order for steelhead to “swim, feed, and grow to a large size.” (Tr. 7-11-11 at 209.) Due to its importance for fishery habitat, Mr. Dettman focused on dissolved oxygen levels in most of the streams he's worked on. (Tr. 7-11-11 at 209) Mr. Dettman repeatedly cautioned the Water Board regarding low dissolved oxygen levels in the study reach of the Big Sur river. (Tr. 7-8-11 at 35, 38; Tr. 7-11-11 at 209.) In order to evaluate whether, as Applicant argued, low DO was merely an anomaly, Dettman compared DO in the lower reach of the Big Sur to levels in the Big Sur's upper reach, as well as other streams. (CSPA/CBD-110 at 5 and Figures 2-6; Tr. 7-11-11 at 214) When Dettman compared the DO levels, he concluded that the levels in the study reach were consistently lower, and lower still during Applicant's pumping. (*Id.* at 6; Tr. 7-11-11 at 216) Applicant “mischaracterized the levels of DO as suitable and used an incorrect standard for measuring impacts.” (Tr. 7-11-11 at 211.)

Hanson did not use the accepted DO level used by regional water boards: 7 mg/ liter and 85 percent median saturation. (Tr. 6-16-11 at 236; Tr. 7-11-11 at 210.) Instead, Hanson used 6 mg/ liter and did not measure saturation. (*Id*) Unfortunately, ignoring saturation renders these DO measurements a half-measure at best. (Tr. 7-11-11 at 261:12)

As with the low depth criteria, Mr. Hanson agreed during cross-examination that these periods did not meet the minimum DO standard. (Tr. 6-16-11 at 239-240, *citing* ESR-24 at Figures 52 to 55 and Table 17.) [7]

v. Applicant's Pumping Schedule Corresponds to Low Dissolved Oxygen

Mr. Dettman demonstrated that El Sur's 2007 pumping activity corresponded to changing DO levels and delayed DO recovery in the study area. The lowest DO levels in the study area were recorded while pumps were running, but DO levels increased once the pumps were turned off. (Tr. 7-8-11 at 43; *citing* Hanson (2008), Exh. ESR-34 at Figures 52 to 56.) Dettman further explored this relationship in rebuttal, finding that DO was aberrantly low during the 2007 pump tests, trending lower when pumping was on, and taking longer to recover in the study area than in the upper reaches. (CSPA/CBD-110 at 6 and Figure 5 and 6; Tr. 7-11-11 at 217). Mr. Dettman attributed the changing levels in DO to a combination of intermittent pumping by Applicant and critically-dry low-flow conditions. (Tr. 7-11-11 at 217; CSPA/CBD-110 at 6.) The low DO levels were characterized as "highly stressful and in some cases perhaps lethal in some of the locations." (*Id.;* CSPA/CBD-110 Figure 10). In particular, Dettman identified an acute inability for DO levels to recover after the three-day pump tests, resulting DO patterns "completely outside the natural regime of the healthy stream in this part of the coast," and resulting in DO levels as low as 20 percent; "low enough to case either stress or death." (Tr. 7-11-11 at 220; CSPA/CBD-110 Figure 8.) Further, the pumped water contained depressed DO levels consistent with diverting this water from the stream during the low DO period[8]. (Tr. 7-11-11 at 229.)

Due to the close relationship between Applicant's pumping and low dissolved oxygen, Mr. Dettman recommends curtailing pumping whenever DO drops below 85% saturation and 7 mg/liter in the study area, which also ensures compliance with the Regional

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7 While Applicant objected to Mr. Dettman's hydrogeology testimony, Dr. Hanson often made sweeping hydrogeological conclusions (e.g. poor habitat conditions caused by labor day holiday) to excuse poor steelhead habitat. Thus Applicant appears to embrace a double standard for its own experts. (*See* Tr. 7-11-11 at 192 (discussing Hanson's use of hydrological conclusions: "Hanson does not establish that well operations do not have effects on surface flows... he says, 'the effect of well operations on river flows could not be determined.')

8 See Section III.D, infra.

Board's own water quality objectives. (Tr. 7-11-11 at 218 and 221; CSPA/CBD-110 at 6.) In addition, Mr. Dettman noted that Applicant's proposed oxygenation scheme would be very complex, expensive, and difficult to implement. (Tr. 7-11-11 at 232.) Applicant provided neither specifics nor expert support for this measure.

vi. Connectivity of Lagoon at the Mouth of the Big Sur River Is Critical For Steelhead Habitat

The lagoon at the mouth of the Big Sur river is "relatively more important in this stream than other streams," because: (1) unlike many lagoons, the Big Sur river lagoon maintains year-round connectivity with the ocean, and (2) the majority of steelhead are located in the lagoon during low-flow periods in the Big Sur river. (Tr. 7-8-11 at 37-38; 40-41.) Mr. Dettman testified the connectivity of the lagoon may be threatened by the proposed diversions. (*Id.* at 39.) When the lagoon mouth closes, it causes increased predation, raises harmful carbon dioxide levels, and can force fish into areas with warm temperatures and low dissolved oxygen, which Dettman calls "a definite problem." (Tr. 7-8-11 at 59-60.) While additional study is needed to exactly determine the minimum flows necessary to protect the lagoon, Mr. Dettman believes a minimum bypass flow of 10 to 15 cfs is needed (measured at the lower gage, Tr. 7-8-11 at 55 ln.20) to keep the lagoon open, and also recommends reducing Applicant's diversions when the lagoon mouth is closed.[9] (*Id.* At 54.)

vii. Habitat Suitability Judged By One Disputed Factor, Ignoring Others

Applicant claims acceptable steelhead habitat based on a proxy: the summertime passage of juvenile steelhead over critical riffles at stage/depth of .3 ft. If this height is met, the argument goes, then habitat is sufficient. As explained in Section I.B ii above, Applicant's own data demonstrates that these passage conditions were not met. Yet

9 While Mr. Dettman recommends reducing pumping to "baseline" levels at such points, he strongly cautions that these so-called "baseline" pumping levels "represent substantial fractions of the probable streamflow in the lower river and ZOI of El Sur Ranch's wells. Additionally, the flow criteria for Table A [DEIR 4.3-38] are based on flows that will be substantially reduced prior to reaching the ZOI. This means that it is likely the diversion will be an even greater relative reduction. In this situation, the flow and linked spatial habitat reductions will be substantial and significant."

debating riffle passage misses the larger point: Applicant's passage-as-proxy approach drastically oversimplifies steelhead habitat, entirely to Applicant's benefit. (CSPA/CBD-110 at 4.) As Mr. Dettman testified repeatedly, juvenile fish passage is only one of many criteria to measure steelhead habitat, which consists of “more than just maintaining migration opportunities over critical riffles in the summertime.” (Tr. 7-8-11 at 52.). In Mr. Dettman's own words, “it is not in my opinion, and I think in most fishery biologists' opinion, a single number that you could use to set flow requirements in the summertime for juveniles.” (Tr. 7-8-11 at 61) Worse, the .3 depth will provide adequate habitat “only for the very smallest fish of the current brood year.” (*Id.* At 81) Dettman concludes that passage is not a sufficient criteria to evaluate quality of rearing habitat for juvenile steelhead. (Tr. 7-11-11 at 205; 231.) Instead, other factors must be examined including stream velocity, type of sand and substrate, stream width, shading and in-stream cover. (*Id.* at 206; CSPA/CBD-110 at 4.)

As described above, biological constraints beyond streambed conditions are also important: dissolved oxygen (DO) levels were consistently unhealthy for steelhead during low flow periods, and temperature levels were also above a healthy level. (Temperature testimony at Tr. 6-16-11 at 232 and 237, noting increased temperature also increases oxygen demands.) Low flows also cause a reduction in food production of macrobenthic invertebrates, decreased mobility and contributes to low growth rates of juveniles (Tr. 7-8-11 at 46; 60-61.)[10] These factors are unaccounted for in an overall suitability determination based only on a .3 ft juvenile fish passage.

Given Hanson's reliance on a .3 ft depth criteria for habitat suitability, Dettman observes “there may be an impression that flow for adult migration is not needed later than May.” (Tr. 7-11-11 at 208.) However, this would be a false impression. By comparing studies of other rivers, it appears likely that summer run steelhead would be present in the Big Sur river. Yet the .3 ft depth championed by Hanson allows passage by juvenile steelhead through critical riffles, but nothing more. Such a low minimum depth may also

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10 Applicant argues that steelhead can choose to avoid pools with poor habitat (such as low DO). However, this assumes such a choice can in fact be made, and ignores the reality that countless steelhead have been documented in poor habitat conditions.

encourage predation. (Tr. 7-8-11 at 62) Considering a .3 ft depth to be suitable habitat thus assumes no adult steelhead, or salmon, are present in summer months. Yet there is ample evidence that adult steelhead do exist in summer months, and also evidence that larger silver salmon are present during the summer as well. (*See* Hanson Cross, Tr. 6-16-11 at 247:1; Dettman Direct, Tr. 7-8-11 at 79-80; LeNeve Testimony, CRSA-1.) Therefore, these parties recommend a .6 or .7 ft depth should be used instead as a minimum depth (stage) requirement, because it would allow adult steelhead and silver salmon passage during summer months. (Tr. 7-11-11 at 208.)

In conclusion, a more complete evaluation of habitat conditions would have reached a far different conclusion if it had considered DO, pool size, temperature, and food production. (Tr. 7-8-11 at 52.) In Mr. Dettman's words, "a large fish can't really exist in a situation where there's only .3 or .5 feet depth." (Tr. 7-8-11 at 71:14.) Likewise, the question of habitat suitability would have been far different in the presence of summer adult steelhead and/or silver salmon.

viii. Poor Steelhead Habitat "Unusual" Because Applicant's Studies Do Not Test Actual Permit Conditions

Applicant attempts to characterize poor steelhead habitat conditions as unusual, but these conditions only appear unusual due to the constraints placed on the studies themselves. As a prime example, Hanson (2007) concluded that well production did not impact steelhead habitat -- but Hanson based this conclusion on above-normal 2006 seasonal flows, and well production of only 84 AF/month. (Dettman, CSPA/CBD-100 at 6; Tr. 7-8-11 at 42). As a practical matter, Hanson's conclusion regarding habitat suitability is based on diverting less than half of the monthly amount requested by Applicant for summer months in the Fourth Amendment. (ESR-40, Condition 3, requesting 203 AF/mo in summer.[11]) Conversely, this conclusion ignores the 2007 critically dry season.

11 However, actual 30-day diversion averages could be much higher under the Fourth Amendment because the so-called "monthly" limits do not limit 30-day diversions. Assuming such 30-day periods span between multiple months, a 30-day period could actually contain 400+ acre-feet of diversions, while each individual month was kept to the permitted 206 acre-feet. Thus the Fourth Amendment allows 30-day diversions nearly five times greater than the 84 AF / month evaluated by Dr. Hanson in his 2007 report. As a

Mr. Dettman testified that harmful impacts to steelhead habitat would be evident if studied under the actual conditions to be permitted: (1) if flows had been typical late-summer flows; (2) if full requested amounts had been diverted during the critical low flow periods in 2004 and 2007; if (3) both pumps had been running; if (4) the pumps had been run for a sustained period; and (5) if measurements of depth and flow had been continuously taken after the pumps were turned off (due to the delayed pump effects). (*Id.;* Tr. 7-8-11 at 41-42.) Without these conditions present, Hanson's conclusions are of little value.

D. CSPA et al's Recommended Permit Conditions Are Designed to Provide Sufficient Depth, Dissolved Oxygen and Connectivity Between Lagoon and Ocean for Suitable Year-Round Steelhead Habitat.

The above sections describe low population density and size of steelhead in the Big Sur river, and then connects Applicant's pumping during low flow periods to low depth, low dissolved oxygen, decreased food and high temperatures. Even if these poor conditions were somehow considered acceptable, there is an unspoken assumption made by Applicant that these past studies demonstrate suitable habitat for future diversions, when (a) applicant has applied to pump 50-100% more than what was pumped during these studies; and (b) the stream conditions themselves are highly variable.

There is no reliable evidence in record that Applicant's last-minute changes to its application will address either of these long-term concerns.[12] It remains a mystery who invented these supposedly protective measures, since upon cross-examination, Applicant's experts admitted that they had not reviewed the changes made in the Fourth Amendment to the application. As a result, the justifications provided by Applicant's experts were necessarily *post hoc.*

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result, CSPA et al. again recommends that any monthly limitations should be eliminated from the final permit in favor of basing permitting terms on Water Code 1004 and biological impacts.

12 The application's EIR did not evaluate a bypass flow requirement. By the EIR's own unique logic, such permit conditions would have been rejected as unacceptable constraints on the project goal to deliver the requested amount of diversion-- not to mention unnecessary, since impacts were only measured above and beyond inflated "baseline" diversion levels. Of course, the EIR's consultants *could* have defined the project in such a way that different diversions amounts could be considered as project alternatives, making bypass flows a valid consideration. This was not done.

In contrast, Mr. Dettman made a series of supplemental and alternative recommendations specifically designed to assure sufficient depth, dissolved oxygen and lagoon connectivity for steelhead habitat. (Tr. 7-8-11 at 52:8-9; CSPA/CBD-100 at 14 *citing* Appendix Figure 8 and Table 2.) In an effort to correct these fundamental problems with the Big Sur stream habitat, Mr. Dettman's recommendations would serve the purpose of the Endangered Species Act and work to recover the species. (Tr. 7-8-11 at 74.)[13]

Mr. Dettman's recommended permit conditions include separate winter and summer minimum bypass flows, and in practical terms allow for the requested diversion limits-- as long as sufficient habitat conditions are met.[14] Setting such bypass flow requirements are crucial because "the proposed diversion is within, or near, the range of seasonal minimum daily flows during many years." (CSPA/CBD-100 at 8-9, finding e.g. that the proposed diversion would affect summer flows in two-thirds of years.) In particular, the separate summer and winter diversion bypass flows are set to protect against dropping below a "threshold, below which habitat decreases rapidly, and above which habitat quality changes more slowly." Because Applicant is receiving the economic benefit from its diversion, these gages should be paid for by Applicant. For summer months, Dettman has gauged this flow to be 20 CFS for depth (Tr. 7-8-11 at 53), 15 CFS for DO *(Id. at* 53), and 10 to 15 CFS for lagoon connectivity *(Id. at* 54). Given these three variable requirements, bypass flows should be set at the highest minimum common denominator, which for summer months is above 20 CFS as measured at the lower USGS gauge[15]. Mr. Dettman's recommendations

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13 On the eve of the hearing, Applicant proposed its own set of bypass flows as part of an extensive Fourth Amendment to its application. (ESR-40.) However, Applicant can by-pass the by-pass flows themselves by somehow demonstrating adequate fish passage. (*Id.)* Applicant's laundry list of proposed terms, conditions, exceptions and loopholes are a marvel of complexity and would be nearly impossible to enforce, absent a level of Board supervision incommensurate with its budget. Instead, protective bypass flows combined with permanent real-time reporting would provide an elegantly simple and much cheaper alternative.

14 However, the requested permit amounts are also subject to beneficial use and (non-)waste requirements, which CSPA/CBD/VWA do not believe have been met. *See* Section III, *infra.* As a result, these parties recommend a permitted diversion based on Water Code section 1004, as well as minimum bypass flows that minimize biological impacts.

15 Mr. Dettman's recommendations involve use of both gages, the upper gage in the winter, and the lower gage in the summer (after July 19th), to use for measuring minimum bypass flows. (*See, e.g.,* Cross of D. Dettman, Tr. 7-8-11 at 56.) 13.) An essential contributing factor to the bypass flow recommendations is that <u>additional</u> flow must be provided at the upper gage to account for any loss of flow between the gage and the point of diversion. Because the lower gauge does not require such adjustments, Dettman believed it was more suitable after July 19th. Ultimately, because Applicant is requesting the diversion and thereby causing

also address lagoon and dissolved oxygen levels directly, requesting that diversions are reduced when DO falls below 90 percent and cease pumping if DO is below 75 percent.[16] (Tr. 7-8-11 at 54-55; CSPA/CBD-100 Appendix, Figure 8 and Table 2.)

III. HYDROLOGY

A. Applicant's Study Parameters Minimize Pumping Impacts on Big Sur River

i. Horton's Zone of Influence Is Too Small to Account for the Majority of Flow Loss.

The proper calculation of the zone of influence for El Sur Ranch's wells is fundamental to accurately assess environmental impacts from Applicant's water pumping operation. (Testimony of Kit Custis, Exhibit DFG-C-A at 2, 45-46). Because Applicant used a zone of influence with multiple limiting factors, the hydrological studies based on those measurements consistently underestimate impacts. (*Id.*, at 1-3, 45-46).

The calculations by Mr. Custis show that the limited sampling of the river within Dr. Horton's ZOI is insufficient to account for losses in the stream. (*Id*. at 46; Cross-Examination of Kit Custis, Tr. 6-17-11 at 226:23-227:15, 228:7-16). The section of river between VT2 and VT3 is approximately 31 to 38 percent of the zone of influence for the two wells. (Custis, Exhibit DFG-C-A at 46; DFG-C-49; Tr. 6-17-11 at 230:25-231:8). Thus, the conclusions drawn from data collected between the two points measures river water loss for only one third of the zone of influence. (Custis, Exhibit DFG-C-A at 46). It is highly likely that there are additional losses of flow from the river elsewhere, such as above VT-1 and in the lagoon. (Cross-Examination of Horton, Tr. 6-16-11 at 201:3-5; Custis, Exhibit DFG-C-A at 46; Custis, Tr. 6-17-11 at 231:8-15) As explained below, Horton's rebuttal testimony proves Custis correct, demonstrating that river flow unaccounted for in the VT measurements is entering the pumps through Creamery Meadow. (*See* Section I(b), *infra*; Rebuttal Cross-Examination of Paul Horton, Tr. 7-11-11 at 156:24-157:15)

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harm to the river, Applicant should also be responsible for paying for protective measures, including ongoing monitoring and the installation of actual flow meters, instead of using inaccurate, easily manipulated, and post-use calculations based on electrical use. Calculations based on electrical use would not allow for real-time measurements of diversions, making it impossible to determine at any given time whether permit conditions are being met.

16 To effectively measure DO, Mr. Dettman also recommends installation of a water quality measurement station in the lower study reach. (Tr. 7-8-11 at 55.)

ii. Loss of Flow Into Lagoon Left Unaccounted For

In 2006, measurements taken in the lagoon by Applicant's hydrogeology expert Horton document a loss in surface flow. (Custis, Tr. 6-17-11 at 231:8-9). In 2007, Horton stated that he could not make a calculation with regard to the lagoon, and dropped this area out of the study reach. (Custis, Tr. 6-17-11 at 231:4-15). This is problematic in that both the old and new wells should include the lagoon in their actual zone of influence, but remain unaccounted for in the version relied upon by Horton. (*Id*. at 230:15-231:15; Custis, Exhibit DFG-C-A at 46; Horton, Tr. 6-16-11 at 201:3-5). Pumping of the two adjacent wells should induce a deeper cone of depression, and thereby induce more river loss and a longer recovery period. (*Id*.) With two thirds of the zone of influence neglected from Applicant's study area, impacts such as those seen at the lagoon are not appropriately considered. (*Id*.)

Custis observed only three transects measured surface flow in the river, with none on the edge of the ZOI. Of the three transects, VT1 was well downriver from the edge of the zone of influence while VT2 and VT3 were established in the middle of the zone. (Custis, Tr. 6-17-11 at 223:15- 224:21, 228:7-14; ESR 2, Figure 3-3). There is a definite loss in river flow from VT1 to VT3, but specific data recording surface flow coming in to the zone of influence is not available to understand how much of that loss from VT1 to VT3 is occurring inside the zone. (Custis, Tr. 6-17-11 at 226:23-227:5). In order to properly measure what is happening within the zone of influence, it is essential to know what is coming in and what is going out of the zone, not just what is happening within. (*Id*. at 223:22-224:2). Therefore, Mr. Custis testifies that Applicant was mistaken in not establishing a transect proximate to Piezometer 6, at the edge of the zone of influence. (*Id*. at 227:5-6, 228:7-14).

iii. Measurement site VT1 was located too far downstream to measure flow loss into Creamery Meadow

Mr. Custis testified that surface flow lost upstream of VT1 as subterranean flow is not later regained by the river, but instead is pumped by Applicant and ultimately goes unaccounted for in stream flow losses. (Custis, Exhibit DFG-C-A at 46-47; Custis, Tr. 6-17-11 at 236:3-21). When a well next to a river pumps water, the drawdown changes both the natural paths of the subterranean flow and the natural gains and losses to the river flow. (Custis, Exhibit DFG-C-A, 46-47). Rivers typically lose flow on the upstream side of a riffle and gain flow on the downstream. (*Id.*) Proper sampling points are essential to accurately record gains and losses in flows. (Custis, Tr. 6-17-11 at 237:25-238:25).

Stream water is likely lost into the alluvium upstream of VT1, to become subterranean flow moving beneath Creamery Meadow toward the pumps. (*Id*. at 236:12-21, 239:10-18). As described by Applicant, it is approximately 35 times easier for water to flow horizontally through the alluvial aquifer material from the Big Sur River than it is to flow vertically through the riverbed to the underlying aquifer. (ESR-2 at 8-1). This hydrological feature underlines the importance of subsurface water leaving the river upstream of VT1. This loss, however, is not in Applicant's data because flow levels were not measured above VT1. (Custis, Tr. 6-17-11 at 239:19-240:8). In the natural hydrology of a river, surface flow lost upstream is regained downstream. (Custis, Exhibit DFG-C-A at 46-47). In contrast, the water that the Big Sur river is supposed to regain is lost to Applicant's pumps.

Mr. Custis testified that surface water is flowing underneath Creamery Meadow to the pumps. (Custis, Tr. 6-17-11 at 239:10-18). In rebuttal, Horton reversed his earlier position, and posited that water upstream of his zone of influence was indeed making its way to the pumps: "[I] totally agree that the water is discharging from the stream above the zone of influence is entering the flow and eventually pumped by the wells." (Rebuttal Cross-Examination of Paul Horton, Tr. 7-11-11 at 160:9-11). Thus, there is water leaving the river unaccounted for above VT1, moving as subsurface water to the pumps, and leaving the aquifer for ranch irrigation instead of reentering the river. (*Id*.; Custis, Tr. 6-17-11, at 239:19-240:8).

iv. Actual measures of surface flow by Applicant demonstrate a significant loss of water from the river.

As explained above, habitat connectivity and passage during the 2007 study show fluctuations in depth with activation of just one of the two pumps. (ESR 24, Tables 16 and 17). The study method utilized cycle pumping, meaning Applicant would go at least one week without pumping from the wells, then pump for one week with one of the wells. (Cross-Examination of Paul Horton, Tr. 6-16-11 at 225:12-20). Both pumps were not turned on simultaneously to test the impacts, leaving the potential effect on river depth unknown under such circumstances. (*Id*. at 226:2-10).

Impacts measured from the testing of one well by Applicant at passage transect 11 on August 30 show an average depth of .12 feet with both wells off. (ESR 24, Table 16). Activation of the new well to pump 2.37 cubic feet per second on September 5, resulted in the average depth dropping to .06. (*Id*.) With both wells off on September 12, the river climbed .09 feet to .15 feet. (*Id*.) Another measurement taken at transect 9, river depth started at .31 feet, dipped .11 feet with pumping from the new well, recovered to .37 feet, then dropped another .11 feet (*Id*., Table 13, 8/30/07-9/26/07). This result occurred repeatedly throughout the 2007 cycle pumping tests, exhibiting significant dips in average depth with one well pumping, then corresponding climbs with both wells off. (*Id*., Tables 12-17; Horton, Tr. 6-16-11 at 226:14-227:3). The importance of these consistent drops in surface flow cannot be overstated. Such reductions represent a significant change in depth (stage) and flow when surface flows are ranging below 20 cubic feet per second, which is a common reality within the Big Sur River. (*Id*., Tables 12-17) Mr. Dettman likewise testified to the small change in flow creating a substantial loss of depth; (*See* Section II.C.iii, *supra*.; Rebuttal of Dettman, Tr. 7-11-11 at 205:3-7, CSPA/CBD-110 at 3:21-23).

B. Pump tests conducted by Applicant were inadequate in duration, and did not properly assess impacts of sustained diversions of water.

The severity of impacts caused by diverting from the subterranean flow also depends upon duration of pumping. (Custis, DFG-C-A at 2; Custis, Tr. 6-17-11 at 86:2-7). In the tests conducted by ESR, the longest period of time tested for continuous pumping was only eight days. (Horton, Tr. 6-16-11 at 199:16-200:3). This limited testing occurred despite Applicant's request for a 30-day sustained diversion of water from the pumps. *(See, e.g.,*ESR-40 at 1). Custis testified that this discrepancy prevents the ability to assess the prolonged impact of pumping from the wells. (Custis, Tr. 6-17-11 at 84:2-19).

To approximate the actual impacts of Applicant's sustained pumping at the proposed rate, Mr. Custis developed an alternative analysis with pumping at the same rate and duration as the proposed permit, and calculated losses in river flow when both the old and new well were pumping in 2007, from late September to early October. (*Id*. at 84:24-85:2). Custis performed his calculation of river flow losses using two stream depletion models, and relied upon data from ESR-6, Table 3-1. (*Id*. at 85:4-11; Custis, DFG-C-A at 49). From Applicant's Table 3-1, pumping of both wells at 5.02 cubic feet per second (cfs) results in river loss of 1.0 to 1.2 cfs in Zones 2 to 4. (*see* DFG-C-46; Direct Examination of Custis, Tr. 6-17-11 at 85:13-15; Custis, DFG-C-A, 50). Yet the area of loss accounted for by Applicant in the table is only Zones 2 to 4, which accounts for only 40 percent of the total. (Custis, Tr. 6-17-11 at 85:15-19; Custis, DFG-C-A at 50). However, when Custis calculated the theoretical depletion rate of both wells pumping at a rate of 5.02 for the same zones, at the end of five days of pumping stream depletion totaled 3.425 cfs. (Tr. 6-17-11 at 85:20-86:7; Custis, DFG-C-A at 50). In addition, the five-day duration of the pump test allowed a smaller cone of depression to develop; an extended pump time would create a larger cone and further increase the delayed impact. (Tr. 6-17-11 at 86:4-7; DFG-C-A at 50). Custis testified that at five days of pumping stream depletion was 50 to 75 percent of the total pumping, but after 30 days stream depletion would be approximately 80 percent of the total pumping. (Tr. 6-17-11 at 86:8-11; DFG-C-A at 50).

C. The Big Sur River frequently undergoes changes, altering the river channel and the consistency of connectivity between surface flow and subterranean flow.

A fundamental flaw in the analysis of ESR regarding the impacts of diversions on the surface flow of the river is that they assume relatively static conditions. (Custis, DFG-C-A at 2). In reality, however, the Big Sur River channel is frequently undergoing change. *Id*. The top foot of materials in the river, known as the colmation layer, changes with the channel, and changes over time with flow, meaning hydraulic conductivity is continuously altered. (Cross-Examination of Custis, Tr. 6-17-11 at 217:19-219:1, 221:17-222:14; Cross-Examination of Horton, Tr. 6-16-11 at 209:19-210:15). These changes are significant in that as they occur, impacts from pumping will also change. (Custis, DFG-C-A, 48-49). Therefore, the conclusions put forth by ESR are flawed in that they falsely assume a constant condition in the Big Sur River. *Id*.

i. The river channel undergoes frequent changes that alter pumping impacts.

The Big Sur River in the area of the ESR wells is highly dynamic, with frequent documented changes in channel location and geometry from 1929 until today. (Custis, DFG-C-A at 47). Custis testified that approximately 74 percent of the time since Applicant's wells have been in place (1950 to 1994), the low flows in the river were closer to the wells and the river meandered less. (*Id*. at 48).[17]

For Applicant's studies to be reflect actual conditions in the study reach, the dynamic nature of the Big Sur River must be factored in to the calculations. However, the conclusions of Applicant assume that river channel conditions remain static. (*Id*.) The data does not factor in variable conditions of the streambed regarding the distance between the well and the river, the hydraulic characteristics of the aquifer, hydraulic conductivity, the permeability and thickness of any hydraulic conductivity streambed layer, and the duration of pumping. (*Id*.) The basis ESR relies upon, that losses from the stream are well-determined and consistent, is erroneous because the Big Sur River is always in flux. (*Id*. at 48-49).

Mr. Custis illustrated a recent channel change event in his testimony, which was later confirmed by Mr. Horton. In 1995, a major storm event dramatically moved the channel of the river. (Custis, Tr. 6-17-11 at 221:21-24; Cross-Examination of Horton, Tr. 6-16-11 at 248:20-249:1). This moved the river away from the well locations, but as both Custis and Horton testified, it is possible that with another major storm event the river could move closer to the wells. (Horton, Tr. 249:2-12; Custis, DFG-C-A at 48). Jon Philipp, a hydrogeologist, also testified to a recent channel change. He stated that in the summer months of 2004, 2006, and 2007 there was just a single channel at PT4 in the area of the

17 This includes the first ten years of the CEQA baseline period when the river was closer to the wells, and therefore losses from pumping likely increased, however, this is not a fact considered in the environmental impact analysis from ESA. (*Id*.)

ERS wells, but this configuration has since changed, as shown in ESR-59, to become two channels. . (Cross-Examination of Jon Philipp, Tr. 7-11-11 at 83:2-16). As recently as summer of 2011, Mr. Custis has observed another shift in the channel. (Custis, Tr. 6-17-11 at 222:15-22).

ii. The colmation layer frequently shifts, altering hydraulic connectivity

The colmation layer in the Big Sur River is approximately one foot thick and determines hydraulic conductivity between the surface flow and subterranean flow. (Custis, DFG-C-A, 45; Custis, Tr. 6-17-11 at 217:19-218:18). This layer is subject to change year to year with the river's flow or with a storm event, any high-flow event, or with a change in the river channel. (Horton, Tr. 6-16-11 at 209:16-210:15; Custis, Tr. 6-17-11 at 221:17-20, 222:4-14). With alteration of the colmation layer, the conductivity of the stream is affected. (Custis, Tr. 6-17-11 at 217:25-218:4). As Custis testified, the colmation layer at the bottom of the streambed is like a layer cake. It is important how the sedimentation —including sand, silt, and finer grain material— settles in the riverbed and layers, because the formation greatly affects permeability. (*Id*. at 218:6-18).

ESR conducted tests to measure permeability between the river and subterranean flow based on the colmation layer. (*Id*. at 218:19-25). One test was done with the streambed unaltered, a second test removed the upper foot of bed material, and the third test replaced the previously removed, upper foot of material. (See DFG-C-48a to 48c; Custis, DFG-C-A at 45). The results showed that with the streambed unaltered, vertical hydraulic conductivity ranged from 121 to 126 feet per day. (*Id*.) After removal of the colmation layer, conductivity ranged from 668 to 960 feet per day. (*Id*.) Finally, the results showed that conductivity was greatly increased with total removal of the colmation layer. Permeability in the streambed ranged from approximately 3,470 to 3,950 feet per day. (*Id*.)

The measurements taken of Big Sur River with altered colmation layers serve to show the inconsistency of riverbed hydraulic conductivity. *Id*. Hydraulic conductivity between the surface water and the groundwater system are highly dependent upon the temporary make-up of the colmation layer. (Horton, Tr. 6-16-11 at 115:2-6). Because of the inconsistent nature of the colmation layer, surface flow impacts from pumping are constantly changing. ESR must account for these impacts.

iii. Hydraulic conductivity for the zone of influence was improperly calculated.

Within the Big Sur River, there are a variety of sediment types, or geological units, such as silt, cobble or sand. (Cross-Examination of Custis, Tr. 6-17-11 at 214:7-19). Each unit has a different level of hydraulic conductivity. (*Id*.) Instead of running calculations using the different geological units and hydraulic conductivity levels, ESR chose to take the average of all the units to create one unit, known as the geometric mean. (*Id.* at 213:15-21, 214:23-215:3; Custis, DFG-C-A at 44). This creates a flawed analysis in that ESR assumes that there is a single type of geological unit when multiple types are present. (*Id*. at 213:15-21; Custis, DFG-C-A at 44).

Custis argues that instead of calculating an average number from a large spread in hydraulic conductivity among the geological units, each unit needs to be separated out as its own area and calculated separately. (Custis, Tr. 6-17-11 at 217:10-17). Instead, ESR chose to average a table of numbers ranging from 311 feet per day and 36 feet per day, a spread of 8.6 to 1—a range characterized as "significant" by Custis in his testimony. (see ESR-5, Table 3-2; *Id*. at 216:15-217:10). It is Custis' opinion that the methodology chosen by ESR did not produce an accurate result. (Custis, DFG-C-A at 45). Subdividing the areas into regions of similar bed materials and then averaging the hydraulic conductivity within each subarea is a better methodology. (*Id*.) Gains and losses from each subarea could then be calculated and the total gain or loss would be the sum of the subareas. (*Id*.) This figure could then be validated with measurements of the actual flow. (*Id*.) By choosing to use a geometric mean, it is Mr. Custis' opinion that ESR compromised accuracy in their data on hydraulic conductivity. (*Id*.)

C. Residual Loss After Pumping Stops Is Not Accounted for in Applicant's Studies.

Diversions from underflow continue to affect surface and subterranean flows long after pumping has ceased. (Custis, DFG-C-A, 2). Groundwater loss and stream depletion don't occur simultaneously; rather, stream depletion can actually progress more slowly than recovery of underflow. (Custis, Tr. 6-17-11 at 120:5-13). Therefore, Applicant's measurement of water level in the aquifer immediately after pumping ceases is an inaccurate measurement of drawdown, because the surface water fraction is not yet in balance. (*Id*.) Applicant's inability to account for residual stream depletion is due to the limited scope of the region studied: losses from pumping do not necessarily occur within the limited zone of influence described by Applicant. (Cross-Examination of Kit Custis, Tr. 6-17-11 at 122:8-10). Pumped water can be replaced by water lost from outside of the zone, above VT1 and from the lagoon, to maintain the water balance in the study reach—otherwise out-flows would far exceed the in-flows. (*Id*. at 122:3-17, 124:8-15). In a subterranean stream with defined bedrock channels, there are few sources to replace water lost. The stream is most likely choice within the system; the ocean cannot fill that gap. (*Id*. at 123:3-8, 124:8-16).

i. Applicant's Mass Balance Equation Uses a Different "Zone of Influence" And Fails to Account for Residual Losses in the Big Sur River

In Dr. Charles Harvey's testimony, he described his mass balance equation, as seen in ESR-49a and b. The diagram he presented was not based on data collected by ESR, but described as "a fundamental water balance." (Cross-Examination of Dr. Charles Harvey, Tr. 7-8-11 at 291:5-8). Harvey did not determine anything specific to the Big Sur river, but rather, presented an equation that is a "basic inputs equal output kind of thing" that "would also apply to some completely different system." (*Id*. at 291: 5-16).

The first problem with Dr. Harvey's mass balance equation as applied to study reach is his defined zone of influence. Harvey did not establish specific boundaries, but rather imagined an amorphous zone of influence that "extends upstream from the wells and extends downstream from the wells." (Harvey, Tr. 7-8-11 at 217:19-23, 291:2-4). Thus Harvey's Zone of Influence is whatever area is affected by pumping. *(Id.)* This is different from the zone of influence estimated by Horton, which is defined as having a 1,000-foot radius of influence from the wells. (Cross-Examination of Dr. Charles Harvey, Tr. 7-8-11 at 286:18-23). Applicant's definition of the zone of influence is roughly represented by the cylinder portrayed in Dr. Harvey's illustration, as seen in ESR-49a and b, but Harvey does not consider the cylinder to be accurate for his own definition. (*Id*. at 218:12-16). Due to this difference, Harvey's version of Zone of Influence would have accounted for considerably more loss to the river than the limited one imposed by Horton in his studies.

Dr. Harvey's equation also assumed that the aquifer is a steady state, and that storage water isn't changing. (Harvey, Tr. 7-8-11 at 218:18-22). The symbol ∆I represents inflow and assumes "a high rate of water flowing in that's independent of pumping within the zone of influence." (Harvey, Tr. 7-8-11 at 219:3-4). This inflow is assumed to be consistent and unaffected by pumping levels, because it's outside the zone of influence. (Harvey, Tr. 7-8-11 at 220:13-15). Thus, ∆I in the equation is equal to zero. (ESR-49b). As for where that groundwater comes from, Harvey views this as irrelevant. (Harvey, Tr. 7-8-11 at 262:14-20).

Harvey testified, however, that the gap created by pumping from the aquifer does have to be filled from somewhere. (Harvey, Tr. 7-8-11 at 262:21-24). He agreed that it is possible that the water coming in to refill the gap is water that has left the river from somewhere upstream to fill the aquifer. (*Id*. at 262:25-263:3).

As detailed above, Custis testified that important residual impacts are happening within the river above the zone of influence. (Cross-Examination of Kit Custis, Tr. 6-17-11 at 122:3-10). Where the groundwater flow is coming from is not irrelevant. Rather, it is an variable unaccounted for in Harvey's equation; Harvey's equation simply doesn't include it.

D. Dissolved oxygen measurements from pumped water demonstrate that significant surface flow is being pumped by applicant.

As part of the applicants monitoring efforts during pump tests, measurements were taken of dissolved oxygen content in the actual pump water. (Dettman, Tr. 7-11-11 at 225:19-21). This information was used by Mr. Dettman to assess what fraction of water diverted and pumped is coming from surface flows. (CSPA/CBD-10, 7:31-8:2).[18]

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18 During cross-examination, Applicant attempted to claim that its own pump tests were invalid. (Rebuttal Cross-Examination of Dettman, Tr. 7-11-11 at 253:9-22). While the testimony was excluded, it begs the question why Applicant would intentionally invalidate its own tests. More importantly, the *patterns* in DO levels cannot be accounted for by faulty testing: the trends in dissolved oxygen were extremely consistent with the surface readings, both in high dissolved oxygen measurements and low. (Tr. 7-11-11 at 253:20; CSPA/CBD-

Mr. Dettman testified that the DO measurements demonstrate that Applicant is diverting "a high proportion of oxygenated surface water from the river." (*Id*.; Dettman, Tr. 7-11-11 at 226:19-25). Dettman studied the 2006 and 2007 operations from El Sur's old and new well tests. (Dettman, Tr. 7-11-11 at 226:4-6). He noted that dissolved oxygen levels from the pumped water were dissimilar to levels typically measured in groundwater. (*Id*. at 226:13-14). Instead, the dissolved oxygen levels more closely aligned with surface water levels. (CSPA/CBD-110, 8:3-11). This trend is clearly displayed in Figure 10 of CSPA/CBD-110, which plots the dissolved oxygen levels in groundwater from 2004 with the dissolved oxygen levels measured from the 2007 pump tests. (CSPA/CBD-110, Figure 10).

Dettman observed that El Sur's dissolved oxygen data indicated a close link between surface water and pump diversions. (*Id*. at 9:11-10:4). When pumping started, the levels of dissolved oxygen generally increased throughout the pumping period. (see CSPA/CBD-110, Figures 9 and 10; Dettman, Tr. 7-11-11 at 228:20-229:1). These high levels of dissolved oxygen indicated that there was a greater fraction of surface water drawn into the pump. (*Id*.) A second trend Dettman noted was that around September 1, the levels of dissolved oxygen measured from the pumped water dropped significantly. (*Id*. at 229:4-13). Dettman testified that this was due to corresponding low dissolved oxygen levels measured in the river. (*Id*.) Thus the low oxygenation in the pumped water reflected the low oxygenation in the river at that time. (*Id*.) These patterns were consistent with Horton's measurements of dissolved oxygen concentrations during late August, June and September of 2007. (*Id*.)

Conclusion

Applicant's hydrology studies are severely constrained by the limited zone of influence, failure to account for shifting streambed, inaccurate gauging of hydraulic connectivity, and failure to account for residual loss. Moreover, DO measurements suggest a much higher fraction of streamflow diversions. As a result, Applicant's impacts on surface flows are in all likelihood far greater than those measured by the hydrology studies. Given

110 at 10:15-18). It would be impossible for tampering to randomly create a set of data so closely related to surface flow trends.

the understatement of Applicant's true impacts, SWRCB should assume that the diversions by Applicant are at or near 1:1 with loss of surface flow from the Big Sur river.

IV. REASONABLE AND BENEFICIAL USE AND WATER CODE §1004

A. The Proposed Diversion Should be Guided by the Reasonable and Beneficial Use Requirements of the Water Code, Caselaw, and the Delta Watermaster Report

The requirement for reasonable and beneficial use of a water right is set forth in Article 10, Section2 of the California Constitution and Cal. Water Code § 100. Water Code § 275 further requires the Water Board to take all appropriate proceedings or actions to prevent waste and unreasonable use of water. (*See also,* SWRCB Decision 1600 (D-1600) at pp. 19-20.) Water Code § 275 tasks the Board with the responsibility to ensure reasonable and beneficial use, and also provides the Board with a "separate and additional power" of enforcement. (*Imperial Irrigation Dist. v. State Water Res. Control Bd*., 186 Cal. App. 3d 1160, 1170 (Cal. App. 4th Dist. 1986.)) Conversely, the Water Board cannot award a water right which would result in the unreasonable use of water: "no one can have a protectable interest in the unreasonable use of water." (*City of Barstow v. Mojave Water Agency,* (2000) 23 Cal. 4Th 1224, 1242.)

Reasonable and beneficial use is not set by an absolute standard, but depends on the facts and the circumstances of each case. (*See, e.g., People ex rel. State Water Resources Control Bd. v. Forni*, 54 Cal. App. 3d 743, 750 (Cal. App. 1st Dist. 1976.) Critically, this factual determination is dependent in part on the relative scarcity of the water requested for diversion: "What may be a reasonable beneficial use, where water is present in excess of all needs, would not be a reasonable beneficial use in an area of great scarcity and great need." *Forni*, 54 Cal. App. 3d at 743, *quoting Tulare Dist. v. Lindsay-Strathmore Dist.* (1935) 3 Cal.2d 489, 567.)

The *Imperial Irrigation District* cases upheld Water Board Decision 1600 and with it the Board's ability to judge the efficiency of irrigation as a measure of whether a diversion was reasonable and beneficial. (186 Cal. App. 3d 1160.) As explained the next section, Applicant in this matter prides itself on inefficient irrigation.

The Delta Watermaster report goes a step further and recommends that the Board actively consider agricultural efficiency in making its reasonable use determinations. In the fall of 2010, Delta Watermaster Craig Wilson released the report "The Reasonable Use Doctrine and Agricultural Water Use Efficiency." (SWRCB 2010.; introduced at January 2011 Board Meeting.) The Report's central tenant was that the reasonable and beneficial use criteria should be applied to agricultural efficiency: "Persons who do not employ some or all of [efficient water] technologies, where they are economically justifiable, locally cost effective and not harmful to downstream agriculture and other environmental needs, are simply using water unreasonably." (*Id.* at 10)

Thus both the caselaw and the Watermaster report condition a beneficial use determination on both efficiency and on potential harm to wildlife resources. As the Board itself has noted before, "excessive diversion or an unreasonable method of diversion of water to the detriment of instream fish and wildlife uses may he wasteful even if there arc no objections from competing consumptive users." D-1600, *citing Environmental Defense Fund v. East Bay Municipal Utility District*, 200 Cal.3d at 200.)

El Sur Ranch uses flood irrigation on uncultivated croplands, and has not only failed to demonstrate any effort at conservation, it has embarked on a program of high use which suggests over-watering and waste. In Applicant's own words, "our practice is to irrigate as often as we can." (Tr. 6-16-11 at 251:3) However, the Water Board has both the power and the responsibility to prevent inefficient irrigation and an unreasonable use of water. "An excessive diversion of water for any purpose cannot be regarded as one for a beneficial use, in so far as it is in excess of any reasonable requirement for that purpose." (*Tulare Irrigation Dist. v. Lindsay-Strathmore Irrigation Dist.* (1935) 3 Cal.2d 489.) There is no reason for the Board to issue a permit for water above and beyond the per-acreage calculation for reasonable use set forth at Water Code § 1004. The application of reasonable and beneficial use yields a result of around 605 acre-feet, based on the 2.5 acre-foot requirement of Water Code § 1004.

B. Applicant's definition of "Cultivated Cropland" would categorize any irrigated pasture as "cultivated".

Applicant seeks to escape beneficial use restrictions and Water Code § 1004 by arguing that it is growing "cultivated cropland" that requires exponentially much more water than typical irrigated pasture. (Sage testimony, Tr. 6-16-11 at 144: 11-25.) Sage testified there are two components to differentiating between cultivated and uncultivated pasture: that "the forage composition of the plants growing [on non-cultivated land] is much different than on the irrigated pasture," and "certain cultural practices" including "fertilization of it, the weed control, also re-seed and re-planting." (*Id.*)

Regarding the first factor, Applicant distinguishes types of plant composition by whether a plant can or cannot survive without irrigation in the local climate. (Cross of Dr. Allen, Tr. 6-16-11 at 256:14-18.) Dr. Allen describes the pasture as "improved pasture grasses, legumes, clover." And notes that They're not plants that would typically grow in that environment because of the dry, dry summers." (*Id.*) To be cultivated, it is enough that pastures, even if they are "quite permanent," are "started through cultivation and planning."

The second element is "cultural practices." According to Mr. Sage, this includes "fertilization," "weed control," "re-seed" and "re-planting." Mr. Hill adds no clarity: "It's the make-up of the species and the mix of plants … . there is mowing, fertilizing (both very limited), weed control, replanting of bare ground, fencing, re-shaping dikes." (Tr. 6-17-11 at 21:18-19; *see also Id.* at 20-21.) From the hearing, it was unclear if and how frequently any of these practices were actually carried out on Applicant's land. Moreover, it is unclear how these "cultural practices" change the nature of the plants to make them non-pasture crops.

At hearing, a DFG Attorney attempted to understand the difference "between an irrigated pasture that is cultivated and an irrigated pasture that is uncultivated." (Tr. 6-17-11, p. 20, lines 5-7.) It appears that the only line drawn by applicant and his experts is between irrigated pasture and pasture that is not irrigated. According to their definition, all irrigated pasture is "cultivated," and Water Code Section 1004 applies only to a type of pasture that by Applicant's definition does not exist.

C. Beneficial Use should be based on Applicant improving its efficiency of water use.

Mr. Sage characterized Applicant's operation as a “somewhat unique situation” whose irrigated pasture creates a “very enviable position.” (Tr. 6-16-11 at 151:11-18.) Considering both the value of the Big Sur River’s public trust resources, and the exceptional request for year-round diversions in a coastal setting, it is reasonable and correct for the Board to assume and/or incorporate efficiency improvements by El Sur Ranch in issuing its final permit.

The El Sur Ranch is operated with flood irrigation technology that is fundamentally inefficient, and the same that was used 40 years ago. Mr. Asmus testified that the operation relies on turning on water, observing when irrigation of an area is completed, then shutting down and irrigating the next area. (Tr. 6-16-11 at 85: 6-13.) Mr. Hill also acknowledged in responding to Mr. Lindsay that the ranch has “over-irrigated” in some years. (Tr. 6-16-11 at 304:13-15.) Mr. Hill acknowledged leaks and recent repairs, and stated that some of the El Sur Ranch water lines are over 60 years old. (Tr. 6-16-11 at 286:7-17.)

Dr. Allen testified, “If someone were there 24/7, I think the irrigation efficiencies could improve.” (Tr. 6-16-11at 170:9-11.) Mr. Hill demurred that there was a lack of available labor, and the current 2100 square foot house for the ranch manager was a constraint on finding personnel to man the ranch. (Tr., 6-17-11 at 16:9 through 17:16.) It defies credibility that the superb natural setting and an owner who has likely expended millions of dollars on this application cannot attract sufficient labor to have a person on site to monitor irrigation as it happens.

A tailwater recovery system could extend by several weeks or more the ability to irrigate during the dry season, should a protective minimum flow requirement be established, and thus improve the year-round viability of irrigated pasture. At hearing, Applicant estimated the cost of installing a tailwater recovery system at about $125,000-$150,000. (Tr. 6-16-11 at 253: 2-24.) In such case, it would be worth the investment. The Board should either order its installation as a term of the permit, or issue the permit with the understanding that such improvements are both feasible and necessary to maintain Applicant's year-round irrigation.

D. Beneficial Use Determination Requires Accurate Measurement of Irrigated Land

Reasonable and beneficial use measurements would be different if Applicant had accurately estimated the actual land to be irrigated. The application's DEIR (p. 2-5) states that total project is 292 acres, of which 267 acres are irrigated pasture. The DEIR also states that an existing riparian right serves 25 acres of these 267 acres of pasture.[19] Therefore, 242 acres should be subject to the requested diversion. However, Mr. Custis used the ArcMap GIS mapping program to measure DEIR Figure 2-3's proposed place of use (POU) for the irrigated pasture, and calculated that only 248 acres, not 267 acres, constitute the total acreage for the POU. The Center's own GIS specialist performed the same calculation as DFG with ArcMap, also based on DEIR Figure 2-3, and his measurement was about the same as CDFG's (246 acres). (*See* CSPA-3) Subtracting 25 acres for riparian diversion from this produces a figure of 223 acres. Parties ask the permit to be based on a beneficial use determination using an accurate estimate of irrigated land, with the riparian land subtracted from the total.

E. The Permit Should Be Based on Water Code § 1004

The application's DEIR states that the land being irrigated on El Sur Ranch is irrigated pasture. (DEIR 2-1). According to USDA's publication "Environmental Effects of Land Use-Changes," irrigated pasture is considered a type of uncultivated crop: "The NRI definition of uncultivated crops includes land in hay with no rotation and single-cropped horticulture." *(See also* Testimony of Kit Custis, DFG-C-A.) As explained above, Applicant's distinction between irrigated pasture and cultivated cropland appears to be based on whether the main type of plants require irrigation—meaning *any* land irrigated by Applicant would fall under this definition of cropland. Applicant's pasture is not exceptional and not outside the laws of nature, and should be regulated by Water Code § 1004.

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19 However, the SWRCB hearing notice states that 90 acres were determined to be subject to riparian water rights on the El Sur property; it is unclear how Applicant obtained the discretion to reduce the number to 25.

Conclusion

Opinions such as *EDF* and D-1600 create a two-part test for reasonable and beneficial use, one that takes into account both the efficiency with which the diversion is implied, and the risk of potential harm to fish and wildlife. Both Water Code § 1004 and traditional consideration of local water use practices point to a reasonable use level that is under half of the requested diversion and over a third less than Applicant's average historical diversion, while the Watermaster further recommends classifying inefficient irrigation practices as presumptively unreasonable. Further, both the CDFG and Dettman testimony point to public trust harm from the requested diversions. Given these factors, Applicant's reasonable and beneficial use is around 605 acre-feet when based on the 2.5 acre-foot requirement of Water Code § 1004. In testimony and video presentation, Mr. Hill explained he actually used about 990 acre-feet per year; with efficiency improvements, this amount could be far less. (*See* Tr. 6-16-11 at 220:1-2; ESR-13.)

V. CONCLUSION

For over a decade Applicant has been allowed to divert unpermitted and at will, while commissioning study after study on biology, hydrology, and agricultural characteristics. When Applicant's 2004 studies showed impacts, Applicant commissioned the 2006 studies, and when those showed impacts, the 2007 studies were commissioned. Various stages and iterations of EIR's have appeared and disappeared accordingly. Meanwhile, the primary study requested by CDFG to resolve its protest, a study of impacts to the lagoon, was never conducted.

In the view of these parties, Applicant's studies (and experts and lawyers) have failed to mask the harm to the river, or prove that Applicant's diversions to pasture are not excessive. If anything, Applicant's studies underline the adage "the devil is in the details" and the importance of such studies' constraints. Due to these constraints, the true impacts of Applicant's diversions remain largely untested and unknown. Perhaps the one conclusion Applicant and other parties agree upon in this matter is that there is a great deal of disagreement.

At hearing, Mr. Shutes repeatedly noted the uncertainty inherent in issuing a permit when CDFG's long-term flow and habitat studies are not completed. Nonetheless, CSPA et al. expect the Board to issue a permit; the remaining questions are for how much water, and with what conditions[20]. Given the ongoing study of the river and the precautionary approach inherent in the Board's public trust duties, CSPA et al recommend that the final permit should be: (1) limited to beneficial use and Water Code § 1004; (2) conditioned upon protective minimum bypass flows and curtailment triggers developed by Mr. Dettman; and (3) incorporate protective conditions and a long-term monitoring program to be paid for by applicant, as recommended by Mr. Shutes and CDFG. Mr. Dettman's permit conditions concern immediate impacts, while Mr. Shutes' recommendations address the need for long-term study, monitoring and reporting, and the responsibility of Applicant to pay for such measures.

After sufficient long-term study and monitoring (undertaken by CDFG or another agency), it may be possible that more water can be taken; it could also demonstrate that the limited diversions permitted so-far are still harmful to the river. Until such long-term study and monitoring are completed, the Board should place its public trust and statutory duties first and limit diversions in the permit accordingly.

Respectfully Submitted,

DATED: Sept 14, 2011

BY: DALazar
D. Adam Lazar
Center for Biological Diversity

[20] In conjunction, the Environmental Impact Report for Application 30166 should be revised and re-circulated for public comment based on actual permitted conditions, as such conditions were not included as alternatives or mitigation in the EIR. It is worth repeating once again that the EIR should not evaluate impacts only above an unpermitted and inflated "baseline" condition, and that the full breadth of impacts from all pumping should be accounted for in the biological impacts and cumulative impacts analysis.